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INDUCED POLARIZATION GEOPHYSICAL INVESTIGATIONS

S½ NE¼ Sec. 22 and NE¼ & N½N½ SE¼ Sec. 21
T 17 S, R 13 E

Pima District, Pima County, Arizona

for

Mrs. Frances G. Emmons

June, July 1962

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

INTRODUCTION

During the period June 27 through July 14, 1962, two northerly striking lines of induced polarization measurements using a 500 ft. electrode spacing were made across the NE¼ of Sec. 21, T 17 S, R 13 E and one generally northwest-southeast line was run across the Arlie Claim Group in the S½ NE¼ Sec. 22, T 17 S, R 13 E. using a 1,000 ft. electrode spacing. This work was done at the request of Mrs. Frances Emmons, owner of the claims in these two respective areas. Mr. Franklin Seward, geophysicist was in charge of the work with Mr. Chris Ludwig, geophysicist, assisting. In addition, four helpers were required to conduct the survey.

Cost of the survey exceeded $1,000 for the area in Sec. 21 and $500 for the area in Sec. 22.

In addition to legal annual labor requirements, objective of the work was to provide the maximum practical subsurface information available for this type and order of magnitude expendature, and in particular, any indications of mineral concentrations especially worthy of being test drilled as well as any subsurface geologic factors which might be considered either more or less favorable for water well testing.

On this basis, it was technically necessary to use a relatively long (1,000') dipole spacing and resultant length of line (#3) to hopefully detect the deeper bedrock anticipated

in Sec. 22 and also to follow it up to the outcrops to the northwest. This is why this line was necessarily so long and extended so far beyond the Arlie Claims. Alluvium being apparently considerably shallower in Sec. 21, allowed us to effectively and efficiently use a shorter 500' dipole interval on Lines 1 & 2 in this area.

For possible legal convenience, at the end of this report we have separated the required text on the two respective parcels. In case your legal counsel advises that separate affidavits be filed, these together with a copy each, of the plan map and the appropriate respective "sectional data sheets" may be submitted for recording purposes.

RECOMMENDATIONS

1. In view of weak or negative indications obtained, no additional induced polarization work is recommended for the time being.

2. In spite of the rather speculative and probable deep potential, a magnetic survey would be worthwhile and should be the next consideration--particularly for any further geophysical appraisal of mineral possibilities.

3. No especially favorable drill targets were revealed. Therefore, at present, any drilling with the sole objective of valuable mineral discovery would be essentially wildcat in nature, and preferably should be held in abeyance pending

further geophysical appraisal. If drilling for purely mineral purposes is to be done regardless, the best tentative locations in lieu of any additional information are:

(a) 200' SW of the NE corner of Arlie #1 Claim, preferably drilled at least 1,000' deep or to bedrock.

(b) 100' N of Sahuarita Road on the center of Emmons #47 Claim near our station 1S on Line #1, preferably drilled at least 750' deep or to bedrock.

4. Drill most anywhere for at least 1 some water on the Arlie Claims.

5. On the NE 200 acres of Sec. 21., confine water drilling to as far away from outcrops as possible and especially toward the extreme SE and NW corners of the area, or, possibly near the common eastern corner of Emmons #2, & #3 claims. (See "Conclusions" below regarding relative merits of these various locations.)

CONCLUSIONS

1. The induced polarization measurements show no positive evidence of strong sulfide mineralization to our estimated depth of electrical penetration which is approximately 1,000' +/- 50% in the Emmons claims area. The very weak and indefinite indications obtained at the two locations mentioned above under "Recommendations" #3 are most likely to be of no economic significance, nevertheless, from the standpoint of possibility, they must be tentatively considered.

2. In other words, if sulfide mineralization exists it is either essentially deeper than we penetrated, or quantitatively, is in concentrations too small, weak or scattered to have been definitely detected in this type of broad preliminary reconnaissance.

3. The direct current resistivity measurements made in the course of the I. P. investigations are strong in character and relate to observed surface and reasonably expected or reported subsurface geologic conditions such as broad faults or scarps and the major contact between bedrock and alluvium.

4. Magnetic coverage would definitely aid substantially in over all interpretation of available information and further appraisal of mineral potential.

5. If added groundwater exploration by drilling is contemplated in the NE 200 acres of Sec. 21, a more detailed examination using a considerably smaller electrode spacing, and possibly additional methods such as magnetics, would be at least desirable if not essential to insure maximum possible success. Otherwise, except very locally and as noted in recommendation #5, above, the general potential is not too favorable in that any particular site might be dry, or at best a rather small or intermittent producer.

6. General water potential on the Arlie Claims is good and should be fairly similar over the whole area with increasing

production favorability and slightly less depth from surface to water toward the east and vice versa toward the west. Well yields should increase somewhat with depth, especially toward the east. Average bedrock depth is estimated of the order of 1,000' +/- 50% and relatively shallower toward the west and deeper to the east.

PROCEDURE, INTERPRETATION AND METHOD

Line #1 was centered near the location monument of Emmons #47 Claim and run generally north-south across the eastern sides of the limestone hills to the north and south of center respectively. Line #2 was centered near the location monument of Emmons #50 and run N 22° E - S 22° W. along the western flanks of the above mentioned hills. The extremely sharp resistivity contrasts observed on these lines probably relate to fairly steep geological contacts, either fault or igneous-sedimentary, though conceivably could be the reflection of near vertical alluvial-sedimentary (erosional) contacts.

Between the two limestone hills, as already more or less confirmed by drilling, both lines show a thickness of alluvial section approaching three or four hundred feet, particularly to the west or northwest of a direct line between the two hills. A major modern surface drainage passes between the two hills along the north side of the south hill and it is conceivable

that a likely subsurface ridge connecting the two bedrock outcrops could provide some daming action possibly forming a basin or reservoir of some extent to the northwest.

Line #3 was run approximately N 60° W - S 60° E across the Arlie claim group in the S½ of the NE¼ of Sec. 22, T 17 S, R 13 E and again passed near the north side of the north hill mentioned on Lines #1 & #2. Results further confirmed an apparent lack of any strong polarization effects that might have been expected from sulfides in the vicinity of the limestone contacts in this area. Resistivities decrease to the east probably corresponding to increasing depth to bedrock in this direction.

Included with this report are a plan map showing the location of the lines and sectional data sheets showing the direct current earth resistivities above the ground line with the percent frequency effects plotted as a superscript to the resistivities. The metallic conduction factors are plotted below the line. The resistivities which have units of ohm-feet over 2 pi are contoured on a logarithmic interval. No attempt was made to contour the metallic conduction factor because of the lack of anomalism observed. The percent frequency effect is the ratio of the direct current resistance to the alternating current impedence and is used as a relative indication of possible degree of sulfide mineralization. Frequency effects of from two to four percent, and sometimes considerably higher,

depending on the overall magnitude of the direct current resistivities, are the usual order of magnitude background "noise". Frequency effects of twice average background are questionably anomalous; three times background, moderately anomalous and four or more times background strongly anomalous. Frequency effects in this survey ranged from zero to five per cent which is considered to be background.

Respectfully submitted,

HEINRICHS GEOEXPLORATION CO.

Walter E. Heinrichs, Jr.,
President & General Manager

July 20, 1962
P. O. Box 5671
Tucson, Arizona

July 19, 1962

Claims in Section 21, T 17 S, R 13 E, G.& S. R. B. & M.
Pima County, Arizona

In order to most efficiently gain sufficient depth of penetration and maximum technical subsurface and latteral detailed information regarding these claims, two - 5 electrode, 500' dipole spacing setups were made on two lines (#1 & #2) and run out in both directions to a maximum of six 500' intervals between sender and receiver dipoles, utilizing a conventional so called Eltran induced polarization system as currently in general accepted use in mineral exploration work.

Lay out of the work in relation to discovery and boundaries of the claims is shown on the attached plan map.

Cost of the work exceeded $1,000.00.

Basic findings are summarized on an attached "sectional data sheet" for the particular line involved.

Execution of the survey and compilation of results was performed by Mr. Franklin A. Seward, Jr. and Mr. Chris Ludwig, graduate engineers and employees of Heinrichs Geoexploration Company, under the direct supervision of Mr. Walter E. Heinrichs, Jr., P. E. President and General Manager of the company.

HEINRICHS GEOEXPLORATION CO.

Walter E. Heinrichs, Jr.

Registered Professional Engineer (Mining)
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WALTER E. HEINRICHS, JR.
DEC. 31, 1962
ARIZONA, U. S. A.

808 W. Grant Rd.
P. O. Box 5671
Tucson, Arizona

July 19, 1962

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Pima County, Arizona

In order to most efficiently gain sufficient depth of penetration and maximum technical subsurface and latteral detailed information regarding these claims, one 5-electrode 1,000' dipole spacing setup was made on one line (#3) and run out in both directions to a maximum of six 1,000' intervals between sender and receiver dipoles, utilizing a conventional so called Eltran induced polarization system as currently in general accepted use in mineral exploration work.

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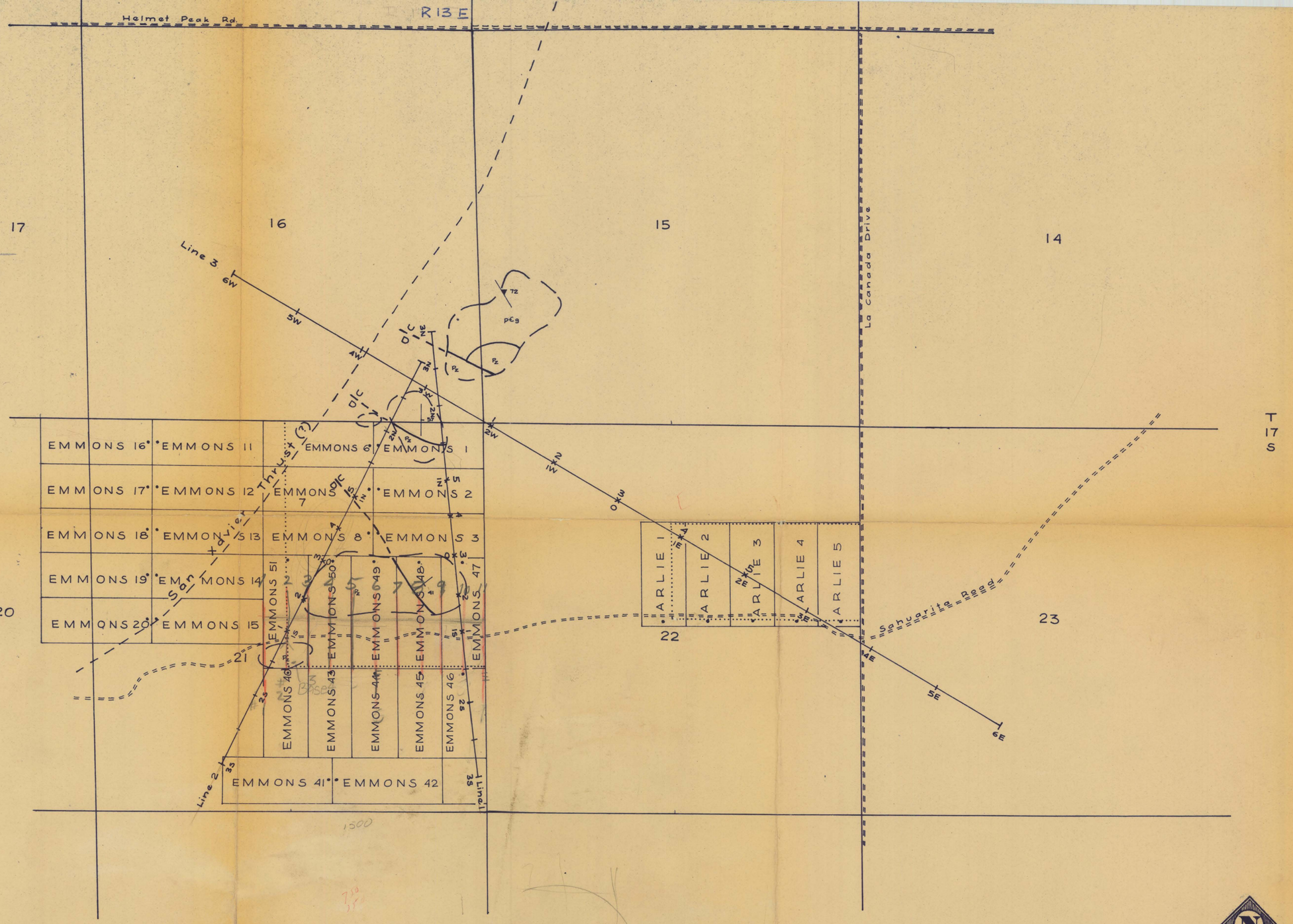


LEGEND

- 4W 3W 2W 1W 0 1E 2E — Electrode No. / Station No. — I.P Line
- U/D — Fault
- Road
- Contact
- 30 — Strike & dip of beds
- 72 — Strike & dip of foliation.

Rocks other than Alluvium:

- Pz — Paleozoic sed. rocks
- PEg — Granite
- Disc.
- Surface boundary

Registered Professional Engineer (Mining) — CERTIFICATE EXPIRES — WALTER E. HEINRICHS, JR. — DEC. 31, 19 67 — ARIZONA, U.S.A.

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

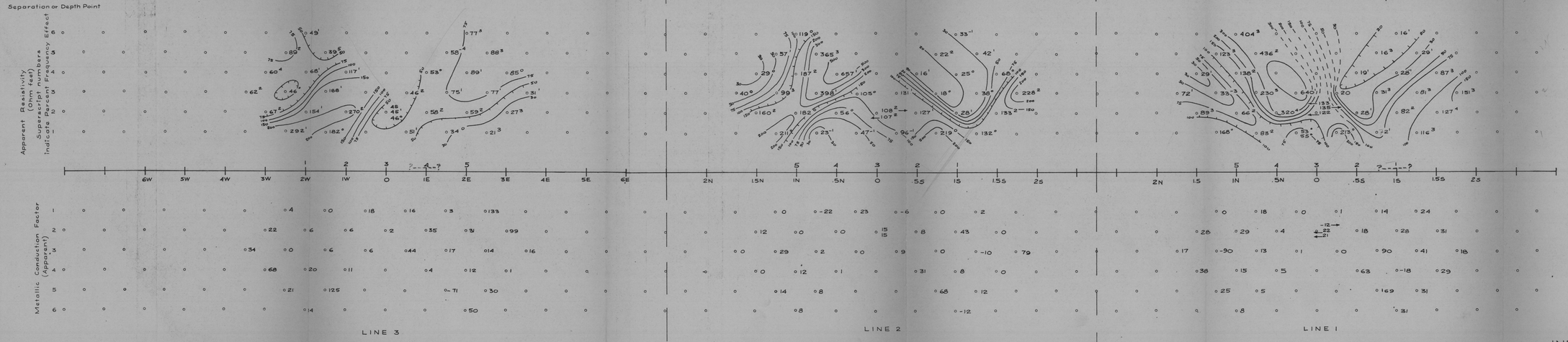
INDUCED POLARIZATION SURVEY and GEOLOGY

FOR

MRS. L. B. EMMONS

Emmons & Arlie Claim Groups
Pima Mining District
Pima County, Arizona

SCALE: 1" = 1000'	CONTOUR INTERVAL:	REVISIONS
	DATA BY: F.A.S., C.S.L. & W.E.H.	
DATE: July 1962	SHEET OF	
DRAWN BY: I.B.	DRAWING NO.:	FILE:



LINE 3

LINE 2

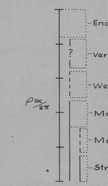
LINE 1

Location: Sta. 0 is located approx. 1800' E of W. Sec. Line & 1000' S. of N. Sec. Line
Sec. 22, T 17 S - R 13 E
Line bearing approx. N.120° E.

Location: Sta. 0 is located approx. 1850' S. of N. Sec. Line & 2200' W. of E. Sec. Line
Sec. 21, T 17 S - R 13 E
Line bearing approx. North 25° East

Location: Sta. 0 is located approx. 400' W. of E. Sec. Line & 1800' S. of N. Sec. Line
Sec. 21, T 17 S - R 13 E
Line bearing approx. North - South

INTERPRETATION LEGEND



C.I. = Logarithmic

(( )) Indicates questionable data

M.C.F.

SECTIONAL DATA SHEET
for
MRS. L. B. EMMONS

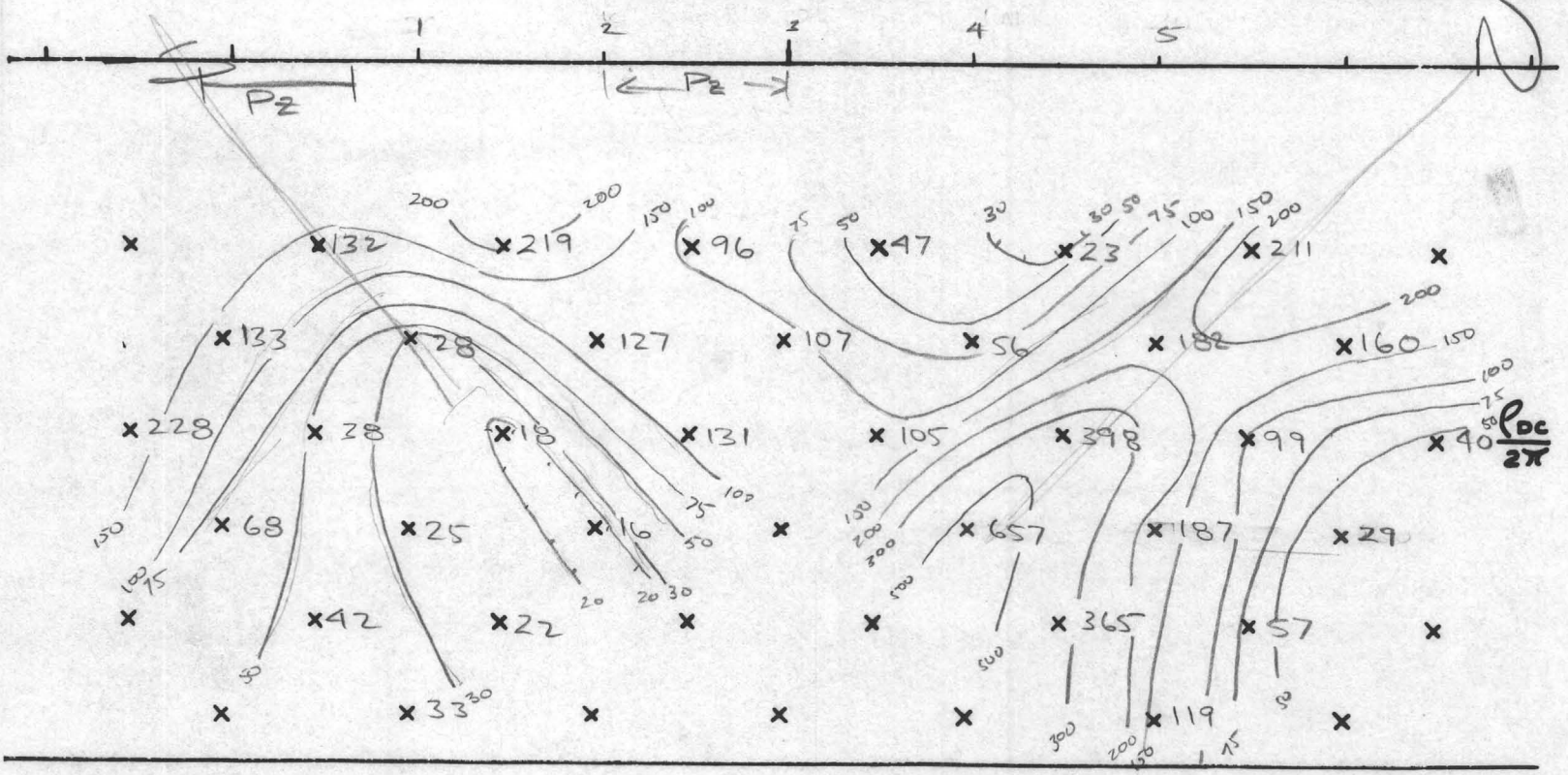
LINE No. 1 & 2 & 3

INDUCED POLARIZATION SURVEY

HEINRICHS GEOEXPLORATION CO.

Scale: Lines 1 & 2: 1"=500'; Line 3: 1"=1000'
Date: July 1962

HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING _____

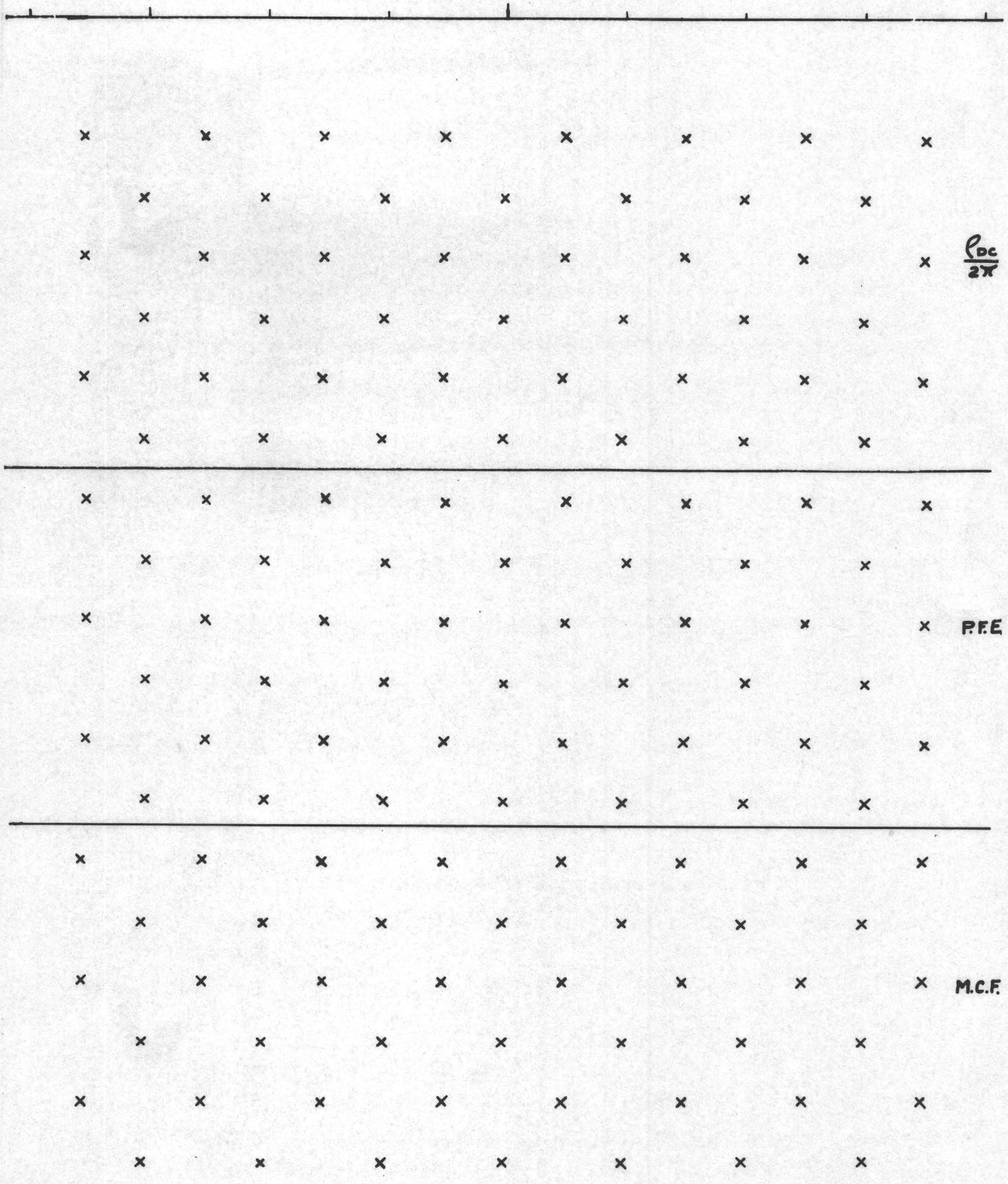


P.F.E

M.C.F.

AREA _____ LINE _____ a = _____ ' SCALE: _____ DATE: _____

HEINRICHS GEOEX. - INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING_____



AREA_____ LINE_____ a = ' SCALE:_____ DATE:_____

HEINRICHS GEOEXPLORATION COMPANY
MINERAL ENGINEERING CONSULTANTS AND CONTRACTORS
GEOPHYSICAL, GEOLOGICAL AND ECONOMIC APPRAISALS
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July 19, 1962

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Pima County, Arizona

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