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INDUCED POLARIZATION SURVEY

of the

PINAL CLAIM GROUP

PINAL COUNTY, ARIZONA

for

CUTLASS EXPLORATION AND DEVELOPMENT

February 1974

by

**HEINRICHS GEOEXPLORATION COMPANY
P.O. Box 5964 Tucson, Arizona**

GEOEX Job #896

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In Map Pocket:

Induced Polarization Location and Interpretation Plan

INTRODUCTION

At the request of Dr. R. H. Seraphim, Geological Consultant on behalf of Cutlass Exploration and Development, Heinrichs GEOEXploration Company completed an induced polarization (IP) survey on the Pinal Claim Group, Papago Indian Reservation, Pinal County, Arizona. This survey took place during the interim January 23 to February 7, 1974, after initial discussions and a brief field inspection by our Senior Geophysicist, Mr. Paul A. Head, with Dr. Seraphim.

GEOEX personnel involved in the field work were Mr. Russell Jolliffe, Geophysical Supervisor; Mr. Ronald Petersen, Geophysicist and Mr. Thomas Downing, Technical Assistant. Interpretation and report are by Mr. Chris S. Ludwig, Chief Geophysicist assisted by the GEOEX staff.

The purpose of this IP survey was to detect and delineate any significant subsurface sulfide zones in an area showing indications of disseminated copper mineralization. Previous geophysical work in the eastern half of the claim group indicated open-ended IP response to the west which the GEOEX survey extended and closed off.

CONCLUSIONS AND RECOMMENDATIONS

A generally N65°E trending zone of probable sulfide caused anomalous IP response, deepening to the west and about 1000 feet wide, was defined which apparently correlates with the previous IP anomalism; extending it from about 66W to 106W. This extended anomalism is of such size and strength as to be of possible economic significance, particularly if there is a favorable ratio present of ore polarizing minerals to non-ore polarizing minerals.

Drilling is recommended to determine the economic potential of the IP response. Two initial drill sites are suggested to test the strongest portions of the anomaly at depth. (Please refer to the appended "Comments on Drilling IP Targets" for further details on drilling.)

1. A vertical hole collared near 5S on Line 86W should test the IP high within its strongest portion, in a previously undrilled area, and apparently near favorable surface geologic indications. Top of the polarizable source is interpreted as being roughly 1000 feet deep, and the drill hole should be programmed for at least 1500 feet total depth to obtain a representative intersection of the causative subsurface source material.

2. A vertical hole is suggested near 0-N/S on Line 76W to test similar, somewhat shallower IP response than on Line 86W. This target is nearer to previous deep drilling, which was apparently only marginally interesting, and is therefore given a lower priority than the 86W target. Depth to the top of the source is estimated at roughly 750 feet, but the drill hole should sample to about 1500 for a proper evaluation.

If this initial drilling gives encouraging results, additional geophysical targets can be selected by reference to the surface projected anomalism on the plan map and its correlation with all other information available. The weaker fringes of IP response should also be given some consideration, particularly if in areas of geochemical or geological interest. In some districts, the weaker IP zones can be of more interest than the stronger zones which may only be reflecting higher pyrite concentrations. In this area, because of the moderate to low strength sulfide concentrations indicated, initial attention has been focused on the strongest response in the hope it would have the highest probability of being economically significant.

The previous geophysical coverage in the east half of the claim group was somewhat randomly situated and internally inconsistent, making it difficult to properly interpret and correlate with the recent coverage. Therefore, additional N-S IP coverage on 500 foot dipole lengths and 1000 foot line separations is recommended east of Line 76W to give a complete and coherent geophysical assessment of the property.

INTERPRETATION

The GEOEX coverage shows an elongate, generally N65°E trending IP anomaly, deepening (and probably weakening) to the southwest, ranging in relative strength from moderate to very weak. The moderate and weak strength response is probably the most significant and defines a zone 500 to 1500 feet in width, and at least 4000 feet long; open-ended to the east. A very weak anomalous fringe adds about 500 feet of width to the zone and at least 1000 feet of strike length to the southwest. Line 116W is considered to delimit the western end of the anomaly at least to the depths searched, i.e., 1500 to 2000 feet below surface.

Depth to the top of the anomaly source is variable and difficult to estimate. Lines O-N/S and 76W suggest roughly 750 feet to the top. Line 86W suggests about 1000 feet, Line 96W between 1000 and 1500 feet, and Line 106W deeper than 1500 feet to the source. Actually, the top of the source may be a very gradational increase in polarizable content rather than a sharply defined boundary.

Depth extent of the anomaly source is probably to at least 2000 feet below surface in that no decrease is indicated even on the deepest coverage.

The anomaly response pattern is compatible with a fairly steeply dipping, depth extended wide body, having little or no resistivity contrast with its surroundings. The lack of resistivity contrast is somewhat atypical but could be explained, for example, by silicification (generally a high resistivity rock alteration product) counteracting the effect of any conductive polarizable mineralization present.

The cause of the anomalous polarization is likely metallic lustered sulfide mineralization such as pyrite or chalcopyrite, although other metallic lustered non-sulfide minerals, such as certain iron and manganese oxides, or graphite or conceivably even certain clay minerals, could be contributing to the response. In the strongest parts of the anomaly, about 0.5 to 2 percent total sulfide by volume (roughly 1 to 4 percent by weight) is estimated based on the interpreted source geometry and comparison with "typical" disseminated sulfide zones in the southwestern U.S. The weaker fringing response perhaps represents less than 0.5 to 1 percent total sulfide by volume.

These estimated sulfide concentrations are meant only as a crude relative guide and in practice are often found to be at considerable variance with actual sulfide assays. Regardless, the indicated polarizable concentration is high enough that the anomaly could be of economic interest providing the ratio between ore polarizing mineral content (such as chalcopyrite, molybdenite, etc.) and non-ore polarizing mineral content (such as pyrite, magnetite, etc.) is reasonably high.

Outside the anomaly, most of the area shows a rather low, uniform, background IP response. The resistivity shows little correlation with the IP. Lower resistivities are noted on the north halves of the N-S lines and near surface along most of Line 116W and are probably caused by a relatively conductive veneer of alluvium overlying the more resistive bedrock.

The self potentials are quite uniform over the area surveyed and show no obvious correlation with the IP. Lack of self potential lows implies a lack of actively oxidizing, relatively interconnected, conductive sulfides within several hundred feet of the surface. This is not in conflict with the IP which suggests a rather disseminated, not particularly conductive, deep sulfide zone in this case.

PROCEDURES

A GEOEX MK-4 multifrequency IP system was employed to obtain this coverage with sending frequency pairs of 0.3 vs. 3.0 hz and 0.1 vs. 1.0 hz. The standard collinear dipole-dipole array was used with both 500 and 1000 foot dipole lengths on all lines except Line O-N/S which had 500 foot dipoles only. Data was obtained with "spreads" of five sending electrodes for the 1000 foot dipole coverage and seven sending electrodes for the 500 foot dipole coverage.

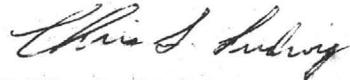
Sending-receiving dipole separations range from 1 to 6 dipole lengths on all lines and, typically, this should give resolvable depth penetration within the zone ranging from about 300 feet to as much as 2000 feet below surface for the 1000 foot dipole coverage. The 500 foot dipole lines would double the resolution but would penetrate only about one half as deep as the 1000 foot dipole lines.

A total of 20.5 line miles of IP coverage was obtained on this survey, of which 12.3 miles is "subsurface" plotted data.

The IP data are presented on "sectional" data sheets, one for each spread, showing, from top to bottom; resistivity, percent frequency effect (PFE), and metallic conduction factor (MCF) contoured in "sectional" form. The self potential readings taken in conjunction with the IP readings are shown at the bottom of the 500 foot dipole sectional sheets in profile form. An "Induced Polarization Location and Interpretation Plan" is also included showing the surface projected plan interpretation at a scale of 1" = 400' to overlay the Cutlass geology and claim base maps.

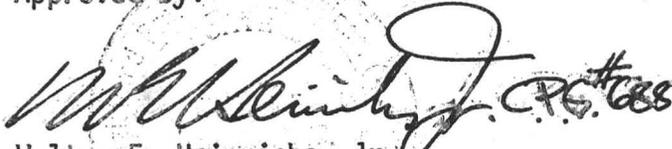
Respectfully submitted,

Heinrichs GEOEXploration Company

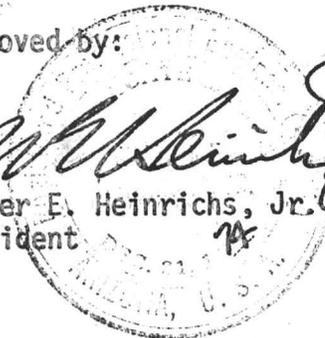


Chris S. Ludwig
Chief Geophysicist

Approved by:



Walter E. Heinrichs, Jr.
President



COMMENTS ON DRILLING I.P. TARGETS

To maximize the probability that a recommended drill hole will intersect the source of an induced polarization anomaly, the following points should be considered:

1. The anomaly has been caused by some physical property, hopefully a polarizable body containing economically interesting metallic mineralization, and this property should be determined before abandoning the anomaly.

2. Location of drill holes should be made relative to the actual sending and receiving electrode positions as they exist on the ground.

3. Due to inherent limitations in the I.P. method, depth interpretations are only approximate and the determination of dip is severely limited, particularly for angles greater than 45° . Also, targets can generally be laterally resolved no finer than the station spacing (dipole length). Because of these limitations, targets less than one dipole spacing in width, particularly when steeply dipping or deeper than the dipole length, may be difficult to intersect. In these cases, several drill holes in a fence line should be considered. For the steeply dipping cases, angle drilling may also prove advantageous, mainly where the direction of dip can be geologically inferred and the drill hole oriented such that an optimum intersection of the zone of interest is obtained.

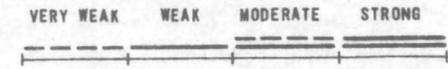
4. An observed anomaly can be the effect of a polarizable body laterally offset to the side of a line and therefore, if practical, drilling should be confined to those portions of the anomalous zones well defined by several lines. Also, it should be noted that a single line cannot define the strike direction of an elongate anomalous zone - another reason for utilizing several parallel lines.

5. Logging of the drill core must be done with special care to note the quantity of all possible polarizable material such as pyrite, graphite, magnetite, manganese oxides and clay minerals as well as the polarizable ore minerals. The anomalous source could conceivably be overlooked if the core is not carefully logged.

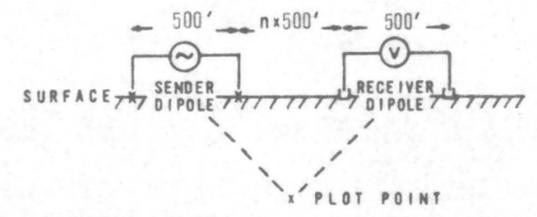
6. Typical sections of core representing the gross physical properties of material encountered in the drilling should be tested in the laboratory for their I.P. parameters, if there is some doubt about confirmation of the anomalous source.

INDUCED POLARIZATION TRAVERSE
SECTIONAL DATA SHEET
of
PINAL CLAIM GROUP
for
CUTLASS EXPLORATION & DEVELOPMENT

RELATIVE ANOMALY STRENGTH

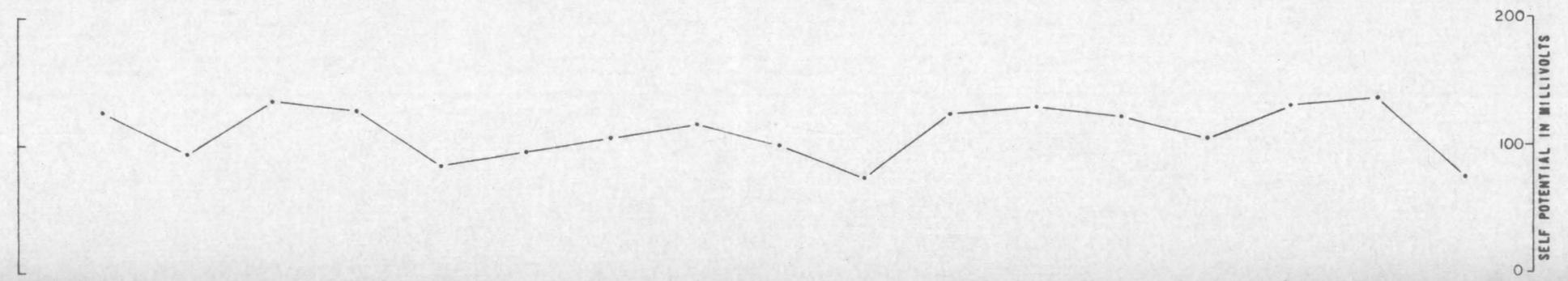
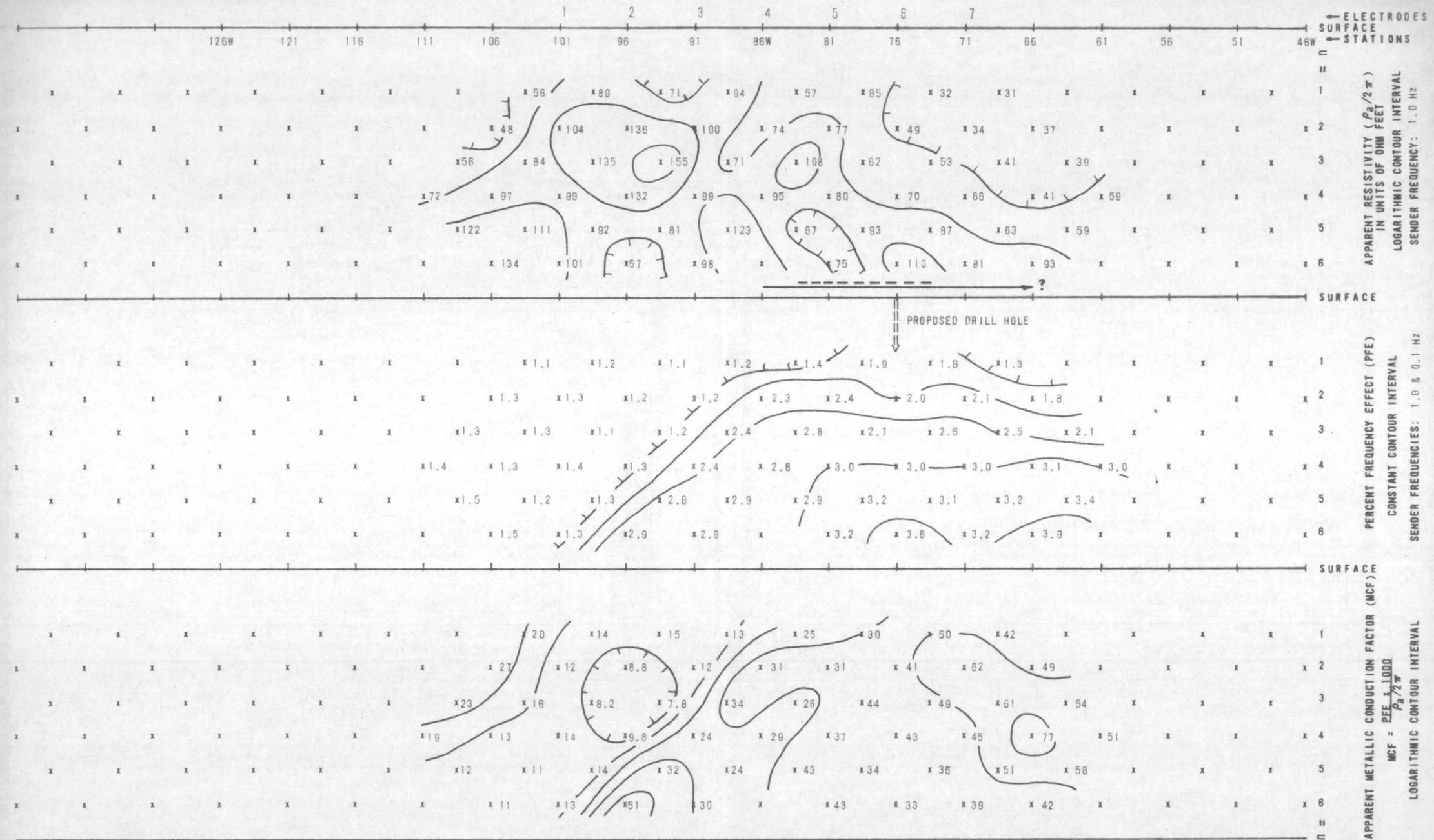


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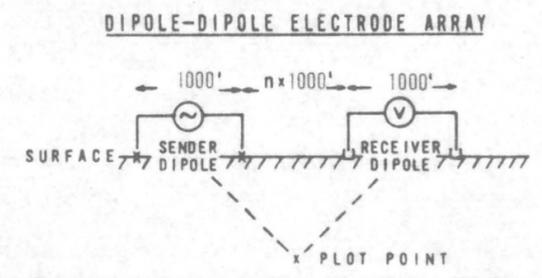
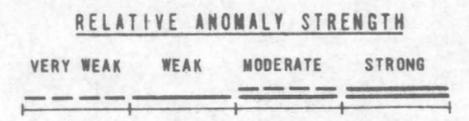


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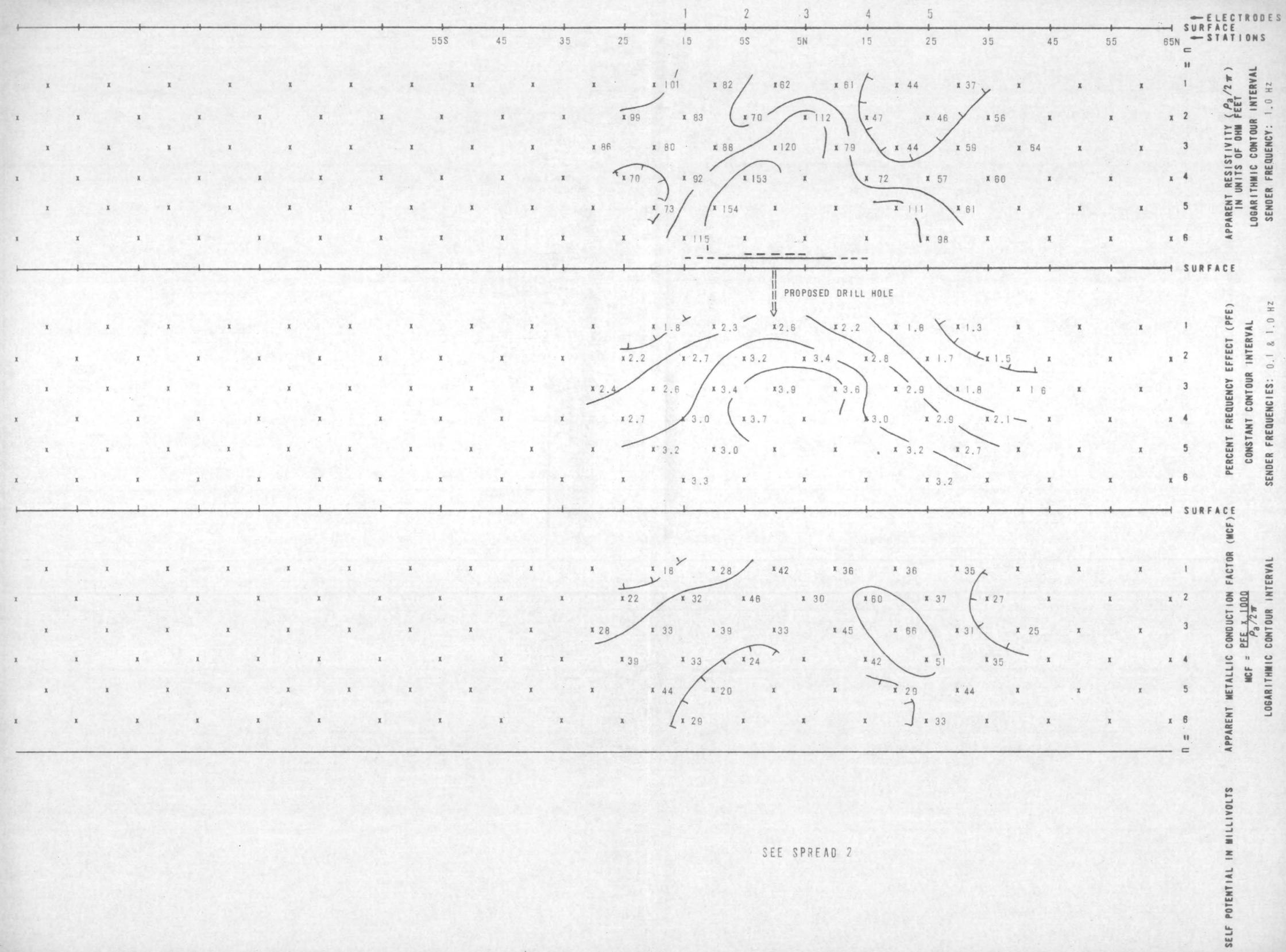
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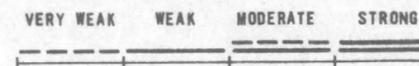
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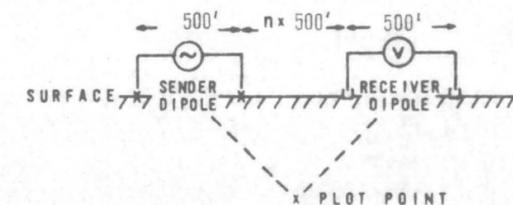
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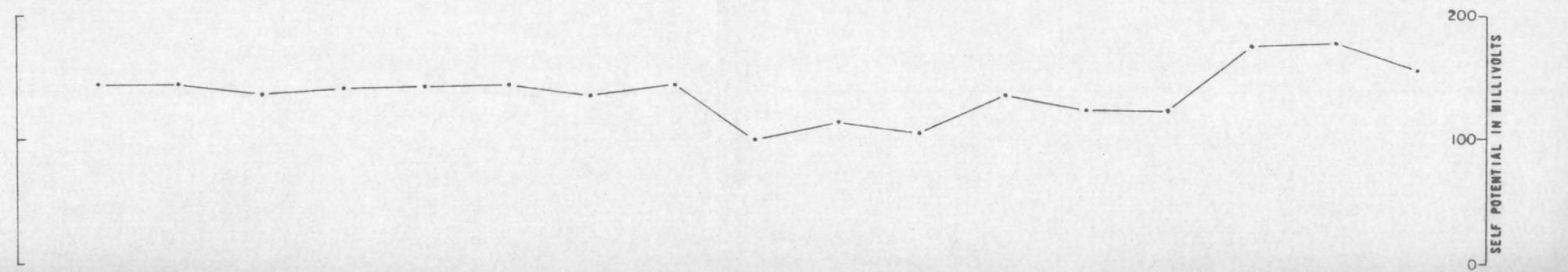
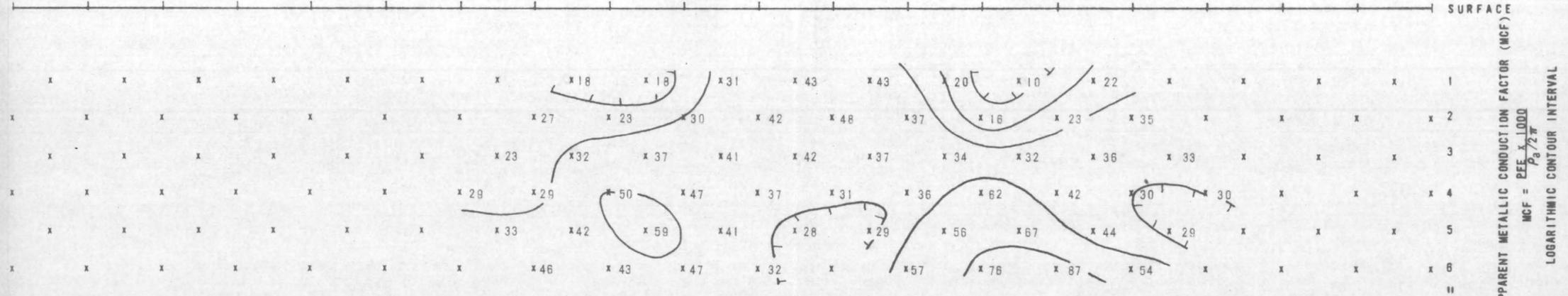
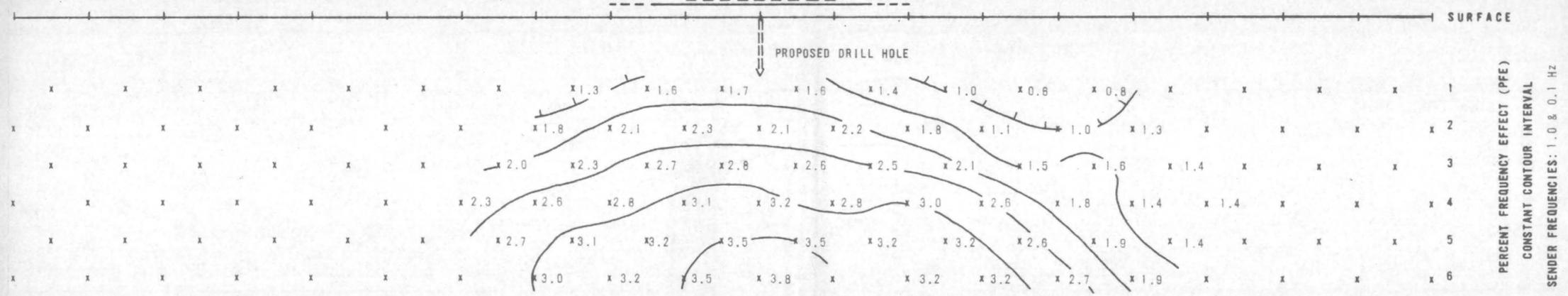
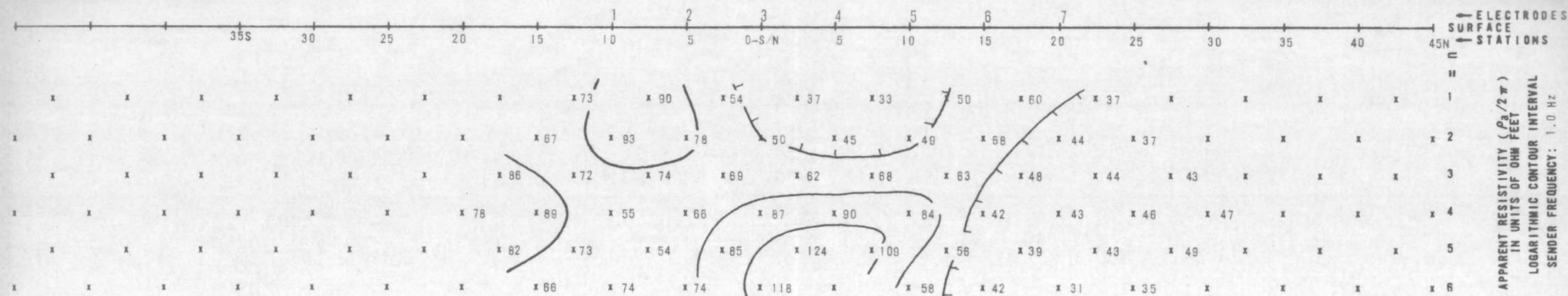
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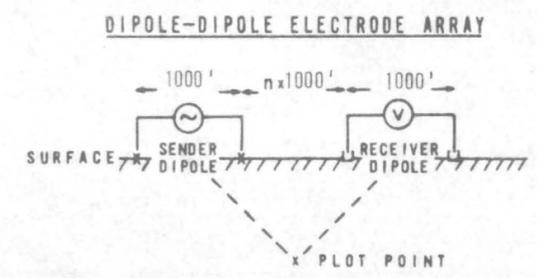
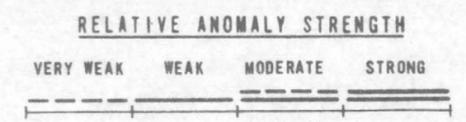
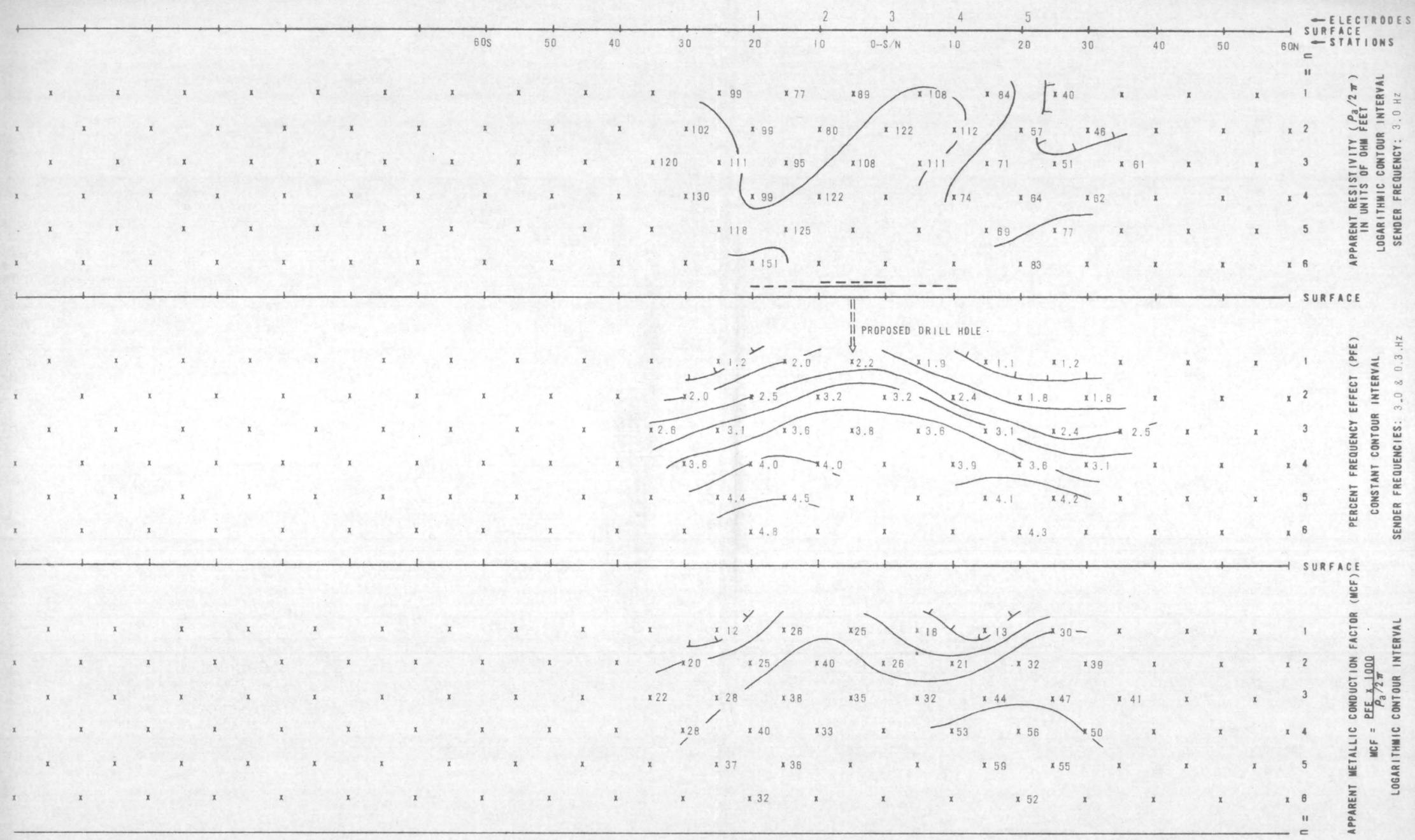


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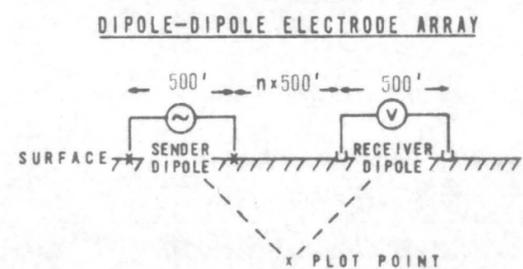
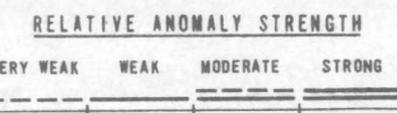
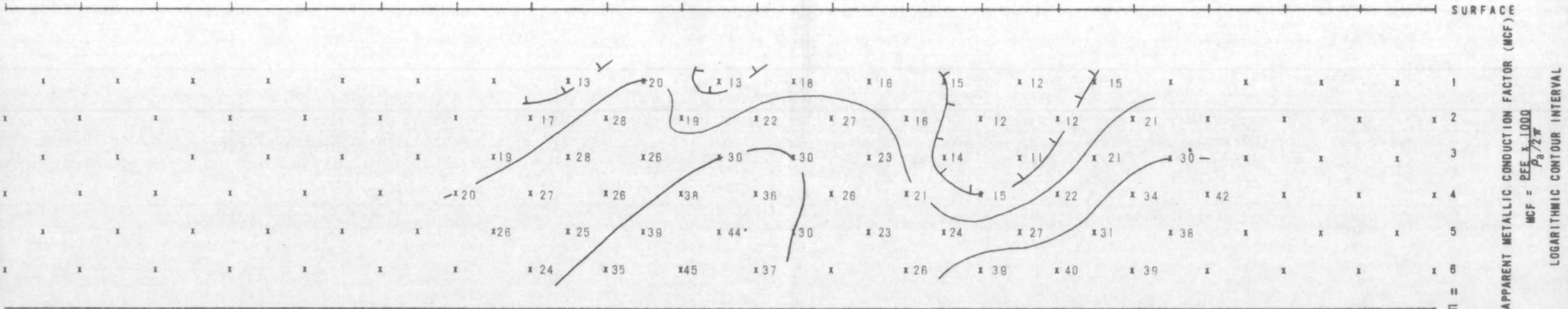
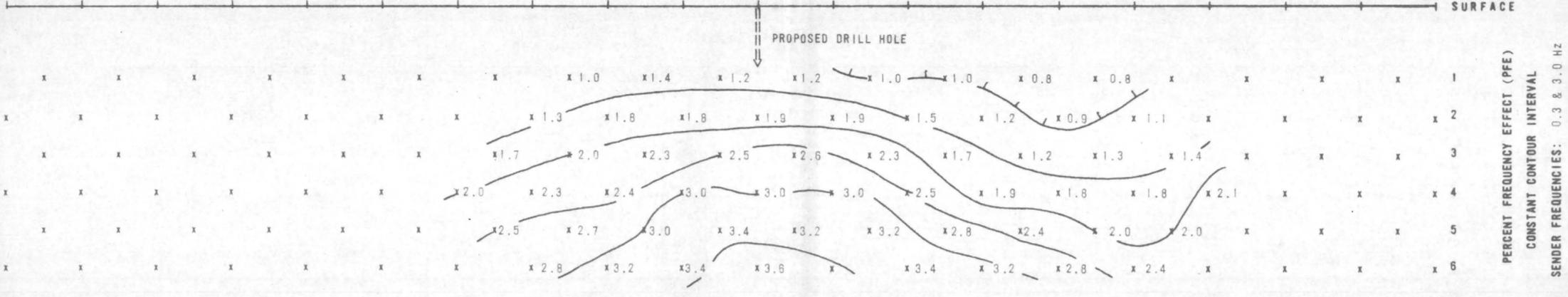
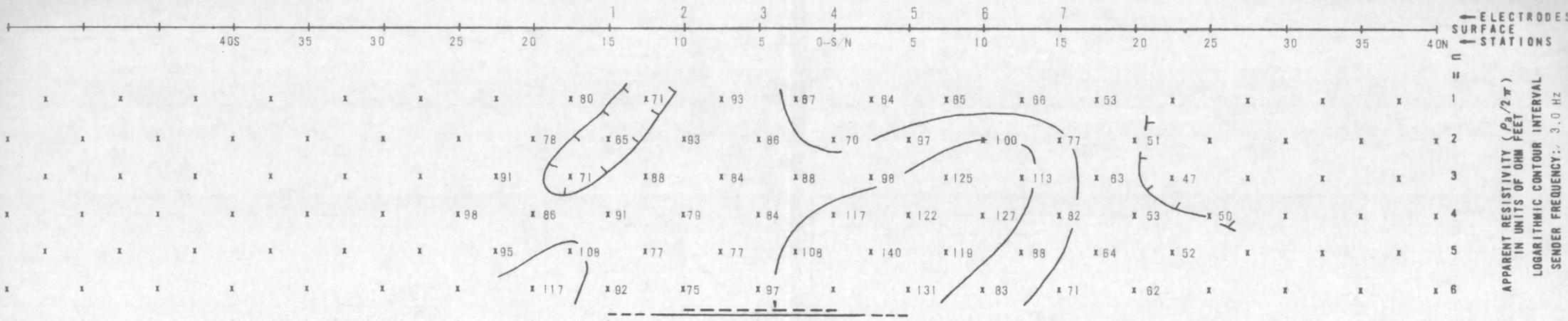
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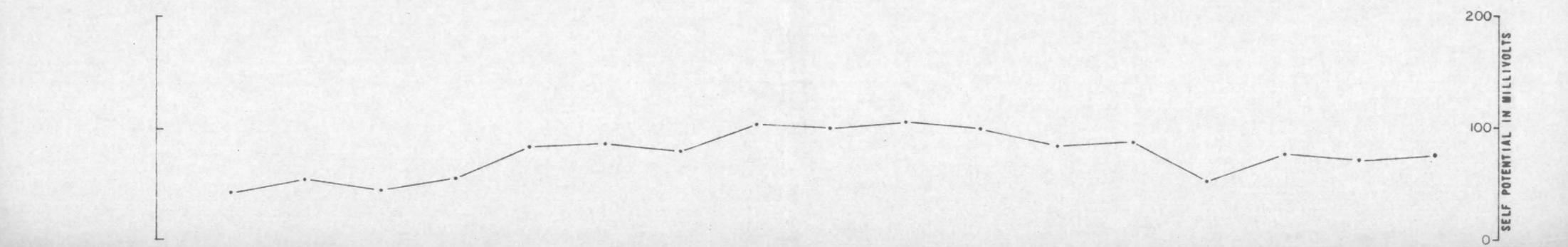
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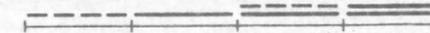
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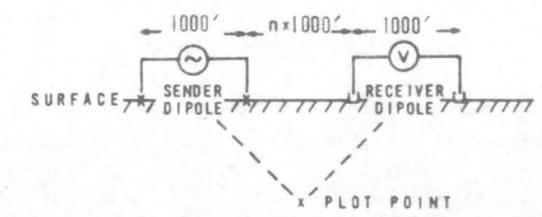
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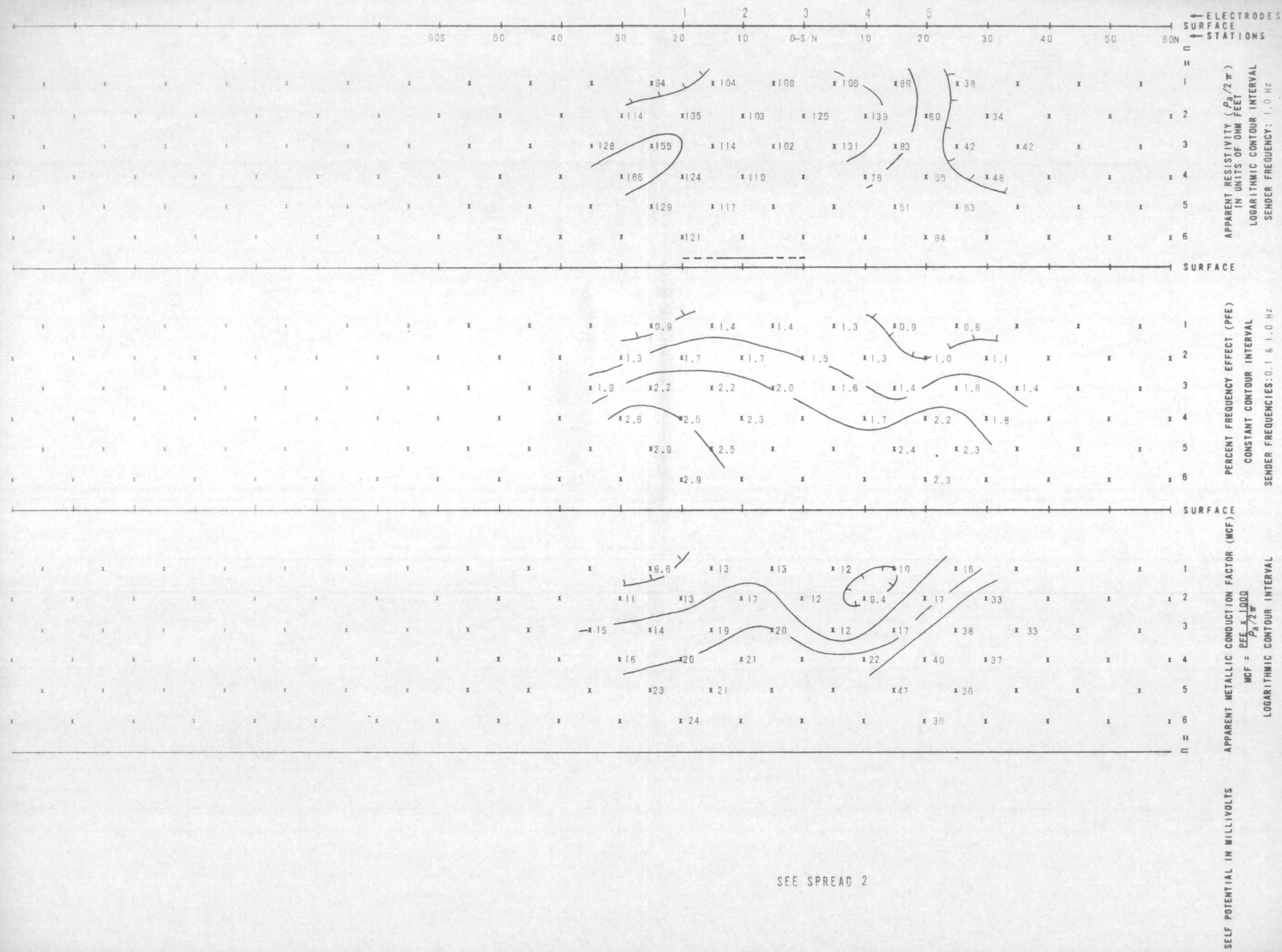
VERY WEAK WEAK MODERATE STRONG



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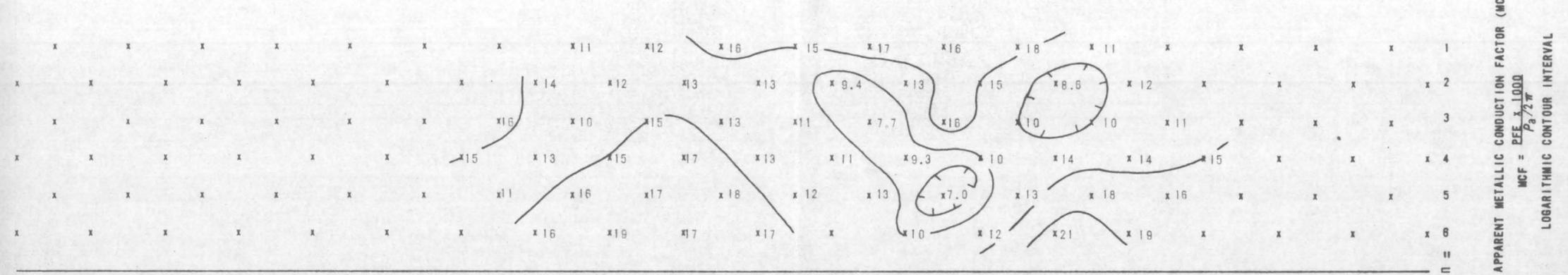
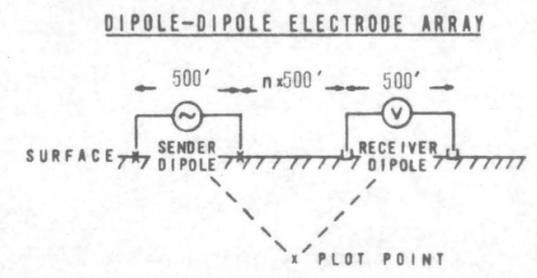
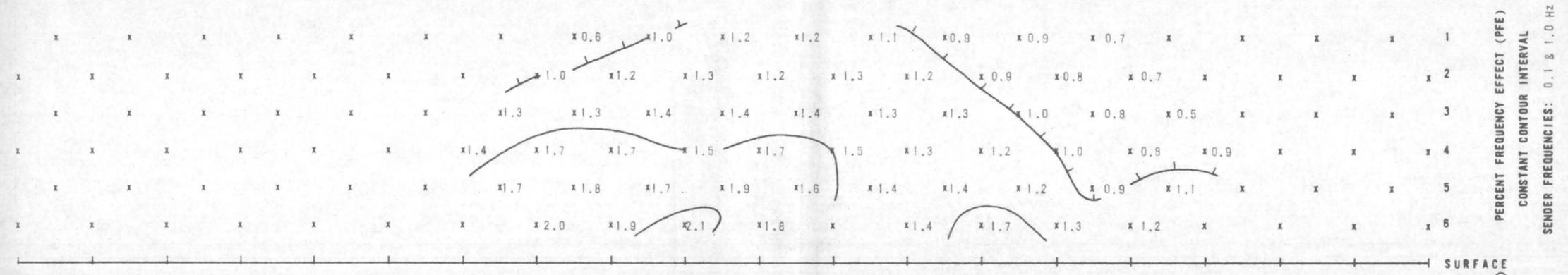
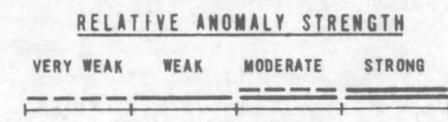
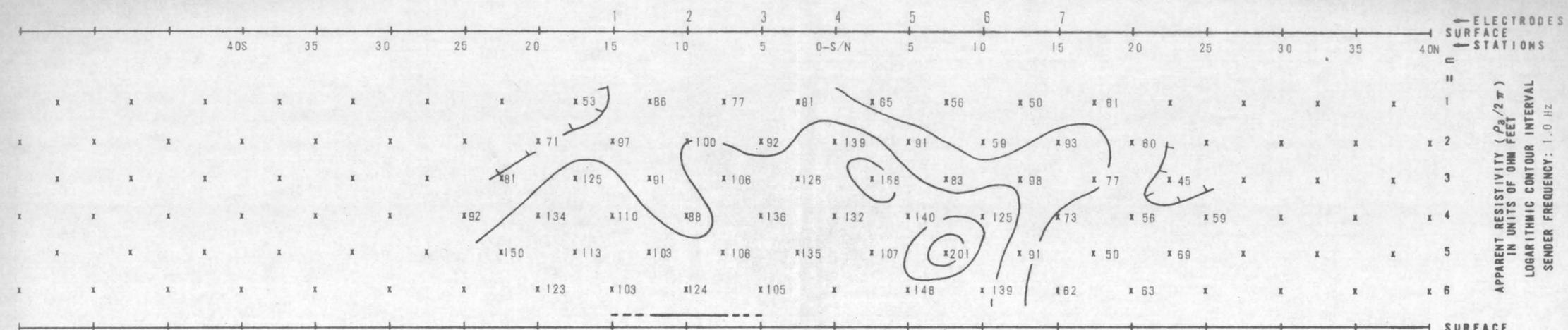
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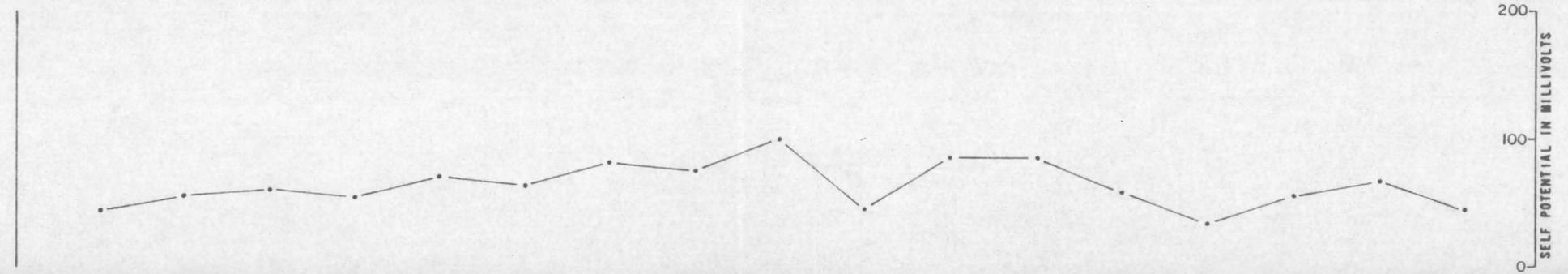
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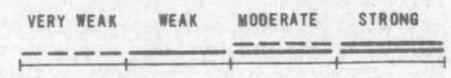


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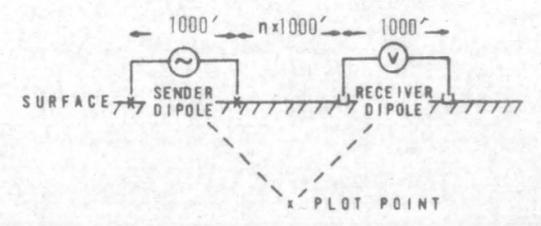
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DIPOLE-DIPOLE ELECTRODE ARRAY



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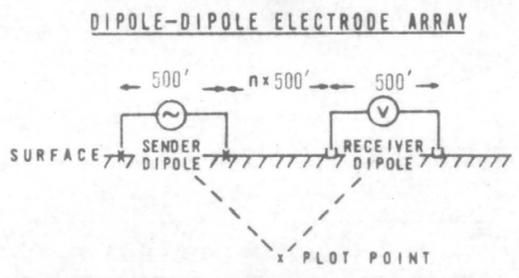
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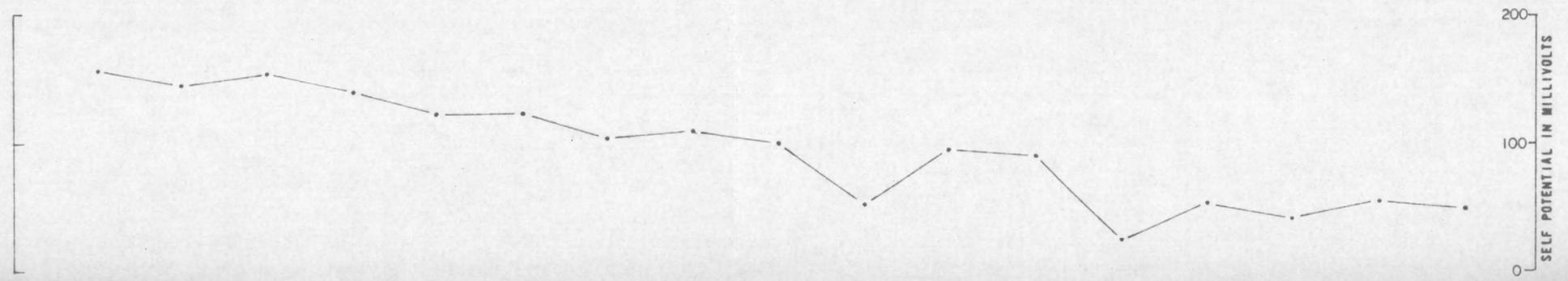
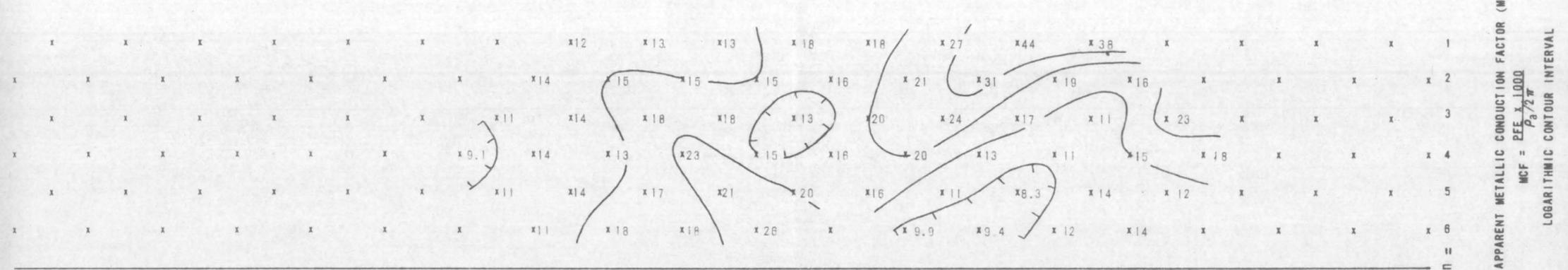
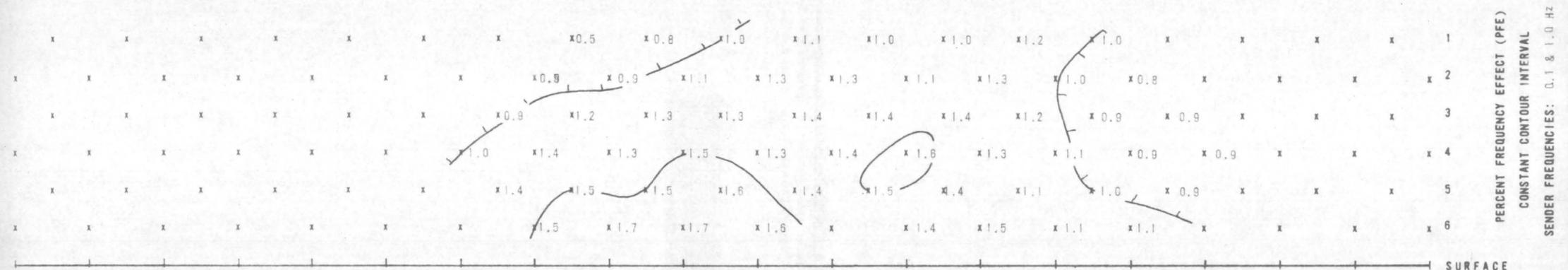
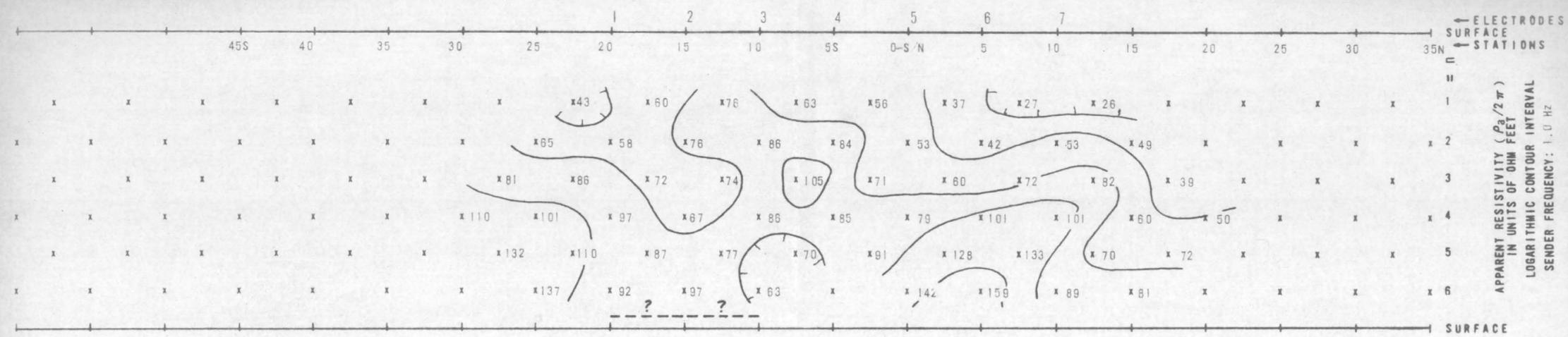
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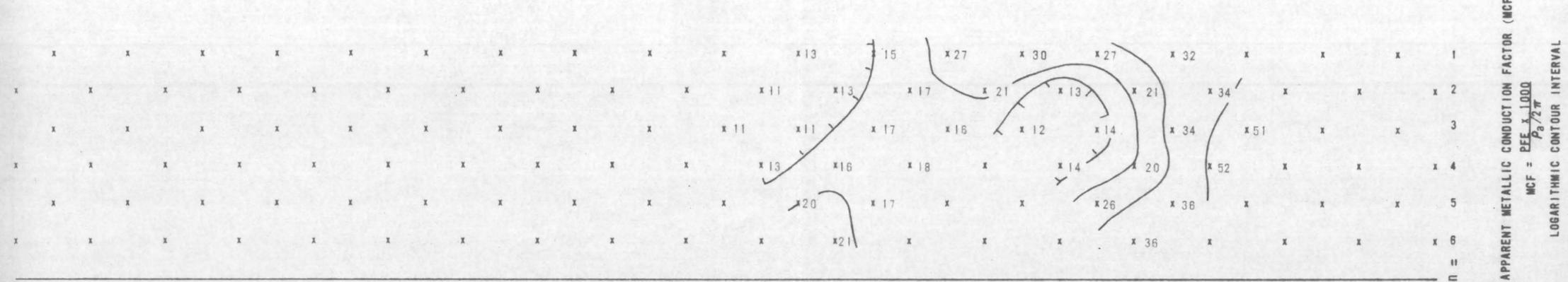
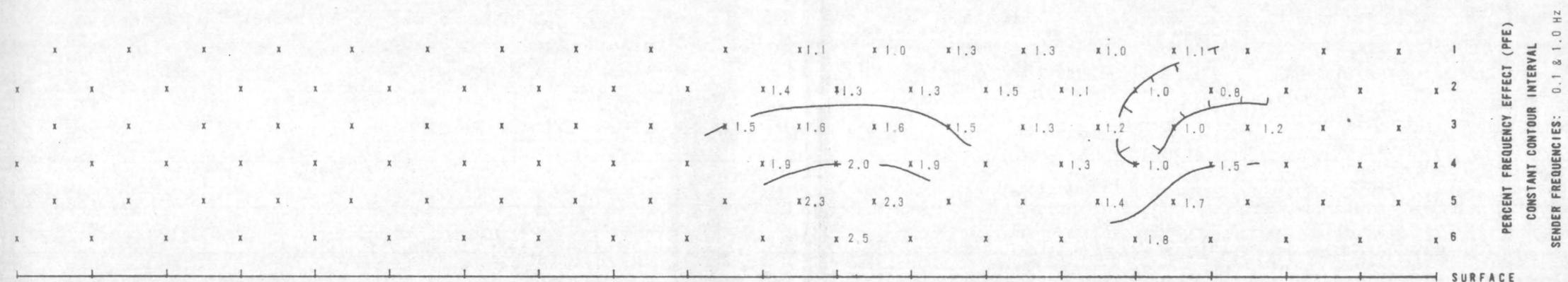
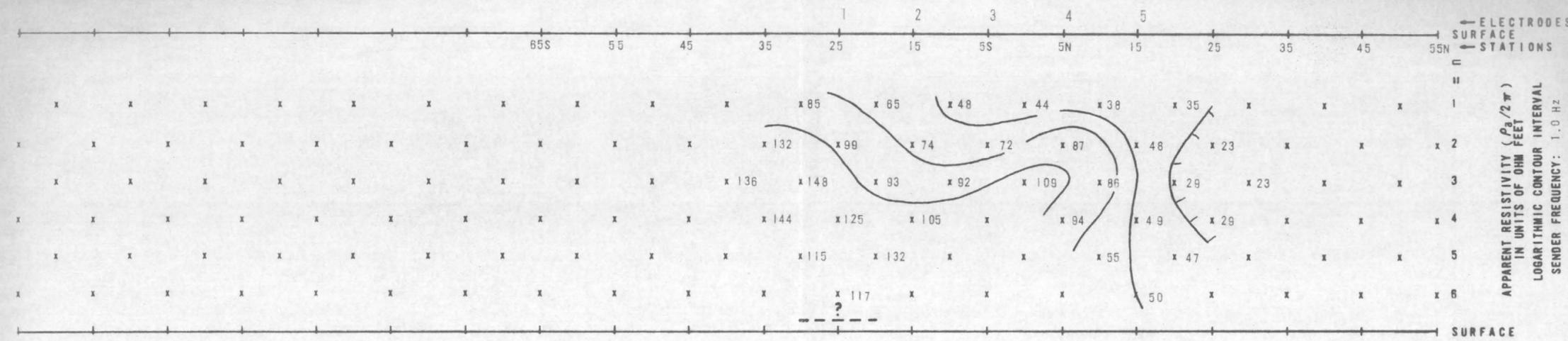


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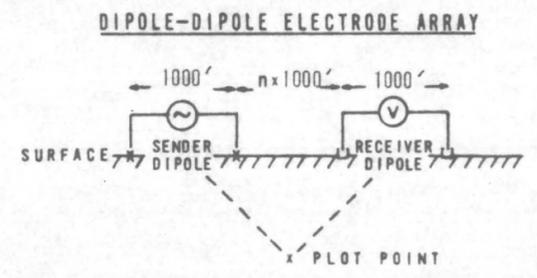


SEE SPREAD 2

896-74

LINE NO.
116W
SPREAD(S)
1
BEARING
N/S

INDUCED POLARIZATION TRAVERSE
SECTIONAL DATA SHEET
of
PINAL CLAIM GROUP
for
CUTLASS EXPLORATION & DEVELOPMENT



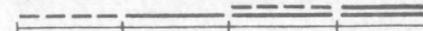
DATE
FEBRUARY 1974

HEINRICHS  GEOEXPLORATION COMPANY
806 W. GRANT ROAD, POST OFFICE BOX 5964, TUCSON, ARIZ., 85703, PHONE: (602)623-0578

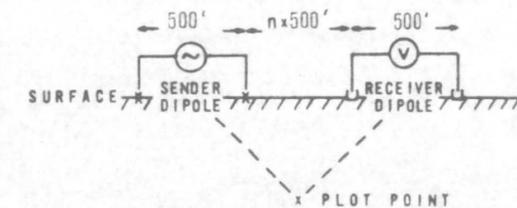
INDUCED POLARIZATION TRAVERSE
SECTIONAL DATA SHEET
of
PINAL CLAIM GROUP
for
CUTLASS EXPLORATION & DEVELOPMENT

RELATIVE ANOMALY STRENGTH

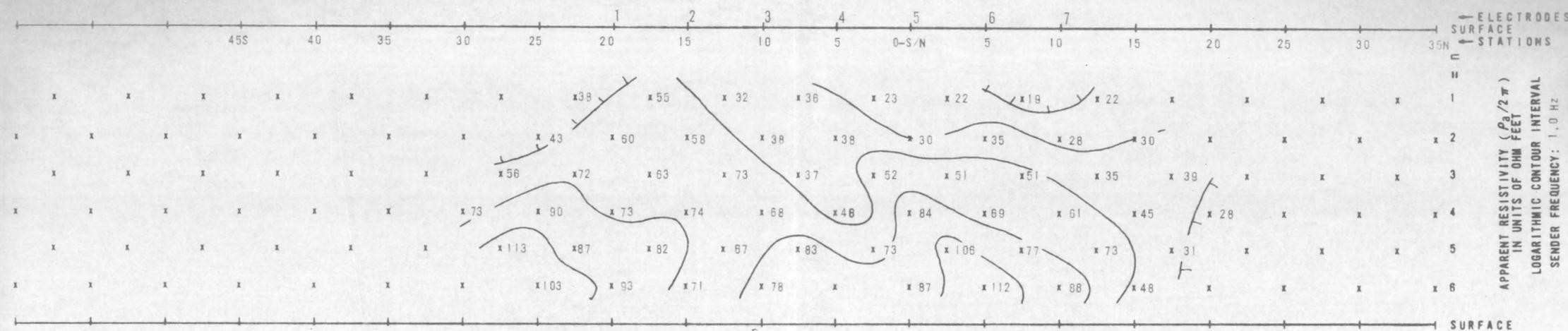
VERY WEAK WEAK MODERATE STRONG



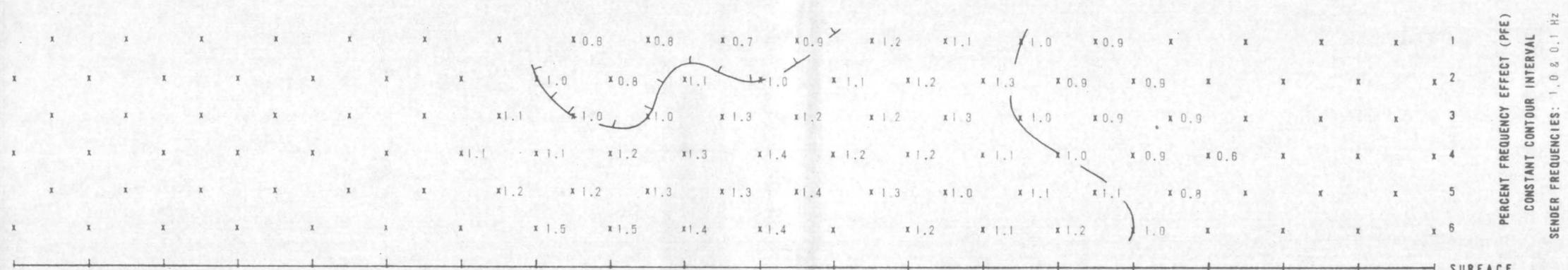
DIPOLE-DIPOLE ELECTRODE ARRAY



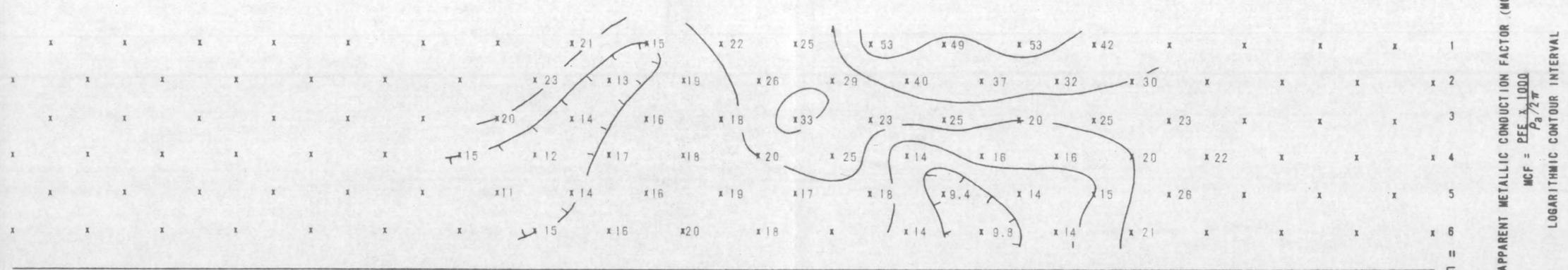
DATE
FEBRUARY 1974



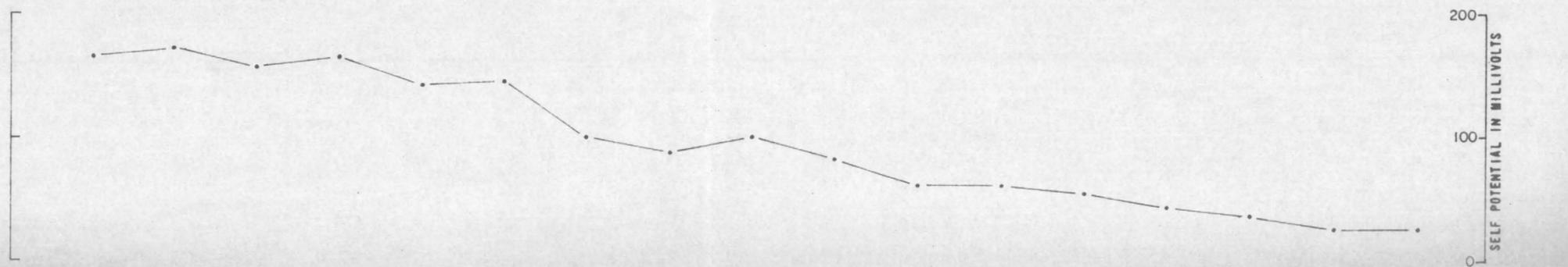
APPARENT RESISTIVITY ($P_a/2\pi$)
IN UNITS OF OHM FEET
LOGARITHMIC CONTOUR INTERVAL
SENDER FREQUENCY: 1.0 Hz



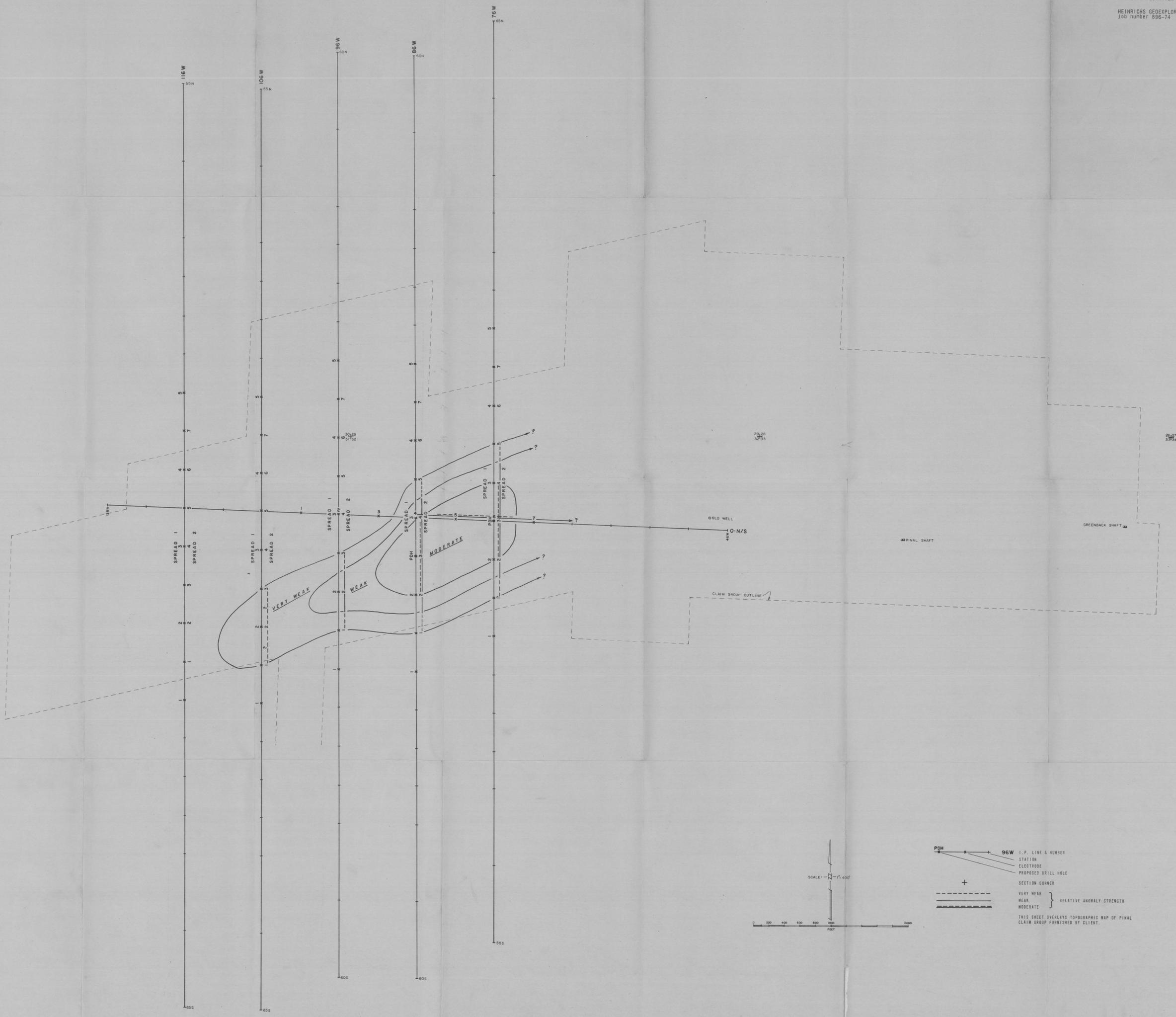
PERCENT FREQUENCY EFFECT (PFE)
CONSTANT CONTOUR INTERVAL
SENDER FREQUENCIES: 1.0 & 0.1 Hz



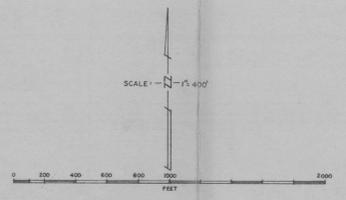
APPARENT METALLIC CONDUCTION FACTOR (MCF)
 $MCF = PFE \times \frac{1000}{P_a/2\pi}$
LOGARITHMIC CONTOUR INTERVAL



HEINRICHS  GEOEXPLORATION COMPANY
808 W. GRANT ROAD, POST OFFICE BOX 5964, TUCSON, ARIZ., 85703, PHONE: (602)623-0578



PDH + 96W I.P. LINE & NUMBER
 x STATION
 | ELECTRODE
 x PROPOSED DRILL HOLE
 + SECTION CORNER
 } RELATIVE ANOMALY STRENGTH
 VERY WEAK
 WEAK
 MODERATE
 THIS SHEET OVERLAYS TOPOGRAPHIC MAP OF PINAL CLAIM GROUP FURNISHED BY CLIENT.



28127
33934

INDUCED POLARIZATION SURVEY

of the

PINAL CLAIM GROUP

PINAL COUNTY, ARIZONA

for

CUTLASS EXPLORATION AND DEVELOPMENT

February 1974

by

HEINRICHS GEOEXPLORATION COMPANY
P.O. Box 5964 Tucson, Arizona

GEOEX Job #896

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Line 116W (Spread 2, 500' dipoles)	

In Map Pocket:

Induced Polarization Location and Interpretation Plan

INTRODUCTION

At the request of Dr. R. H. Seraphim, Geological Consultant on behalf of Cutlass Exploration and Development, Heinrichs GEOEXploration Company completed an induced polarization (IP) survey on the Pinal Claim Group, Papago Indian Reservation, Pinal County, Arizona. This survey took place during the interim January 23 to February 7, 1974, after initial discussions and a brief field inspection by our Senior Geophysicist, Mr. Paul A. Head, with Dr. Seraphim.

GEOEX personnel involved in the field work were Mr. Russell Jolliffe, Geophysical Supervisor; Mr. Ronald Petersen, Geophysicist and Mr. Thomas Downing, Technical Assistant. Interpretation and report are by Mr. Chris S. Ludwig, Chief Geophysicist assisted by the GEOEX staff.

The purpose of this IP survey was to detect and delineate any significant subsurface sulfide zones in an area showing indications of disseminated copper mineralization. Previous geophysical work in the eastern half of the claim group indicated open-ended IP response to the west which the GEOEX survey extended and closed off.

CONCLUSIONS AND RECOMMENDATIONS

A generally N65°E trending zone of probable sulfide caused anomalous IP response, deepening to the west and about 1000 feet wide, was defined which apparently correlates with the previous IP anomalism; extending it from about 66W to 106W. This extended anomalism is of such size and strength as to be of possible economic significance, particularly if there is a favorable ratio present of ore polarizing minerals to non-ore polarizing minerals.

Drilling is recommended to determine the economic potential of the IP response. Two initial drill sites are suggested to test the strongest portions of the anomaly at depth. (Please refer to the appended "Comments on Drilling IP Targets" for further details on drilling.)

1. A vertical hole collared near 5S on Line 86W should test the IP high within its strongest portion, in a previously undrilled area, and apparently near favorable surface geologic indications. Top of the polarizable source is interpreted as being roughly 1000 feet deep, and the drill hole should be programmed for at least 1500 feet total depth to obtain a representative intersection of the causative subsurface source material.

2. A vertical hole is suggested near 0-N/S on Line 76W to test similar, somewhat shallower IP response than on Line 86W. This target is nearer to previous deep drilling, which was apparently only marginally interesting, and is therefore given a lower priority than the 86W target. Depth to the top of the source is estimated at roughly 750 feet, but the drill hole should sample to about 1500 for a proper evaluation.

If this initial drilling gives encouraging results, additional geophysical targets can be selected by reference to the surface projected anomalism on the plan map and its correlation with all other information available. The weaker fringes of IP response should also be given some consideration, particularly if in areas of geochemical or geological interest. In some districts, the weaker IP zones can be of more interest than the stronger zones which may only be reflecting higher pyrite concentrations. In this area, because of the moderate to low strength sulfide concentrations indicated, initial attention has been focused on the strongest response in the hope it would have the highest probability of being economically significant.

The previous geophysical coverage in the east half of the claim group was somewhat randomly situated and internally inconsistent, making it difficult to properly interpret and correlate with the recent coverage. Therefore, additional N-S IP coverage on 500 foot dipole lengths and 1000 foot line separations is recommended east of Line 76W to give a complete and coherent geophysical assessment of the property.

INTERPRETATION

The GEOEX coverage shows an elongate, generally N65°E trending IP anomaly, deepening (and probably weakening) to the southwest, ranging in relative strength from moderate to very weak. The moderate and weak strength response is probably the most significant and defines a zone 500 to 1500 feet in width, and at least 4000 feet long; open-ended to the east. A very weak anomalous fringe adds about 500 feet of width to the zone and at least 1000 feet of strike length to the southwest. Line 116W is considered to delimit the western end of the anomaly at least to the depths searched, i.e., 1500 to 2000 feet below surface.

Depth to the top of the anomaly source is variable and difficult to estimate. Lines 0-N/S and 76W suggest roughly 750 feet to the top. Line 86W suggests about 1000 feet, Line 96W between 1000 and 1500 feet, and Line 106W deeper than 1500 feet to the source. Actually, the top of the source may be a very gradational increase in polarizable content rather than a sharply defined boundary.

Depth extent of the anomaly source is probably to at least 2000 feet below surface in that no decrease is indicated even on the deepest coverage.

The anomaly response pattern is compatible with a fairly steeply dipping, depth extended wide body, having little or no resistivity contrast with its surroundings. The lack of resistivity contrast is somewhat atypical but could be explained, for example, by silicification (generally a high resistivity rock alteration product) counteracting the effect of any conductive polarizable mineralization present.

The cause of the anomalous polarization is likely metallic lustered sulfide mineralization such as pyrite or chalcopyrite, although other metallic lustered non-sulfide minerals, such as certain iron and manganese oxides, or graphite or conceivably even certain clay minerals, could be contributing to the response. In the strongest parts of the anomaly, about 0.5 to 2 percent total sulfide by volume (roughly 1 to 4 percent by weight) is estimated based on the interpreted source geometry and comparison with "typical" disseminated sulfide zones in the southwestern U.S. The weaker fringing response perhaps represents less than 0.5 to 1 percent total sulfide by volume.

These estimated sulfide concentrations are meant only as a crude relative guide and in practice are often found to be at considerable variance with actual sulfide assays. Regardless, the indicated polarizable concentration is high enough that the anomaly could be of economic interest providing the ratio between ore polarizing mineral content (such as chalcopyrite, molybdenite, etc.) and non-ore polarizing mineral content (such as pyrite, magnetite, etc.) is reasonably high.

Outside the anomaly, most of the area shows a rather low, uniform, background IP response. The resistivity shows little correlation with the IP. Lower resistivities are noted on the north halves of the N-S lines and near surface along most of Line 116W and are probably caused by a relatively conductive veneer of alluvium overlying the more resistive bedrock.

The self potentials are quite uniform over the area surveyed and show no obvious correlation with the IP. Lack of self potential lows implies a lack of actively oxidizing, relatively interconnected, conductive sulfides within several hundred feet of the surface. This is not in conflict with the IP which suggests a rather disseminated, not particularly conductive, deep sulfide zone in this case.

PROCEDURES

A GEOEX MK-4 multifrequency IP system was employed to obtain this coverage with sending frequency pairs of 0.3 vs. 3.0 hz and 0.1 vs. 1.0 hz. The standard collinear dipole-dipole array was used with both 500 and 1000 foot dipole lengths on all lines except Line 0-N/S which had 500 foot dipoles only. Data was obtained with "spreads" of five sending electrodes for the 1000 foot dipole coverage and seven sending electrodes for the 500 foot dipole coverage.

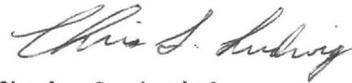
Sending-receiving dipole separations range from 1 to 6 dipole lengths on all lines and, typically, this should give resolvable depth penetration within the zone ranging from about 300 feet to as much as 2000 feet below surface for the 1000 foot dipole coverage. The 500 foot dipole lines would double the resolution but would penetrate only about one half as deep as the 1000 foot dipole lines.

A total of 20.5 line miles of IP coverage was obtained on this survey, of which 12.3 miles is "subsurface" plotted data.

The IP data are presented on "sectional" data sheets, one for each spread, showing, from top to bottom; resistivity, percent frequency effect (PFE), and metallic conduction factor (MCF) contoured in "sectional" form. The self potential readings taken in conjunction with the IP readings are shown at the bottom of the 500 foot dipole sectional sheets in profile form. An "Induced Polarization Location and Interpretation Plan" is also included showing the surface projected plan interpretation at a scale of 1" = 400' to overlay the Cutlass geology and claim base maps.

Respectfully submitted,

Heinrichs GEOEXploration Company

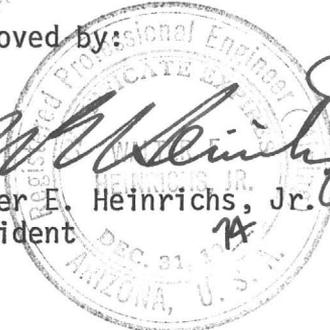


Chris S. Ludwig
Chief Geophysicist

Approved by:



Walter E. Heinrichs, Jr.
President



COMMENTS ON DRILLING I.P. TARGETS

To maximize the probability that a recommended drill hole will intersect the source of an induced polarization anomaly, the following points should be considered:

1. The anomaly has been caused by some physical property, hopefully a polarizable body containing economically interesting metallic mineralization, and this property should be determined before abandoning the anomaly.

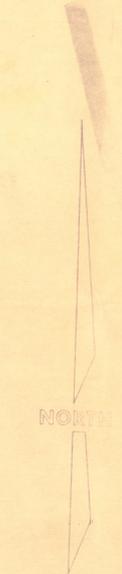
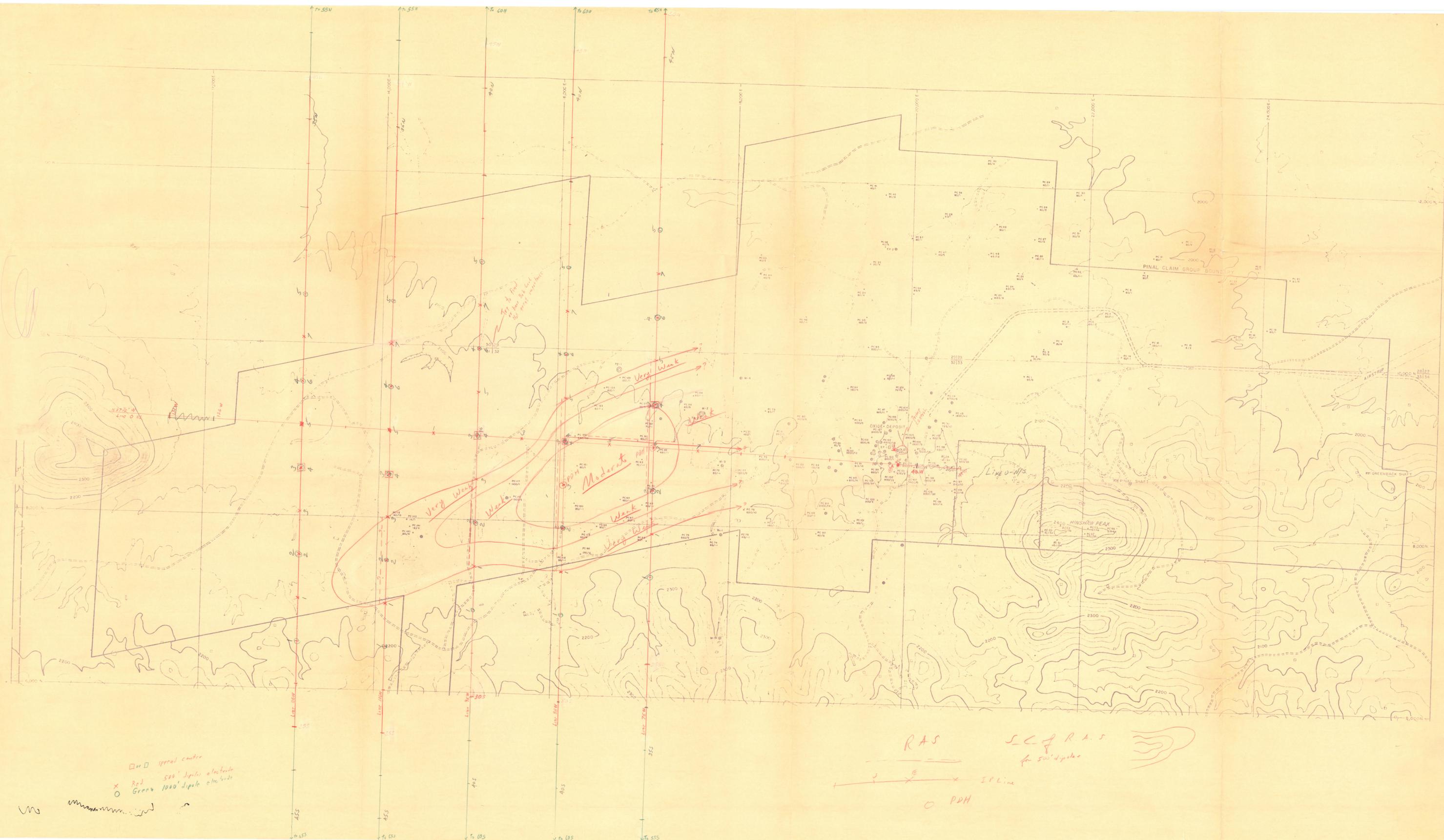
2. Location of drill holes should be made relative to the actual sending and receiving electrode positions as they exist on the ground.

3. Due to inherent limitations in the I.P. method, depth interpretations are only approximate and the determination of dip is severely limited, particularly for angles greater than 45° . Also, targets can generally be laterally resolved no finer than the station spacing (dipole length). Because of these limitations, targets less than one dipole spacing in width, particularly when steeply dipping or deeper than the dipole length, may be difficult to intersect. In these cases, several drill holes in a fence line should be considered. For the steeply dipping cases, angle drilling may also prove advantageous, mainly where the direction of dip can be geologically inferred and the drill hole oriented such that an optimum intersection of the zone of interest is obtained.

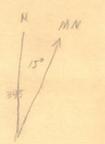
4. An observed anomaly can be the effect of a polarizable body laterally offset to the side of a line and therefore, if practical, drilling should be confined to those portions of the anomalous zones well defined by several lines. Also, it should be noted that a single line cannot define the strike direction of an elongate anomalous zone - another reason for utilizing several parallel lines.

5. Logging of the drill core must be done with special care to note the quantity of all possible polarizable material such as pyrite, graphite, magnetite, manganese oxides and clay minerals as well as the polarizable ore minerals. The anomalous source could conceivably be overlooked if the core is not carefully logged.

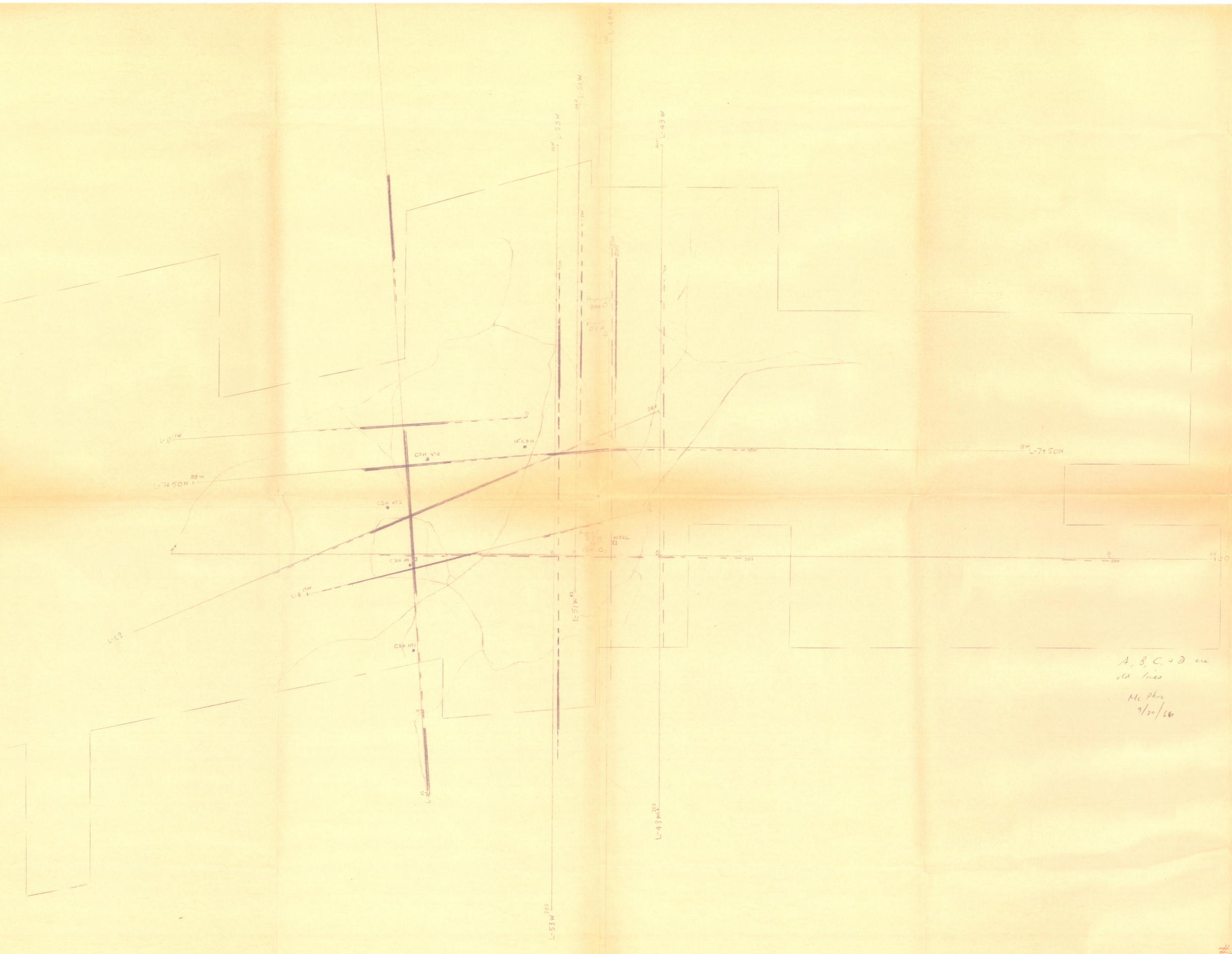
6. Typical sections of core representing the gross physical properties of material encountered in the drilling should be tested in the laboratory for their I.P. parameters, if there is some doubt about confirmation of the anomalous source.



1" = 400'

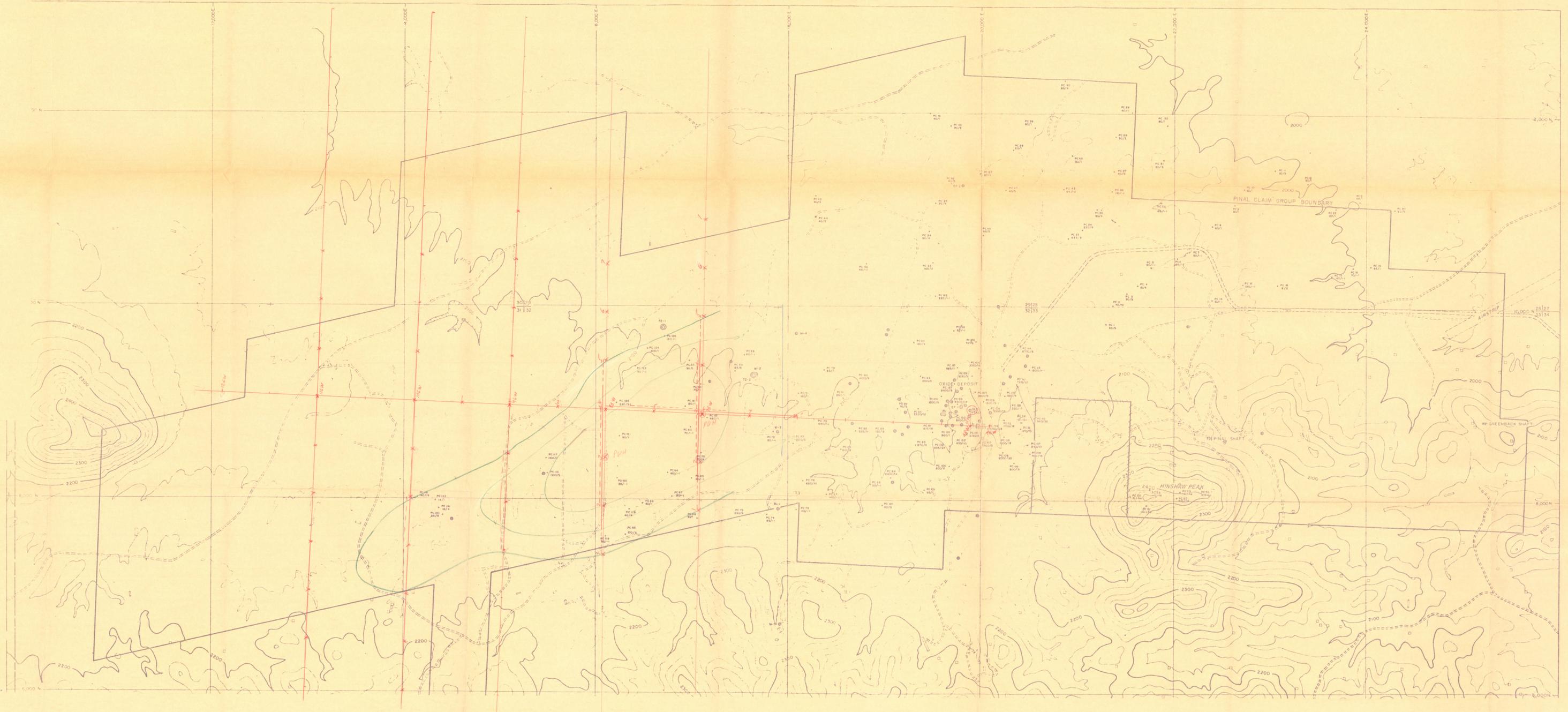


Job # 896



A, B, C, & D are
old lines
Mc phz
9/20/66

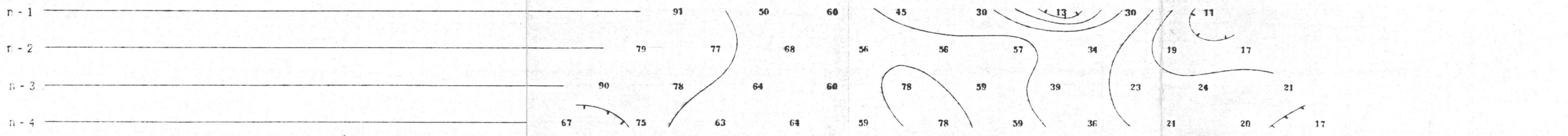
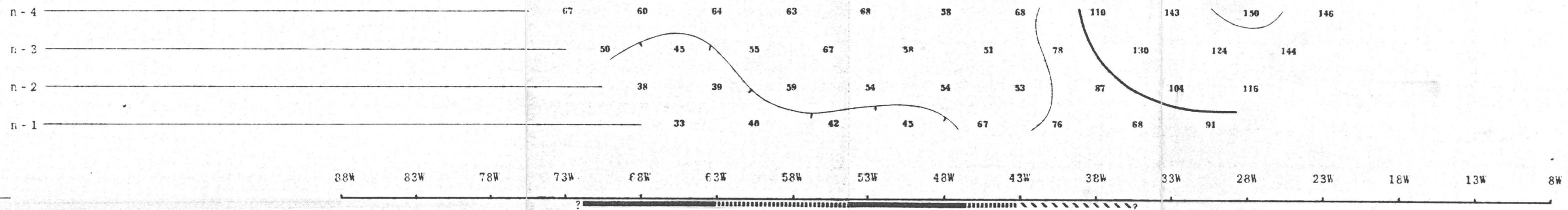
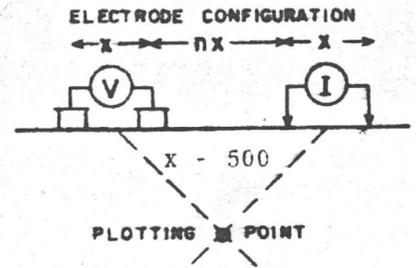
Job #896



McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



EL PASO NATURAL GAS COMPANY
 PINAL COPPER CORPORATION PROPERTY, PINAL CTY., ARIZONA, U.S.A.

Scale - One inch = 500 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCY 0.05 & 125 C/S

DATE SURVEYED SEPT. 1966

APPROVED

DATE

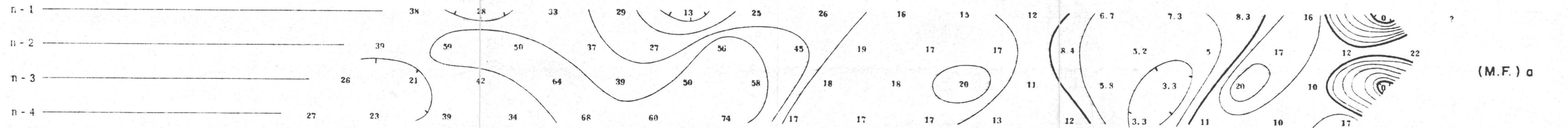
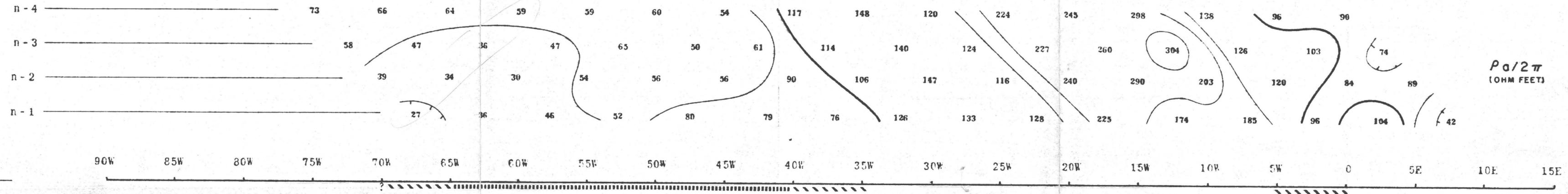
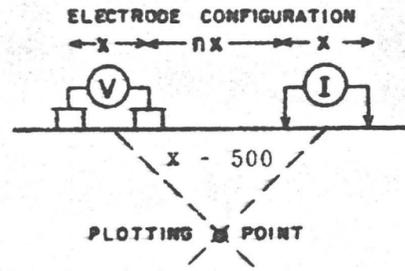
McPHAR GEOPHYSICS LIMITED

LINE NO.-7+50

McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

EL PASO NATURAL GAS COMPANY
 PINAL COPPER CORPORATION PROPERTY, PINAL CTY., ARIZONA, U.S.A.

Scale - One inch = 500 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

FREQUENCY 0.058-1.25 C.P.S.

DATE SURVEYED SEPT. 1966

APPROVED

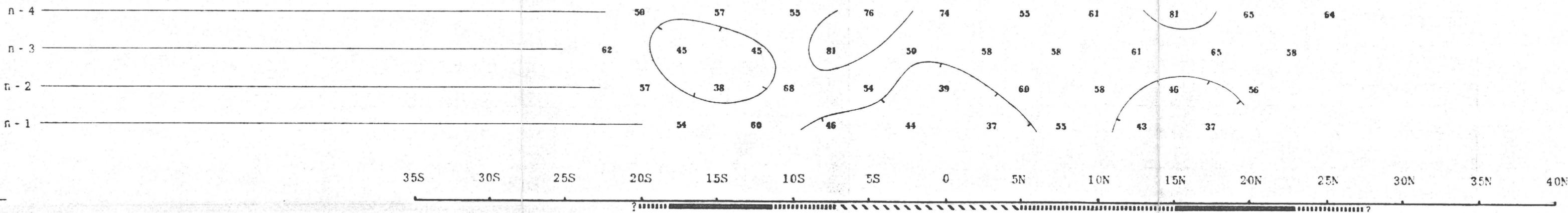
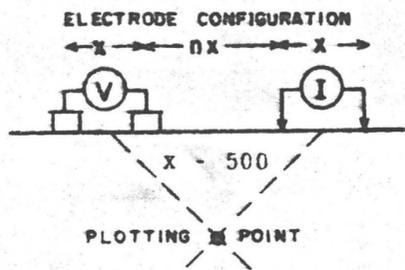
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LINE NO.-0

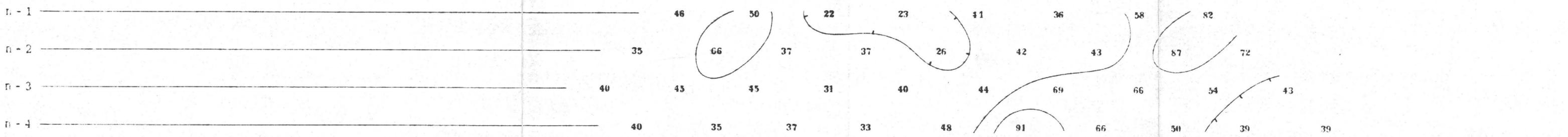
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INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



$P a / 2 \pi$
(OHM FEET)



(M.F.) a

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

EL PASO NATURAL GAS COMPANY
PINAL COPPER CORPORATION PROPERTY, PINAL CTY., ARIZONA, U.S.A.

Scale - One inch = 500 Feet

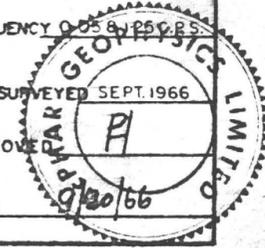
NOTE LOGARITHMIC CONTOUR INTERVAL

FREQUENCY 0.05 HZ (25 CPS)

DATE SURVEYED SEPT. 1966

APPROVED

DATE 9/30/66

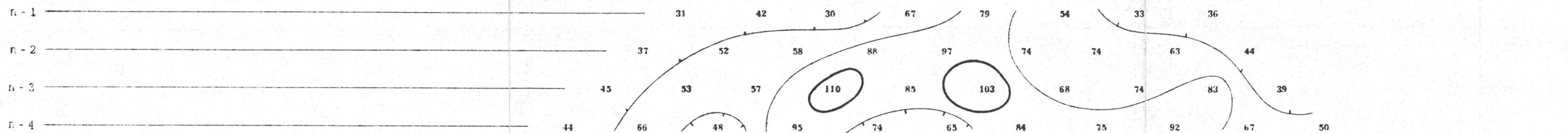
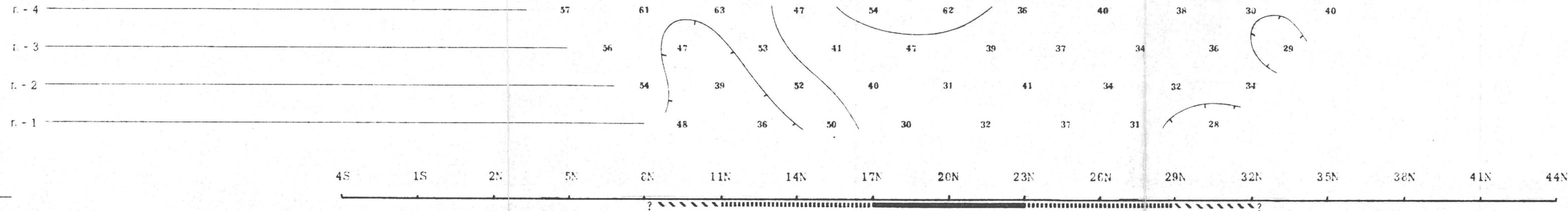
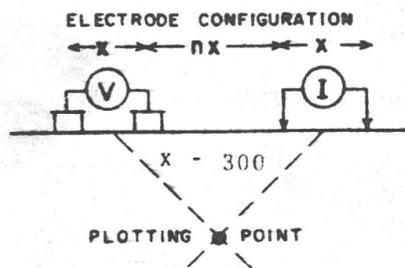


LINE NO.-53W

McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



EL PASO NATURAL GAS COMPANY
 PINAL COPPER CORPORATION PROPERTY, PINAL CTY., ARIZONA, U.S.A.

Scale - One inch = 300 Feet

NOTE: LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

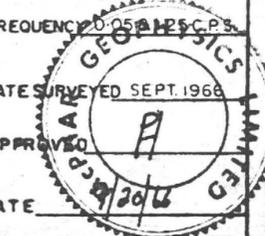
POSSIBLE

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DATE SURVEYED SEPT. 1966

APPROVED

DATE

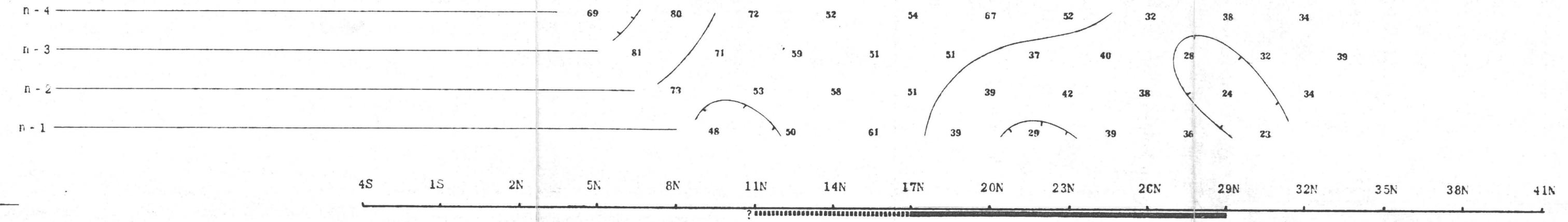
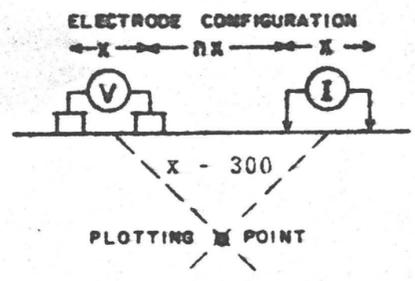


LINE NO. - 51W

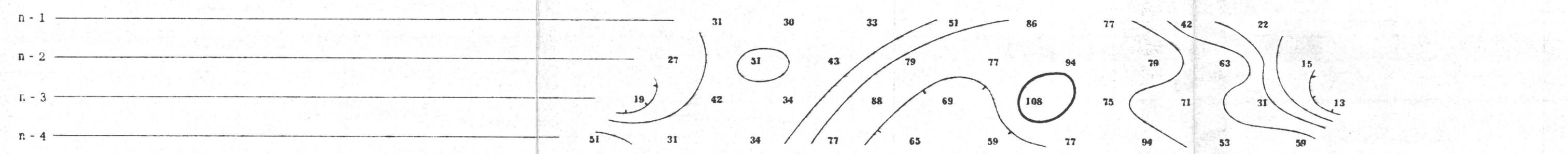
McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



$P_a/2\pi$
(OHM FEET)



(M.F.) a

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

EL PASO NATURAL GAS COMPANY

PINAL COPPER CORPORATION PROPERTY, PINAL CTY., ARIZONA, U.S.A.

Scale - One inch = 300 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

FREQUENCY 0.05 Hz @ 25 C.P.S.

DATE SURVEYED SEPT. 1965

APPROVED

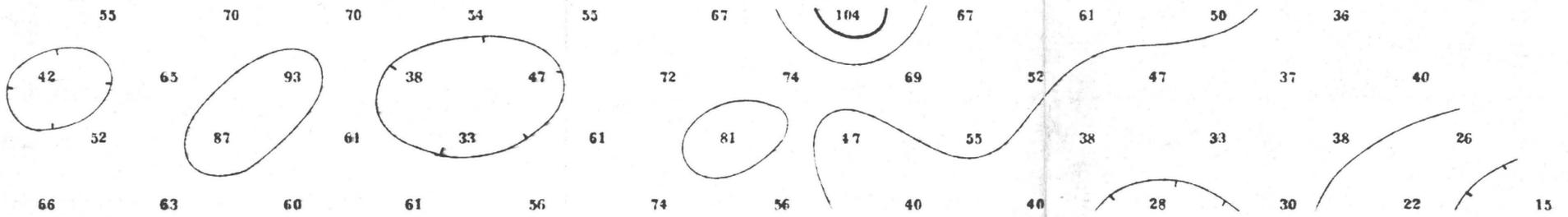
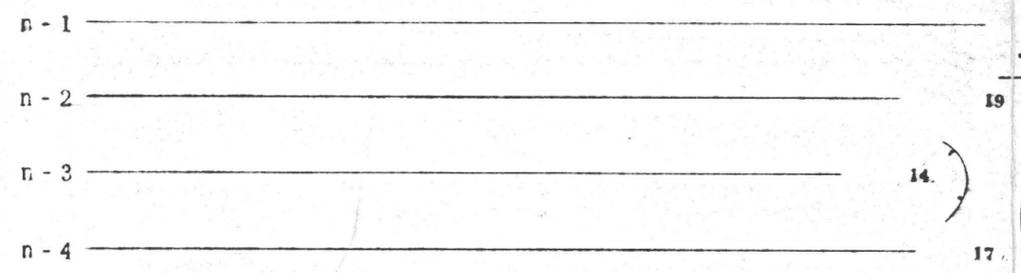
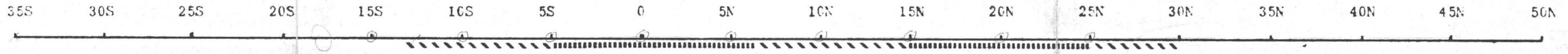
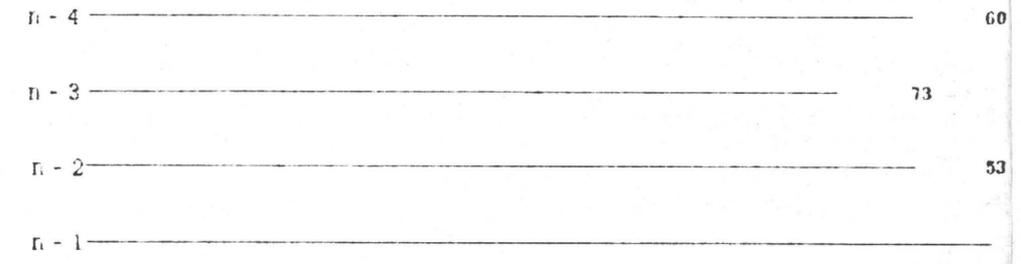
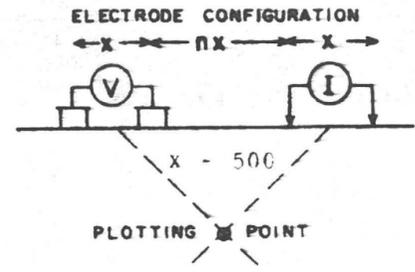
DATE 9/20/65

LINE NO. 48W

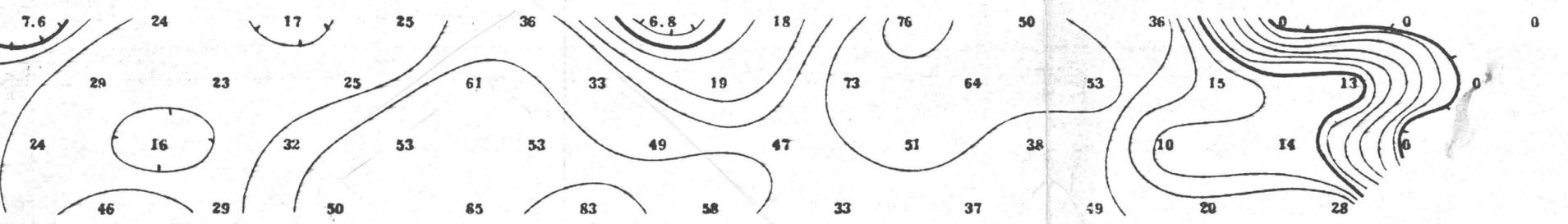
McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



$\rho a / 2\pi$
(OHM FEET)



(M.F.) a

75
5
37.5
50
42.5

SURFACE PROJECTION OF ANOMALOUS ZONES

- DEFINITE
- PROBABLE
- POSSIBLE

EL PASO NATURAL GAS COMPANY

PINAL COPPER CORPORATION PROPERTY, PINAL CTY., ARIZONA, U.S.A.

Scale—One inch = 500 Feet

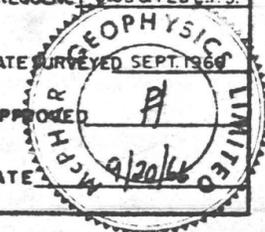
NOTE LOGARITHMIC CONTOUR INTERVAL

FREQUENCY 0.05 & 1.25 C.P.S.

DATE SURVEYED SEPT. 1969

APPROVED

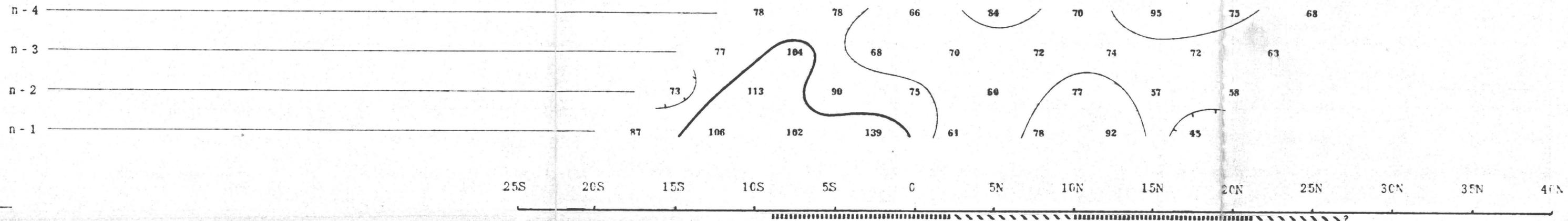
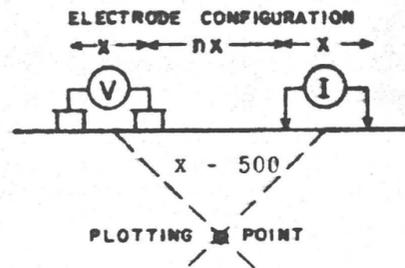
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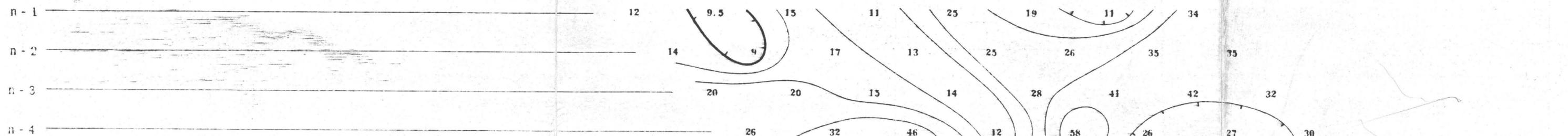
McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



$P a / 2 \pi$
(OHM FEET)



(M.F.) a

SURFACE PROJECTION OF ANOMALOUS ZONES

- DEFINITE
- PROBABLE
- POSSIBLE

EL PASO NATURAL GAS COMPANY
PINAL COPPER CORPORATION PROPERTY, PINAL CTY., ARIZONA, U.S.A.

Scale - One inch = 500 Feet

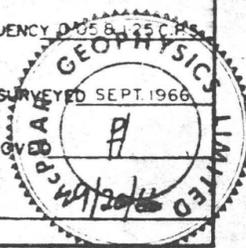
NOTE LOGARITHMIC CONTOUR INTERVAL

FREQUENCY 0.05 B. 125 C. H.

DATE SURVEYED SEPT. 1966

APPROVED

DATE

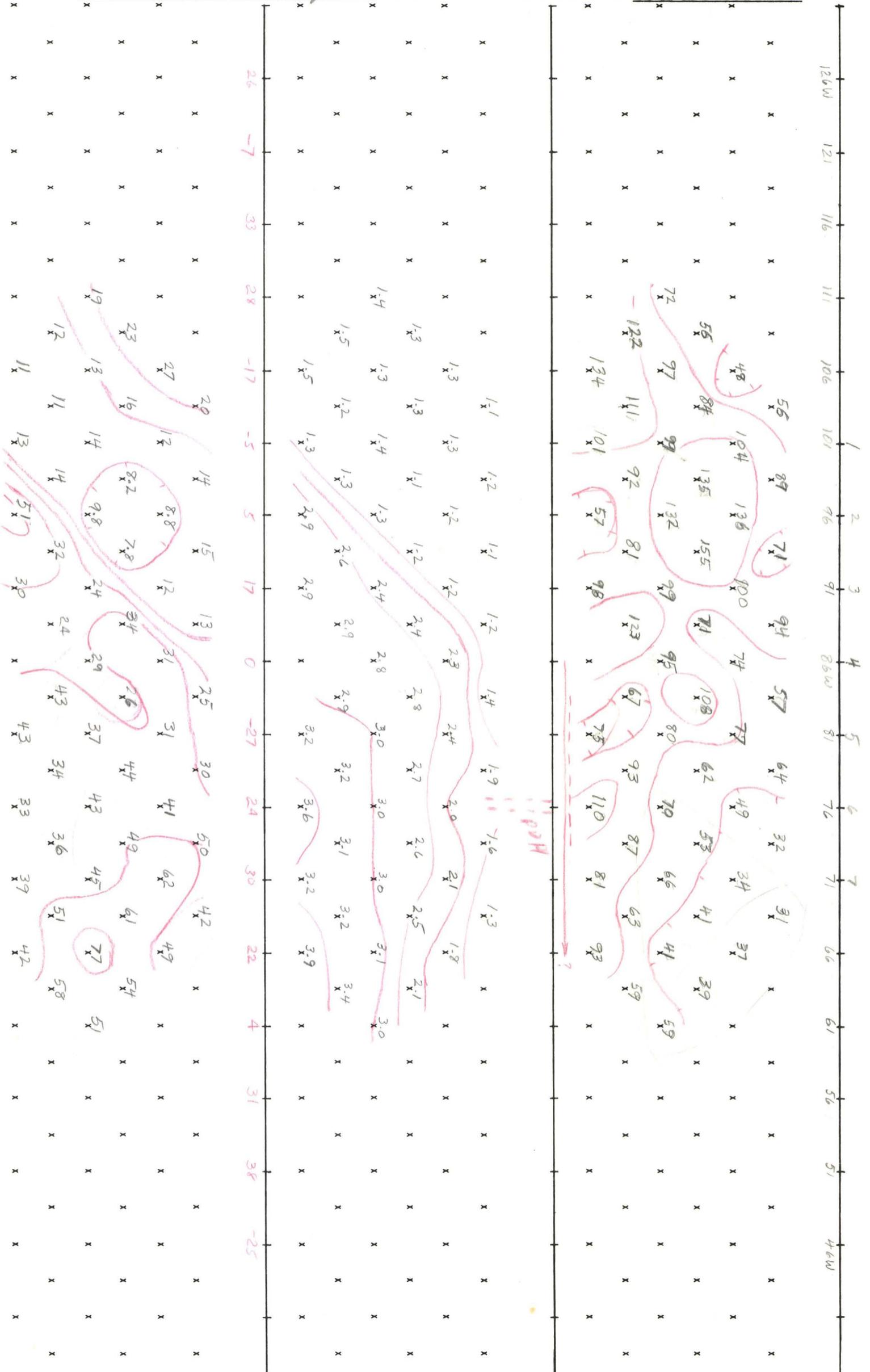


LINE NO.-43W

JOB# 896 LINE# 0-1 a = 500' BEARING 88 1/2° W - N 8 1/2° E

CLIENT Cutlass DATE JAN 74 FREQUENCIES 1.0 & 0.1 Hz

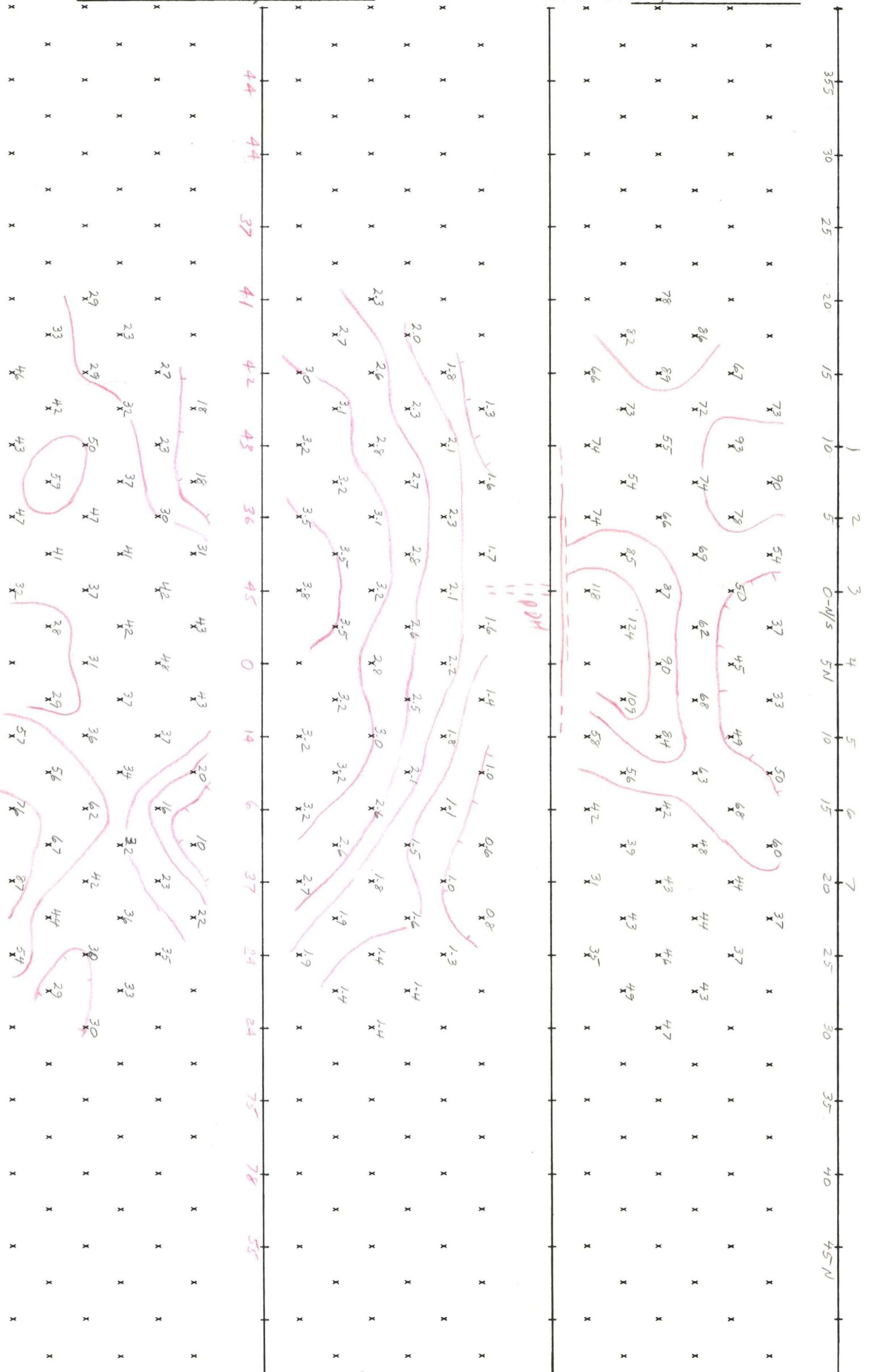
AREA Minal Chain Group RESISTIVITY FREQUENCIES 1.0



JOB# 896 LINE# 76 2 a = 500' BEING N-S

CLIENT Cutlass DATE JAN 74 FREQUENCIES 1.0 & 0.1 Hz

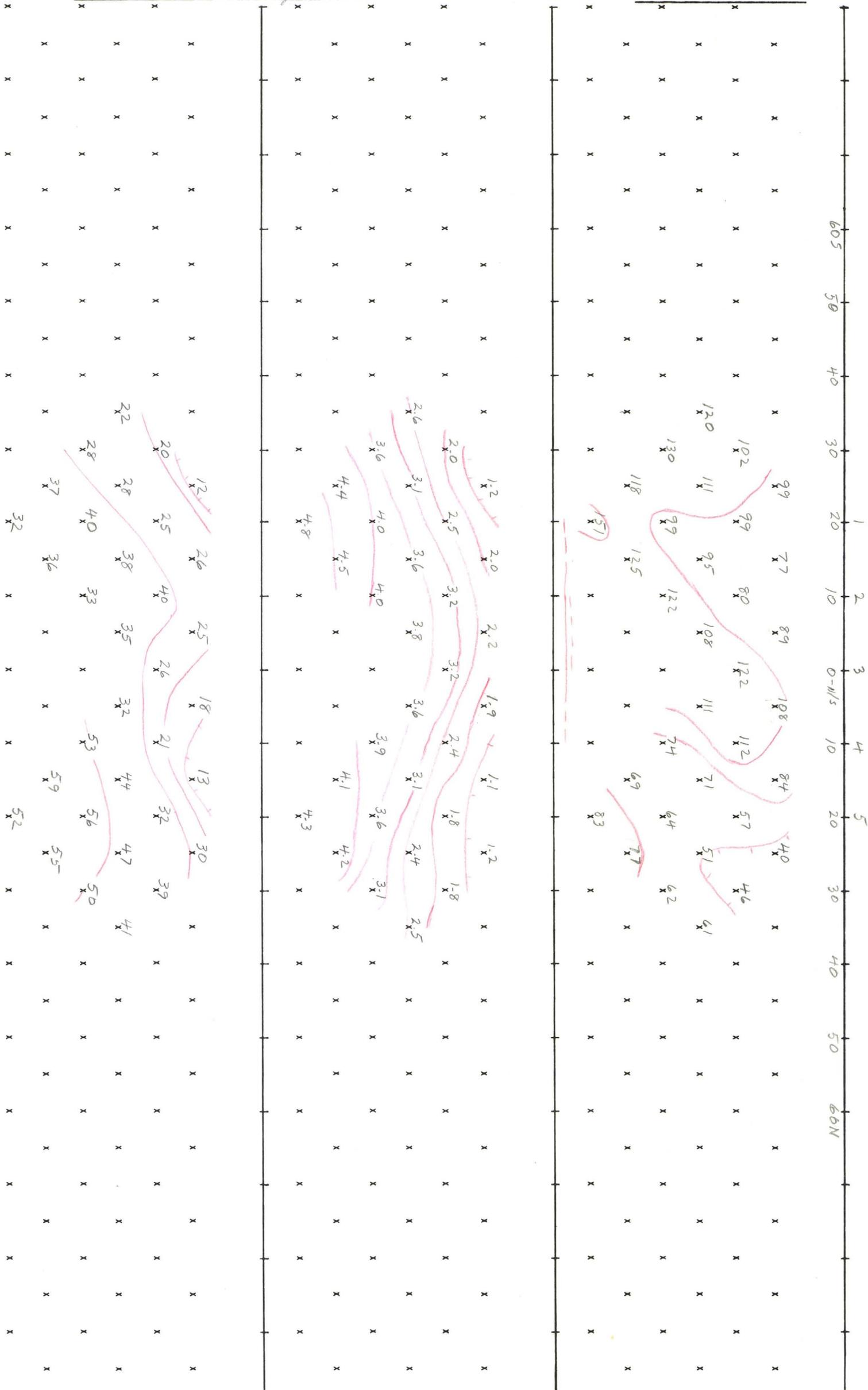
AREA Pinal Cln Exp RESISTIVITY FREQUENCIES 1.0



JOB# 896 LINE# 86 1 a = 1000' 3 RING W-S

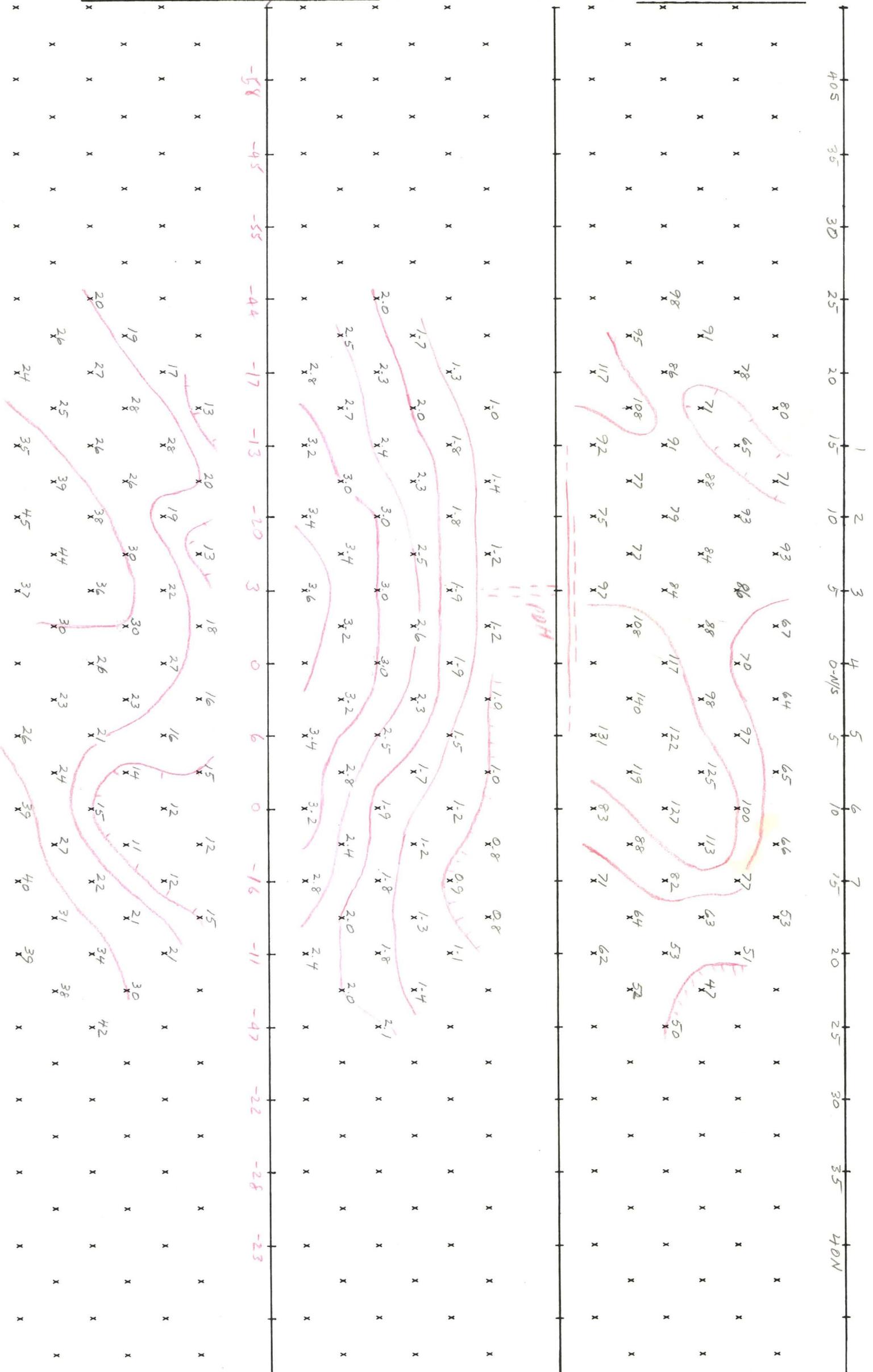
CLIENT Cu Tlase Exploration & Development DATE JAN 74 FREQUENCIES 3.0 & 0.3 Hz

AREA Pinal Clm Group RESISTIVITY FREQUENCIES 3.0

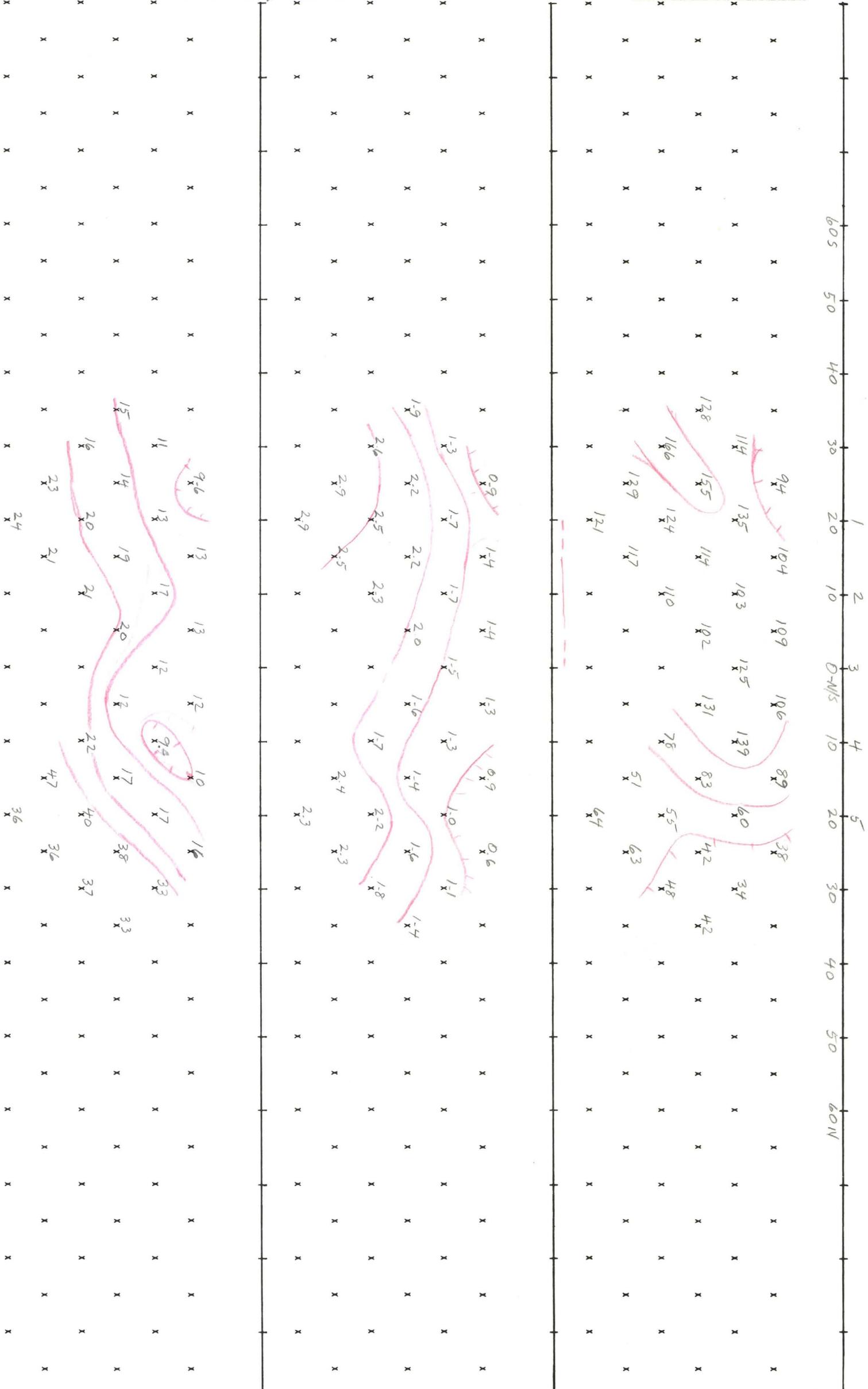


JOB# 896 LINE# 86 a = 500' BEARING N - S
 CLIENT Cutliss DATE JAN 74 FREQUENCIES 3.0 & 0.3 Hz

AREA Pinal Claim Grp RESISTIVITY FREQUENCIES 3.0



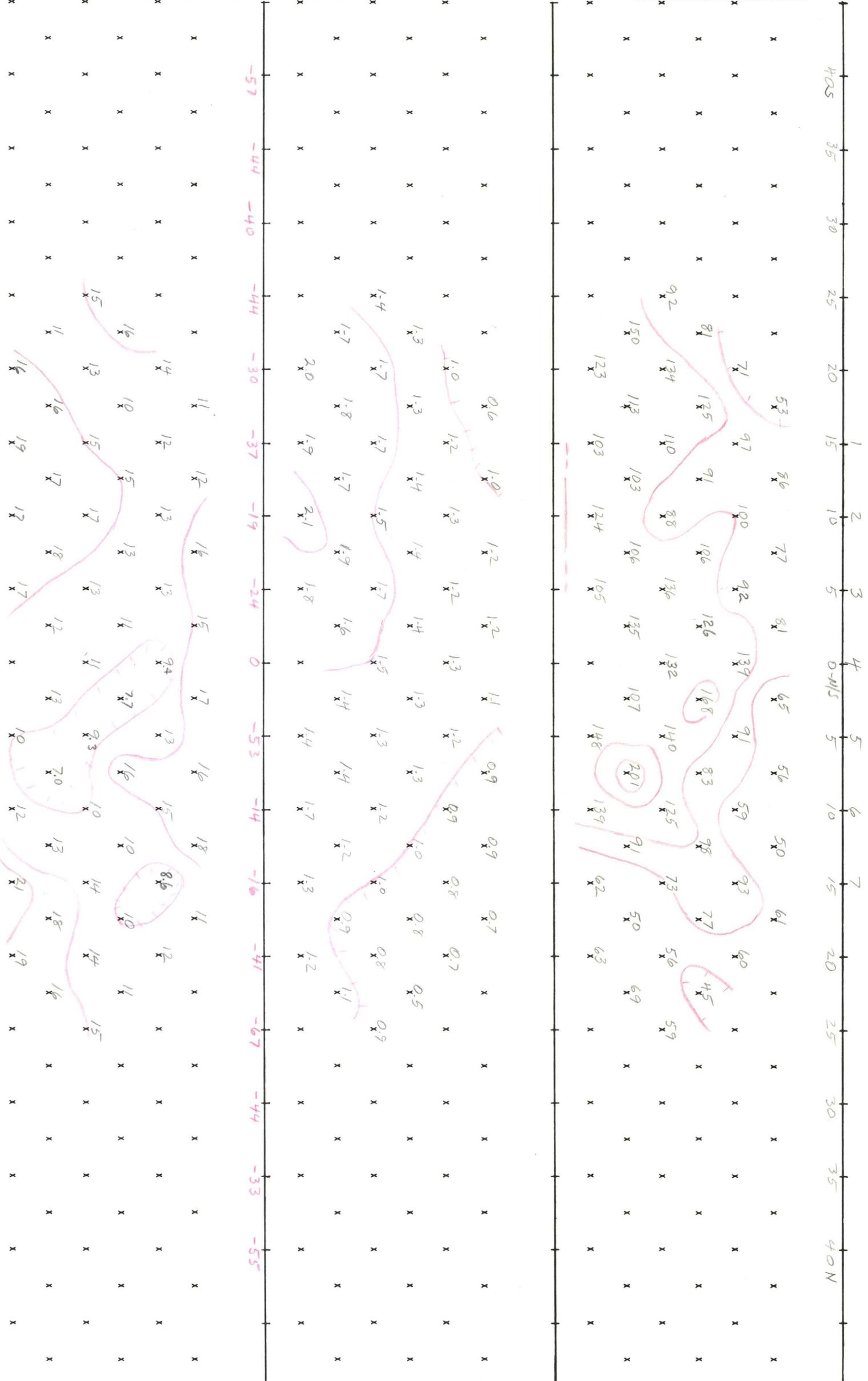
JOB# 896 LINE# 96 SP 1 a = 1000' BEARING N-S
 CLIENT Cutlass DATE JAN 74 FREQUENCIES 1.0 & 0.1 Hz
 AREA Pinal c/m exp RESISTIVITY FREQUENCIES 1.0



JOB# 896 LINE# 96 SP 2 a = 500' BEARING N-9

CLIENT Carliss DATE JAN 74 FREQUENCIES 1.0 & 0.1 Hz

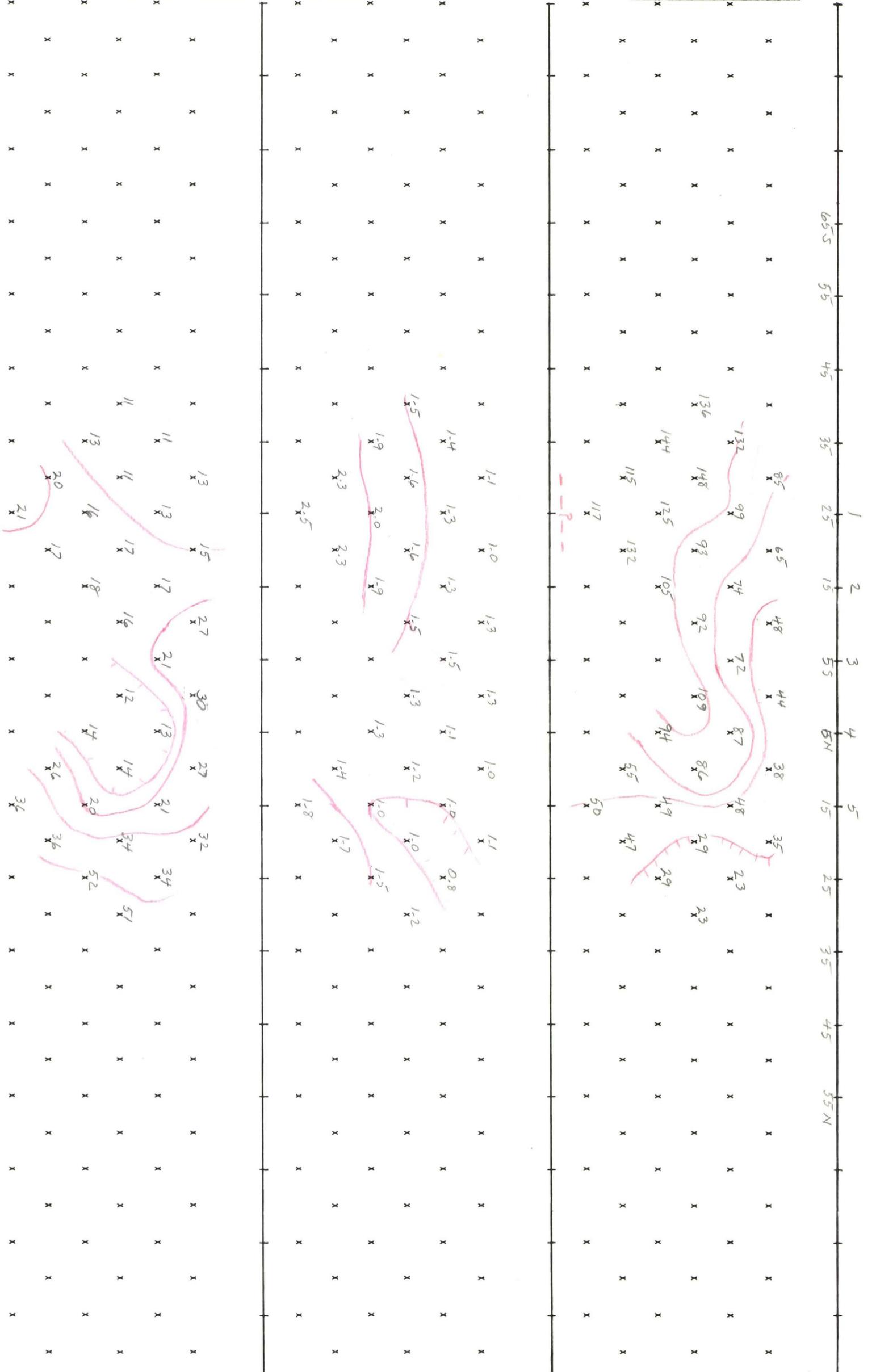
AREA PINAL CLAIM GROUP RESISTIVITY FREQUENCIES 1.0



JOB# 896 LINE# 116 SP 1 a = 1000' BEARING N-S

CLIENT Catlass DATE FEB 74 FREQUENCIES 1.0 & 0.1 Hz

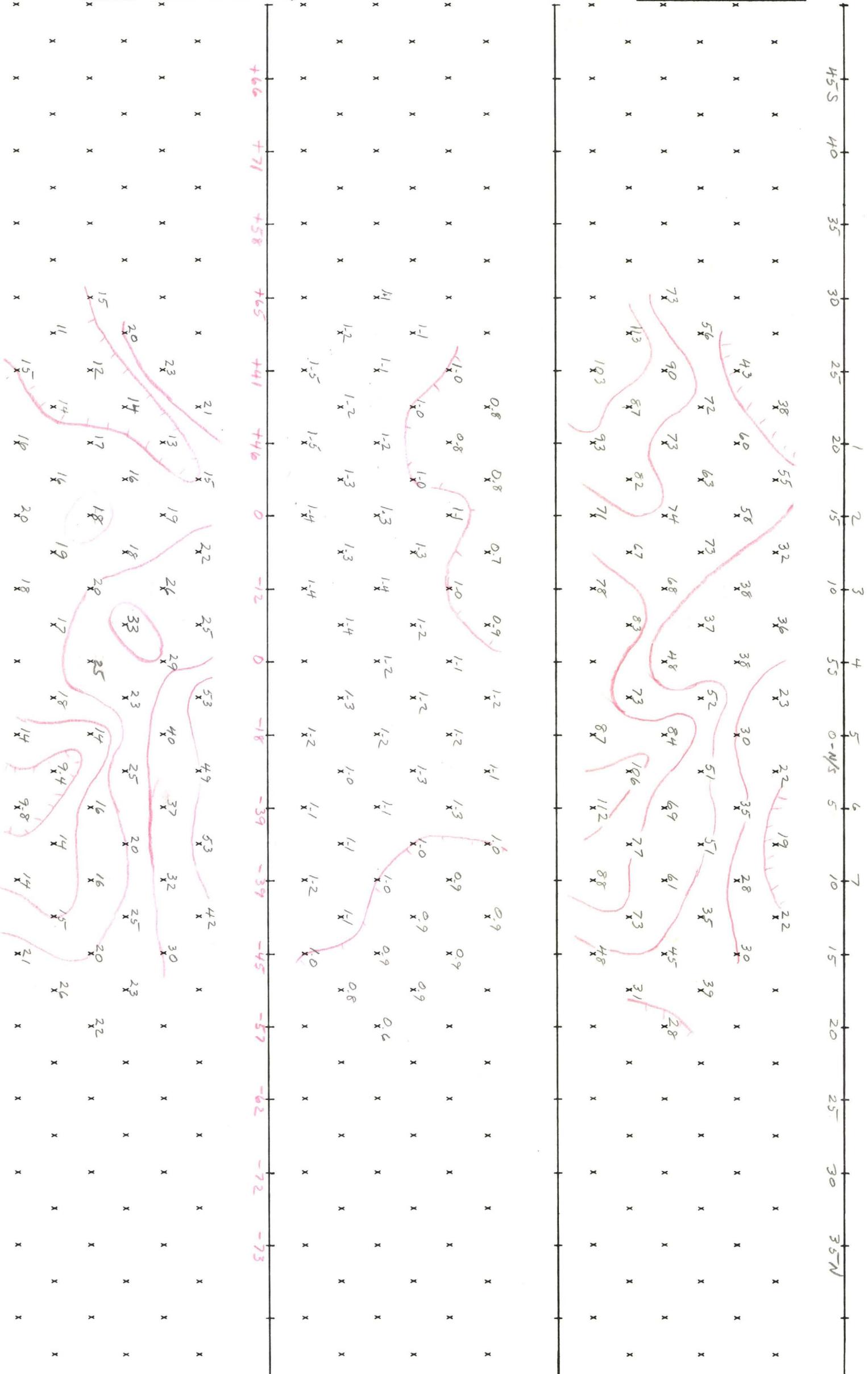
AREA PINAL CLM GRD RESISTIVITY FREQUENCIES 1.0



JOB# 896 LINE# 116 SP 2 a = 500' BEARING N-S

CLIENT Cutlass DATE FEB 74 FREQUENCIES 1.0 & 0.1 Hz

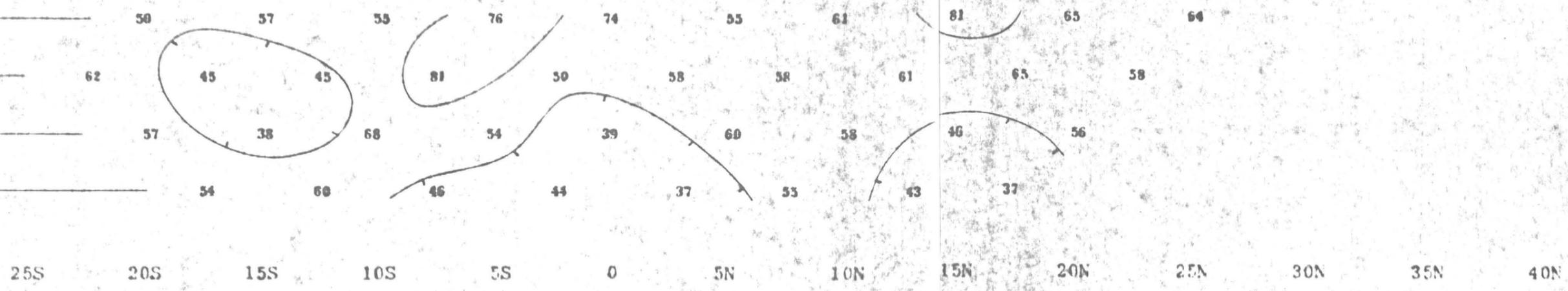
AREA Pinal Gm Grp RESISTIVITY FREQUENCIES 1.0



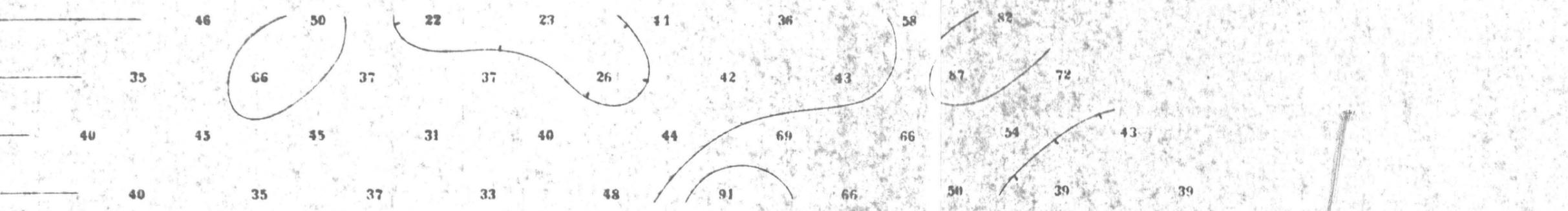
McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



$P_a/2\pi$
(OHM FEET)



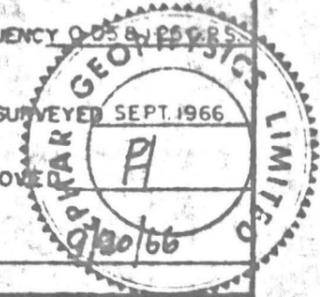
(M.F.) a

EL PASO NATURAL GAS COMPANY
PINAL COPPER CORPORATION PROPERTY, PINAL CTY., ARIZONA, U.S.A.

Scale - One inch = 500 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

FREQUENCY 0.05 & 1.25 C.P.S.
 DATE SURVEYED SEPT. 1966
 APPROVED *[Signature]*
 DATE 9/30/66

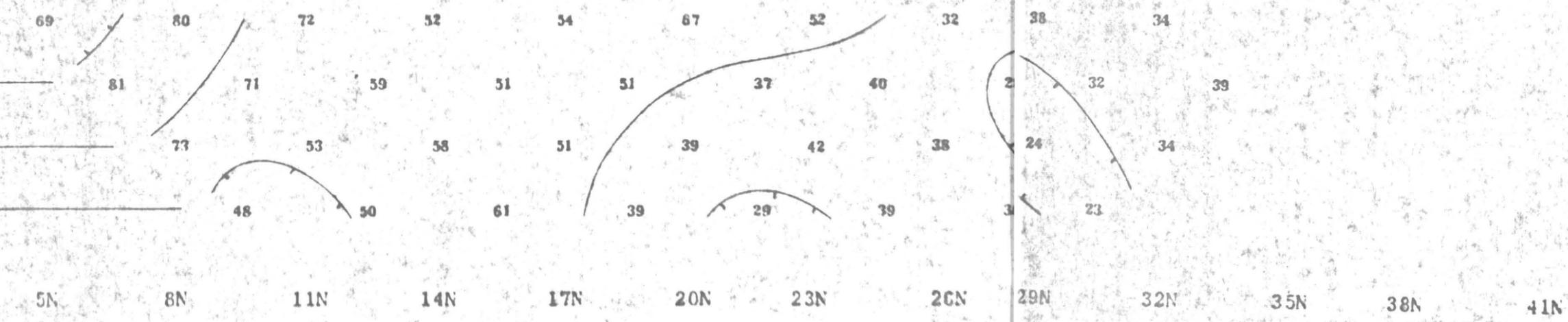


LINE NO.-53W

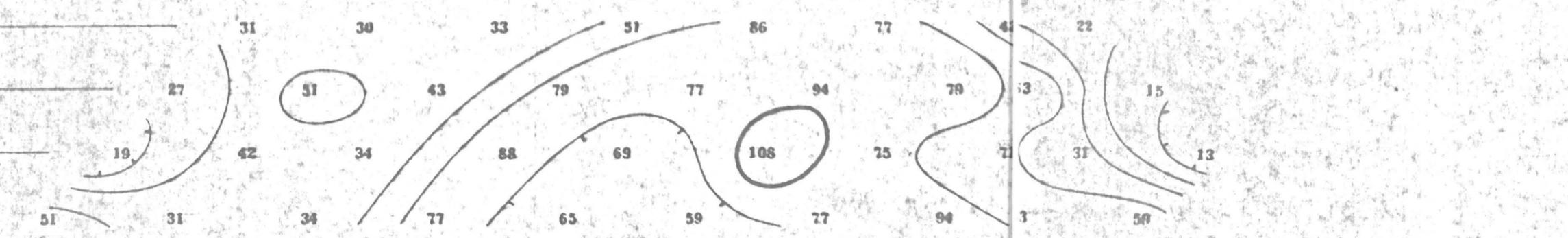
McPHAN GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



$\rho_a / 2\pi$
(OHM FEET)



(M.F.) α

EL PASO NATURAL GAS COMPANY

PINAL COPPER CORPORATION PROPERTY, PINAL CTY., ARIZONA, U.S.A.

Scale - One inch = 300 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

FREQUENCY 0.05 Hz 25 C.P.S.

DATE SURVEYED SEPT. 1965

APPROVED

DATE 9/20/65

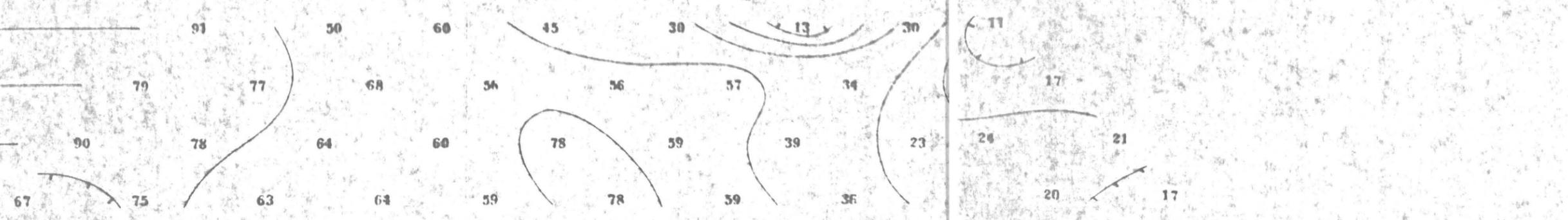
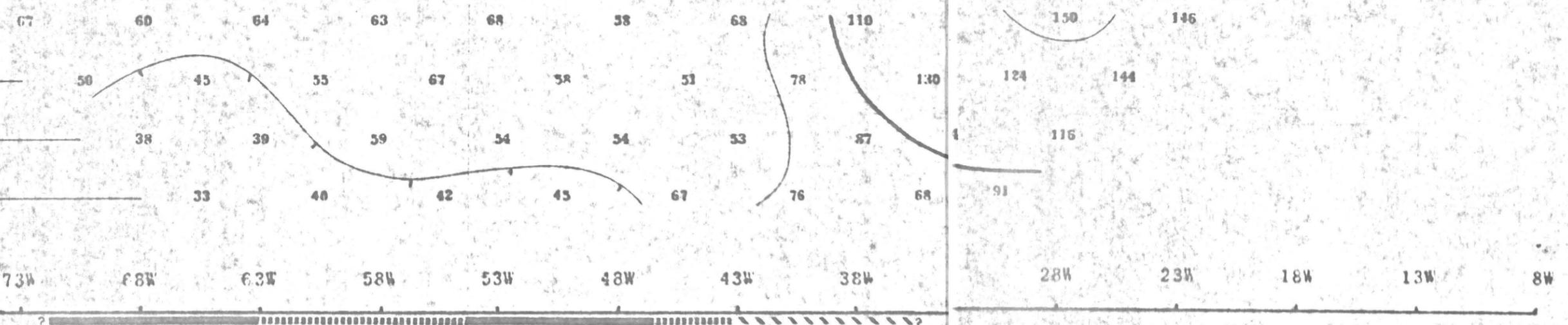


LINE NO - 4RW

McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: CONTOURS AT
LOGARITHMIC MULTIPLES
OF 10-15-20-30-50-75-100



LINE NO. 7+50N

EL PASO NATURAL GAS COMPANY

PINAL COPPER CORPORATION PROPERTY, PINAL CTY., ARIZONA, U.S.A.

Scale - One inch = 500 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

FREQUENCY 0.058125 C.P.S.

DATE SURVEYED SEPT. 1965

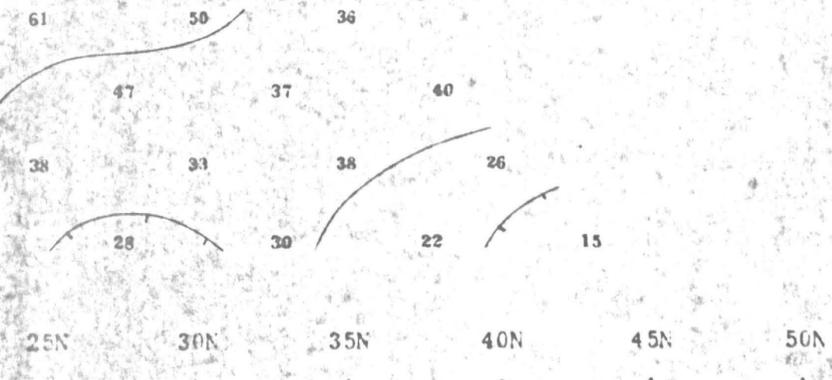
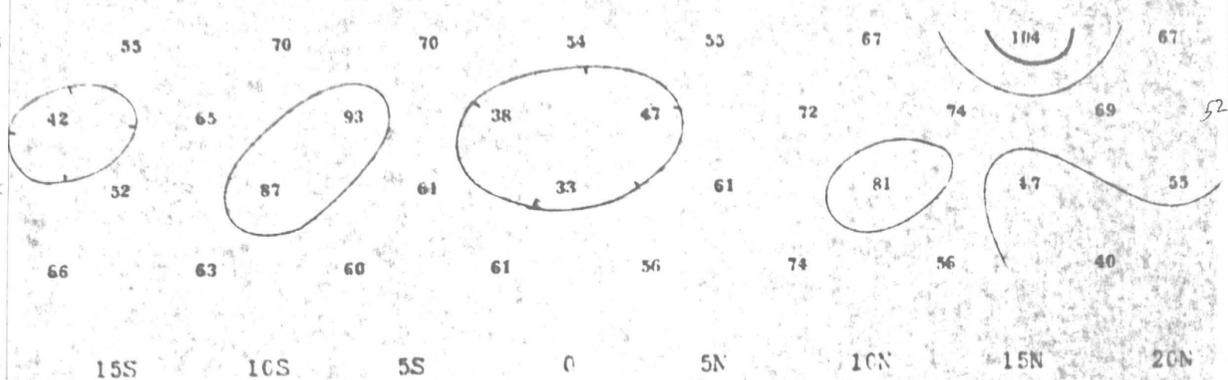
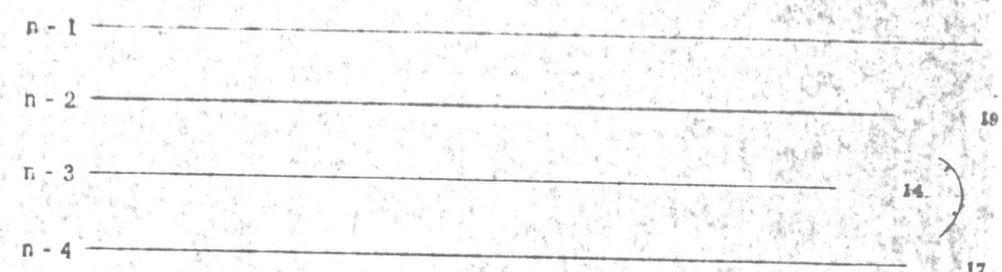
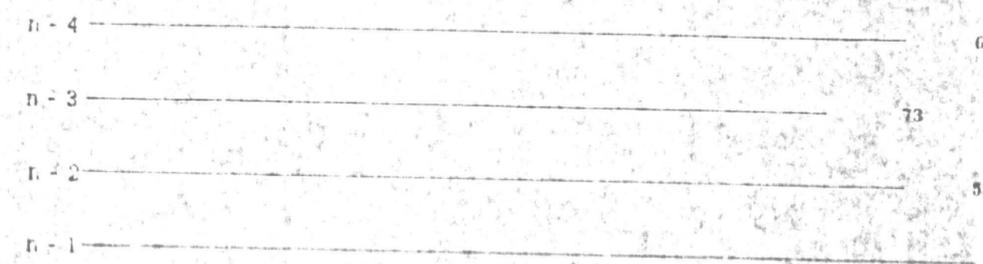
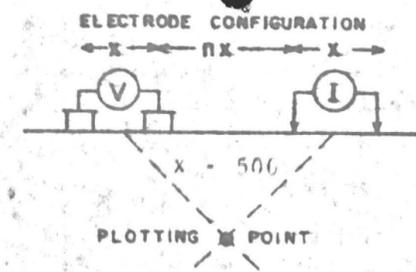
APPROVED *A*

DATE 9/20/66

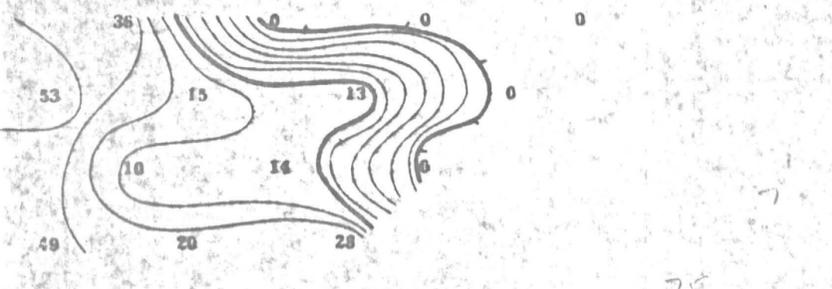
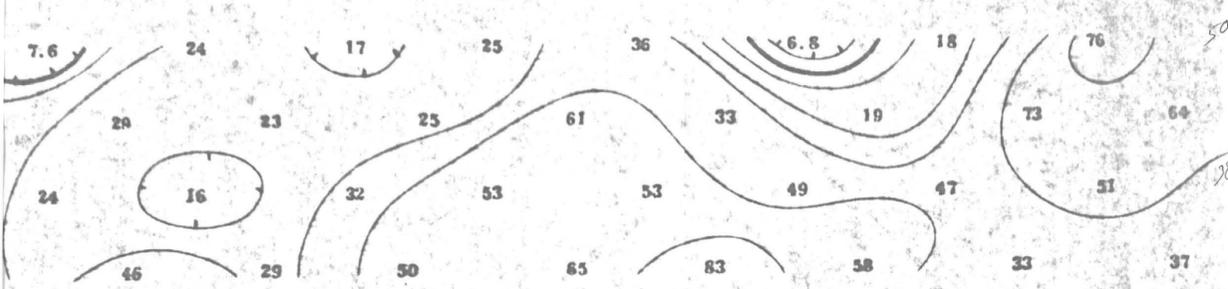
NOTE: CONTOURS LOGARITHMIC MULTIPL. OF 10-15-20-30-50-75-100

McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

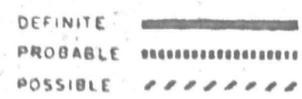


$\rho a / 2\pi$
(OHM FEET)



(M.F.) a

SURFACE PROJECTION OF ANOMALOUS ZONES



EL PASO NATURAL GAS COMPANY

PINAL COPPER CORPORATION PROPERTY, PINAL CTY., ARIZONA, U.S.A.

Scale - One inch = 500 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

7.5
5
37.5
5
142.5

FREQUENCY 0.058125 C.P.S.

DATE SURVEYED SEPT. 1969

APPROVED *[Signature]*

DATE 9/20/69



LINE NO. 48W

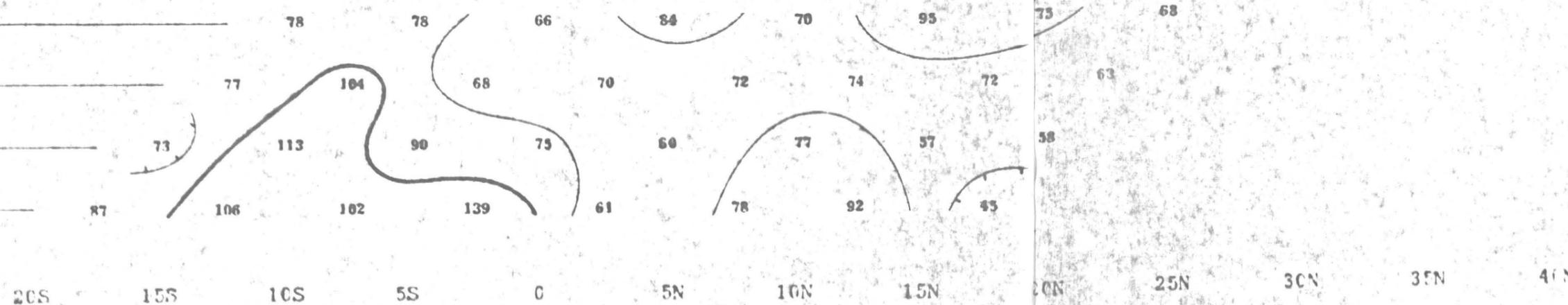
15

17

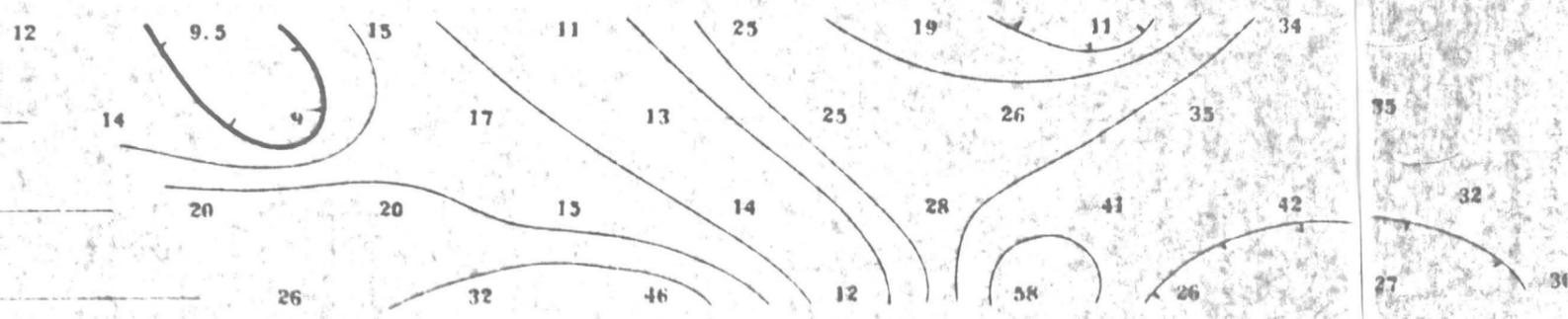
McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE. CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



$P_a/2\pi$
(OHM FEET)



(M.F.) a

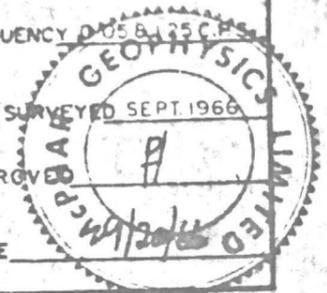
EL PASO NATURAL GAS COMPANY

PINAL COPPER CORPORATION PROPERTY, PINAL CTY., ARIZONA, U.S.A.

Scale - One inch = 500 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

FREQUENCY 0.05 B, 1.25 C.P.F.
 DATE SURVEYED SEPT. 1966
 APPROVED *[Signature]*
 DATE *[Signature]*

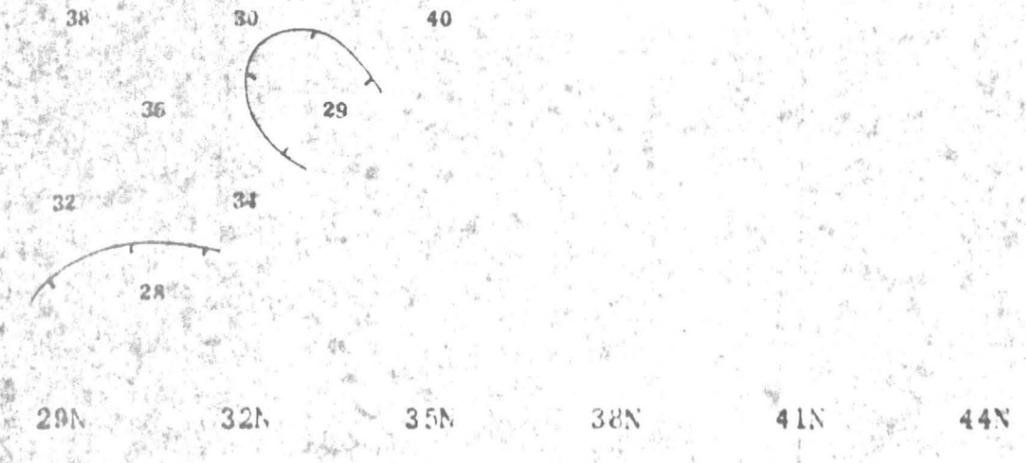
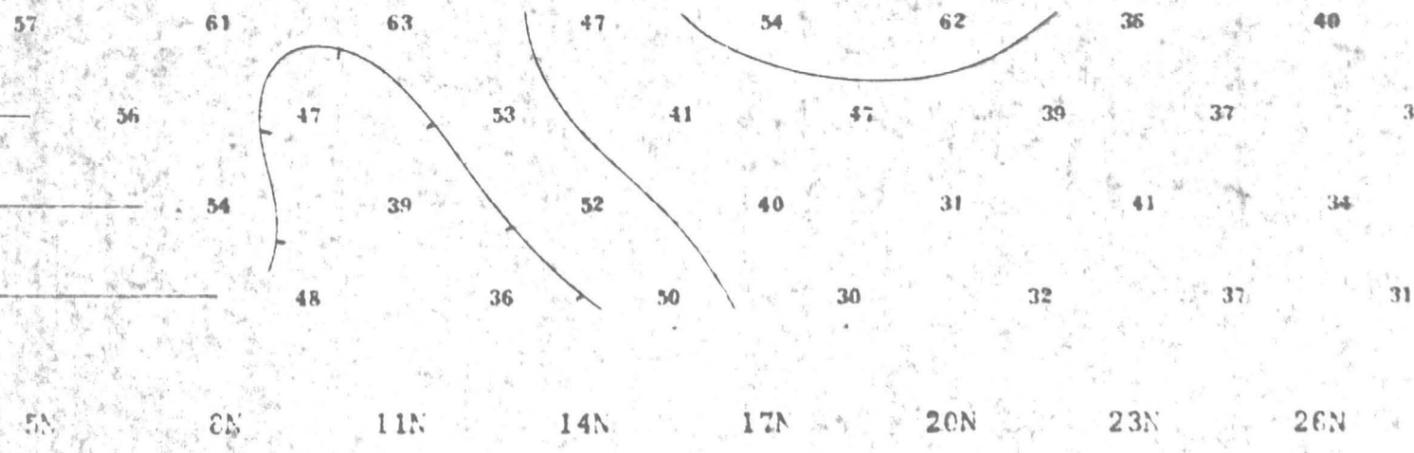


LINE NO-43W

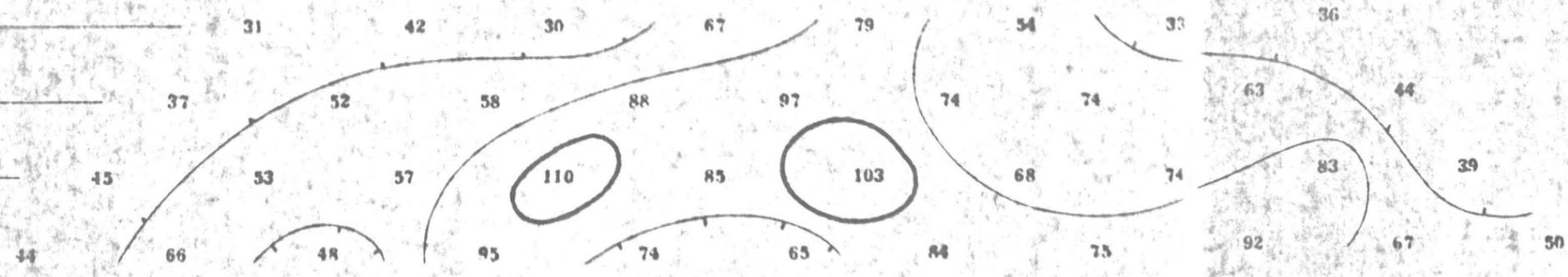
MCPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



$\rho_a / 2\pi$
(OHM FEET)



(M.F.) α

EL PASO NATURAL GAS COMPANY

PINAL COPPER CORPORATION PROPERTY, PINAL CTY., ARIZONA, U.S.A.

Scale - One inch = 300 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

FREQUENCY 0.05 HZ S.C.P.S.

DATE SURVEYED SEPT. 1966

APPROVED *[Signature]*

DATE *9/20/66*

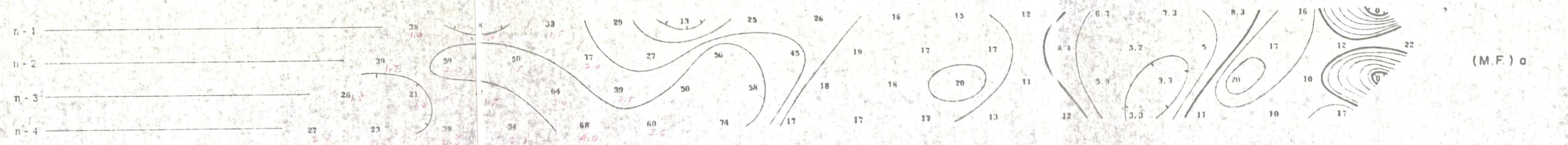
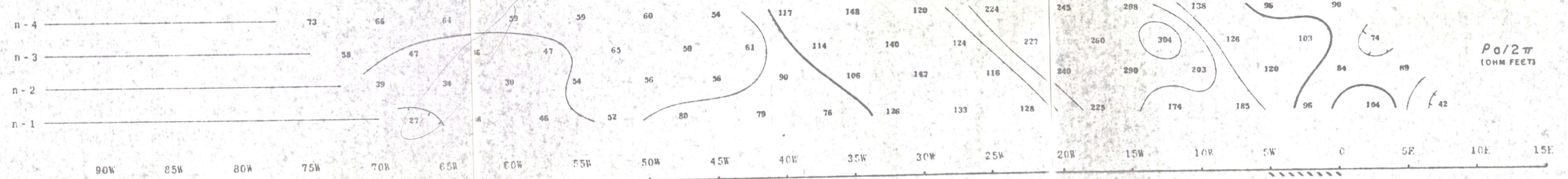
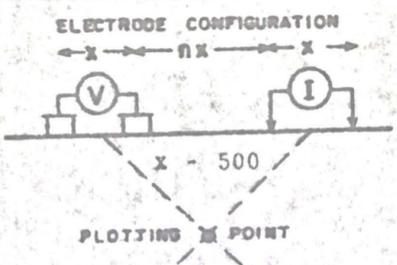
MCPHAR GEOPHYSICS LIMITED

LINE NO - 51W

NOTE: CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100

McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY



SURFACE PROJECTION OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE

EL PASO NATURAL GAS COMPANY
PINAL COPPER CORPORATION PROPERTY, PINAL CTY., ARIZONA, U.S.A.

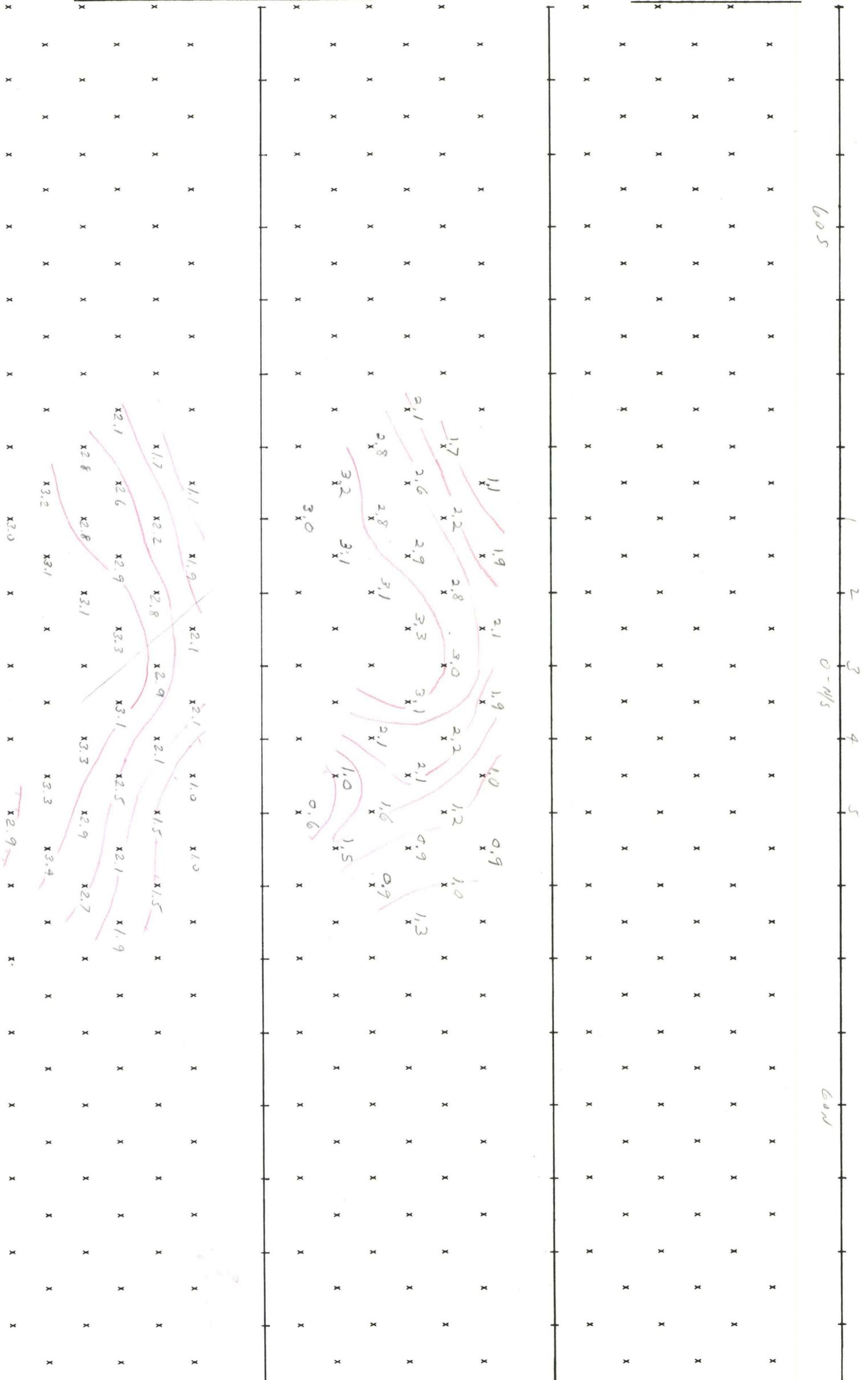
Scale - One inch = 500 Feet
NOTE LOGARITHMIC CONTOUR INTERVAL

FREQUENCY 0.58, 25 CPS
DATE SURVEYED SEPT 1966
APPROVED
DATE 9/20/66

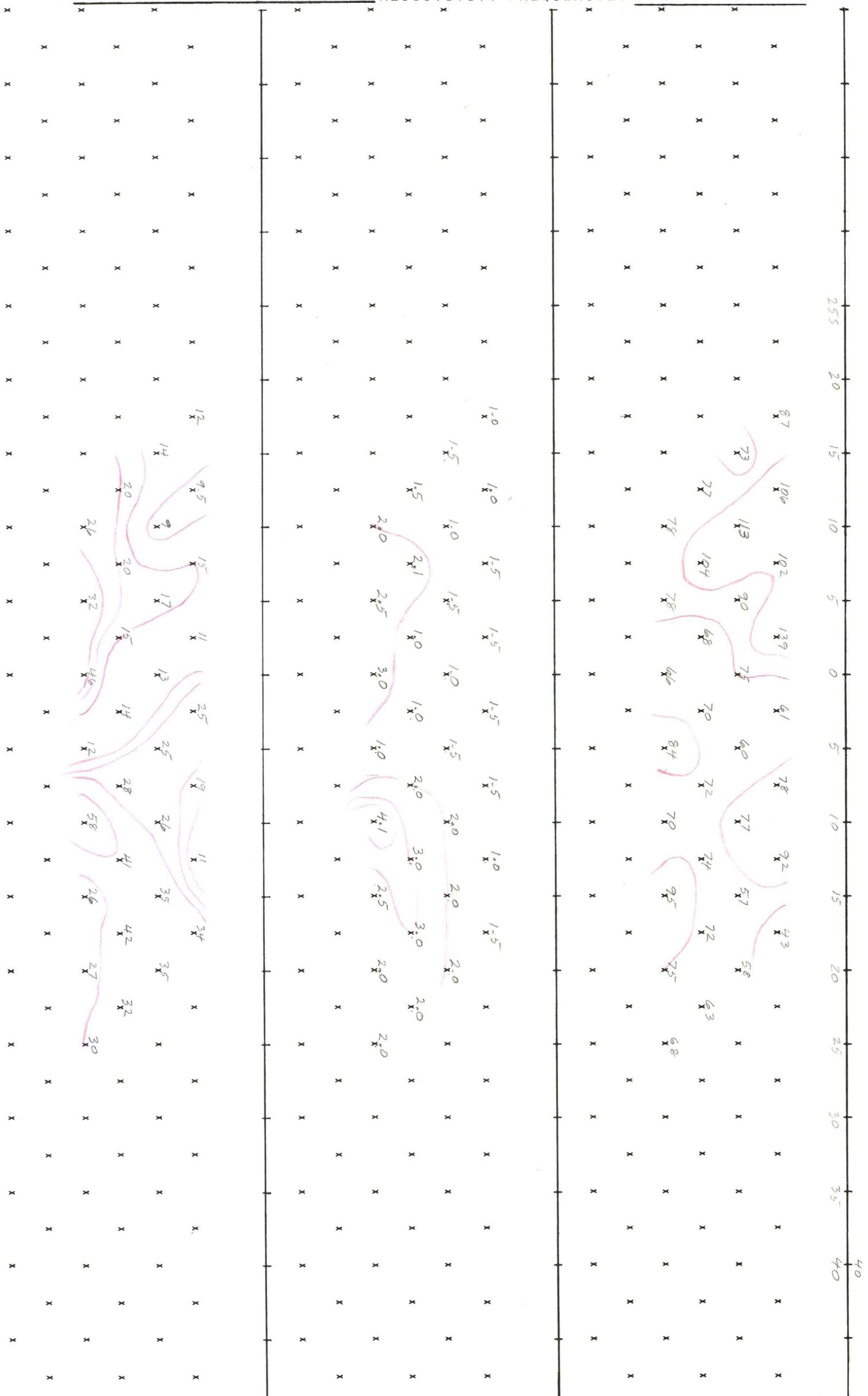
LINE NO.-0

JOB# 896 LINE# 86 SP 1 a = 1000' BEARING _____
 CLIENT _____ DATE _____ FREQUENCIES _____ & _____ Hz

AREA _____ RESISTIVITY FREQUENCIES



AREA _____ RESISTIVITY FREQUENCIES



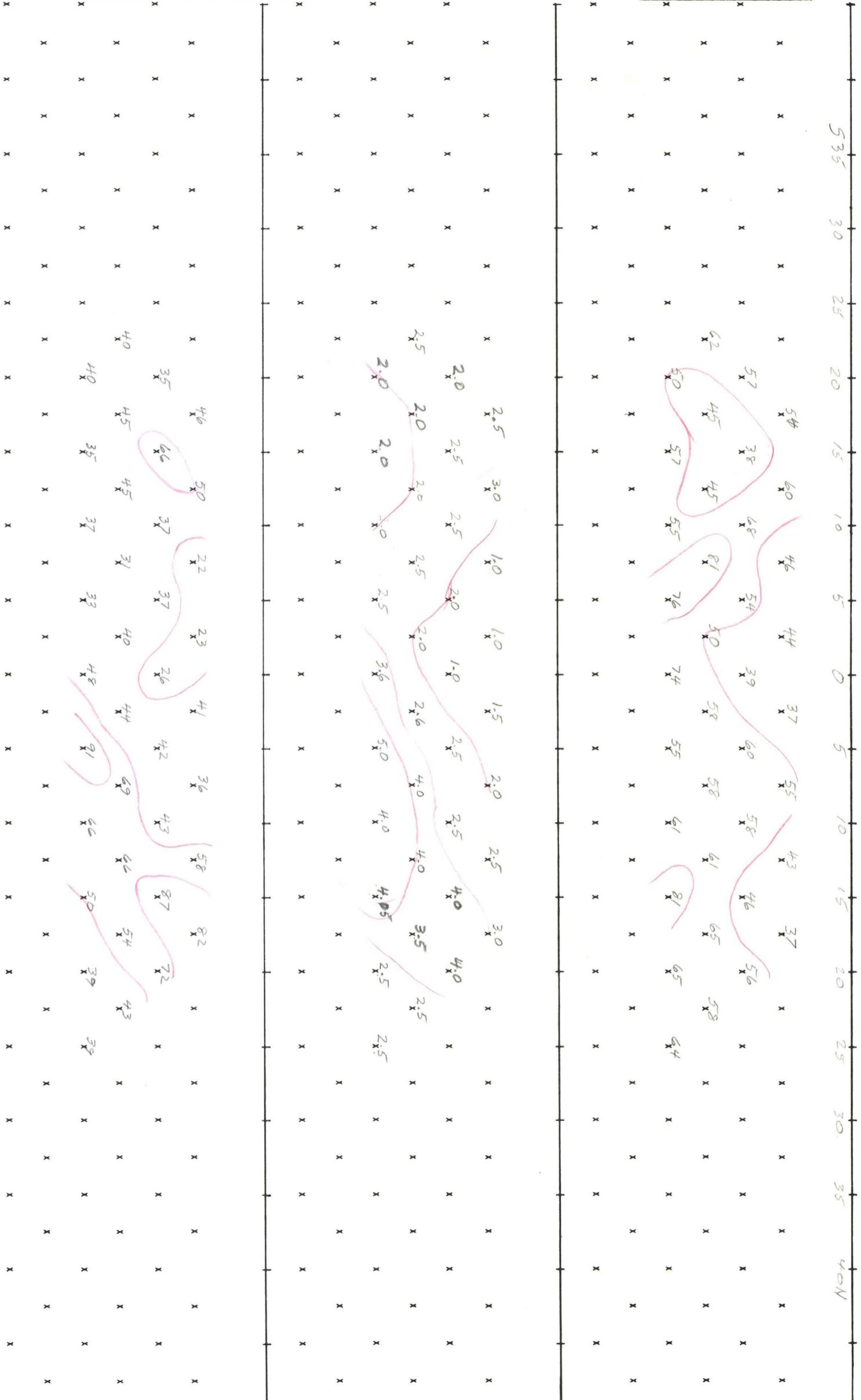
Line 43w MIC Phon

JOB# _____ LINE# _____ a = _____ 3D _____ ING _____
 CLIENT _____ DATE _____ FREQUENCIES _____ & _____ Hz

AREA _____ RESISTIVITY FREQUENCIES

535 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40N

Line 53 W McPhar.



I. P. SENDER NOTES

JOB No. 896 AREA Pinal Ctm Grp
 LINE 106W, HALF N, SP. 1, DATE 6 Feb 74
1000'

PAGE 1HEINRICHS
GEOEX

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE	5S-5N	5N	15N	15N	25N	25N	35N	35N	45N	45N
RANGE	1666X30	1666X30	1666X30	1666X30	1666X30	1666X30	1666X30	1666X30	1666X30	1666X30
VOLTAGE	820	640	800	560	640	800	780	460	620	800
CURRENT	5	5	5	5	5	5	5	5	5	5
SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2		
RECEIVE	35N	45N	55N	65N	75N	85N	95N	105N		
RANGE	1666X30	1666X30	1666X30	1666X30	1666X30	1666X30	1666X30	1666X30		
VOLTAGE	760	460	620	800	760	440	620	780		
CURRENT	5	5	5	5	5	5	5	5		

FREQUENCIES 1.040.1SENDER No. 8661-SOPERATOR T. DowningRECEIVER No. D.D.OPERATOR R.J.

COMMENTS:

I. P. SENDER NOTES

JOB No. 896 AREA PINAL CLM-GRP.LINE 106W, HALF S, Sp. 1, DATE 7 Feb 74
1000'PAGE 2HEINRICHS
GEOEX

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE	55-155	155	255	255	355	355	355	455	455	455
RANGE										
VOLTAGE	810	580	810	660	580	810	830	650	570	800
CURRENT	5	5	5	5	5	5	5	5	5	5
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		
RECEIVE	455	555	555	555	555	655	655	655		
RANGE										
VOLTAGE	830	650	570	790	830	650	570	790		
CURRENT	5	5	5	5	5	5	5	5		

FREQUENCIES 1-090.1SENDER No. 8661-9OPERATOR R.J.RECEIVER No. D.D.OPERATOR R.P.

COMMENTS:

I. P. RECEIVER NOTES, JOB NO. 896, AREA Pinal Claim GroupLINE 96W, HALF N, SR. 1, $\alpha =$ 1000', BEARING NSENDER STA. 0 = ELECTRODE NO. 3, DATE 2-1-74PAGE 1HEINRICHS
GEOEX

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE	0-10N	10	20N	20	30N	30				40N
MULTIPLIER	10	1.0	1.0	10	1.0	1.0	1.0	1.0	1.0	0.1
PFE	1.5	1.3	1.5	1.1	1.5	1.8	0.8	1.2	1.6	1.9
CUR. (AMPS)	5	5	5	5	5	5	5	6	6	5
POINT NO.	1		2	1	2	3				4
SEP. (n)	1	1	2	1	2	3	1	2	3	4
H. F. Mv	184	73.0	21.0	149	57.9	21.9	63.6	29.9	16.6	6.48
DRIFT	—	+0.2	—	—	—	—	—	—	—	—
1.0 PFE $K_n/1000$										
0.3 PFE P_{CAL}										
0.1 PFE PFE_c	1.3	1.1	1.3	0.9	1.3	1.6	0.6	1.0	1.4	1.7
3.0 MV $P/2\pi$	110	44	50	89	139	131	38	60	83	78
DRIFT MCF	12	25	26	10	9	12	16	17	17	22
S. P.	+24.9	0.0		+3.6			+3.2			
NOISE										
POT RES.										
CULT & CMTS										

110 125 223 348 328 15 150 208 195

I. P. RECEIVER NOTES, JOB No. 896, AREA Pinal Claim Group

LINE 96 W, HALF N, SR. 1, $a = 1000'$, BEARING N

SENDER STA. 0 = ELECTRODE No. 3, DATE 2-1-74



PAGE 2

HEINRICHS
GEOEX

SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2		Cal
RECEIVE	40			50N	50			60N		2-1-74
MULTIPLIER	1.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1		1.0
PFE	1.3	1.8	2.4	2.6	1.6	2.0	2.5	2.5		+0.2
CUR. (AMPS)	6	6	6	5	6	6	6	5		1.0
POINT No.										
SER. (n)	2	3	4	5	3	4	5	6		
H. F. MV	16.8	8.35	5.51	2.50	8.47	4.84	3.71	1.89		1018
DRIFT	—	—	—	—	—	—	—	—		—
1.0 PFE	$K_n/1000$									
0.3 PFE	P_{CAL}									
0.1 PFE	PFE_c	1.1	1.6	2.2	2.4	1.4	1.8	2.3	2.3	
3.0 MV	$P/2\pi$	34	42	55	51	42	48	63	64	
DRIFT	MCF	33	38	40	47	33	37	36	36	
S. P.		-5.8				+22.0				
NOISE										
POT RES.										
CULT & CMTS										

85 105 138 128 105 120 158 160

I. P. SENDER NOTES

JOB No. 896 AREA Pinal Clm Exp
 LINE 96W, HALF N, SP. 1, DATE 1 Feb 74
1000'

PAGE 1HEINRICH'S
GEOEX

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	
RECEIVE	0-10N	10N	20N	20N		30N	30N			40N	
RANGE	100x50	→						300x20	→		
VOLTAGE	730	560	730	540	550	720	470	640	660	720	
CURRENT	5	5	5	5	5	5	5	6	6	5	
SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2			
RECEIVE	40N			50N	50N			60N			
RANGE											
VOLTAGE	560	630	660	710	560	630	650	710			
CURRENT	6	6	6	5	6	6	6	5			

FREQUENCIES 1.040.1
 SENDER No. 26721-3
 OPERATOR R. J.
 RECEIVER No. D. D.
 OPERATOR R. P.

COMMENTS:

I. P. SENDER NOTES

JOB No. 896 AREA Pinal Clm Grp
 LINE 96W, HALF 5, SP. 1, DATE 4 Feb 74
1000'

PAGE 2HEINRICHS
GEOEX

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE	0-105	105	205	205		305	305			405
RANGE	166.6x30									
VOLTAGE	440	510	440	530	510	440	530	530	510	440
CURRENT	5	5	5	5	5	5	5	5	5	5
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		
RECEIVE	405			505	505			605		
RANGE										
VOLTAGE	530	530	510	440	530	530	510	440		
CURRENT	5	5	5	5	5	5	5	5		

FREQUENCIES 1.0 @ 0.1SENDER No. 8661-5OPERATOR R.J.RECEIVER No. D.D.OPERATOR R.P.

COMMENTS:

I. P. RECEIVER NOTES, JOB No. 896, AREA Pinal C/m ExpLINE 116W, HALF N, SP. 1, $\alpha = 1000'$, BEARING NSENDER STA. _____ = ELECTRODE No. _____, DATE 5 Feb 74PAGE 2HEINRICHS
GEOEX

SEND		4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2	CAL	
RECEIVE		35N			45N	45N			55N		
MULTIPLIER		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	+0.3	
PFE		1.1	1.3	1.3	1.7	1.5, 1.7	1.8	2.0	2.1	+0.85	
CUR. (AMPS)		5.0		1.2	1.6				5.0	1	
POINT No.											
SEP. (n)		2	3	4	5	3	4	5	6		
H. F. MV		9.70	4.85	4.10	2.61	3.89	2.40	2.23	1.49	102.8	
DRIFT		0.0	0.0	0.0±.2	0.0±.2	0.0±.2	0.0±.2	0.0	0.0±.2		
1.0 PFE	$K_n/1000$										
0.3 PFE	P_{CAL}										
0.1 PFE	PFE_c	0.8	1.0	1.0	1.4	1.2	1.5	1.7	1.8		
3.0 MV	$P/2\pi$	23	29	49	55	23	29	47	50		
DRIFT	MCF	34	34	20	26	51	52	36	36		
S. P.		-10.0				-7.6					
NOISE						15.1 (Filter on 3.0)					
POT RES.						2.3	+0.3)				
CULT & CMTS						0.0					

I. P. SENDER NOTES

JOB No. 896 AREA Pinal Claim GroupLINE 116 W, HALF N, SP. 1, DATE 2-5-741000'PAGE 1HEINRICHS
GEOEX

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE	55-5N	5N	15N	15N	25N	25				35N
RANGE	166x30	166x30	166x30	166x30	166x30	166x30	166x30			
VOLTAGE	900	490	900	440	490	900	780	440	490	900
CURRENT	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2		
RECEIVE	35			45N	45			55N		
RANGE	166x30									
VOLTAGE	780	440	480	900	780	440	480	900		
CURRENT	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		

FREQUENCIES 1.0 40.1SENDER No. 8661OPERATOR RCPRECEIVER No. D.DOPERATOR 001.FA

COMMENTS:

7.87 1.6 3.89 1.5
3.09 1.9 1.51 2.3

4

I. P. SENDER NOTES

JOB No. 896 AREA Pinal Claim Group
 LINE 16 W, HALF 5, SP. 1, DATE 2-5-74
1000'

PAGE 2HEINRICHS
GEOEX

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE	55-155	15	255	25		355	35			455
RANGE	166x30									
VOLTAGE	740	420	740	460	420	740	830	460	420	740
CURRENT	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		
RECEIVE	45			555	55			655		
RANGE	166x30									
VOLTAGE	830	460	420	740	830	460	420	740		
CURRENT	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		

FREQUENCIES 1.0 & 0.1SENDER No. 8661OPERATOR RCPRECEIVER No. DDOPERATOR Joliffe

COMMENTS:

I. P. RECEIVER NOTES, JOB No. 896, AREA Pinal Clm Exp
 LINE 86W, HALF N, SR. 1, $\alpha =$ 1000', BEARING N
 SENDER STA. 00 = ELECTRODE No. 3, DATE 28 Jan 74



PAGE 1

HEINRICHS
GEOEX

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE	0-10N	10N	20N	20N	30N	30N	30N	30N	30N	40N
MULTIPLIER	10	10	1.0	10	1.0	1.0	1.0	1.0	1.0	0.1
PFE	2.3	2.1	3.3	1.2	2.5	3.7	1.3	1.9	3.2	4.0
CUR. (AMPS)	4	5	4	6	5	4	6	6	5	4
POINT No.	3	3	12	3	12	30	3	12	30	60
SER. (n)										
H. F. MV	117.0	178.0	40.1	167.0	46.1	14.7	80.1	28.3	11.7	4.89
DRIFT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I.O PFE	$K_n/1000$	1.2	1.0	1.8	0.7	1.4	2.1	0.8	1.1	1.9
0.3 PFE	P_{CAL}	2.1	2.1	2.9	1.0	2.1	3.1	1.0	1.5	2.5
0.1 PFE	PFE_C									
3.0 MV	$P/2\pi$	89	108	122	338 84	112	111	40	57	71
DRIFT	MCF									
S. P.	+14.0	+26.0		-6.9			+24.0			
NOISE										
POT RES.	16K	3K		4K			3.5K			
CULT & CMTS										

CAL 99.1
 +0.1 - 112
 +0.1 - 347

I. P. SENDER NOTES

JOB No. 896 AREA Pinal Claim Group
 LINE 86 W, HALF N, SP. 1, DATE 1-28-74

PAGE ~~2~~ 1HEINRICHS
GEOEX

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE	10-10N	10	30X20	30N	30	40N	40	40N	40N	40N
RANGE	20X200	50X100	20X200	20X300	50X100	20X200	20X300	20X300	50X100	20X200
VOLTAGE	760	780	760	740	770	760	560	740	780	750
CURRENT	4.0	5.0	4.0	6.0	5.0	4.0	6.0	6.0	5.0	4.0
SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2		
RECEIVE	40			50N	50			60N		
RANGE	20X300	20X300	50X100	20X200	20X300	20X300	50X100	20X200		
VOLTAGE	550	730	760	740	590	780	800	800		
CURRENT	6.0	6.0	5.0	4.0	6.0	6.0	5.0	4.0		

FREQUENCIES 3.0; 1.0; 40.3

SENDER No. 26721

OPERATOR RCP

RECEIVER No. 34726

OPERATOR Jol. tte

COMMENTS: 1.0 = cal.

I. P. SENDER NOTES

JOB No. 896 AREA Pinal Claim GroupLINE 86 W, HALF 5, SP. 1, DATE 1-29-741000'PAGE 2HEINRICHS
GEOEX

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE	0-105	10	205	20	305	30				405
RANGE	20x300	50x100	20x300	50x100	50x100	20x300	20x200	50x100	50x100	20x300
VOLTAGE	580	640	580	790	640	580	780	780	630	580
CURRENT	6.0	5.0	6.0	5.0	5.0	6.0	4.0	5.0	5.0	6.0
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		
RECEIVE	40			505	50			605		
RANGE	20x200	50x100	50x100	20x300	20x200	50x100	50x100	20x300		
VOLTAGE	770	780	620	570	770	780	620	570		
CURRENT	4.0	5.0	5.0	6.0	4.0	5.0	5.0	6.0		

FREQUENCIES 3.0, 4.0, 3.1SENDER No. 26721OPERATOR RCPRECEIVER No. 34726OPERATOR Jol. Ho

COMMENTS:

Cal = 1.0

I. P. RECEIVER NOTES, JOB No. 896, AREA Pinal Clin Exp
 LINE 76W, HALF 5, SR. 1, $\alpha =$ 1000', BEARING S
 SENDER STA. 5N = ELECTRODE No. 3, DATE 1-31-74



PAGE 3

HEINRICHS
GEOEX

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	
RECEIVE	5N-55	55	155	155		255	255			355	
MULTIPLIER	1.0	(10)1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
PFE	2.0	2.4(54)	2.8	3.5	2.5	3.4	4.2	2.0	2.9	3.6	3.9
CUR. (AMPS)	3	5	3	5	5	4	4	5	5	4	
POINT No.											
SEP. (n)	(602)	1	2	1	2	3	1	2	3	4	
H. F. MV	(59.9)	7(107)	103	28.0	137	29.2	16.0	134	34.7	14.7	10.2
DRIFT	(-)	(-1.8)	-	-	-	-	+0.2	+0.1	-	+0.1	-
1.0 PFE	$K_n/1000$										
0.3 PFE	P_{CAL}		(10)								
0.1 PFE	PFE_G	2.2	2.6	3.3	2.3	3.2	3.9	1.8	2.7	3.4	3.7
3.0 MV	$P/2\pi$	60	(100) 62	112	82	70	120	101	83	88	153
DRIFT	MCF	37	42	29	28	46	33	18	32	39	3.4-4.2
S. P.		+22.8	+38.2		+21.9			+11.5			24
NOISE											
POT RES.		5	4								
CULT & CMTS											

() Nor. Rec. - no good!

I.P. SENDER NOTES

JOB No. 896 AREA Pinal Ctm Grp
 LINE 76W, HALF N, SP. 1, DATE 30 Jan 74
1000'

PAGE 1HEINRICHS
GEOEX

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE	34-15N	15N	25N	25N		35N	35N			45N
RANGE				50x100			50x100			
VOLTAGE	440	890	700	680	780	660	700	670	770	660
CURRENT	2	5	5	5	5	5	5	5	5	5
SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2		
RECEIVE	45N			55N	55N			65N		
RANGE	50x100			110x50	50x100	50x110	50x100	50x110		
VOLTAGE	700	670	750	710	700	720	750	710		
CURRENT	5	5	5	5.5	5	5.5	5	5.5		

FREQUENCIES 1.0 & 0.1SENDER No. 26721-5OPERATOR R. J.

RECEIVER No.

OPERATOR R. R.

COMMENTS:

I.P. SENDER NOTES

JOB No. 896 AREA Pinal Clm GrpLINE 76W, HALF ~~S~~, SP. 1, DATE 31 Jan 74PAGE 2HEINRICHS
GEOEX

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE	5-5s	35s	25s	25s		25s	25s			35s
RANGE			300x10							
VOLTAGE	440	690	450	790	680	560	530	780	680	560
CURRENT	3	5	3.0	5	5	4	4	5	5	4
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		
RECEIVE	35s			45s	45s			55s		
RANGE				500x10	500x10					
VOLTAGE	530	770	670	700	660	770	670	700		
CURRENT	4	5	5.0	5	5	5	5	5		

FREQUENCIES 1.0 + 0.1SENDER No. 26721-5OPERATOR R. J.RECEIVER No. D.R.OPERATOR R. P.

COMMENTS:

I. P. SENDER NOTES

JOB No. 896 AREA Pinal Claim Group
 LINE 116W, HALF N, SP. 2, DATE 2-5-74
500'

PAGE 1HEINRICHS
GEOEX

SEND	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	
RECEIVE	55	0	0	5N	5	10N				
RANGE	166x30					166x30				
VOLTAGE	460	480	420	460	480	380	420	460	480	
CURRENT	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
SEND	5-6	4-5	3-4	2-3	1-2	6-7	5-6	4-5	3-4	2-3
RECEIVE	10				15N	15N				
RANGE	166x30					166x30				
VOLTAGE	380	380	420	460	490	500	380	380	420	460
CURRENT	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

FREQUENCIES 1.0 & 0.1SENDER No. 8661OPERATOR RCPRECEIVER No. D.D.OPERATOR Jahffe

COMMENTS:

I. P. SENDER NOTES

JOB No. 896 AREA Pinal Claim Group
 LINE 116 W, HALF N, SP. 2, DATE 2-5-74
500'

PAGE 2HEINRICHS
GEOEX

SEND	1-2	6-7	5-6	4-5	3-4	2-3				
RECEIVE	20N	20				25N				
RANGE	166x30	166x30								
VOLTAGE	500	500	380	380	420	460				
CURRENT	5.0	5.0	5.0	5.0	5.0	5.0				
SEND	6-7	5-6	4-5	3-4	6-7	5-6	4-5			
RECEIVE	25			30N	30		35N			
RANGE	166x30				166x30					
VOLTAGE	500	380	380	420	510	380	380			
CURRENT	5.0	5.0	5.0	5.0	5.0	5.0	5.0			

FREQUENCIES 1.0 40, 1SENDER No. 8661OPERATOR RCPRECEIVER No. D.D.OPERATOR Doliffe

COMMENTS:

I.P. SENDER NOTES

JOB No. 896 AREA Pinal Claim GroupLINE 116W, HALF 5, SP. 2, DATE 2-0-74500'PAGE 3HEINRICHS
GEOEX

SEND	-	-	3-4	4-5	5-6	6-7				
RECEIVE			15			20.5				
RANGE			166x30							
VOLTAGE			430	380	380	500				
CURRENT			5.0	5.0	5.0	5.0				
SEND	2-3	3-4	4-5	5-6	6-7	1-2	2-3	3-4	4-5	5-6
RECEIVE	20					25.5	25			
RANGE	166x30									
VOLTAGE	480	430	380	380	500	500	480	430	380	380
CURRENT	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

FREQUENCIES 1.040.1SENDER No. 8661OPERATOR RCPRECEIVER No. D.D.OPERATOR Jaliffe

COMMENTS:

I. P. SENDER NOTES

JOB No. 896 AREA Pinal Claim GroupLINE 116 W, HALF 5, SP. 2, DATE 2-5-74500'PAGE 4HEINRICHS
GEOEX

SEND	6-7	1-2	2-3	3-4	4-5	5-6				
RECEIVE	305	30	—————	—————	—————	355				
RANGE	166x30	—————	—————	—————	—————	—————				
VOLTAGE	500	500	480	430	380	380				
CURRENT	5.0	5.0	5.0	5.0	5.0	5.0				
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4			
RECEIVE	35	—————	—————	405	40	—————	455			
RANGE	166x30	—————	—————	—————	—————	—————	—————			
VOLTAGE	460	440	400	350	480	440	400			
CURRENT	5.0	5.0	5.0	5.0	5.0	5.0	5.0			

FREQUENCIES 1.0 & 0.1SENDER No. 8661OPERATOR RCPRECEIVER No. D.D.OPERATOR Doliffe

COMMENTS:

I. P. SENDER NOTES

JOB No. 896 AREA Pinal Cim ExpLINE 106W, HALF IX, SP. 500¹², DATE _____
500¹PAGE 01HEINRICHS
GEOEX

SEND	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	
RECEIVE	5S	00	00	5N	5N	5N			10N	
RANGE	100X30	100X30	100X30	100X30	100X30	1666X30	100X30	100X30	100X30	
VOLTAGE	860	840	860	860	840	720	860	880	860	
CURRENT	3	3	3	3	3	5	3	3	3	
SEND	5-6	4-5	3-4	2-3	1-2	6-7	5-6	4-5	3-4	2-3
RECEIVE	10N				15N	15N				→
RANGE	1666X30	1666X30	100X30	100X30	100X30	1666X30	1666X30	1666X30	100X30	100X30
VOLTAGE	640	720	860	880	860	360	640	720	880	880
CURRENT	5	5	3	3	3	5	5	5	3	3

FREQUENCIES

SENDER No.

OPERATOR

RECEIVER No.

OPERATOR

COMMENTS:

I. P. SENDER NOTES

JOB No. 896 AREA Pinal Cim GpLINE 106W, HALF N, SP. 2, DATE 6 Feb 74
500'PAGE 2HEINRICHS
GEOEX

SEND	1-2	6-7	5-6	4-5	3-4	2-3				
RECEIVE	←20N	20N				25N				
RANGE	100X30	1666X30	1666X30	1666X30	1333X30	1333X30				
VOLTAGE	860	340	600	660	940	960				
CURRENT	3	5	5	5	4	4				
SEND	6-7	5-6	4-5	3-4	6-7	5-6	4-5			
RECEIVE	25N			30N	30N		35N			
RANGE	1666X30	1666X30	1666X30	1333 X30	1666X30	1666X30	1666X30			
VOLTAGE	340	600	660	940	340	600	660			
CURRENT	5	5	5	4	5	5	5			

FREQUENCIES 1.0 90.1

SENDER No. 86615

OPERATOR T. Downing

RECEIVER No. D.D.

OPERATOR R-J.

COMMENTS: Start Here.

I. P. SENDER NOTES

JOB No. 896 AREA Pinal Cim Exp
 LINE 106W, HALF 5, SP. 2, DATE 7 Feb 74
500'

PAGE 3HEINRICHS
GEOEX

SEND	—	—	3-4	4-5	5-6	6-7					
RECEIVE	5-10	10-15	155	—————			205				
RANGE											
VOLTAGE			890	660	600	350					
CURRENT			3.5	5	5	2.5					
SEND	2-3	3-4	4-5	5-6	6-7	1-2	2-3	3-4	4-5	5-6	
RECEIVE	205	—————				255	255	—————→			
RANGE											
VOLTAGE	640	890	670	610	420	680	920	900	670	610	
CURRENT	2.5	3.5	5	5	6	2.5	3.5	3.5	5	5	

FREQUENCIES 1.090-1SENDER No. 8661-5OPERATOR R.J.RECEIVER No. P.O.OPERATOR R.P.

COMMENTS:

I. P. SENDER NOTES

JOB No. 896 AREA Pinal Clm GrpLINE 106W, HALF 5, SP. 2, DATE 7 Feb 74
500'PAGE 4HEINRICHS
GEOEX

SEND	6-7	1-2	2-3	3-4	4-5	5-6				
RECEIVE	305	305	—————			355				
RANGE										
VOLTAGE	420	690	930	920	680	620				
CURRENT	6	2.5	3.5	3.5	5	5				
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4			
RECEIVE	355	—————		405	405	—————		455		
RANGE					250X10	350X10				
VOLTAGE	690	940	930	690	700	960	940			
CURRENT	2.5	3.5	3.5	5.0	2.5	3.5	3.5			

FREQUENCIES 1.0 & 0.1SENDER No. 8661-5OPERATOR R.J.RECEIVER No. D.D.OPERATOR R.P.

COMMENTS:

I. P. RECEIVER NOTES, JOB No. 896, AREA Pinal Claim Group
 LINE 96W, HALF 5, SR. 2, $\alpha =$ 500', BEARING N
 SENDER STA. 00NS = ELECTRODE No. 4, DATE 2-4-74



PAGE 5
 HEINRICH'S
 GEOEX

SEND	3-4	4-5	5-6	6-7	2-3	3-4	4-5	5-6	6-7	EMC
RECEIVE	10			15.5	15				20.5	
MULTIPLIER	10	1.0	1.0	1.0	10	1.0	1.0	1.0	1.0	
PFE	1.6	1.5	1.0	1.6	1.3	1.6	1.7	2.0	1.9	+0.3
CUR. (AMPS)	5								5	
POINT No.										
SEP. (n)	1	2	3	4	1	2	3	4	5	
H. F. MV	256	74.3	40.9	21.2	288	83.0	35.4	22.6	12.9	102.0
DRIFT	+0.2	—	—	-0.2	—	—	—	—	—	
1.0 PFE $K_n/1000$										
0.3 PFE P_{CAL}										
0.1 PFE PFE_c	1.2	1.2	1.4	1.4	1.0	1.3	1.4	1.7	1.6	
3.0 MV $P/2\pi$	77	89	123	127	86	100	106	136	135	
DRIFT MCF	16	13	11	11	12	13	13	13	12	
S. P.	-17.3				+2.0					
NOISE										
POT RES.										
CULT & CMTS										

S.P.: 5-10S = +4.6 ; 0-5S = -23.8

I.P. SENDER NOTES

JOB NO. 896 AREA Pinal Cim Grp
 LINE 96W, HALF N, SR. 2, DATE 1 Feb 74
500'

PAGE 1HEINRICHS
GEOEX

SEND	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	
RECEIVE	0-5N	5N	4-10N		10	10N			15N	
RANGE										
VOLTAGE	650	500	630	650	510	550	630	650	610	
CURRENT	5	5	5	5	5	6	5	5	6	
SEND	5-6	4-5	3-4	2-3	1-2	6-7	5-6	4-5	3-4	2-3
RECEIVE	15N				20N	20N				→
RANGE										
VOLTAGE	460	460	630	660	660	660	460	650	570 630	660
CURRENT	5	5	5	5	6.5	6	5	7	4.5	5

FREQUENCIES 1.0 & 0.1SENDER No. 26722OPERATOR R.J.RECEIVER No. D-Damp.OPERATOR R.P.

COMMENTS:

I-P SENDER NOTES

 JOB No. 896 AREA Pinal Cim Exp
 LINE 96W, HALF N, SP. 2, DATE 1 Feb 74
500'
PAGE 2HEINRICHS
GEOEX

SEND	1-2	6-7	5-6	4-5	3-4	2-3			
RECEIVE	25M	25M	—————			30M			
RANGE									
VOLTAGE	620	670	470	650	950	500			
CURRENT	6	6	5	7	5	\$2.6			
SEND	6-7	5-6	4-5	3-4	6-7	5-6	4-5		
RECEIVE	30M	—————		35M	35M	—————		40M	
RANGE	300x20	100x50	350x20	250x20					
VOLTAGE	670	470	650	950	670	470	560		
CURRENT	6	5	7	5	6	5	6		

FREQUENCIES 1.0 & 0.1SENDER No. 26721OPERATOR R.J.RECEIVER No. D-DOPERATOR R.P.COMMENTS: 5-6 max is 5a in 500-10 mode.

I. P. SENDER NOTES

JOB No. 896 AREA Pinal Clm Grp
 LINE 96W, HALF S, SP. 2, DATE 4 Feb 74
500'

PAGE 3HEINRICHS
GEOEX

SEND	-	-	3-4	4-5	5-6	6-7				
RECEIVE	-	-	105	-----			155			
RANGE										
VOLTAGE			640	450	440	520				
CURRENT			5	5	5	5				
SEND	2-3	3-4	4-5	5-6	6-7	1-2	2-3	3-4	4-5	5-6
RECEIVE	155	-----				205	205	----->		
RANGE										
VOLTAGE	650	640	450	440	520	490	660	640	450	440
CURRENT	5	5	5	5	5	5	5	5	5	5

FREQUENCIES 1.080.1

COMMENTS:

SENDER No. 8661-3OPERATOR R-JRECEIVER No. D.D.OPERATOR R.P

I. P. SENDER NOTES

JOB No. 896 AREA Pinal Cim Grp
 LINE 96W, HALF 5, SP. 2, DATE 4 Feb 74
500

PAGE 4HEINRICHS
GEOEX

SEND	6-7	1-2	2-3	3-4	4-5	5-6			
RECEIVE	255	255	—————			305			
RANGE									
VOLTAGE	520	500	660	650	450	450			
CURRENT	5	5	5	5	5	5			
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4		
RECEIVE	305	—————		355	355	—————		405	
RANGE									
VOLTAGE	500	670	650	450	500	670	650		
CURRENT	5	5	5	5	5	5	5		

FREQUENCIES 1.0 & 0.1SENDER No. 8661-5OPERATOR R. J.RECEIVER No. D-DOPERATOR R. P.

COMMENTS:

J. P. RECEIVER NOTES, JOB No. 896, AREA Pinal Cim Exp

LINE 86W, HALF N, SR. 1, $a =$ 500', BEARING N

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



PAGE 4

HEINRICHS
GEOEX

SEND	6-7	5-6	4-5	3-4	6-7	5-6	4-5	4-5		
RECEIVE	30N			35N	35N		40N			
MULTIPLIER	1.0	0.1	0.1	0.1	0.1	0.1	0.1	1.090-1%		
PFE	1.5	1.9	1.9-2.1-2.6	2.9	2.2	2.1	2.5	1.9-2.6		
CUR. (AMPS)	6	6	5	5	6	6	5	5		
POINT No.										
SEP. (n)										
H. F. MV	18.7	10.50	6.13	4.21	7.79 9.98	5.98	3.70	37.5		
DRIFT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
1.0 PFE $K_n/1000$							1.5			
0.3 PFE P_{CAL}										
0.1 PFE PFE_C	1.4	1.8	2.0	2.8	2.1	2.0	2.4			
3.0 MV $P/2\pi$	47	53	64	71	50	52	62			
DRIFT MCF	30	34	31	40	42	38	39			
S. P.	-5.6				+5.0					
NOISE										
POT RES.	6.5K				5.5K					
CULT & CMTS										

↑

I, P. SENDER NOTES

JOB No. 896 AREA Pinal Claim Group
 LINE 56W, HALF N, SP. 1, DATE 1-29-74
500'

PAGE 81HEINRICHS
GEOEX

SEND	3-4	2-3	1-2	4-5	3-4	2-3	1-2	3-4	2-3	1-2
RECEIVE	→		15N	15	→		10N	10	→ SN	
RANGE	50X100									
VOLTAGE	790	700	660	730	790	700	650	780	690	650
CURRENT	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
SEND	2-3	1-2								
RECEIVE	SN	→ 0								
RANGE	50X100	50X100								
VOLTAGE	690	650								
CURRENT	5.0	5.0								

FREQUENCIES 3.0 & 0.3SENDER No. 26721OPERATOR RCPRECEIVER No. 34726OPERATOR Tol: Ate

COMMENTS:

I. P. SENDER NOTES

 JOB NO. 896 AREA Pinal Claim Group
 LINE 86 W, HALF N, SP. 1, DATE 1-29-74
PAGE 2HEINRICHS
GEOEX

SEND	6-7	5-6	4-5	6-7	5-6	4-5	3-4	6-7	5-6	4-5
RECEIVE	40	→	35-N	35	→	→	30N	30	→	→
RANGE	20x300	20x300	50x100	20x300	20x300	50x100	50x100	20x300	20x300	50x100
VOLTAGE	640	580	740	640	580	740	800	640	580	740
CURRENT	6.0	6.0	5.0	6.0	6.0	5.0	5.0	6.0	6.0	5.0
SEND	3-4	2-3	6-7	5-6	4-5	3-4	2-3	1-2	5-6	4-5
RECEIVE	→	25 N	25	→	→	→	→	20 N	20	→
RANGE	50x100	50x100	20x300	20x300	50x100	50x100	50x100	50x100	50x100	50x100
VOLTAGE	790	700	640	580	740	790	700	650	780	730
CURRENT	5.0	5.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0

FREQUENCIES 3.0 4.0, 3SENDER No. 26721OPERATOR RCPRECEIVER No. 34726OPERATOR Sol. Pfe

COMMENTS:

I. P. SENDER NOTES

JOB No. 896 AREA Pinal Claim GroupLINE #6 W, HALF 5, SP. 1, DATE 1-29-74500'PAGE #3HENRICHS
GEOEX

SEND	2-3	3-4	4-5	5-6	6-7	3-4	4-5	5-6	6-7	
RECEIVE	20	—————				15.5	15	—————		10.5
RANGE	50X100	50X100	50X100	20X300	20X300	50X100	50X100	20X300	20X300	
VOLTAGE	660	740	690	540	590	740	690	540	590	
CURRENT	5.0	5.0	5.0	6.0	6.0	5.0	5.0	6.0	6.0	
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES 3.0 4 0.3SENDER No. 26721OPERATOR RCPRECEIVER No. 34726OPERATOR 001.ffe

COMMENTS:

I. P. SENDER NOTES

JOB No. 896 AREA Pinal Claim GroupLINE 86 W, HALF S, SP. 1, DATE 1-27-74PAGE 4HEINRICHS
GEOEX

SEND	1-2	2-3	3-4	1-2	2-3	3-4	4-5	1-2	2-3	3-4
RECEIVE	40		35	35			30	30		
RANGE	50x100									
VOLTAGE	630	680	760	630	660	760	700	620	660	760
CURRENT	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
SEND	4-5	5-6	1-2	2-3	3-4	4-5	5-6	6-7		
RECEIVE		25	25					20		
RANGE	50x100	20x300	50x100	50x100	50x100	50x100	50x100	20x300		
VOLTAGE	700	540	620	660	750	700	470	600		
CURRENT	5.0	6.0	5.0	5.0	5.0	5.0	5.0	6.0		

FREQUENCIES 3, 0 4 0, 3

COMMENTS:

SENDER No. 26721OPERATOR RCPRECEIVER No. 34726OPERATOR RCP

I, P. RECEIVER NOTES, JOB No. 896, AREA Pinal CIm Grp
 LINE 76W, HALF N, SR. 1, $\alpha =$ 500', BEARING N
 SENDER STA. SN = ELECTRODE No. 4, DATE 1-30-74



PAGE 2

HEINRICHS
GEOEX

SEND	5-6	4-5	3-4	2-3	1-2	6-7	5-6	4-5	3-4	2-3
RECEIVE	20N				25N	25N				→
MULTIPLIER	10	1.0	1.0	1.0	1.0	10	1.0	1.0	0.1	0.1
PFE	0.5	1.0	2.0	2.9	3.1	0.7	0.9	1.4	2.5	3.1
CUR. (AMPS)	5	5	5	5	5	5	5	5	6.5	6
POINT No.										
SER. (n)	1	2	3	4	5	1	2	3	4	5
H. F. MV	200	57.2	21.1	14.2	10.5	123	36.6	15.7	9.17	6.42
DRIFT	—	—	—	—	—	—	—	—	—	—
1.0 PFE $K_n/1000$										
0.3 PFE P_{CAL}										
0.1 PFE PFE_c	0.6	1.1	2.1	3.0	3.2	0.8	1.0	1.5	2.6	3.2
3.0 MV $P/2\pi$	60	68	63	84	109	37	44	48	42	56
DRIFT MCF	10	16	34	36	29	22	23	32	62	56
S. P.	-13.0					0.0				
NOISE										
POT RES.	4									
CULT & CMTS						4				

L.P. RECEIVER NOTES, JOB No. 896, AREA Pinal Cim Exp
 LINE 76W, HALF N, SR. 1, $\alpha =$ 500', BEARING N
 SENDER STA. SN = ELECTRODE No. 4, DATE 1-30-74



PAGE 4

HEINRICHS
GEOEX

SEND	6-7	5-6	4-5	3-4	6-7	5-6	4-5		
RECEIVE	35N			40N	40N		45N		
MULTIPLIER	1.0	0.1	0.1	0.1	0.1	0.1	0.1		
PFE	1.3	1.3	1.8	2.6	1.3	1.3	1.8		
CUR. (AMPS)	5	5	5	6	5.5	5	5		
POINT No.									
SEP. (n)	3	4	5	6	4	5	6		
H. F. MV	14.5	7.74	4.11	2.78	8.63	4.66	2.63		
DRIFT	—	—	—	—	—	—	—		
1.0 PFE	$K_n/1000$								
0.3 PFE	P_{CAL}								
0.1 PFE	PFE_c	1.4	1.4	1.9	2.7	1.4	1.4	1.9	
3.0 MV	$P/2\pi$	43	46	43	31	47	49	35	
DRIFT	MCF	33	30	44	87	30	29	54	
S. P.		+3.6				+23.3			
NOISE									
POT RES.		2				2			
CULT & CMTS		2				sign			

*change on S.P.

I.P. SENDER NOTES

JOB NO. 896 AREA Pinal Cim Exp
 LINE 76W, HALF N, SP. 2, DATE 30 Jan 74
500'

PAGE 1HEINRICHS
GEOEX

SEND	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	CAL
RECEIVE	5N	10N	10N		15N	15N			20N	
RANGE						100x50				100x10
VOLTAGE	550	520	530	550	520	710	530	560	520	
CURRENT	5	5	5	5	5	5	5	5	5	1
SEND	5-6	4-5	3-4	2-3	1-2	6-7	5-6	4-5	3-4	2-3
RECEIVE	20N				25N	25N				
RANGE	100x50					100x50			130x50	120x50
VOLTAGE	650	720	540	560	520	590	650	720	700	680
CURRENT	5	5	5	5	5	5	5	5	6.5	6

FREQUENCIES 1-0 00-1
 SENDER No. 267218
 OPERATOR R.J
 RECEIVER No.
 OPERATOR R.P.

COMMENTS:

I.P. SENDER NOTES

JOB No. 896 AREA Pinal Clm Grp
 LINE 76W, HALF N, SP. 2, DATE 30 Jan 74
500'

PAGE 2HEINRICHS
GEOEX

SEND	1-2	6-7	5-6	4-5	3-4	2-3			
RECEIVE	30N	30N	—————			35N			
RANGE	100x50	100x50	—————→		130x50	120x50			
VOLTAGE	630 530	600	650	720	700	680			
CURRENT	6.5	5	5	5	6.5	6			
SEND	6-7	5-6	4-5	3-4	6-7	5-6	4-5		
RECEIVE	35N	—————		40N	40N	—————		45N	
RANGE	100x50	—————→		120x50	110x50	100x50	—————→		
VOLTAGE	600	660	730	650	660	660	730		
CURRENT	5	5	5	6	5.5	5	5		

FREQUENCIES 1.0 90.1SENDER No. 26721OPERATOR R.S

RECEIVER No.

OPERATOR R.P.

COMMENTS:

I.P. SENDER NOTES

JOB No. 896 AREA Pinal C1m Grp
 LINE 76W, HALF 5, SP. 2, DATE 31 Jan 74
500'

PAGE 3HEINRICHS
GEOEX

SEND	—	—	3-4	4-5	5-6	6-7				
RECEIVE	54-0	0-55	55	—————		105				
RANGE										
VOLTAGE			540	710	640	580				
CURRENT			5	5	5	5				
SEND	2-3	3-4	4-5	5-6	6-7	1-2	2-3	3-4	4-5	5-6
RECEIVE	105	—————				155	155	————— →		
RANGE										
VOLTAGE	560	550	720	640	580	480	680	660	720	650
CURRENT	5	5	5	5	5	4.5	6	6	5	5

FREQUENCIES 1.040.1
 SENDER No. 26721
 OPERATOR R. J.
 RECEIVER No. D. D. 20693
 OPERATOR R. P.

COMMENTS:

I.P. SENDER NOTES

JOB No. 896 AREA Pinal Cln CrpLINE 76W, HALF 5, SP. 2, DATE 31 Jan 74
500'PAGE 4HEINRICHS
GEOEX

SEND	6-7	1-2	2-3	3-4	4-5	5-6			
RECEIVE	205	205	—————			255			
RANGE									
VOLTAGE	700	490	680	670	730	720			
CURRENT	6	4.5	6	6	5	5.5			
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4		
RECEIVE	255	—————		305	305	—————		355	
RANGE									
VOLTAGE	490	690	670	730	490	700	620		
CURRENT	4.5	6	6	5	4.5	6	5.0		

FREQUENCIES 1.0 & 0.1SENDER No. 26721OPERATOR R. JRECEIVER No. D. DOPERATOR R. P

COMMENTS:

I. P. RECEIVER NOTES, JOB No. 896 AREA Pinal Clm Grp.



PAGE 3

LINE 00NS, HALF W, SP. 1, $\alpha =$ 500', BEARING N87 $\frac{1}{2}$ °W

HEINRICHS
GEOEX

SENDER STA. _____ = ELECTRODE No. _____, DATE 23924 Jan 74

SEND	6-7	1-2	2-3	3-4	4-5	5-6	6-7			
RECEIVE	111	111				116	116			
MULTIPLIER	0.1	1.0	0.1	0.1	0.1	0.1				
PFE	3.1 ^{2.8}	1.5	0.1.5(1.4)	1.6	2.0 +1.0	3.1				
CUR. (AMPS)	2	1.5	1.5	1.5	N.R.(1.5)	1.5(2)				
POINT No.	75884	6	15	30	52.5	84				
SER. (n)			(8.32)		(2.62)	(1.35)				
H. F. MV	2.33	12.1	8.36	4.97	1.77	1.00				
DRIFT	0.0±.2	0.0	0.0(±.2)	0.0	(00±.2)	(00±.2)				
I.O PFE	K _n /1000									
0.3 PFE	P _{CAL}									
0.1 PFE	PFE _C									
3.0 MV	P/2 π									
DRIFT	MCF									
S. P.		+5.2			+4.2					
NOISE			+4.7							
POT RES.										
CULT & CMTS										

() - repeats on 24 Jan

I. P. RECEIVER NOTES, JOB No. 896 AREA Pinal Cln Exp
 LINE 00NS, HALF E, SP. 1, $\alpha =$ 500', BEARING _____
 SENDER STA. _____ = ELECTRODE No. _____, DATE 24 Jan 74



PAGE 6

HEINRICHS
GEOEX

SEND	5-6	4-5	3-4	2-3	1-2	6-7	5-6	4-5	3-4	2-3	
RECEIVE	71W	_____				66W	66W	_____			→
MULTIPLIER	1.0	0.1	0.1	0.1	0.1	1.0	0.1	0.1	(1.0)	(0.1)	
PFE	1.8	2.2	2.9	3.2 3.3	≈ 3.1	1.4(1.5)	2.4(2.2)	4.5	3.2	3.4	
CUR. (AMPS)	1.5	1.2	1.3	1.3	1.9?	5	5	5 ^{2.5-3.0} 2.8	5 ^{3.0-3.4}	5	
POINT No.	15	6	15	30	52.5	15	6	15	30	52.5	
SER. (n)						(102.8)	(28.0)	(17.8)			
H. F. MV	31.7	9.71	5.33	3.48	2.42	64.3	7.52	7.39	(11.7)	(18.84)	
DRIFT	0.0	0.0	0.0	0.0	±0.4	0.0(0.0)	0.0(0.0)	0(0.0)	0.0	0.0	
I.O PFE	$K_n/1000$						2.4	2.9-3.0	3.4	3.8	
0.3 PFE	P_{CAL}										
0.1 PFE	PFE_C										
3.0 MV	$P/2\pi$						27.6	27.6	(+1.5) 11.5	(-2.0) 8.66	
DRIFT	MCF						0.0	0.0	0.0	0.0	
S. P.	= 8.0					-23.0	(-13.0)				
NOISE						"DC" Noise to	1.0mb	spikes	avg of .3-.6mb		
POT RES.							-18.0				
CULT & CMTS											

25 Jan ()

I. P RECEIVER NOTES, JOB No. 896, AREA Pinal C/m Grp



PAGE 7

LINE 00 NS, HALF E, SP. 1, $\alpha =$ 500', BEARING _____

HEINRICHS
GEOEX

SENDER STA. _____ = ELECTRODE No. _____, DATE 24 Jan 74
28

SEND		1-2	6-7	5-6	4-5	3-4	2-3						
RECEIVE		61W	61W				55W						
MULTIPLIER		0.1	1.0	1.0	0.1	0.1	0.1						
PFE		≈ 3.4 $\frac{3.0}{6.0}$	2.0 $\frac{1.8}{2.1}$	2.6-2.7	? $\frac{2.4}{4.2}$	(3.3) $\frac{3.1}{3.7}$	3.8 $\frac{3.4}{4.1}$						
CUR. (AMPS)		5	5	5	5 (3.2)	5	6						
POINT No.		84	6	15	30	52.5	84						
SEP. (n)				(13.7)	(11.0)								
H. F. Mv		4.44	30.9	13.4	10.79	(8.31)	(7.88)						
DRIFT		0.0	0.0	0.0	out. 2	0.0	0.0 \pm 2						
I.O PFE	$K_n/1000$	$\frac{3.9-4.1}{4.0}$	2.0	$\frac{3.0-3.2}{3.0-3.2}$	3.6		(4.1)						
0.3 PFE	P_{CAL}				$\frac{3.1-3.7}{3.1-3.7}$								
0.1 PFE	PFE_c												
3.0 MV	$P/2\pi$	(-2.0) 43.5	(-0.9) 30.6	(-2.6) 13.2	(-1.7) 10.59		(-1.9) 7.73						
DRIFT	MCF	0.0	0.0		0.0								
S. P.			+32.7				(+20.0)						
NOISE				+26.35									
POT RES.													
CULT & CMTS													

28 Jan ()

I. P. SENDER NOTES

JOB No. 896 AREA Pinal Claim GroupLINE 00 NS, HALF W, SP. 1, DATE 1-23-74PAGE 1HEINRICHS
GEOEX

SEND	5-6	-6-7	4-5	5-6	6-7	3-4	4-5	5-6	-6-7	2-3
RECEIVE	86-91 W	91		96 W	96				101 W	101-106 W
RANGE	100x10	150x10	100x10	150x10	150x10	100x10	100x10	100x10	150x10	100x10
VOLTAGE	260	220	340	380	230	320	340	260	240	310
CURRENT	1.0	1.5	1.0	1.5	1.5	1.0	1.0	1.0	1.5	1.0
SEND	3-4	4-5	5-6	6-7	1-2	2-3	3-4	4-5	5-6	6-7
RECEIVE	101			106 W	106					111 W
RANGE	100x10	100x10	100x10	100x10	100x10	100x10	100x10	100x10	100x10	200x10
VOLTAGE	320	340	240	160	310	310	320	320	240	300
CURRENT	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0

FREQUENCIES 1.040.1SENDER No. 8661OPERATOR R. PetersonRECEIVER No. 20693OPERATOR R. SoliffoCOMMENTS: Cal = 1.0

I. P. SENDER NOTES

JOB No. 896 AREA Pinal Claim GroupLINE 00NS HALF W, SP. 1, DATE 1-23-74 41-24-74PAGE 2HEINRICHS
GEOEX

SEND	1-2	2-3	3-4	4-5	5-6	1-2	2-3	3-4	4-5	
RECEIVE	111	—————→			116 W	116	—————→			121 W
RANGE	150x10	150x10	150x10	100x10	150x10	140x10	130x10	130x10	120x10	
VOLTAGE	380	390	460	320	360	390	350	410	400	
CURRENT	1.5	1.5	1.5	1.0	1.5	1.4	1.3	1.3	1.2	
SEND	1-2	2-3	3-4		2-3	4-5	5-6			
RECEIVE	121	—————→		126 W	116	—————→			116 W	
RANGE	130x10	130x10	130x10		150x10	150x10	200x10			
VOLTAGE	360	340	420		400	500	520			
CURRENT	1.3	1.3	1.3		1.5	1.5	2.0			

FREQUENCIES

SENDER No.

OPERATOR

RECEIVER No.

OPERATOR

COMMENTS:

repeat
1-24-74

I. P. SENDER NOTES

JOB No. 896 AREA Pinal Claim GroupLINE 00NS, HALF E, SP. 1, DATE 1-24-74PAGE 3HEINRICHS
GEOEX

SEND	4-5	3-4	2-3	1-2	5-6	4-5	3-4	2-3	1-2	6-7
RECEIVE	76			71 W	71				66 W	66-61 W
RANGE	100X10	130X10	130X10	130X10	150X10	120X10	130X10	130X10	190X10	300X10
VOLTAGE	340	410	340	360	380	400	400	340	56	470
CURRENT	1.0	1.3	1.3	1.3	1.5	1.2	1.3	1.3	1.9	3.0
SEND	5-6	4-5	3-4	2-3	1-2	6-7	5-6	4-5	3-4	2-3
RECEIVE	66				61 W	61				56 W
RANGE	130X10	110X10	120X10							
VOLTAGE	320	360	380							
CURRENT	1.3	1.1	1.2							

FREQUENCIES 1.090.1SENDER No. 2661OPERATOR RCPRECEIVER No. 20693OPERATOR R. JoliffeCOMMENTS: Cal = 1.0

I. P. SENDER NOTES

JOB NO. 896 AREA Pinal Claim GroupLINE 00NS, HALF E, SP. 1, DATE 1-25-74PAGE 4HEINRICHS
GEOEX

SEND	5-6	4-5	6-7	5-6	4-5	3-4	2-3	1-2	6-7	5-6
RECEIVE	66		66					61W	61	
RANGE	30x10	20x10	166x30							
VOLTAGE	770	640	440	580	820	770	620	880	440	560
CURRENT	3.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
SEND	4-5	3-4	2-3		5-6	4-5	3-4	2-3		
RECEIVE			56W		61			56W		
RANGE	166x30				50x100	50x100	50x100	20x300		
VOLTAGE	800				640	880	800	760		
CURRENT	5.0				5.0	5.0	5.0	6.0		

FREQUENCIES 1.0 0.1SENDER No. 8661OPERATOR RCPRECEIVER No. 20693OPERATOR Vol. Pfe

COMMENTS:

26721
1-28-74

Cal = 1.0

I. P. SENDER NOTES

JOB No. 896 AREA Pinal Claim Group
 LINE 00Ns, HALF E, SP. 1, DATE 1-28-54

PAGE 5HEINRICHS
GEOEX

SEND	6-7	5-6	4-5	3-4	6-7	5-6	4-5			
RECEIVE	56			51W	51		46W			
RANGE	20x300	50x100	50x100	50x100	20x300	20x300	50x100			
VOLTAGE	580	620	860	800	780	740	860			
CURRENT	6.0	5.0	5.0	5.0	6.0	6.0	5.0			
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES 1.0 40.1SENDER No. 26721OPERATOR RCPRECEIVER No. 20693OPERATOR Juli RfeCOMMENTS: Cal=1.0



HEINRICHS GEOEXPLORATION COMPANY

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

January 22, 1974

Mr. Steve Radvak
Cutlass Exploration & Development
1604 Royal Center
Vancouver, B. C.

Re: GEOEX Job #896

Dear Mr. Radvak:

The following letter of agreement is formulated according to the discussions held between R. H. Seraphim, Consulting Geologist for Cutlass, and Paul A. Head of Heinrichs GEOEXploration Company and as a result of their field examination at the Pinal Claim Group on January 21, 1974.

We have proposed to extend the 1966 induced polarization done by McPhar, using the dual frequency technique. Specifically, Line 0 N-S is to be partially rerun and extended west to 131+00 W (counting the east coordinate of the "Old Well" as 48+00W) serving as a baseline for the remainder of the survey. Five new north-south lines will then be completed. The layout of this work will be as follows:

- Line 0 N-S: a=500 ft, 7 electrode, centered at 86W,
Total length 9000 feet
- Line 76 W: a=500 ft, 7 electrode, centered at 5N,
Total length 7500 ft.
a= 1000 ft, 5 electrode, centered at 5N,
Total length 12000 ft.
- Line 86 W: a=500 ft, 7 electrode, centered at 0.0N,
Total length 7500 ft.
a= 1000 ft, 5 electrode, centered at 0.0N,
Total length 12000 ft.
- Line 96 W: a= 500 ft, 7 electrode, centered at 0.0N,
Total length 7500 ft.
a= 1000 ft, 5 electrode, centered at 0.0N,
Total length 12000 ft.

Mr. Steve Radvak
January 22, 1974
Page Two

Line 106 W: a= 500 ft, 7 electrode, centered at 5S
Total length 7500 ft.
a= 1000 ft, 5 electrode, centered at 5S.
Total length 12000 ft.
Line 116 W a= 500 ft, 7 electrode, centered at 5S,
Total length 7500 ft.
a= 1000 ft, 5 electrode, centered at 5S,
Total length 12000 ft.

These aggregate 106,500 feet of traverse (20.1 Line miles.)
We estimate that approximately 14 field days will be required and
the total cost including report will be \$5000.00 to \$6,000.00. An
advance payment of \$3,000.00 is requested.

The actual charges will be based on a 3 man crew with equip-
ment at \$250.00 per field day plus expenses. Expenses will include
\$48.00 per day living expenses for the three men and \$15.00 per day
plus \$0.20 per mile for a four-wheel-drive vehicle. Other inciden-
tal job related expenses such as communications will be billed at
our invoice cost plus 15%. Travel time between Tucson and Casa
Grande and return, and standby time due to inclement weather or
client request will be charged at one half the daily work rate plus
expenses as above. Final compilation, computation and drafting will
be charged at \$10.00 per hour. Final interpretation and report will
be charged at \$18.75 per hour. Rough field plots and preliminary
interpretations will be available during the project as needed, sub-
ject to receipt of the requested advance payment.

Our normal work schedule is based on an eight hour work day
and a five day week. Travel time up to one hour per day each way
between the job site and crew base will not be charged. Overtime in
excess of this schedule will be charged at \$37.50 per hour for the
three man crew plus expenses as above.

GEOEX will hold the client harmless from all Workmen's Compen-
sation liability, public liability and property damage liability
incurred by GEOEX employees. All property permits, brushing and
trespass liability, and related costs which are incurred on behalf
of the client will be chargeable to the client at GEOEX cost plus
15 percent. All special insurance premiums, bonds, fees, duties,
licenses, taxes, trespass permits, and related special fees, if any,
will be billed to the client at GEOEX cost plus 15 percent.

Billings may be submitted periodically requesting interim pay-
ments with final payment due in full on presentation of final report.

Mr. Steve Radvak
January 22, 1974
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Your understanding and approval of the above may be indicated by signing as provided below on the attached copy of this letter and returning it to us, or by submitting a purchase order.

Sincerely yours,

Heinrichs GEOEXploration Co.



Paul A. Head
Senior Geophysicist

Date: Jan 24/74
Accepted by: Andrew [unclear]
Title: Consulting Engineer