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Geophysical Survey
Altar Copper Project
Coyote Mining District
Pima County, Arizona

GEOPHYSICAL SURVEY
ALTAR COPPER PROJECT
COYOTE MINING DISTRICT
PIMA COUNTY, ARIZONA

For

Hecla Mining Company

September - October, 1967

By

Heinrichs Geoexploration Company
P. O. Box 5671 Tucson, Arizona 85703
Area Code: 602 Phone: 623-0578

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BASIS OF THE INDUCED POLARIZATION METHOD	1a

IN MAP POCKET: (Total 7 pieces)

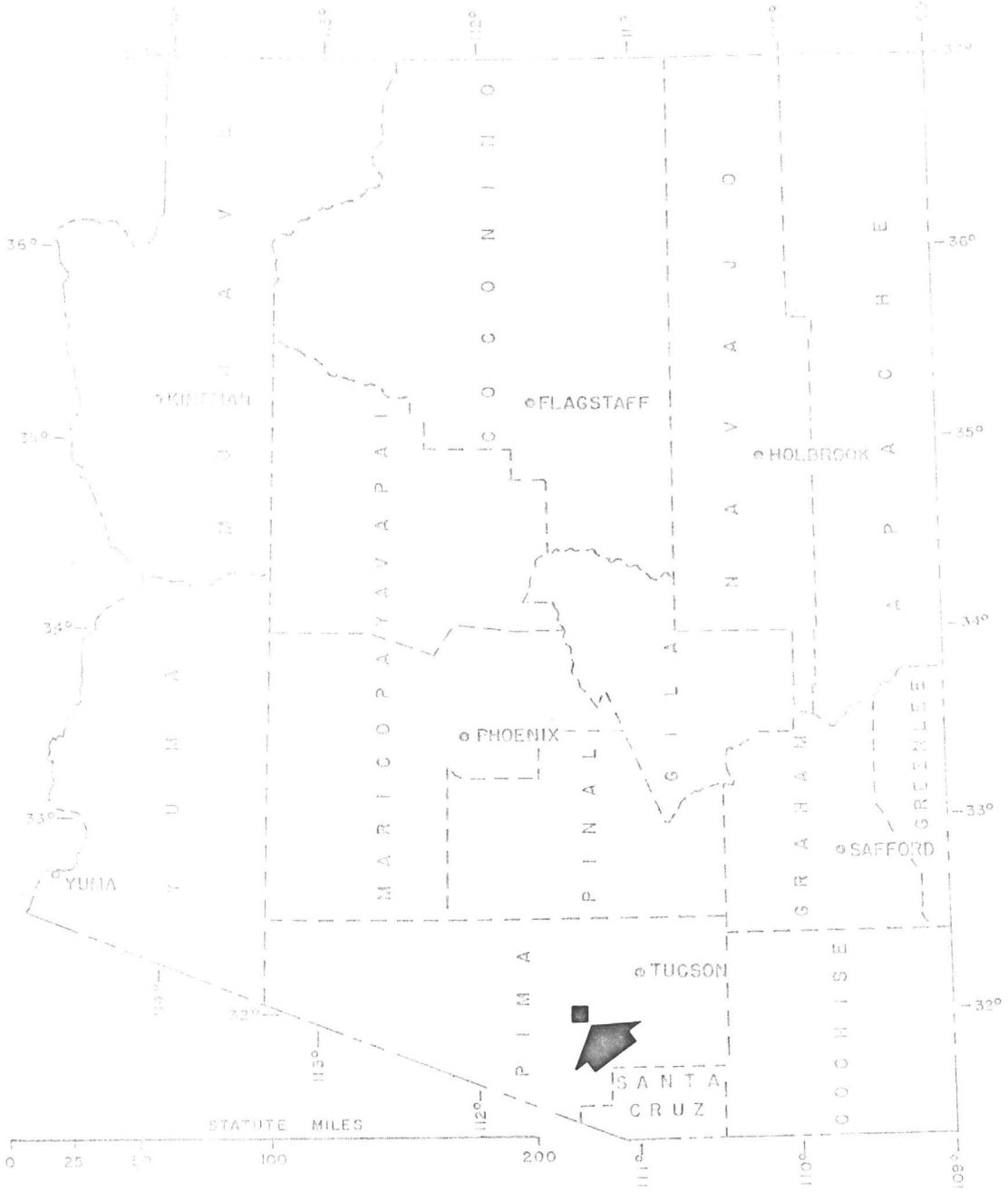
Geophysical Interpretation and Location Plan

Sectional Data Sheets

Line 1 (a=1,000', 3 spreads)
Line 2 (a=1,000', 1 spread)
Line 3 (a=1,000', 2 spreads)
Line 3 (a=1,500', 1 spread)
Line 4 (a=1,000', 1 spread)
Line 5 (a=1,000', 1/2 spread)

GENERAL LOCATION OF
ALTAR COPPER PROJECT
for
HECLA MINING COMPANY

ARIZONA



INTRODUCTION

At the request of Mr. Doug Bell of the Hecla Mining Company, Heinrichs Geoexploration Company conducted and completed a reconnaissance geophysical program in the Altar Copper Project Area, Coyote Mining District, Pima County, Arizona during the interim September 18 to October 19, 1967.

The geophysical program was a combined induced polarization and magnetic survey. The induced polarization work consists of five lines totaling 92,000 feet of surface coverage of which 61,000 feet is "subsurface" plotted data. Lines 2, 3, and 5 are all oriented N-S and run on 1,000 foot dipoles. Line 3 was also run on a 1,500 foot dipole spacing. Lines 1 and 4 were oriented NNE-SSW and E-W respectively and both on a 1,000 foot spacing.

The induced polarization technique used was the dual frequency system utilizing sending frequencies of 0.05 and 3.0 Hz (cycles per second) for Lines 1, 2, 3 (a=1,000 feet) and 5, and 0.05 and 1.0 Hz for Lines 3 (a=1,500 feet) and 4. The electrode configuration used was the conventional collinear dipole-dipole array which typically gives resolvable penetration within the zone from 300 to 1,200 feet below surface for the 1,000 foot dipole spacing and half again as deep for the 1,500 foot spacing. The I.P. data are plotted on sectional data sheets, one for each line, showing resistivity, percent frequency effect (PFE) and metallic conduction factor (MCF) contoured in section with self potential and coincident magnetics in profile form. For additional details regarding theory and interpretation see the "Basis of the Induced Polarization Method" appended with this report.

The magnetic work was done with the truck mounted mobile magnetometer. This is a continuously recording, fluxgate type, total magnetic intensity measuring device. The records were made using a vertical scale of 50 gammas per one-half inch scale division and a horizontal scale of 400 feet per one inch. The magnetic gamma values are referenced to an arbitrary datum. The magnetometer traverses

were mostly N-S on an approximate spacing of one-fourth mile. Several E-W tie lines and random road traverses were also surveyed. The traverses were tied together and loop and drift corrected so that a contour map could be made. A 50 gamma contour interval was used and adequately represents the magnetic variation in this area. A total of 68 miles were surveyed.

A single vertical intensity N-S magnetic profile was run on the east slope of the Coyote Mountains with a Jalander magnetometer. This data is shown on the plan map as a profile and is 10,050 feet long.

The "Geophysical Interpretation and Location Plan" shows the location of all magnetic and I.P. work done plus several of the main structures inferred from the interpretation all plotted on a 1"=1,000' base blow-up of the 15' U.S.G.S. quadrangles covering the area.

The purpose of this survey was to determine if any significant porphyry-type sulfide zones occur in the area and to magnetically map the sub-alluvial geology.

Heinrichs personnel involved in the field work were: I.P. crews; J. King and B. Fedelchak, geophysical crew chiefs, J. Downs, F. Oviedo, G. Routt, M. Fraker and R. Montierth, technical assistants; magnetometer crew; H. Moulinet, crew chief, D. Swanson and J. Bauersachs, technical assistants. Report and interpretation by Chris Ludwig, Senior Geophysicist, with the assistance of the Geoex staff.

CONCLUSIONS AND RECOMMENDATIONS

No definite induced polarization anomalism relating to concentrations of sulfide mineralization was seen on the survey. The only possible sulfide indication was seen on the south end of Line 3, about 1,500 feet below surface and appears quite weak, probably just higher background response.

Resistivities show several interfaces and the probable main bedrock-alluvium contact, southeast of which the alluvium appears to mostly be in excess of 1,000 feet thick.

The magnetics verified the U.S.G.S. aerial magnetic high although showing it to be mislocated about 2,400 feet SW of the actual ground location. No I.P. sulfide response was seen over this anomaly although it is somewhat more conductive than the surrounding material. A volcanic rock is suggested as the causative body.

The magnetics support the I.P. in that the alluvium SE of the main bedrock-alluvium contact is quite thick although possibly containing intercalated volcanics on the southern end of the area.

Several magnetic anomalies have been recommended for ground geologic inspection to determine if they have any possible economic significance. It is expected that these anomalies are related to dikes or possibly a contact.

No further electrical or magnetic work is recommended unless new evidence presents itself or the area to be processed is extended.

INTERPRETATION

Induced Polarization

No definite indications of sulfide concentrations were seen on any of the lines with the possible exception of Line 3 from 90S to at least 135S. This zone appears to have a somewhat higher response than usual background for the area after making corrections for the non-sulfide inductive coupling interference increased PFE with depth. However, this increase may not be due to sulfides as a higher background material could be the cause. In any event, the source of this higher response appears to be about 1,500 feet below surface and is therefore not a reasonable target considering the weakness of anomalism.

Therefore, no porphyry-type sulfides were seen within the area surveyed in the zone from about 300 feet to 1,200 or 1,500 feet below surface. The area was not surveyed in enough detail to completely eliminate the possibility of large sulfide zones occurring within the area of interest. However, the evidence suggests deep alluvium east of the concentrated I.P. coverage.

Resistivities show several indications of interest: On Line 1 at station 70S the resistivity suggests a bedrock-alluvium contact correlating with a similar interface on Line 2 at 5S giving a NE-SW strike to this feature. At depth, this same feature may appear on Line 3 (a=1,500') near 105S.

The alluvium SE of this break, shows a three layer pattern suggestive of a resistive upper layer, conductive middle layer and resistive lower layer. This could correspond to unsaturated alluvium above relatively saline saturated alluvium above crystalline bedrock or perhaps alluvium above Gila-type sediments above bedrock.

The Coleman Road magnetic high appears as a barely noticeable resistivity low on Lines 3 and 4 and could be a relatively porous volcanic rock, possibly a tuff with basaltic layers. Whatever the rock type causing the magnetic high, it shows very little electrical contrast with the alluvium making it difficult to interpret.

At 30N Line 3, another interface is indicated correlating with a general increase in magnetics. Station 20S also shows a minor interface corresponding to the main north boundary of the Coleman Road magnetic high.

A sharp electrical interface appears near 20N, Line 1 which could be the expression of the Ajo Road fault.

Self potential shows only minor typical background variation.

Magnetics

The most obvious anomaly is the 760 gamma magnetic high just east of Coleman Road, flanked on the north by a low. A depth estimate gave about 550 feet to the main causative body although ripples on the top indicate somewhat shallower portions. Cause of this anomaly is unknown although a volcanic material is suspected. No I.P. response was associated, however, the zone is slightly electrically conductive.

Just north and west of the main high are several minor highs and lows suggesting magnetic bedrock within 200 feet of the surface and possibly volcanic source. Two magnetic trends have been shown on the plan map as possible faults or contacts north and south of the main high. The southern trend is roughly parallel to and possibly related to the Ajo Road fault zone.

To the SE of the bedrock-alluvium fault mentioned in the I.P. discussion (and shown on the plan as "possible fault") the magnetics for the most part also indicate deep alluvium usually in excess of 1,000 feet thick. However, on traverse B, near the south end of I.P. Line 5 a 100 gamma low and other relief indicate a magnetic source within several hundred feet of the surface. The I.P. in this area shows the alluvium to be considerably deeper, say in excess of 1,200 feet. Therefore the magnetic effects here may arise from the alluvium itself, perhaps as near surface black sand concentrations or possibly intercalated basalt flows.

A sharp 340 gamma high coming from a dike-like source 40 to 60 feet deep was located on traverse (15) near the NW corner of Section 6 and indicated as 1,200 H on the plan. This anomaly is possibly due to a N-S trending magnetic dike. A ground check could be made in the area north of this anomaly to see if a basic dike outcrops.

The ground magnetometer traverse shows two anomalies of note: A 760 gamma dike-like high at 47+00 and a 1,500 gamma dike-like or contact high at 78+00. Both of these

highs correspond to a minor total intensity high just east on traverse 13 and 12 respectively.

These two anomalies are very shallow, probably surface, and should be geologically checked to see if they are related to anything of possible economic significance.

Respectfully submitted,

HEINRICHS GEOEXPLORATION COMPANY

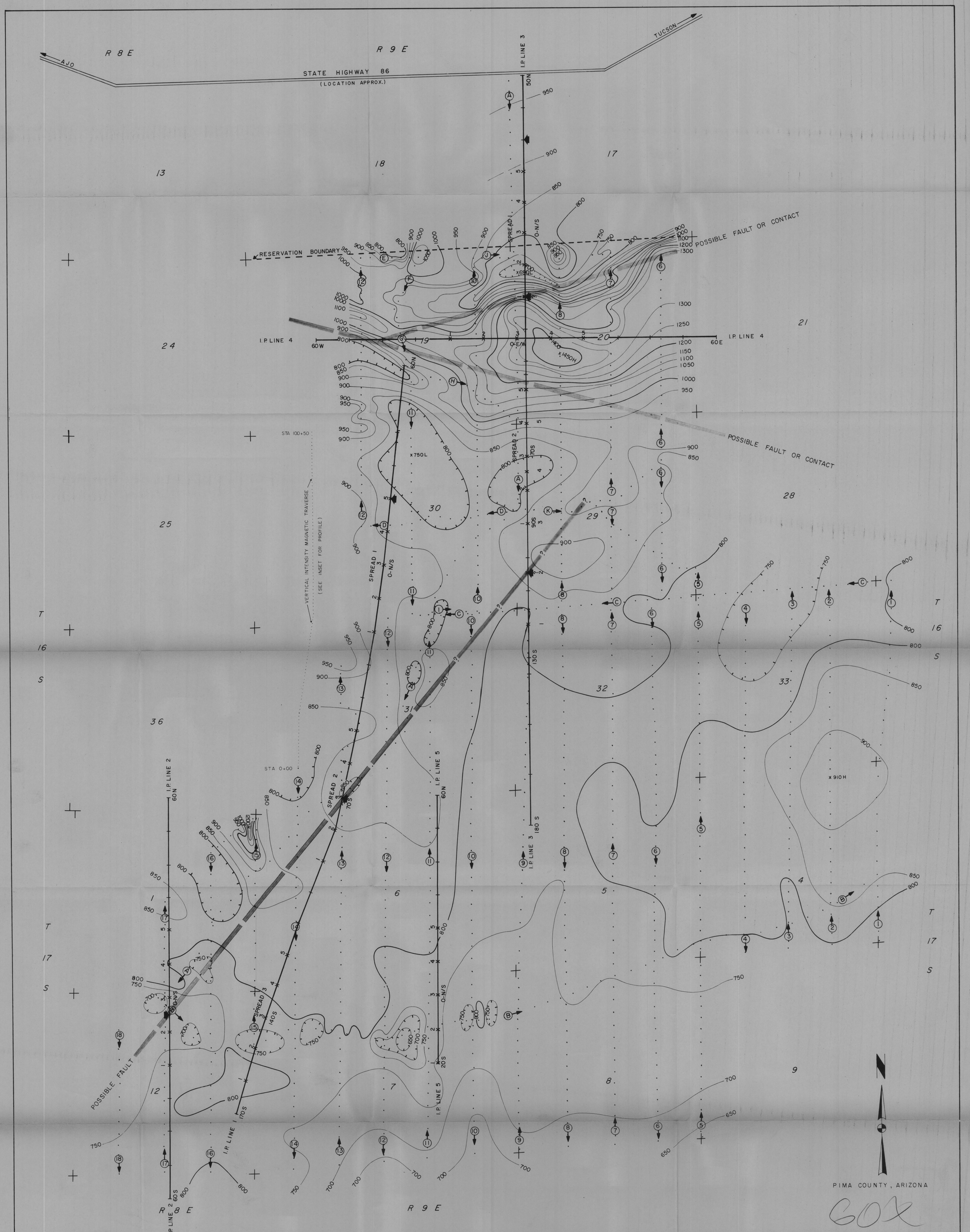
Chris S. Ludwig

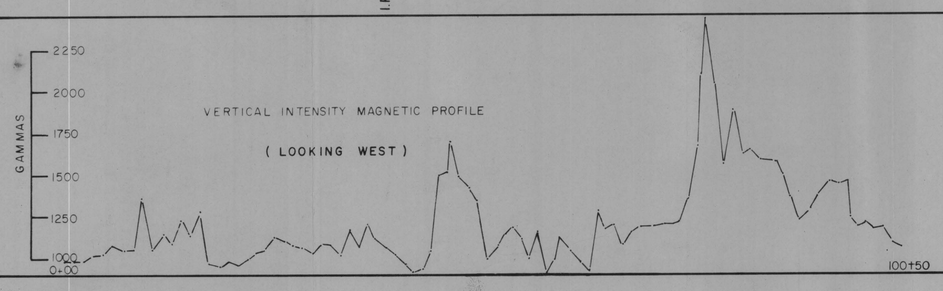
Chris S. Ludwig
Senior Geophysicist

APPROVED: E. Grover Heinrichs

E. Grover Heinrichs
Vice President

October 31, 1967
Tucson, Arizona





I.P. LINE NO. — STATIONS — INTERFACE — ELECTRODES

MOBILE MAGNETOMETER TRAVERSE, DIRECTION & NUMBER

CONTOUR INTERVAL = 50 GAMMAS

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GEOPHYSICAL ENGINEERS

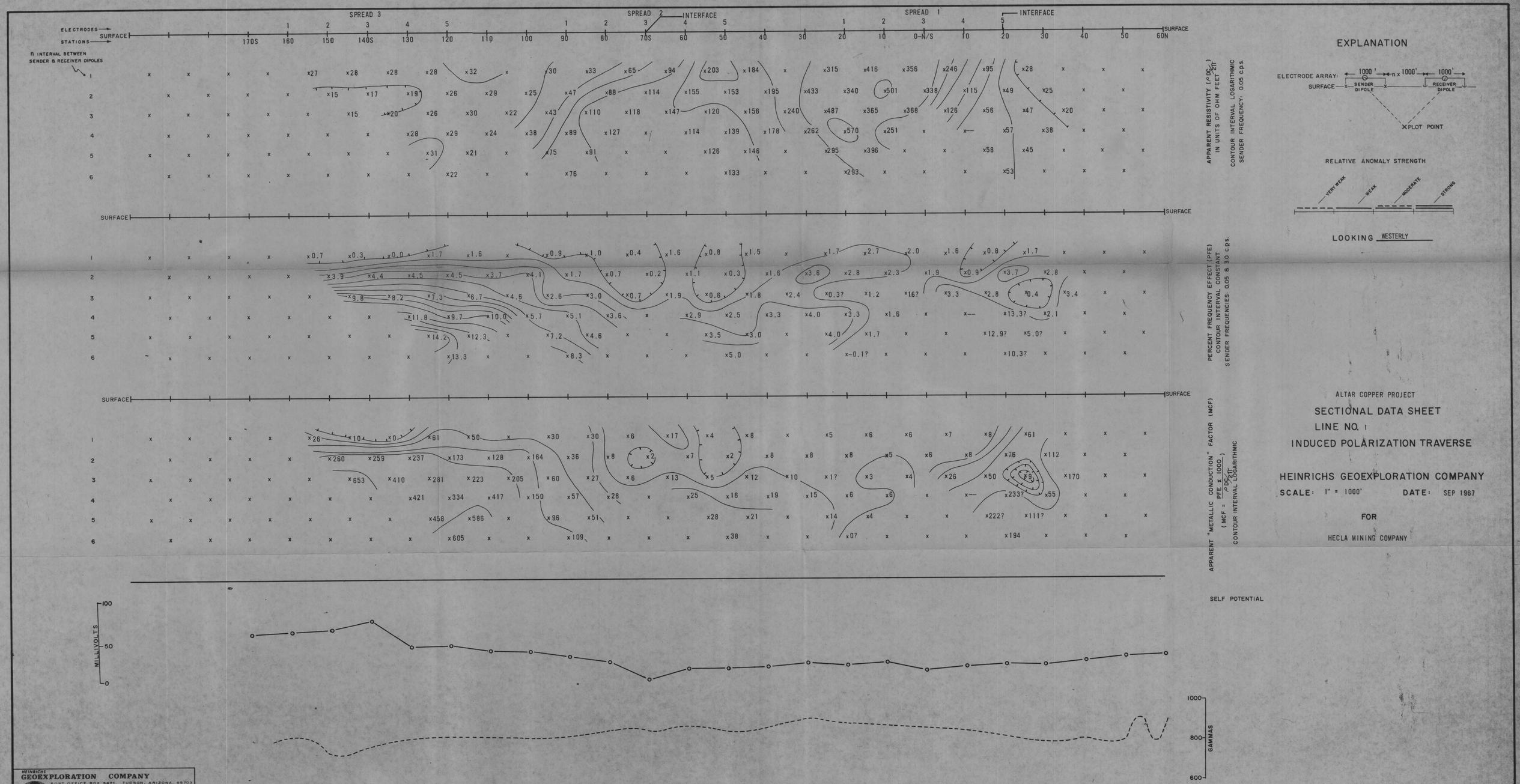
GEOPHYSICAL INTERPRETATION & LOCATION PLAN

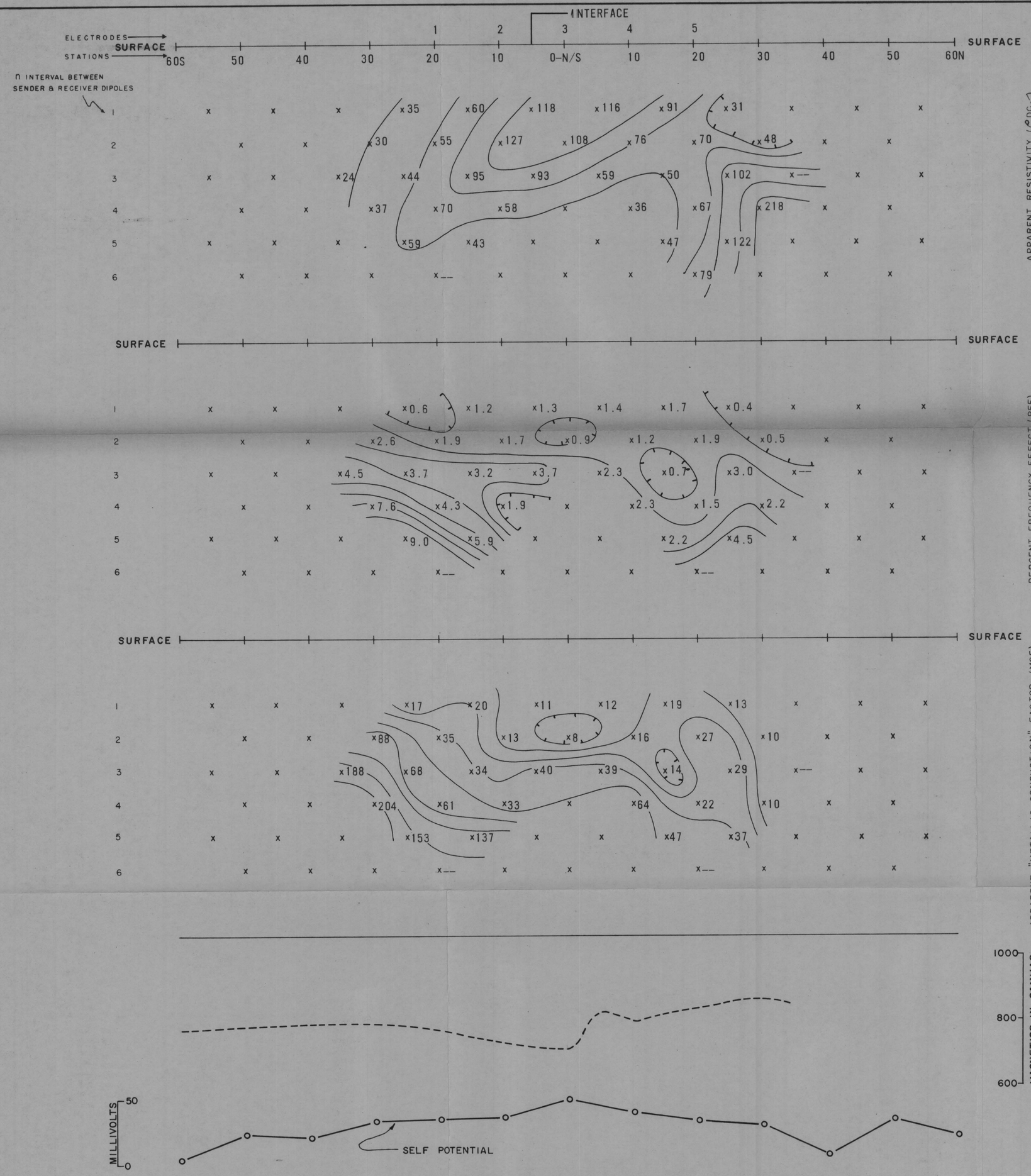
ALTAR COPPER PROJECT

FOR

HECLA MINING COMPANY

SCALE 1" = 1000' | DRAWN BY H.R.M. | DATE OCT. 1967


SPREAD 3
SPREAD 2
INTERFACE
SPREAD 1
INTERFACE
ELECTRODES
STATIONS
SURFACE
170S 160 150 140S 130 120 110 100 90 80 70S 60 50 40 30 20 10 0-N/S 10 20 30 40 50 60N
n INTERVAL BETWEEN SENDER & RECEIVER DIPOLES
APPARENT RESISTIVITY (ρ DC) IN UNITS OF OHM FEET
CONTOUR INTERVAL LOGARITHMIC
SENDER FREQUENCY: 0.05 c.p.s.
PERCENT FREQUENCY EFFECT (PFE)
CONTOUR INTERVAL CONSTANT
SENDER FREQUENCIES: 0.05 & 3.0 c.p.s.
APPARENT "METALLIC CONDUCTION" FACTOR (MCF)
(MCF = PFE x 1000 / ρDC)
CONTOUR INTERVAL LOGARITHMIC
SELF POTENTIAL
MILLIVOLTS
100
50
0
GAMMAS
1000
800
600
EXPLANATION
ELECTRODE ARRAY:
1000' n x 1000' 1000'
SENDER DIPOLE
RECEIVER DIPOLE
PLOT POINT
RELATIVE ANOMALY STRENGTH
VERY WEAK
WEAK
MODERATE
STRONG
LOOKING WESTERLY
ALTAR COPPER PROJECT
SECTIONAL DATA SHEET
LINE NO. 1
INDUCED POLARIZATION TRAVERSE
HEINRICHS GEOEXPLORATION COMPANY
SCALE: 1" = 1000'
DATE: SEP 1967
FOR
HECLA MINING COMPANY
HEINRICHS GEOEXPLORATION COMPANY
POST OFFICE BOX 5671, TUCSON, ARIZONA, 85703
Phone: 602/623-0578
Cable: GEOEX, Tucson
vancouver
sydney
geophysical engineers



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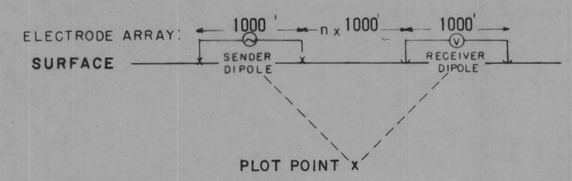

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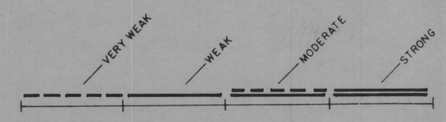

LOOKING WEST

ALTAR COPPER PROJECT

SECTIONAL DATA SHEET

LINE NO. 2

INDUCED POLARIZATION TRAVERSE

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SCALE: 1" = 1000' DATE: SEP 1967

FOR

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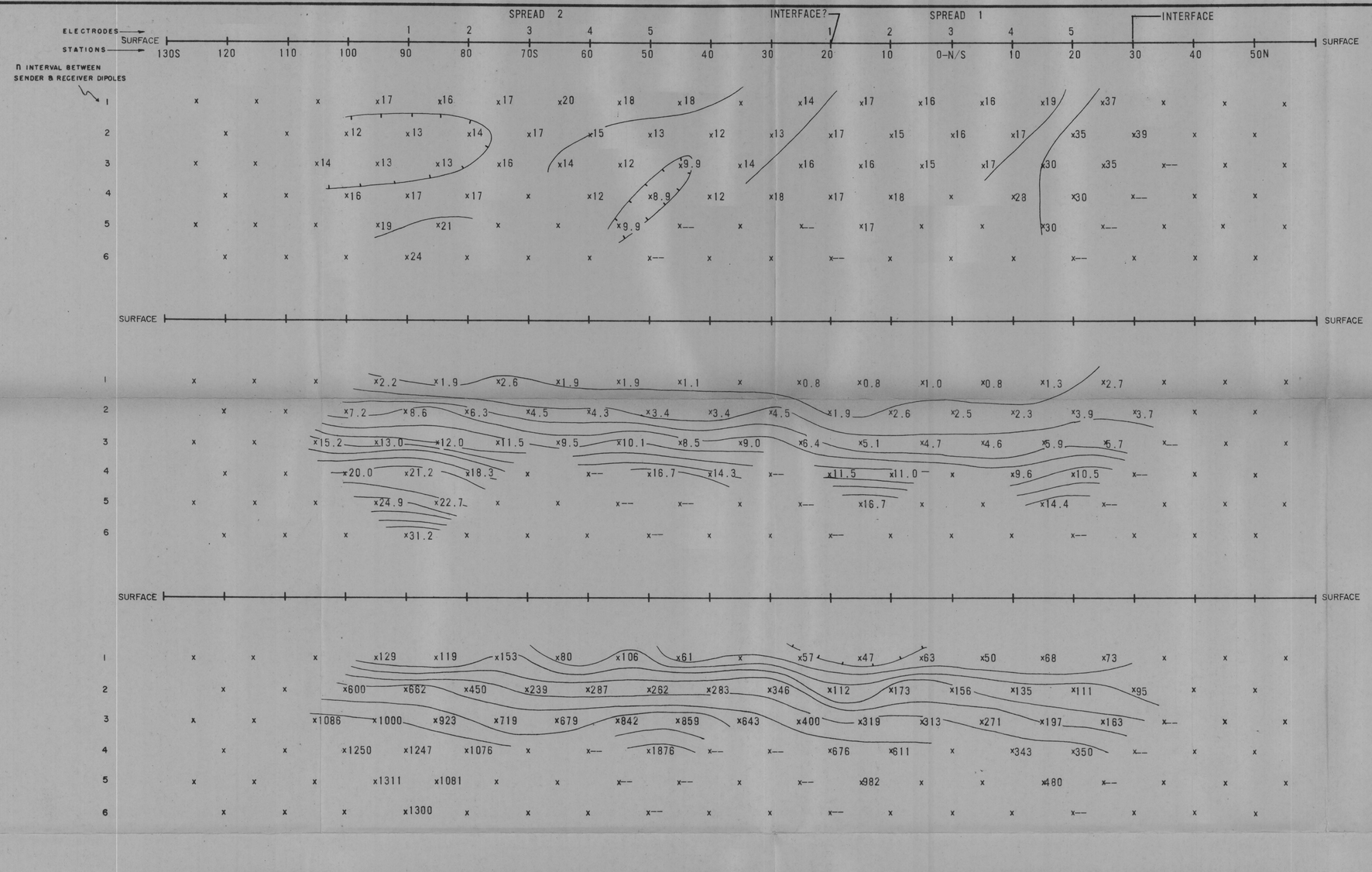

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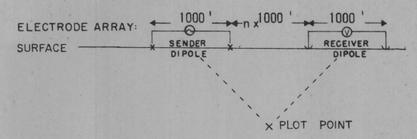

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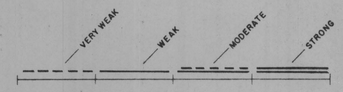

LOOKING WEST

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SECTIONAL DATA SHEET
LINE NO. 3
INDUCED POLARIZATION TRAVERSE

HEINRICHS GEOEXPLORATION COMPANY

SCALE: 1" = 1000' DATE: OCT 1967

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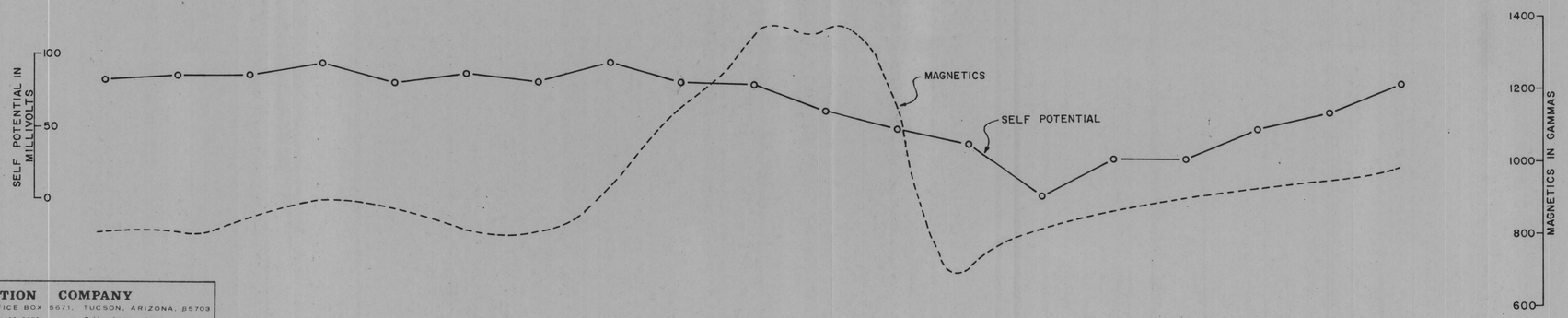

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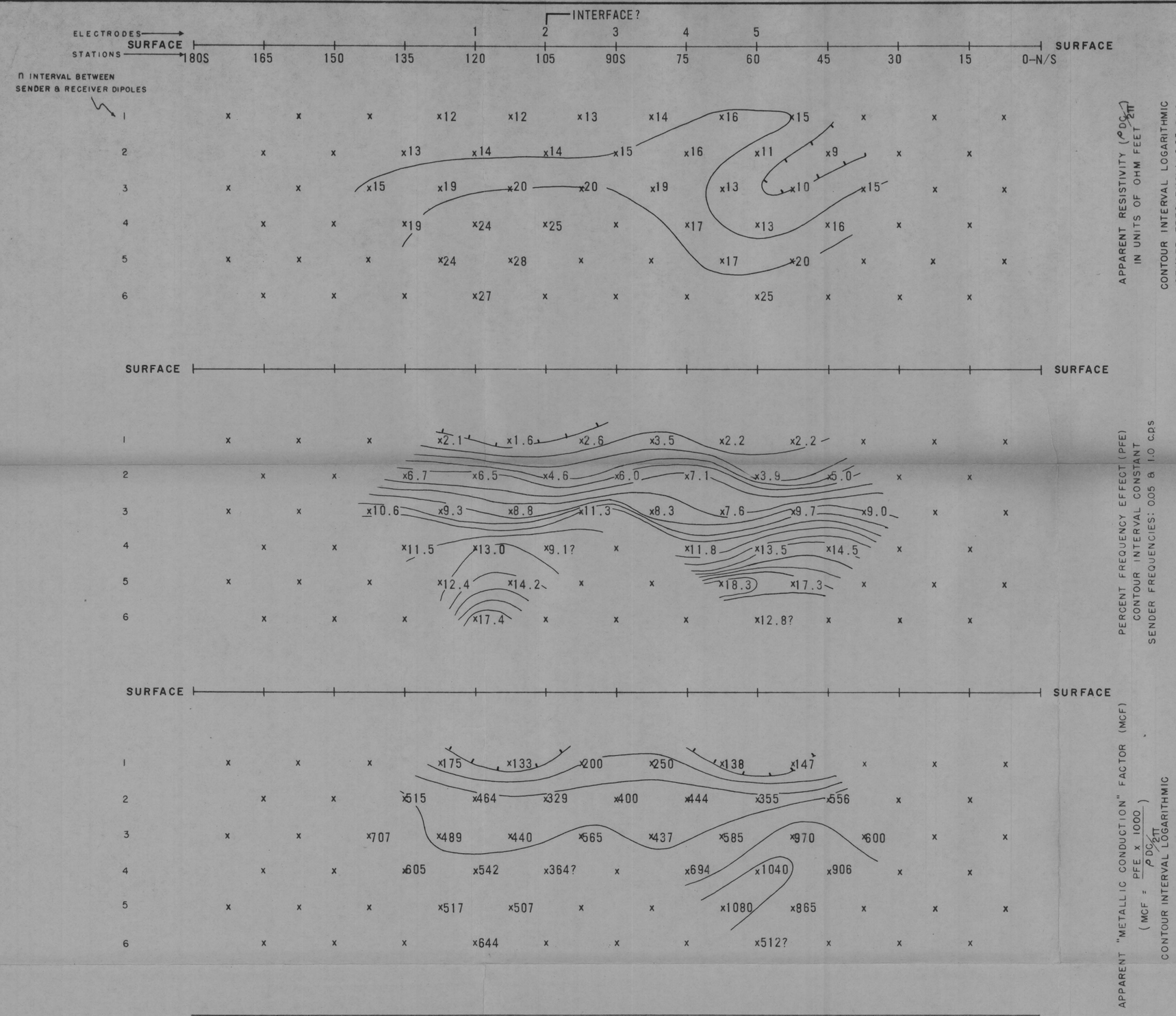

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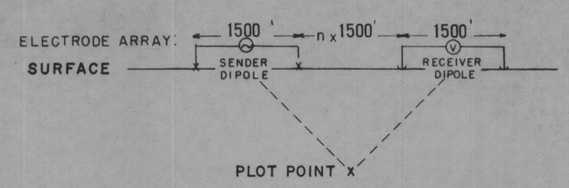

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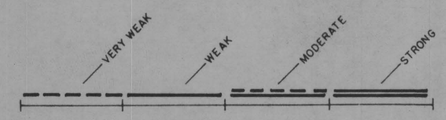

LOOKING WEST

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SECTIONAL DATA SHEET

LINE NO. 3 (SPREAD 3 a=1500')

INDUCED POLARIZATION TRAVERSE

HEINRICHS GEOEXPLORATION COMPANY

SCALE: 1" = 1500' DATE: OCT 1967

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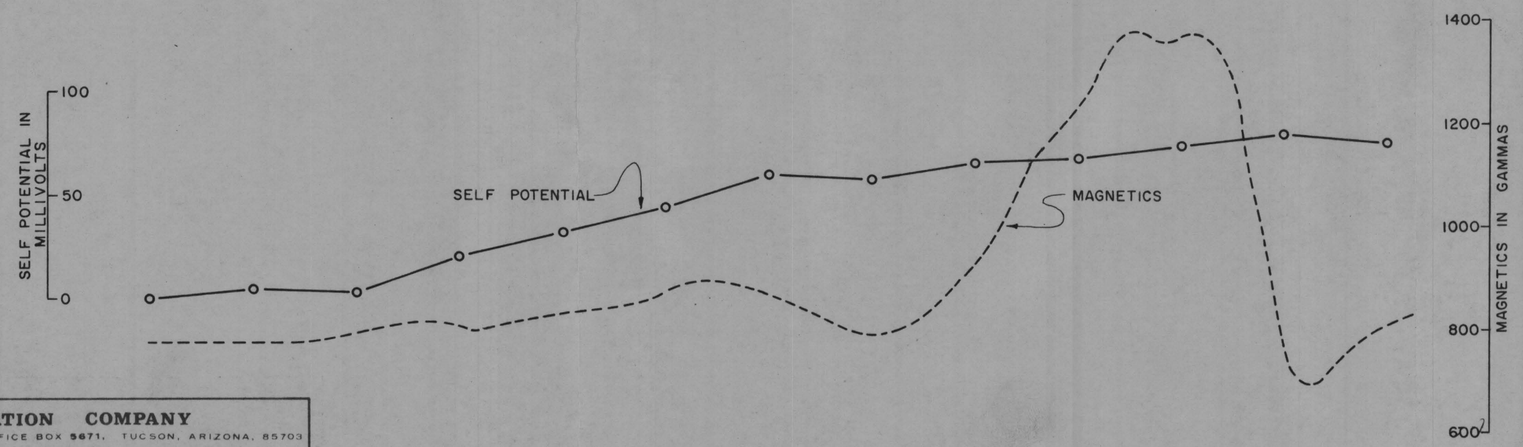

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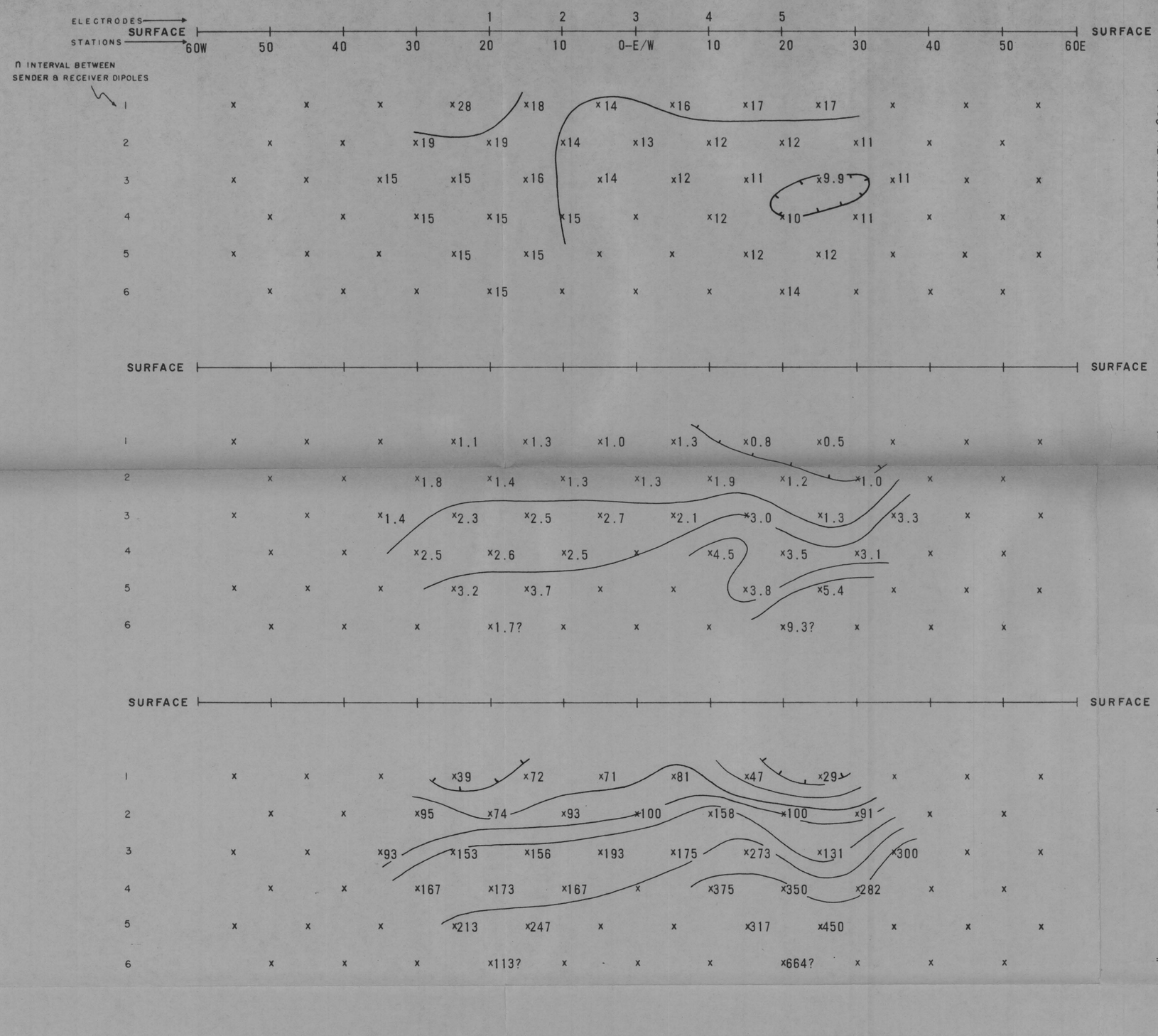

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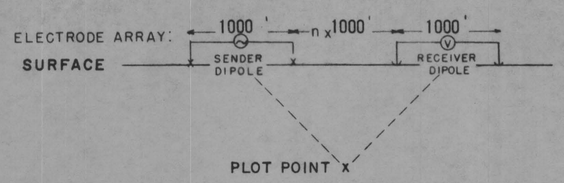

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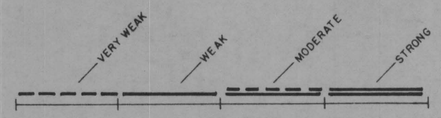

LOOKING NORTH

ALTAR COPPER PROJECT

SECTIONAL DATA SHEET

LINE NO. 4

INDUCED POLARIZATION TRAVERSE

HEINRICHS GEOEXPLORATION COMPANY

SCALE: 1" = 1000' DATE: OCT 1967

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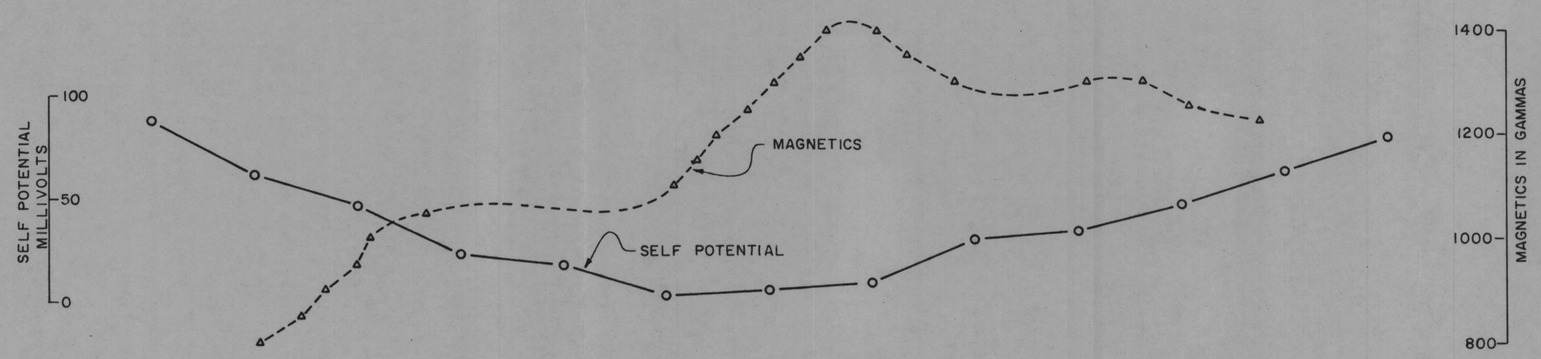

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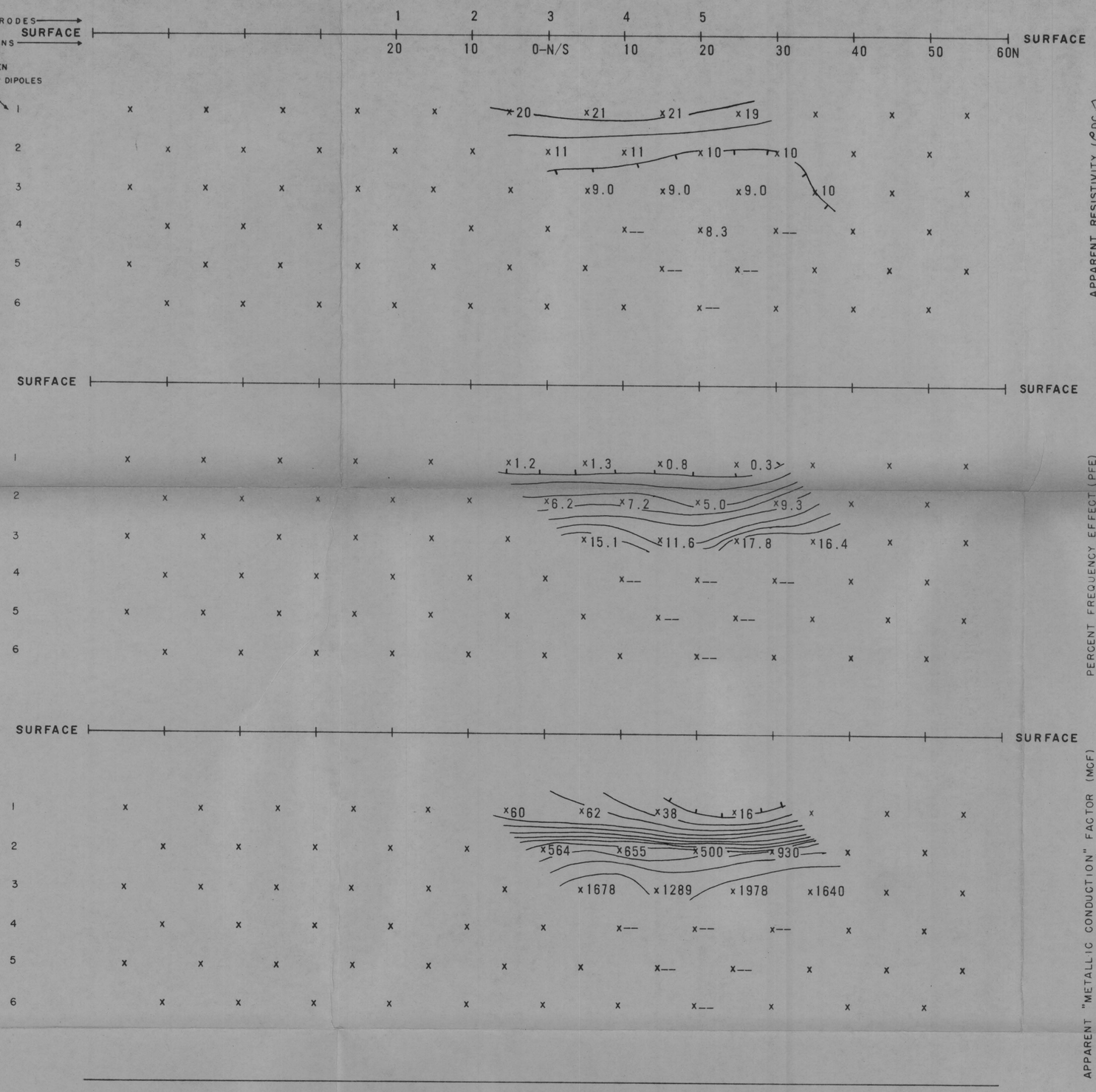

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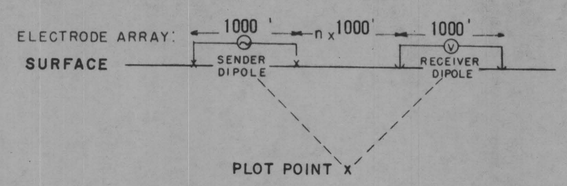

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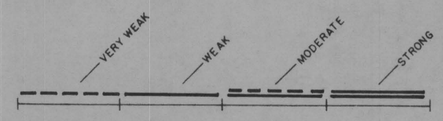

LOOKING WEST

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SECTIONAL DATA SHEET

LINE NO. 5

INDUCED POLARIZATION TRAVERSE

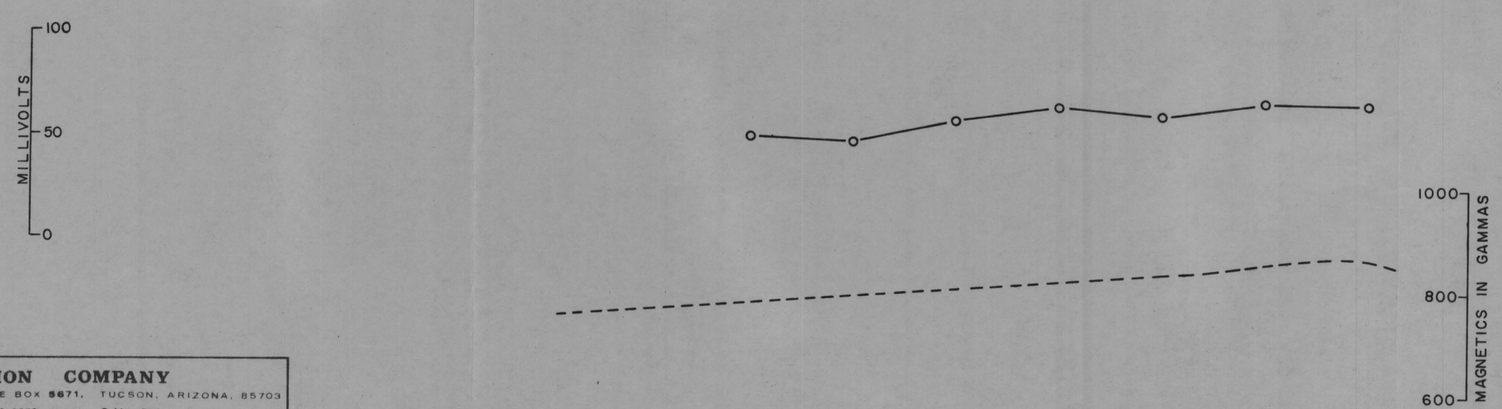
HEINRICHS GEOEXPLORATION COMPANY

SCALE: 1" = 1000' DATE: SEP 1967

FOR

HECLA MINING COMPANY

SELF POTENTIAL



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TWIN BUTTES DISTRICT

9-9-64

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2-0+00	5751	5751		4:35	
1-0+00	5685	5685		4:40	
3-108+00	6067	6067		5:00	
				SEPT 15 '64	
			-57.5		
3-108+00	6041	6041		8:35	
2-108+00	5918	5917		8:45	
1-108+00	5652	5652	507.7	8:50	
1-99+00	5598	5598	502.3	9:00	-.4
1-90+00	5598	5597	502.3	9:10	-.8
1-81+00	5609	5610	503.4	9:15	-1.0
1-72+00	5607	5606	503.2	9:30	-1.5
1-63+00	5670	5673	509.6	9:35	-1.7
1-54+00	5607	5609	503.3	9:45	-1.9
1-45+00	5858	5858	526.1	9:55	-.3
1-36+00	5645	5645	505.1	10:05	-.6

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HECLA GRAVITY

9-15-64 (3)

TR.MK. REG. U.S. PAT. OFF.

1-27+00	5596	5596	500.2	10:20	-1.0
1-18+00	5606	5608	501.3	10:30	-1.3
1-9+00	5612	5612	501.8	10:40	-1.6
1-0+00	5666	5666	507.2	10:45	-1.8
2-0+00	5815	5815	522.1	11:10	-2.5
2-9+00	5892	5892	529.8	11:20	-2.8
2-18+00	5832	5832	523.8	11:30	-3.1
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2-36+00	6003	6003	540.9	11:55	-3.8
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2-72+00	5816	5816	517.8	12:25	+1.8
2-81+00	5798	5798	516.0	12:35	+3.0
2-90+00	5848	5848	521.0	12:40	+3.6
2-99+00	5882	5882	524.4	12:45	+4.2
2-108+00	5935	5935	529.7	1:00	+6.0
3-108+00				1:10	
				9-16-64	
3-108+00	6211	6211		7:25	
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5-81+00	6617	6617	589.9	7:55	2.9
5 72+00	6515	6515	579.7	8:05	5.0
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5-54+00	6421	6421	570.3	8:15	5.8

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HECLA GRAVITY

9-16-64 (4)

			Base C	TIME	drift
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5-36+00	6346	6346	5570	8:30	.135
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5-18+00	6403	6403	5627	8:50	.315
5-9+00	6334	6334	5558	8:55	.360
5-0+00	6407	6407	5631	9:05	.495
4-0+00	6187	6187	5411	9:50	.900
4-9+00	6212	6212	5436	10:00	.99
4-18+00	6278	6278	5502	10:10	1.08
4-27+00	6258	6258	5482	10:20	1.17
4-36+00	6352	6352	5576	10:30	1.26
4-45+00	6301	6300	5529	10:35	1.30
4-54+00	6288	6288	5512	10:40	1.30
4-63+00	6283	6283	5520	10:50	.29
4-72+00	6379	6379	5616	10:55	.36
4-81+00	6433	6433	5670	11:00	.48
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3 99+00	6265	6265	5493	11:55	+.22
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3 72+00	6191	6191	5419	12:15	1.1
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3 54+00	6197	6197	5425	12:23	1.6
3 45+00	6314	6314	5558	12:35	0
3 36+00	6277	6277	5521	12:55	.1
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3 18+00	6243	6243	5487	1:15	+.2

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42

HECLA GRAVITY 9-16-64 (5)

3-9+00	6087	6087	5331	1:25	+.2
3-0+00	6050	6050	5294	1:30	+.2
3-108+00	6246	6246	5490	2:00	+.3

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42

September 13, 1967

Mr. Doug Bell
Hecla Mining Company
2020 East 13th Street
Tucson, Arizona

Re: Proposed I.P.-Momag Survey, Altar Copper Project, Coyote Mountain Area, Pima County, Arizona.

Dear Doug:

Confirming our conversation of yesterday, we herewith propose for our mutual agreement and understanding as follows:

On or about Monday, September 18, 1967, Geoex will furnish a three man I.P. crew using maximum penetration equipment, (MK 4 Sender) and a two man Mobile Magnetometer crew (Momag). Scope of the survey is as follows:

I.P.

Dipole spacing = 1,000 feet
Line spacing = 1/2 mile
Total estimated miles of I.P. line = 33
Total estimated cost of I.P. will be = $11,600.00

MOMAG: Line spacing = 1/4 mile except where vehicle is not able to drive because of terrain. In the rough areas a hand magnetometer will be used.
Total estimated miles of magnetics = 55
Total estimated cost of magnetics = $2,500.00

Charges for a three man I.P. crew will be at the rate of $275.00/day
Additional men to accelerate the job will be at $50.00/man day
Momag charges will be at the rate of $280.00/day
Compilation and interpretation on all phases will be $125.00/staff day
Vehicle charges will be $12.00/day (+$0.12/mile).
Directly related supplies, communications, and other incidental expenses will be charged at our cost.

1 Excessive weather delay and standby charges are one-half the daily rate. Equipment breakdown in excess of one hour will be made up or not charged.

Our crews have been instructed to respect the ranchers private property and to minimize destroying the grass and also to refrain from parking near the cattle tanks.

It is understood and agreed that this project shall be complete within 60 days of your authorization for us to proceed.

Theaarea to be surveyed is outlined on the enclosed U.S.G.S. quad and it is understood that the program may be modified from time to time as results justify it, based on our best professional judgement and with your mutual agreement.

2 All property permits, brushing and trespassing-liability and related costs incurred on behalf of client assumed by client.

3 Geoex will save client harmless from all Workmen's Compensation, public liability and property damage liability incurred by Geoex employees.

4 Preliminary reports or copies of rough field plotting sheets will be available as work progresses.

5 Payments due on presentation. Billings may be submitted periodically with final statement after completion of final report.

6 Indication of your understanding and approval of the above by executing as provided below on the attached copy of this letter and returning it to us, will be most appreciated.

Very truly yours,
HEINRICHS GEOEXPLORATION COMPANY

E. Grover Heinrichs
Vice President

DATE:_____
ACCEPTED BY:_____
TITLE:_____

TO: Mr. H. E. Harper

FROM: J. Douglas Bell

SUBJECT: Suggested Exploration, Altar Copper Project, Pima County, Arizona

DATE: 7 June 1967

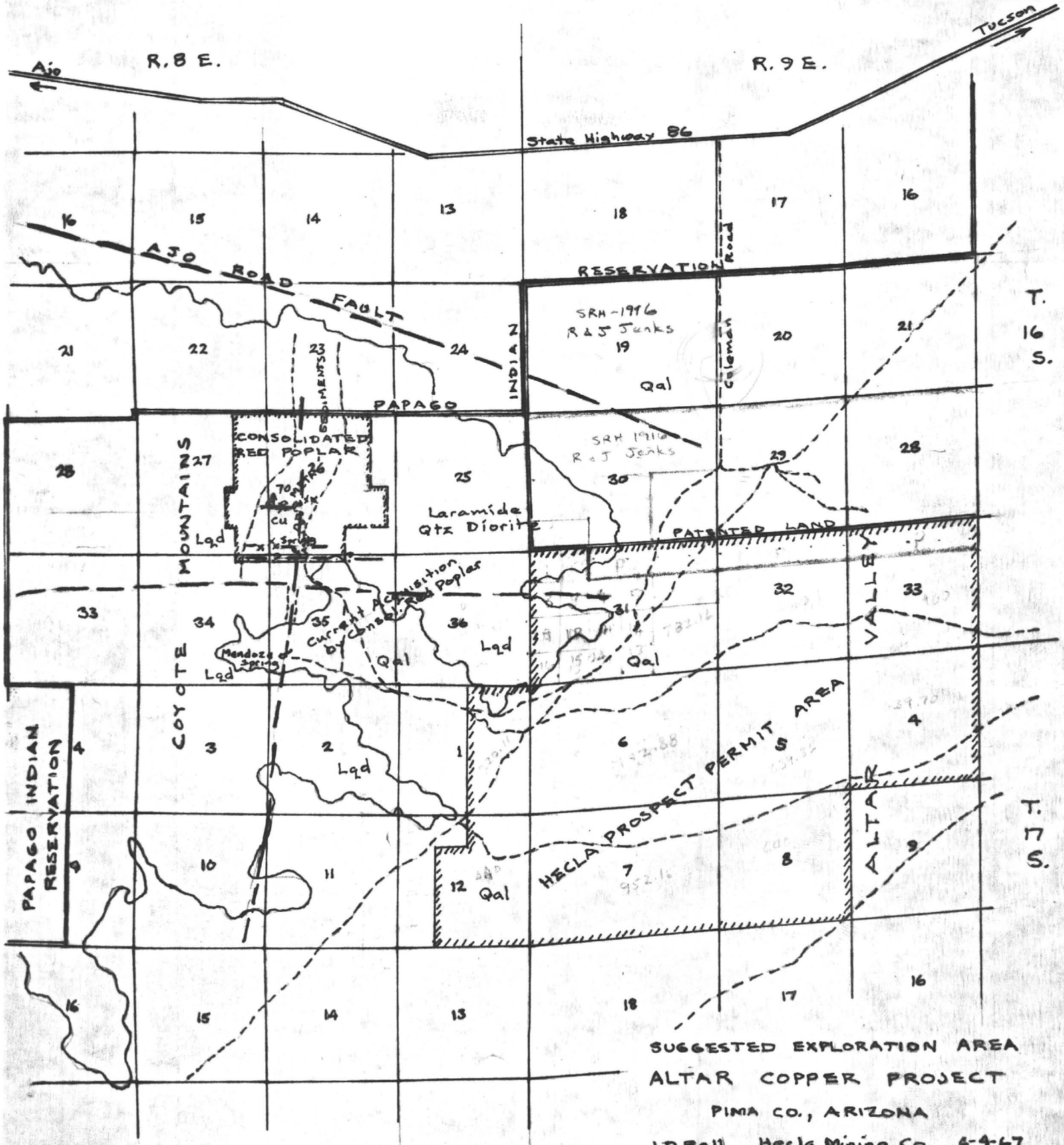
In the accompanying report on the Coyote Mountain copper prospect currently under exploration by Consolidated Red Poplar, Ltd., of Toronto, Canada, it was pointed out that, although the Canadian company's prospect is regarded as of the contact metamorphic variety without evidence of very sizable mineralization, it bears certain similarities in environment to the profitable Sierrita-Pima District some 25 miles to the east. Location of the Coyote prospect relative to the Pima and the Silver Bell districts is shown on the attached Geologic Index Map; the Ajo District is about 70 miles west on the projection of the E-W faulting shown on the map. General similarity of stratigraphic and intrusive relationships between the Coyote area and the Pima District is illustrated on the Index Map. In both districts, early production was gained from high grade copper deposits localized along easterly-trending fault structures cutting metamorphosed Paleozoic limestones; pyrometasomatic effects are present in both areas. Much more ore was produced in the early mines of the Pima District than was the case in the Coyote area, where steep, rough topography and difficult access may have contributed to the lesser development.

Intruding and nearly engulfing the limestone block in the Coyote area are rocks mapped as Laramide granite on the Arizona County Geologic Map. The intrusives were studied and categorized as diorite, monzonite, and alaskite by Wargo and Kurtz (see their sketch map, attached) in a Masters Thesis study; inspection of outcrops in the north part of the east flank of the Coyote Mountains indicates the rocks are a quartz diorite in composition, evidencing very little alteration except for a regional somewhat gneissoid planar metamorphic character. Much pegmatite injection is evident, and a N-trending basic fine-grained dike was noted in the vicinity of Mendoza Springs.

A north-south fault trends through the limestone block in the Coyote area, evidenced by fractures in the rocks and defined topographic saddles and drainages. The fractures are prominent near Mendoza Springs, but show no evidence of mineralization.

Old productive workings in the limestone block are aligned on an E-W trend, and E-W faulting dipping 70 N has been definitely identified in the West Adit workings, where 12 tons of 17% Cu were mined from the fault zone. E-W fractures and topographic depressions indicate other faults of this system in the area. A large mass of quartz diorite, showing some E-W fractures, intervenes between the limestone block and the pediment "flat" forming the west side of Altar Valley, to the east.

It will be recalled that, in the Pima District, geophysical search of the pediment area on the E'ly projection of the Mineral Hill-Daisy Zone led to the discovery of the Pima-Mission ore body. Similarly, to the south, exploration of the alluvium-covered pediment east of the Copper King-Copper Queen mine zone led to discovery of the Anaconda ore body. A similar relationship may exist in the Coyote area; one of the guidelines of exploration in the Southwest is to prospect alluvium-covered pediments fronting ranges in which Laramide intrusives and known copper occurrences are associated.



SUGGESTED EXPLORATION AREA
ALTAR COPPER PROJECT
PIMA CO., ARIZONA
J D Bell Hecla Mining Co. 6-4-67

For these reasons, while I do not regard the chances in Consolidated Red Poplar's prospect as very attractive, I do believe the pediment zone to the east is worthy of a geophysical prospecting effort. Concealed contacts between Laramide intrusives and older sediments may exist beneath the pediment gravels, and a large pyrometasomatic deposit could be present. It must be emphasized that such prospecting is blind in nature, and is recommended only because of the association of rock types, and some rather tenuous projections of E-W faulting with which copper mineralization seems to be associated in the small workings to the west.

On June 2, 1967, I filed applications for State Prospect Permits on land in ten sections in the pediment zone ESE of the Consolidated Red Poplar prospect area, as shown on the attached Altar Copper Project map. The applications cover a total of 6,796.26 acres; in 45 to 60 days, rental payments totalling $13,592.52 will be due, which if paid, will entitle us to the prospecting rights defined by State law. For a complete coverage, mineral rights on the patented land in Sections 28, 29, and 30, T 16 S, R 9 E, should be obtained. This land is held by R. and J. Jenks; a check at the courthouse shows that Sections 19 and 30 were patented under the Stock Raising Homestead Act of 1916, with minerals reserved to the U. S., making Section 30 open to mining locations. I suspect the same may be true for Sections 28 and ~~29~~; however, the last deed to these sections contains no reference to recording data on the original deed, nor mention of reservation of minerals. A more exhaustive title search will be necessary to determine the status of these sections.

To explore the area covered by the Hecla prospect permits, I would recommend the following geophysical program:

1.	Mobile magnetometer survey, N-S lines at quarter mile spacing, ~~45~~ 52 Line Miles at $100/L.M.	~~$4,500.00~~ 5200.00 2500
2.	Induced polarization survey, N-S lines at half mile spacing, 1000-ft. dipoles, ~~24~~ 33 Line Miles @ $300/L.M.	9900.00 ~~7,200.00~~
	Total geophysical cost	$11,700.00
	Plus permit fees	150.00
	Prospect Permit rentals	13,592.52
	Total direct costs	$25,442.52

We have four options as to procedure with this project. First, we can let it die on the vine, simply by not paying the rentals. Or, second, we can now approach Red Poplar in a position of strength, with control of favorable property, and bid for a joint exploration of all holdings. Darke informed me that Standard Oil of Indiana has told him they might be interested in joint mineral exploration with a mining company, also that Phelps Dodge has contacted him with regard to the Coyote prospect. I do not believe either company has examined the property. Third, we can leave Red Poplar out of it, and approach an outside company for a joint venture. Ken Baker is now Minerals Representative for Amerada Petroleum Company, and he informed me they are looking for joint venture possibilities. Fourth, we can do the job ourselves.

As for direction of the job, I would anticipate only the locating of a few of the section corners for benefit of the Heinrichs crews, furnishing them with a map, and turning them loose. They are adequately experienced in rough direction control, and quite capable of conducting a reconnaissance survey in this manner.

Although I have no way of forecasting what may be present beneath the alluvial cover fronting the Coyote Mountains, I believe there is every bit as good an opportunity of finding an ore body here as there is in the San Xavier tracts upon which bids of $750,000 were made for prospecting rights. I also believe the geological environment here makes the Altar Copper Project as attractive as any tracts which may be opened to future bidding on the Papago Reservation. Initial entry for the project would be far less expensive, and if ore is found, future leasing provisions are also more favorable.

In regard to bids on Reservation tracts, an article in the June 5 issue of the Citizen states that a major company has requested that 4 tracts on the main reservation, totalling 20,000 acres, be advertised for competitive bidding; advertising will begin in about two weeks. My guess is that these will be areas in the vicinity of the Lakeshore (TransArizona) Mine or in the Newmont Vekol area.

Because of the due dates on the rentals for the Altar Copper Project, I would appreciate your comments on this proposal, Herb.

Respectfully submitted,

J Douglas Bell
Geologist, Exploration

JDB:jan

TO: Mr. H. N. Harper

FROM: J Douglas Bell

SUBJECT: Coyote Mountain Copper Prospect, Pima County, Arizona

DATE: 5 June 1967

General

The Coyote Mountain property, located about 50 miles southwest of Tucson, Arizona, is currently being prospected by Consolidated Red Poplar Minerals, Ltd., of Toronto, Ontario. Preliminary investigation of the prospect was made by L. G. Hudson through contact with the company's geological consultant, Mr. Kenneth H. Darke, in early May, 1967, and the data was forwarded to me. On May 22, I accompanied Darke upon a brief visit to the property. Under Darke's direction, a ground magnetics survey has been accomplished by Canadian Aero Corporation, and nine holes have been diamond-drilled; drilling of a tenth hole, CM-8, is in progress.

I have previously reported upon this property in my report entitled "Schroeder Copper Prospect, Pima County, Arizona," dated 24 February 1964. In that report, I concluded that the lack of any large zone of tactite and hematitic alteration indicated that chances of finding any large ore bodies were poor, and that the copper-silver mineralization present occurs as fairly small erratic contact-metamorphic deposits in a probably thin roof pendant of metamorphosed Paleozoic limestones nearly engulfed by Laramide granitic rocks. Data resulting from the current exploration effort has not radically changed that opinion, and at present, I do not regard the Coyote Mountain property as being of much interest to Hecla.

Consolidated Red Poplar is presently expanding its claims holdings to cover a part of the valley floor bordering the Coyote Mountains on the east. Blind geophysical exploration of an alluvium covered pediment bordering Laramide intrusives associated with a known copper occurrence conforms with general exploration policy in the Southwest. I have suggested to Darke that we might be interested in participating in such a project here, separated from the endeavor in the contact-metamorphic area. Presently, I believe a "watch and wait" attitude is advisable.

Location and Ownership

The property consists of 36 unpatented claims located in the Coyote Mountains, Sections 26, 27, 34, and 35, T 16 S, R 8 E, in Pima County, Arizona, some 50 miles SW of Tucson. The claims are leased by Consolidated Red Poplar Minerals, Ltd., Suite 1024, 85 Richmond Street West, Toronto, Ontario. This is a small Canadian company; current assests listed in the 1966 Annual Report totalled about $15,000. A stock issue was floated to cover costs of the current exploration program, which constitutes the principal activity of the company. Approximately $120,000 has been spent to date.

The property is held under a lease which entailed a down payment of $20,000, and a royalty of 5% to a maximum payment of $500,000, plus an over-riding royalty of 2.5% payable during a period of 25 years.

Geology

This is covered in my "Schroeder Copper Prospect" report. A roof pendant of Paleozoic (?) limestone with lesser quartzite and schist, some 1800 feet wide and up to 5000 feet in length, is bordered by Laramide intrusives mapped as diorite and monzonite; numerous pegmatitic sills and dikes invade the metamorphosed sediments, and skarn zones of tactite with magnetite and specular hematite are formed in the metasediments adjoining the intrusions. North-south fracturing and E-W faulting are present. Consolidated Red Poplar has done no detailed geological mapping of the area.

Early Development

Early development, during the period 1910-1920, was concentrated high on the ridge which trends easterly through central part of the claims area; most of the copper showings lie on and south of this ridge. Five or six prospect and development workings are aligned along an E-W trend at 4500-4600 foot elevation on the south face of the ridge. Most of the development, totalling about 1200 feet, is located in the Upper and Lower West Adit workings, the Turquoise Adit, and the 120 foot Main Adit. Skarn zones, some with weak copper carbonates and some without, constitute the outcrops which were prospected. The sediments strike about N 10 W, and dip 45-50 west. Chalcocite and chalcopyrite ore was mined as irregular bedding replacements, probably as contact metamorphic deposits. A fair amount of tungsten has been shown in recent assays. In the lower West Adit, a strong E-W fault is revealed, 4 to 5 feet in width, with polished slickensided planes; 12 tons mined from this fault zone averaged 17% Cu, with some silver and gold. Old reports in my files indicate an early production from these workings of 2000 tons averaging 10% Cu and 1.5 oz. Ag; an equal amount averaging 7% Cu is said to have been discarded on the dumps. Burros were used to haul the ore.

Current Exploration

Darke, upon examination of the property, concluded that the metamorphosed sediments might extend to considerable depth, and that a major disseminated copper deposit in tactite-altered limestones might be present, perhaps extending along favorable beddings and sill contacts for some 2000 feet between the adit zone to the north and similar minor prospects in skarn zones to the south. He recommended a ground magnetics survey, to be followed by drilling of any anomalies, and by drilling of several fences of inclined holes which would test the cross-section of the entire width of metasediments.

The magnetics survey was run by Canadian Aero, and the office-drafted map suggests a model of correctly surveyed data. Unfortunately, a current survey by transit-stadia (see Preliminary Murphy map dated 5-16-67) shows that the grid for the magnetic survey was very poorly engineered, and the exact locations of the magnetic data points are not as shown on the Canadian Aero map. The map does indicate that the adjacent granites are essentially non-magnetic, in the 25-75 gamma range, while the metasediments average about 200 gammas, showing the presence of some magnetite. A zone of higher readings, roughly 250-300 gammas, trends NNE'ly through the property, rudely aligned adjacent to a granitic intrusive on the east, and may represent the principal contact-metamorphic zone; most of the prospect holes and workings are located on the limestone side of this zone, conforming with the usual occurrence of contact-metamorphic deposits. The anomalism is not strong, and suggests a relatively low amount of magnetite mineralization.

Little effort has been made to map the geology of the area, or more specifically, to pinpoint the locations of the pegmatitic sill-like intrusions, limestone areas, and contacts. Consequently, the drawing of sections by which drilling results can be predicted is nearly impossible. My sketch map in the Schroeder report represents the maximum effort in this direction, and I have transferred that data to the Murphy map.

Similarly, little engineering has been done. After drilling nine holes, a belated effort is now in progress to survey hole sites and adjacent terrain for relative locations and elevations.

In drill-hole location, Darke elected to drill his first fence of holes in the vicinity of the old productive workings, with the objective of testing the width of metasediments on the downward projection of the known ore. Very difficult topography has hampered site selections, and badly fractured ground has resulted in high drilling costs and lost holes. With a total expenditure of $120,000, $20,000 has gone for the down-payment, and $15,000 for road building. $85,000 has been expended for the staking of 36 claims, the magnetics survey, consulting charges, and the drilling of 2000 feet of holes. If $35,000 is assigned for the other factors, drilling has apparently cost close to $25.00 per foot.

In the first fence line, across the Adit Zone, nine holes were started. Four were stopped short of the immediate objective of ore projections, and none have tested any maximum width of metasediments. The drill was then shifted to the cupriferous zone 2000 feet to the south, and HG-1 (291') and HG-2 (257') were drilled to test beneath the showings. Currently, the drill is located at CM-8, halfway between the Adit Zone and the South (HG) Zone, with the objective of proving continuity of bedded replacement ore between the two zones and resumption of the testing of the metasedimentary zone by the inclined fence pattern.

The holes are summarized as follows:

CM 1-A (-45, 68') and 1-B (-50, 96'): Drilled as part of fence pattern to test for ore near old Turquoise Adit. Lost in badly fractured ground near old workings. No assays.

CM-1C (-50, 224'): Objective as above, stopped by broken core barrel prior to reaching maximum depth desired. However, my Sections A-A' and B-B' indicate that the hole crosses the N'ly projection of the Turquoise Adit zone about 50' down-dip from known mineralization. Mostly pegmatitic granite in hole, only traces of Cu reported.

CM-2 (-90, 56'): Objective to test ore grade vicinity of Turquoise Adit. Cut 13' (27' to 40' depth) immediately adjacent to old workings assaying 0.009 oz. Au, 5.99 oz. Ag, 11.8% Cu, 0.186% WO_3, and 0.025% Mo.

CM-3 (-50, 308'): Objective, to develop fence pattern in Adit zone and to test down-dip projection of ore in Main Adit. 95 to 100% core recovery. Although hole cuts ore projection about 80' down-dip from Main Adit (my Section B-B'), no ore was found. Logged as almost entirely in pegmatitic granite. Darke attempts to explain failure to find ore as being due to N-Sfault which interrupted down-dip projection of ore; however, his log describes no fault zone until end of hole, which is well east of down-dip projection. Alternate conclusion (mine) is that limestone block containing ore near surface is floored at shallow depth here by massive irregular intrucion of pegmatitic granite.

CM-4 (-70, 142'): Objective, to test down-dip projection of ore in Lower West Adit and to continue fanning pattern. Cut ore section at 118'-129' depth, assay 5.58 oz. Ag, 10.57% Cu, and 0.10% WO_3, approximately 40' from Lower West Adit workings (Section B-B'). No other Cu-Ag assays reported, but 70-90' interval assays 0.02% WO_3 and 90'-115' interval assays 0.37% WO_3 ($15.90/T.).

CM-5 (-42, 82'): Objective, to test grade in vicinity of Lower West Adit workings. Stopped in fractured ground of old workings area. From 0 to 80', average 1.16 oz. Ag, 2.52% Cu. From 10' to 11', 0.047% WO_3; 11' to 25', 0.43% WO_3.

CM-6 (-61, 61'): To further test West Adit zone. Stopped in badly broken ground, vicinity old workings. Cu mineralization 53'-61'; no assays.

CM-7 (-72, 393'): To test area where CM-6 failed. Erratic but fair mineralization:

Interval	Oz. Ag	% Cu	Interval	% WO_3
0- 12	o v e r b u r d e n			
12- 50	Tr.	.018		
50- 80	0.34	2.32	105-117	0.023
80-204	0.06	0.16	120-135	0.18
204-211	0.28	0.70	150-178	0.17
211-248	0.002	0.07	211-230	0.07
248-266	0.32	0.94		
266-297	Tr.	0.04	276-287	0.023

The 30 feet of 2.32% Cu occurs in the immediate vicinity of the West Adit workings. Below this, the averaged grade to 266 ft. is 0.08 oz. Ag and 0.24% Cu. Darke has calculated the average from 50 to 266 feet as 0.07 oz. Ag, 0.53% Cu.

CM-8: Now drilling; no data as yet.

HG-1 (-60, 291'): To test for projection of ore in replacement horizon down-dip from surface Cu showings. Ample skarn in hole, but Cu average about 0.03%. One foot quartz vein at 265' assays 2.32% Cu, 0.48 oz. Ag. Spot assays WO_3, 0.03%.

HG-2 (-60, 257'): Tests same zone as HG-1, but more directly under surface Cu shows:

Interval	Oz. Ag	% Cu	Interval	% WO_3
0-151	Tr.	0.03	60-80	0.005
151-157	0.76	1.65	80-90	0.01
157-187	4.12	4.56	100-120	0.145
187-196	0.40	0.70		

Conclusions

Of the holes drilled in the Adit Zone near the old productive workings, Holes CM-2, CM-4, CM-9, and CM-7 show ore as immediate extensions of the known occurrences; CM-7, in addition, shows low grade ore material in lower horizons, separated by weakly mineralized intervals. CM-10 and CM-3 suggest that the limestone in the immediate vicinity of the holes may bottom at very shallow depth, and that the pegmatitic granite here is relatively unmineralized. None of the holes are sited to prove ore extension southerly along the strike of replacement horizons.

In the southerly drilling, a good show of ore is found in HG-2 approximately 120' down-dip from a surface showing (my Section D-D'); this is overlain by 151' averaging 0.03% Cu. HG-1 should have cut the S'ly projection of this ore if a bedding horizon was the only control, but only traces of copper were found in the hole.

Following is my interpretation of these ore occurrences:

1. Deposition of Paleozoic impure limestones and sandstones.

2. E-W faulting, followed by N-S faulting, creating shattered zones of permeability.

3. Invasion of monzonite and diorite, partially engulfing and penetrating the sediments, accompanied by contact metamorphism along contacts and mineralization replacing beds, principally along permeable zones of E-W faulting. The sill-like intrusions have a general N-S trend paralleling the bedding, and block E-W continuity of ore, resulting in separated deposits. Conceivably, ore might occur in a N-S bedding replacement along the contact-metamorphic zone of higher magnetics, but this has not been proven; I believe E-W fracturing, with increased permeability, is a necessary ingredient. The known ore may extend to some depth in favorable horizons which are cut by E-W faulting; it is not possible to forecast how deep these beds may extend before reaching the roof of the intrusive.

Nothing in the work to date suggests that ore of major dimension will be found in the metasedimentary block, although locally, drilling indicates possibly small ore bodies of workable thickness and grade are present. The ore in HG-2 deserves some follow-up drilling, as does the West Adit zone, although in the latter case, topography entails a difficult road building job to reach adequate drill sites.

Two lines of surface samples are shown on the Murphy map, south of HG-1-2 holes; they show rather startling assays for the widths sampled, the northerly line averaging 3.14% Cu for a width of 800 feet. Darke himself questions the sampling method employed, and lays little stress upon their validity.

In my prior examination, I did not see any skarn zones large or continuous enough to indicate any major ore deposits, and I do not believe the current work has greatly improved the picture. Therefore, I cannot recommend a matching expenditure for an interest in this property.

However, there are some general similarities in the geology of the Coyote Mountains area and that of the Sierrita Pima District, about 25 miles to the east. The area of alluvial cover in the western part of Altar Valley, flanking the Coyote Mountains (in which known copper mineralization occurs) on the east, would appear to be an area in which some geophysical reconnaissance is justified. This is discussed in a separate report entitled "Suggested Reconnaissance in Altar Valley, Pima County, Arizona."

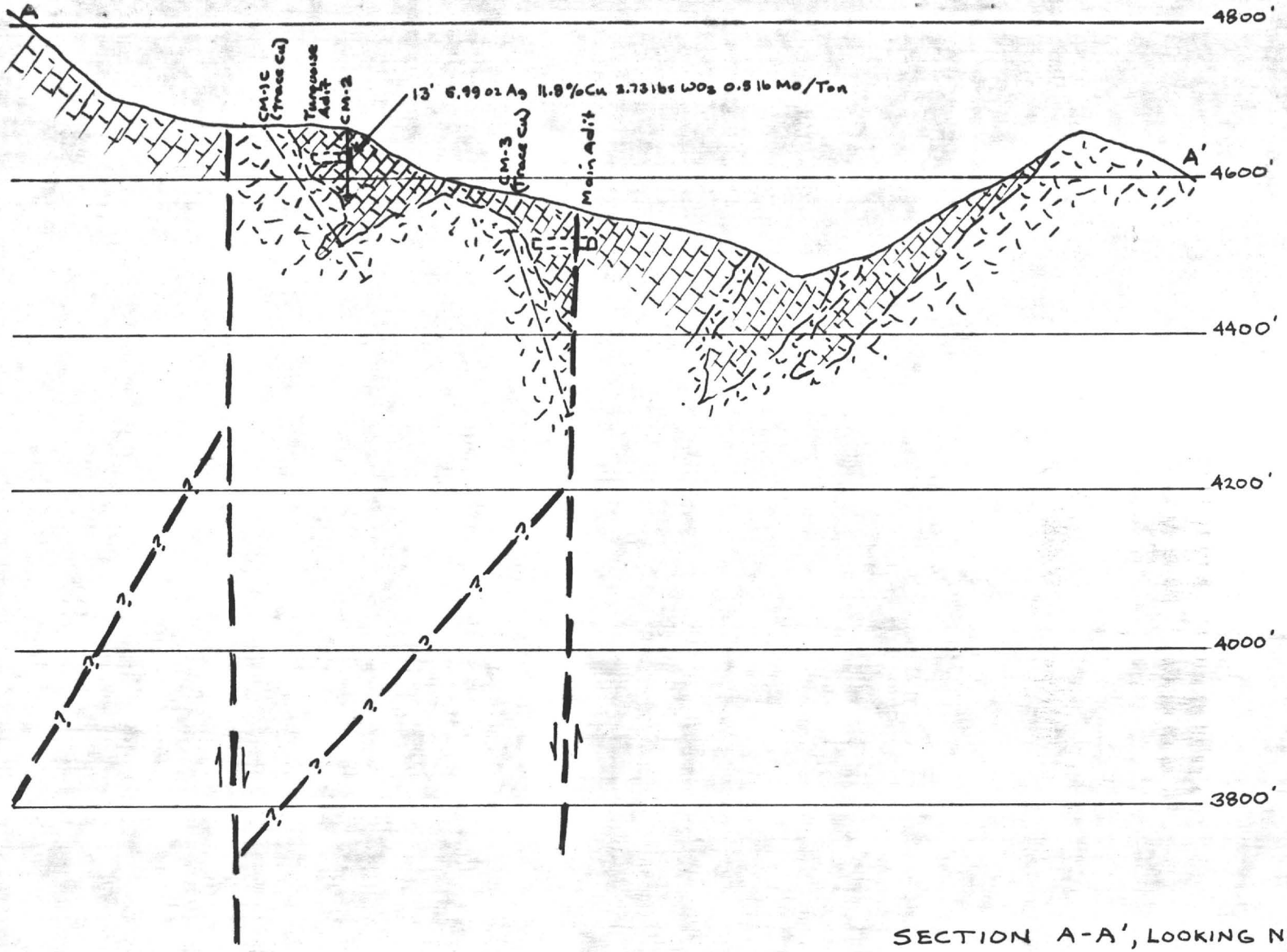
For the time being, I think development of the Coyote Mountain prospect should be watched, but I do not believe the showings to date justify any active interest by Hecla. I am enclosing the Darke file of data upon the property for your information, but since it is my only copy and interest in the area will continue, I would appreciate its return.

Respectfully submitted,

J Douglas Bell
Geologist, Exploration

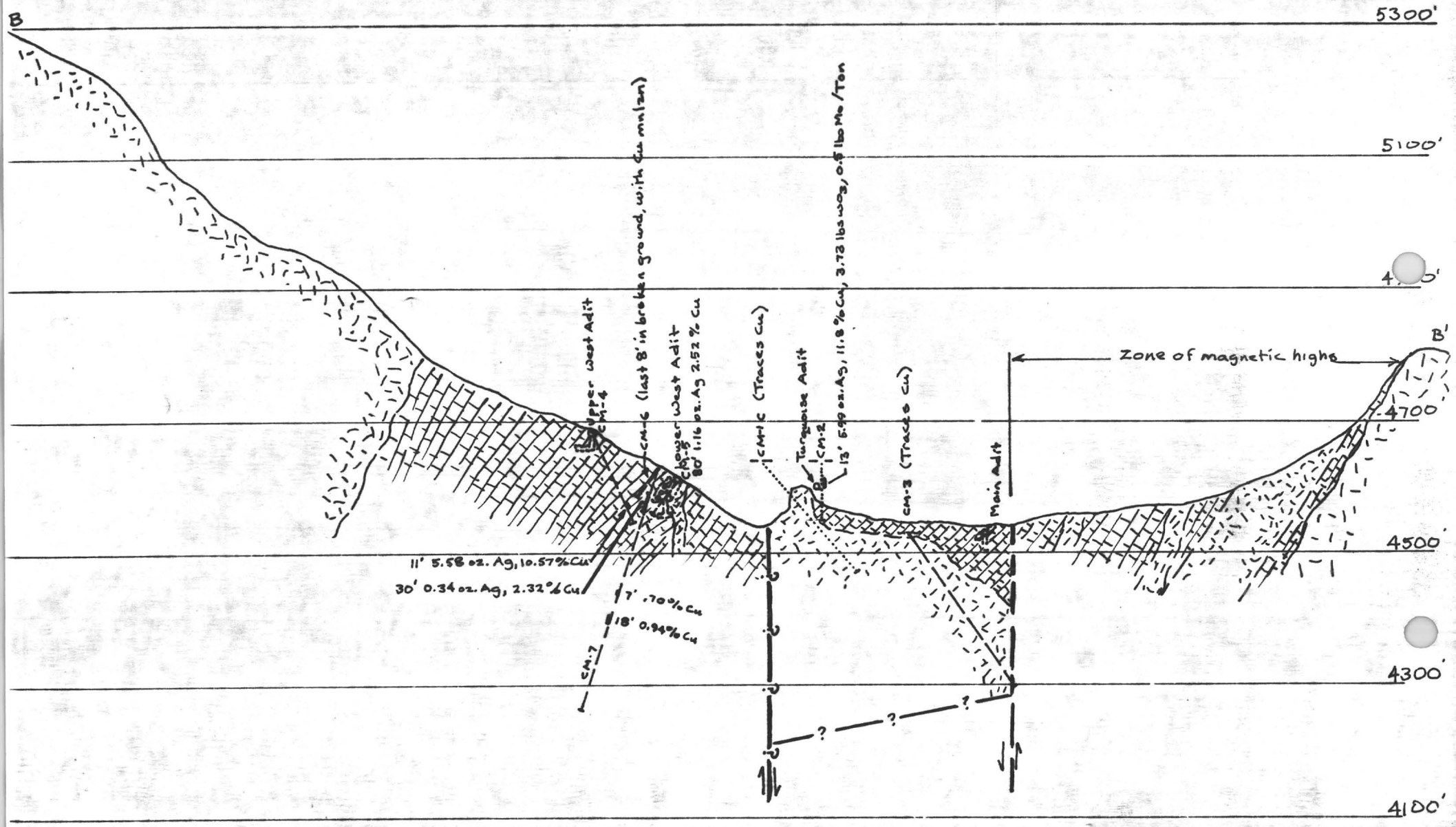
JDB:jan

Enclosure: Darke file



SECTION A-A', LOOKING NNE
COYOTE MOUNTAIN PROPERTY
CONSOL. RED POPLAR MINERALS
PIMA CO. ARIZONA
SCALE: 1" = 200'

J D Bell May 28, 1967



SECTION B-B', Looking North

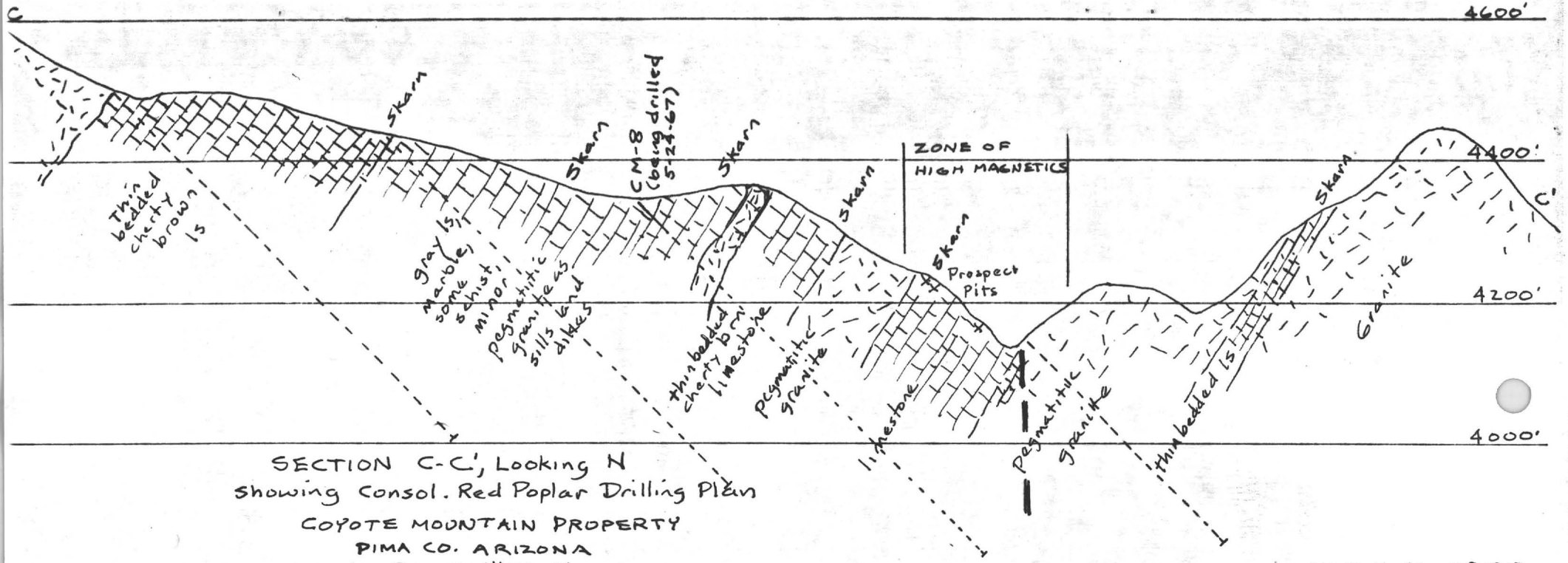
COYOTE MOUNTAIN PROPERTY

CONSOL. RED POPLAR MINERALS LTD

PIMA CO., ARIZONA

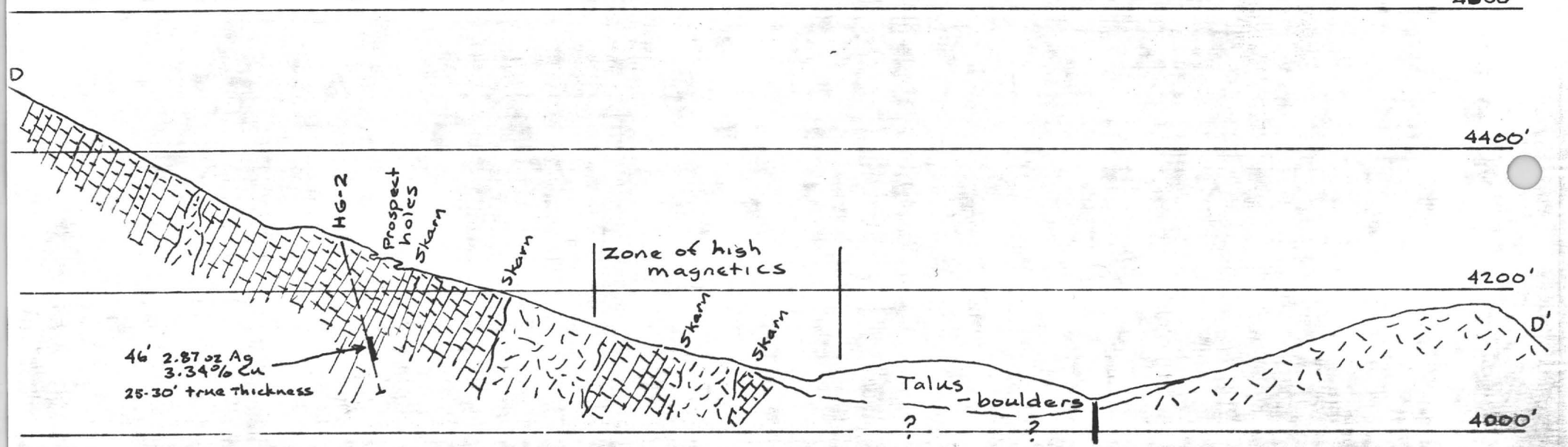
SCALE: 1" = 200'

JDBell May 28, 1967



SECTION C-C', Looking N
Showing Consol. Red Poplar Drilling Plan
COYOTE MOUNTAIN PROPERTY
PIMA CO. ARIZONA
SCALE: 1" = 200'

J D Bell May 28, 1967

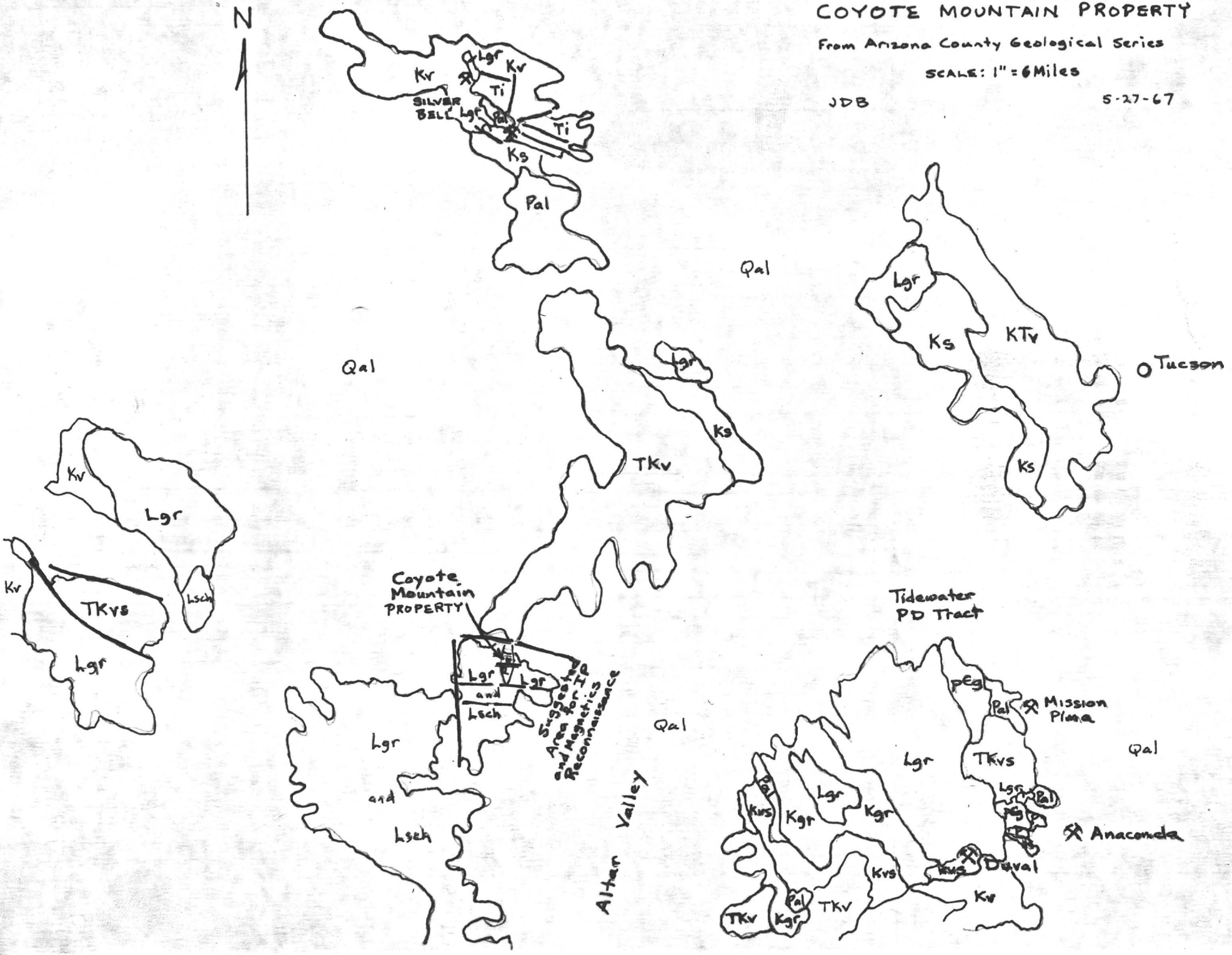


SECTION D-D' LOOKING N
COYOTE MOUNTAIN PROPERTY
PIMA CO., ARIZONA

SCALE: 1" = 200'
J D Bell May 27, 1967

LOCATION AND GEOLOGIC INDEX MAP
COYOTE MOUNTAIN PROPERTY
From Arizona County Geological Series
SCALE: 1" = 6 Miles

JDB 5-27-67



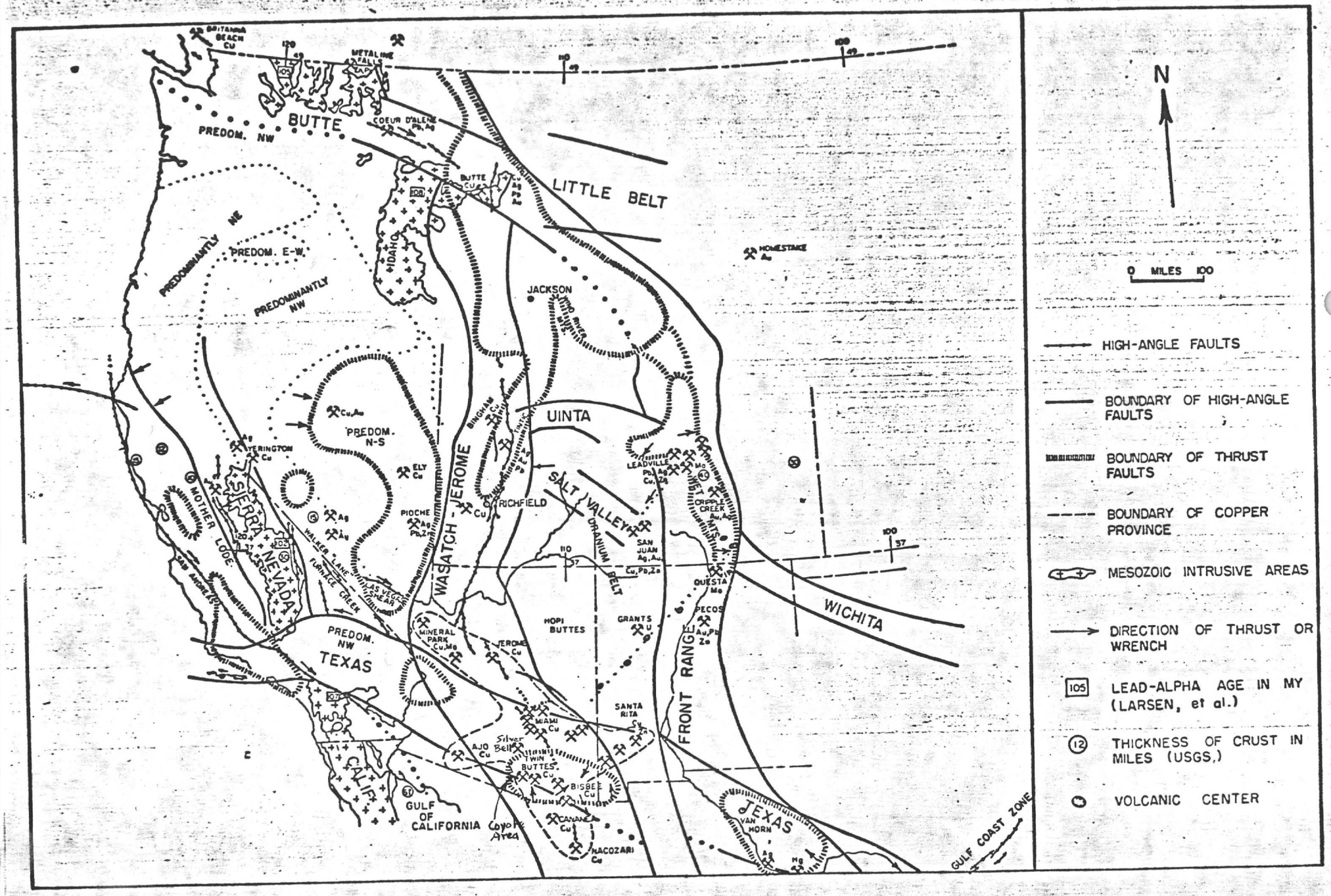
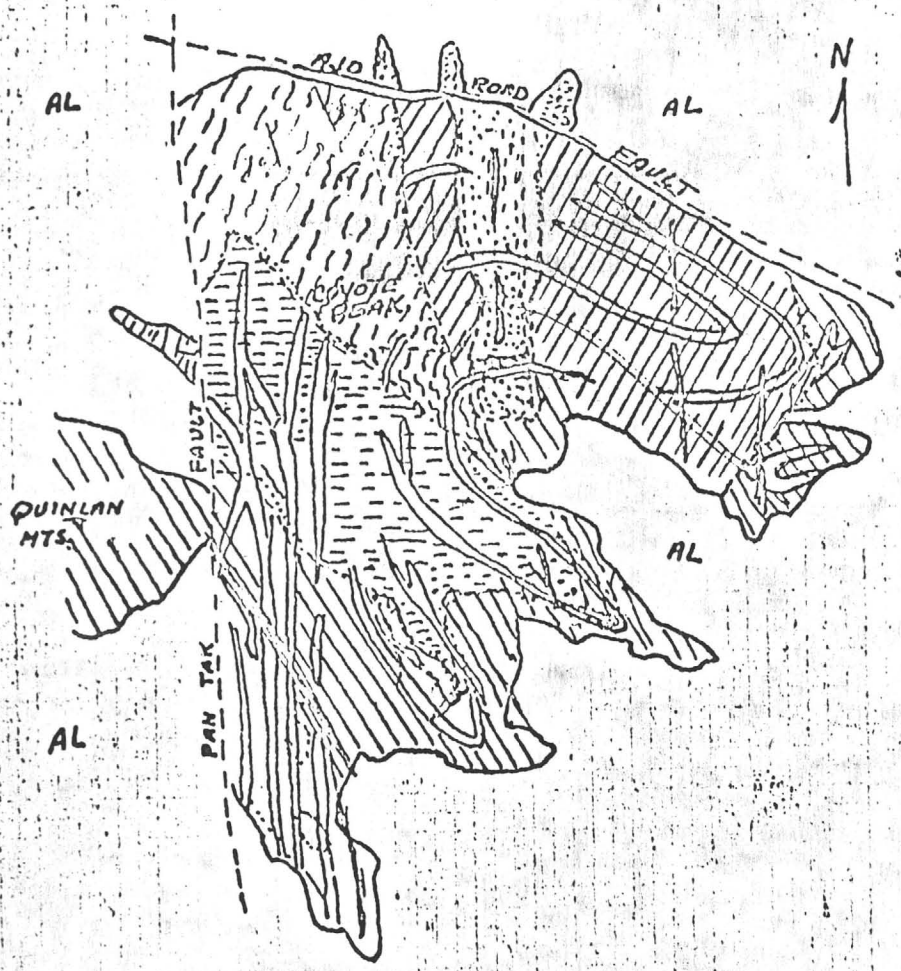


FIGURE 2.—Major structure and ore deposits of the western Cordillera.



GEOLOGY of the

COYOTE MOUNTAINS, ARIZONA

* Sketch made by (?) from the Report 'Geologic and Tectonic Features of the Coyote Mountains, Arizona'

by

J.G. Wargo & W.I. Kurtz

AL	ALLUVIUM
	K-? SHALES
	LAMPROPHYRE
	PEGMATITE
	ALASKITE
	MONZONITE
	DIORITE
	MARBLE & QUARTZITE
	BIOTITE & GNEISS
	FAULT
	CONTACT
	CAVILLO CAMP

TECTONIC FEATURES of the

COYOTE MOUNTAINS, ARIZONA

* Sketch made by (?) from the Report 'Geologic and Tectonic Features of the Coyote Mountains, Arizona' by

J.G. Wargo & W.I. Kurtz

WARGO & KURTZ

HEINRICHS GEOEXPLORATION COMPANY

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

September 13, 1967

Mr. Doug Bell
Hecla Mining Company
2020 East 13th Street
Tucson, Arizona

Re: Proposed I.P.-Momag Survey, Altar Copper Project, Coyote Mountain Area, Pima County, Arizona.

Dear Doug:

Confirming our conversation of yesterday, we herewith propose for our mutual agreement and understanding as follows:

On or about Monday, September 18, 1967, Geoex will furnish a three man I.P. crew using maximum penetration equipment, (MK 4 Sender) and a two man Mobile Magnetometer crew (Momag). Scope of the survey is as follows:

I.P.

Dipole spacing = 1,000 feet
Line spacing = 1/2 mile
Total estimated miles of I.P. line = 33
Total estimated cost of I.P. will be = $11,600.00

MOMAG: Line spacing = 1/4 mile except where vehicle is not able to drive because of terrain. In the rough areas a hand magnetometer will be used.
Total estimated miles of magnetics = 55
Total estimated cost of magnetics = $2,500.00

Charges for a three man I.P. crew will be at the rate of $275.00/day
Additional men to accelerate the job will be at $50.00/man day
Momag charges will be at the rate of $280.00/day
Compilation and interpretation on all phases will be $125.00/staff day
Vehicle charges will be $12.00/day (+$0.12/mile).
Directly related supplies, communications, and other incidental expenses will be charged at our cost.

Excessive weather delay and standby charges are one-half the daily rate. Equipment breakdown in excess of one hour will be made up or not charged.

Our crews have been instructed to respect the ranchers private property and to minimize destroying the grass and also to refrain from parking near the cattle tanks.

It is understood and agreed that this project shall be complete within 60 days of your authorization for us to proceed.

The area to be surveyed is outlined on the enclosed U.S.G.S. quad and it is understood that the program may be modified from time to time as results justify it, based on our best professional judgement and with your mutual agreement.

All property permits, brushing and trespassing-liability and related costs incurred on behalf of client assumed by client.

Geoex will save client harmless from all Workmen's Compensation, public liability and property damage liability incurred by Geoex employees.

Preliminary reports or copies of rough field plotting sheets will be available as work progresses.

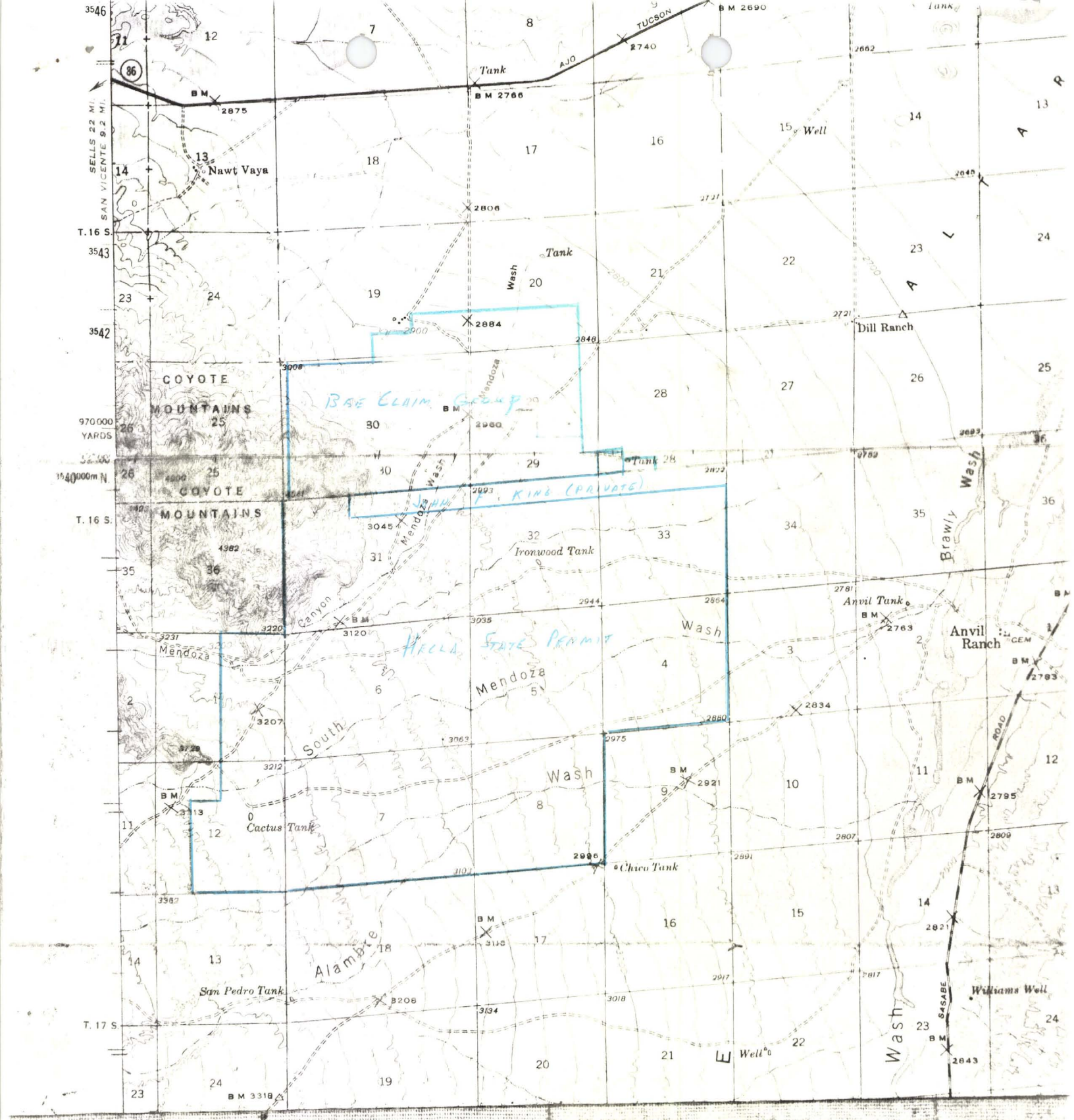
Payments due on presentation. Billings may be submitted periodically with final statement after completion of final report.

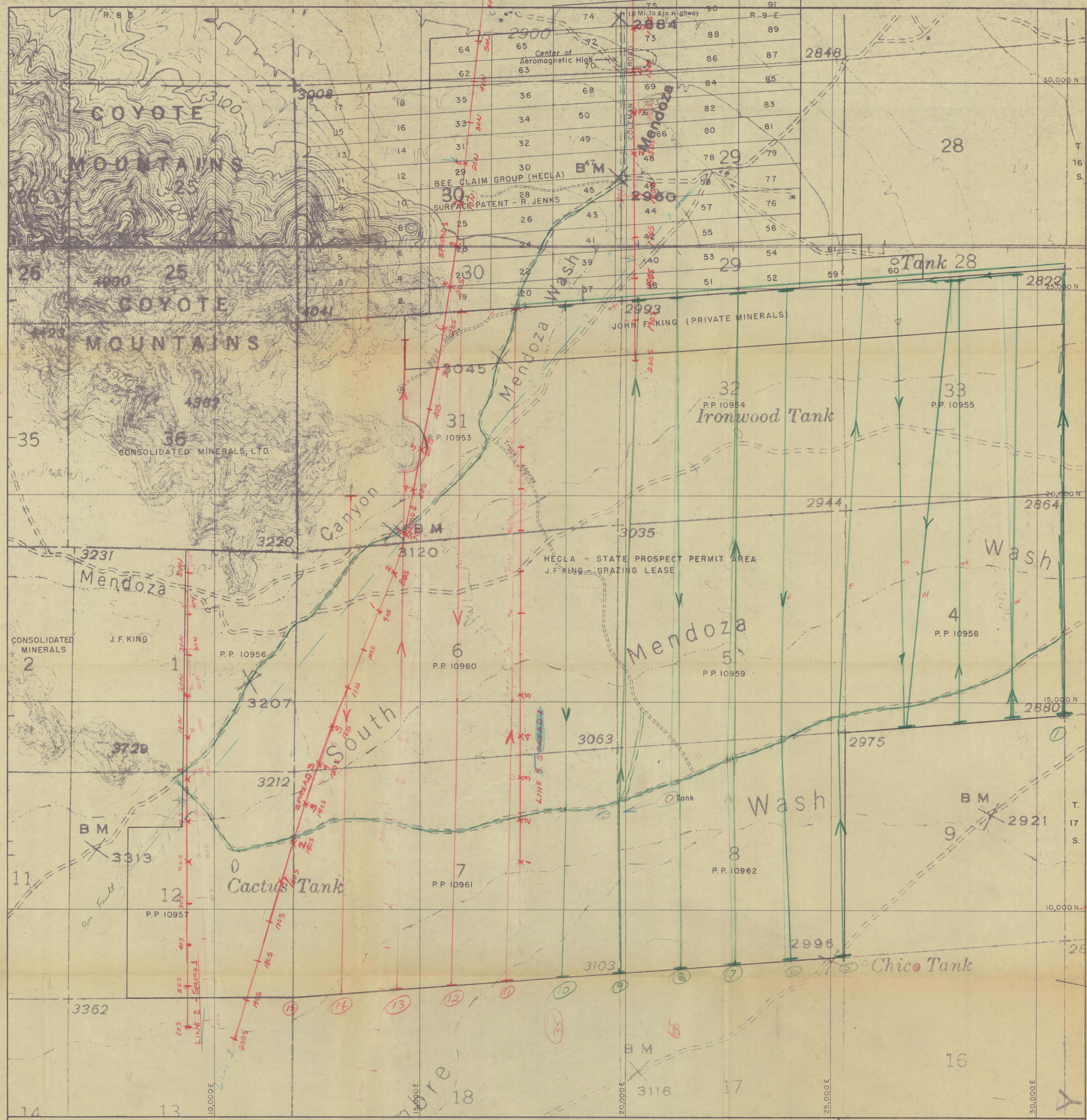
Indication of your understanding and approval of the above by executing as provided below on the attached copy of this letter and returning it to us, will be most appreciated.

Very truly yours,
HEINRICHS GEOEXPLORATION COMPANY

E. Grover Heinrichs
Vice President

DATE: Sept. 15, 1967
ACCEPTED BY: J. Douglas Bell
TITLE: Geologist, Hecla Mining Co.


TUCSON
AJO
Tank
BM 2690
BM 2766
BM 2875
2740
86
Nawt Vaya
SELLS 22 MI.
SAN VICENTE 9.2 MI.
T. 16 S.
T. 17 S.
Well
Tank
Wash
Dill Ranch
COYOTE
MOUNTAINS
BAE CLAIM GROUP
970000
YARDS
1540000m N.
JOHN F. KING (PRIVATE)
Mendoza
Wash
Ironwood Tank
Canyon
HECLA STATE PERMIT
Anvil Tank
Anvil Ranch
Brawly
South
Cactus Tank
Chico Tank
Alambre
San Pedro Tank
Williams Well
SASABE
ROAD
BM 3318
ALTAR Copper Project
Hecla Mining Co.

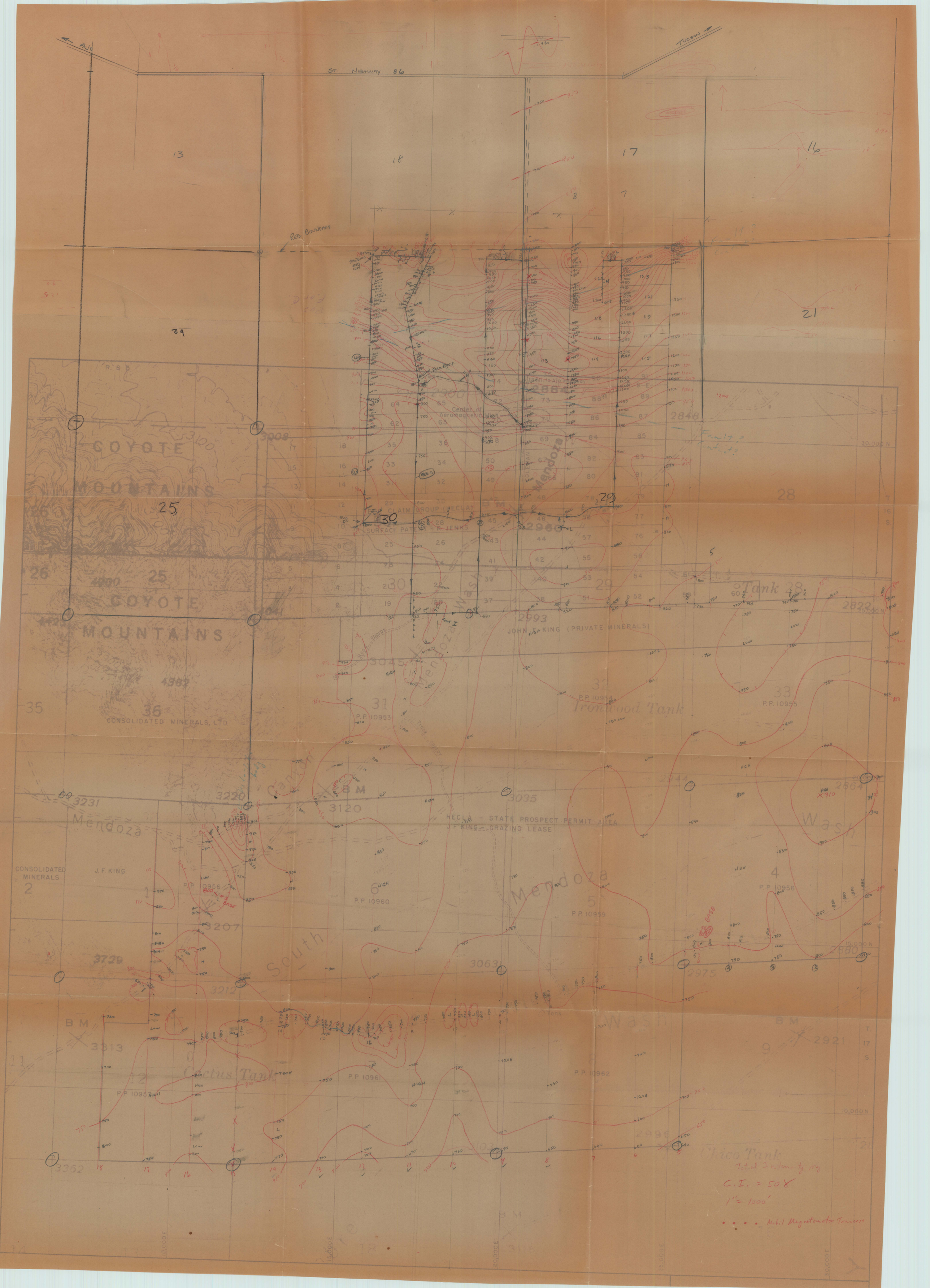


ALTAR COPPER PROJECT AREA

HECLA MINING COMPANY

PIMA COUNTY, ARIZONA

SCALE: 1" = 1,000'


ST. HIGHWAY 86
TUCSON
RES. BOUNDARY
COYOTE MOUNTAINS
CONSOLIDATED MINERALS, LTD
JOHN F. KING (PRIVATE MINERALS)
HECLA - STATE PROSPECT PERMIT AREA
J.F. KING - GRAZING LEASE
Mendoza Wash
Ironwood Tank
Cactus Tank
Chico Tank
Tank 28
South Wash
Total Intensity Mag
C.I. = 50γ
1" = 1000'
Nibil Magnetometer Traverse

PAGE

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT COYOTE MT 10-9-67
LINE 3 HALF S SP. 2 DATE

SEND	45	34	45	23	34	45	12	23	34	45
RECEIVE	70-80S	80-90S	—	90-100S	—	—	100-110S	—	—	—
RANGE	100	100	30	100	10	10	30	10	10	3
DC 1	475470	400 432	110 113	358400	800840	464388	220235	718750	358340	216348
DC 2	475470	399 431	110 113	352402	780840	470382	219236	690778	392314	206245
DC 3	474470	399 432	111 113	351404	774826	470398	220240	720748	390324	194260
DC 4	472470	399432	112 114	348406	801800	460386	216241	720805	368340	235236
DC 5	470472	400 432	110 115	346408	840778	478380	215240	670822	348388	222244
DC 6				345408	852762	480385	215241	656840	304420	210256
DC 7					845782	466395		730742	352362	206253
DC 8						460396		740738	345362	212244
DC AVG.	471.6	41.55	11.21	37.68	8.099	4.285	2.279	7.426	3.56	2.304
AC 1	43.5	38.2	10.1	34.8	7.18	3.62	2.10	6.46	3.00	1.83
AC 2	43.5	38.2	10.1	34.9	7.18	3.62	2.10	6.48	2.99	1.84
AC AVG.										
S.P.	+5.5	-6.7	—	+14.3	—	—	-8.4	—	—	—
AC NOISE	<.2	<.2	—	<.2	—	—	<.2	—	—	—
POT RES.	1K	1K	—	1K	—	—	1K	—	—	—

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT COYOTE MT
LINE 3 HALF S SP. 2 DATE 10-9-67

PAGE

SEND	12	23	34	45	12	23	34	45	Cal	
RECEIVE	120-130 S				130-140 S					
RANGE	10	10	3	3	3	3	3	3	300	
DC 1	442348	280375	250206	160 166	178 191	221 165	173 116	144 75		
DC 2	479374	272 360	241 221	165 162	194 190	224 140	175 125	148 50		
DC 3	435 388	265 390	223 216	170 151	193 171	209 181	174 114	147 53		
DC 4	444 390	248 362	221 228	167 160	202 166	206 171	170 129	132 56		
DC 5	435 398	240 408	230 236	160 155	206 162	210 165	156 128	140 73	205	
DC 6	422 420	263 362	240 225	151 172	195 160	223 168	167 122	132	205	
DC 7		220 420	238 236	165 154	182 188	228 165	183 134	~~1.010~~	205	
DC 8		248 398	236 244	152 166	176 195	225 170	182 112		205	
DC AVG.	4.13	3.18	2.296	1.608	1.84	1.917	1.478	1.010	2	
AC 1	3.62	2.65	1.78	1.23	1.50	1.51	1.11	0.72	193	
AC 2	3.64	2.65	1.79	1.24	1.51	1.50	1.12	0.73	193	
AC AVG.										
S.P.	-0.7				-2.3	0	-0.2			
AC NOISE	<.2				<.2					
POT RES.	1K				1K					

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PAGE

PROJECT Coyote [illegible]

LINE #2 HALF [illegible] SP. 2 DATE 10/9/[illegible]

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE	70-80	8000 —	9000	9000 —	10,000	→	10,000	11,000	→	
RANGE	30	→								
VOLTAGE	420	400	480	460	400	480	420	460	460	480
CURRENT	7.0	7.0	8.0	7.0	7.0	8.0	4.0	7.0	8.0	8.0
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5	CHG	
RECEIVE	11,000	12000	→		12000	12,000	→		2.0	
RANGE	30	→							10	
VOLTAGE	420	460	460	480	420	460	460	420	260	
CURRENT	4.0	7.0	8.0	8.0	4.0	7.0	8.0	7.0	2A	

FREQUENCIES .05 2

SENDER NO. 6645

OPERATOR REX & FELIX

RECEIVER NO. 10001-A

OPERATOR J.R.

COMMENTS:

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Coyote Line 3 Field date 10-9-65 Data page_____ Comp. date 10-10-67. Comp by HRM

(A) Send	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5		
(B) Receive												
(C) n separation												
(D) I	7	7	8	7	7	8	4	7	8	8		
(E) Vdc (avg)	47.16	41.55	11.21	37.68	8.099	4.285	22.79	7.426	3.56	2.304		
(F) DCcal	0.976											
(G) Kn x 10^{-3}	3	3	12	3	12	30	3	12	30	60		
(H) ρ dc=ExFxGx10^3/D	20 19.7	17 17.4	16 16.4	15.816	19 13.5	16 15.7	17 16.7	13 12.5	13 13.0	17 16.9		
(I) Vac Σ	43.5	38.2	10.1	34.85	7.18	3.62	21.0	6.47	2.995	1.835		
(J) AC noise x 2												
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.942											
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	2.1	2.5	4.6	1.9	6.3	11.5	2.2	8.6	12.0	18.3		
(O) MCF=(M-1)(10^5)/H	107	144	280	120	466	732	132	688	923	1083		
	105	147	287	119	450	719	129	662	923	1076		

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		CAL		
(B) Receive												
(C) n separation												
(D) I	4	7	8	8	4	7	8	7		2000		
(E) Vdc (avg)	4.13	3.18	2.296	1.608	1.84	1.917	1.478	1.01		205		
(F) DCcal												
(G) Kn x 10^{-3}	12	30	60	105	30	60	105	168				
(H) ρ dc=ExFxGx10^3/D	12 12.1	13 13.3	17 16.8	21 20.6	14 13.5	16 16.0	19 18.9	24 23.7				
(I) Vac Σ	3.63	2.65	1.785	1.235	1.505	1.505	1.115	0.725		193		
(J) AC noise x 2												
(K) Vac (corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.												
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)	7.2	13.0	21.2	22.7	15.2	20.0	24.9	31.2				
(O) MCF=(M-1)(10^5)/H	595	977	1262	1102	1126	1250	~~1317~~ ~~2363~~	~~1319~~ ~~3374~~				
	600	1000	1247	1081	1086	1250	1311	1300				

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PAGE

PROJECT COYOTE MT 10-5-67
LINE 3 HALF N SP. 2 DATE

SEND	12	23	12	34	23	12	45	34	23	12
RECEIVE	60-70	50-60		40-50			30-40			
RANGE	30	100	10	100	10	3	100	10	3	
DC 1	095 285	450 500	710 770	428 438	868920	237246	434 430	840 721	260290	
DC 2	300 283	445 500	699 762	430 438	850935	222258	435430	841 738	244 299	
DC 3	300 285	445 500	685786	430428	842940	240232	434 432	862718	290260	
DC 4	299 283	442 502	696 790	428 438	840 950	251 241	430 432	870 699	263286	
DC 5	304 282	442 502	692 785	430 428	835 944	226 248	434 430	818 740	245310	
DC 6			682 786	430 438	826954	231 250	430428	835 725	255278	
DC 7			678 805			230245		850740	270288	
DC 8						236245			240276	
DC AVG.	58.4	94.5	14.73	86.4	17.81	4.80	86.3	15.70	5.45	
AC 1	26.6	43.5	6.60	39.8	7.98	2.05	39.8	7.10	2.31	0.8
AC 2	26.6	43.5	6.60	39.5	7.98	2.05	40.0	7.10	2.32	
AC AVG.	53.2	87.0	13.20	79.3	15.96	4.10	79.8	14.20	4.63	1.60
S.P.	+5.2	-11.8		+0.6			-14.3			
AC NOISE	<.1	<.1		<.1			<.1			
POT RES.	700	800		800			600			

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT COYOTE MT 10-5-6
LINE 3 HALF N SP. 2 DATE

PAGE

SEND	45	34	23	12	45	34	23	12	Cal	
RECEIVE	20-30 S				10-20 S					
RANGE	10	3	3		10	3				
DC 1	648680	252210	111126		400322	154175				
DC 2	655708	246200	101105		400318	164150				
DC 3	665700	251204	940106		408320	172159				
DC 4	640720	249220	111900		408308	176154				
DC 5	658718	260207	980950		422308	180155			202	
DC 6	652705	253210	109960		438286				200	
DC 7		275205	114101						202	
DC 8		262200	119850						200	
DC AVG.	13.60	4.64	2.384		7.26	3.30			402	
AC 1	6.15	2.00	0.830	0.37	3.12	1.35			188	
AC 2	6.15	2.00	0.840		3.12	1.35			188	
AC AVG.	12.30	4.00	1.670	0.74	6.24	2.70			376	
S.P.	-7.0				-8.1					
AC NOISE	<.1				<.1					
POT RES.	1K				800					

Well

Well

Well

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT COYOTE MT. 10-5-67

LINE 3 HALF N SP. 2 DATE

SEND	12	23	12	34	23	12	45	34	23	12
RECEIVE	60-70N	50-60N	—	40-50N	—	—	30-40N	—	—	—
RANGE	30	—	—	—	—	—	—	—	—	→
VOLTAGE	500	480	500	420	480	500	420	420	480	500
CURRENT	5.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0	7.0	5.0
SEND	45	34	23	12	45	34	23	12	Cal	
RECEIVE	20-30N	—	—	—	10-20N	—	—	—	2A	
RANGE	30	—	—	—	—	—	—	→		
VOLTAGE	420	420	480	500	500	480				
CURRENT	7.0	7.0	7.0	5.0	8.0	8.0				

FREQUENCIES 0.5 1.5

SENDER NO. 156735

OPERATOR M.F.

RECEIVER NO. 7066T-R

OPERATOR J.K.

COMMENTS:

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Hecla Coyote Line 3 N/S Field date_____ Data page_____ Comp. date_____. Comp by_____

(A) Send	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2		
(B) Receive												
(C) n separation												
(D) I	5	7	5	7	7	5	7	7	7	5		
(E) Vdc (avg)	58.4	94.5	14.73	86.4	17.81	4.80	86.3	15.70	5.45	~147		
(F) DCcal	.498											
(G) Kn x 10^{-3}	3	3	12	3	12	30	3	12	30	60		
(H) ρ dc=ExFxGx10^3/D	17	28	18	18	15	14	18	17	12	9.6→12		
(I) Vac Σ	53.2	87.0	13.20	79.3	15.96	4.10	79.8	14.20	4.63	1.60		
(J) AC noise x 2												
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.935											
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	2.6	1.6	4.3	1.9	4.3	9.5	1.1	3.4	10.1	X		
(O) MCF=(M-1)(10^5)/H	153	80	239	106	287	679	61	262	842	X		

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2		CAL		
(B) Receive												
(C) n separation												
(D) I	7	7	7	5	8	8				2000		
(E) Vdc (avg)	13.60	9.64	2.084	—	7.26	3.20	—	—		402		
(F) DCcal								→		.498		
(G) Kn x 10^{-3}	12	30	60	105	30	60	—	—				
(H) ρ dc=ExFxGx10^3/D	12	9.9	8.9	7.7→9.9	14	12						
(I) Vac Σ	12.30	4.00	1.670	0.74	6.24	2.70	—	—		376		
(J) AC noise x 2												
(K) Vac (corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.								→		.935		
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)	3.4	8.5	16.7	X	8.8	14.3	X	X				
(O) MCF=(M-1)(10^5)/H	283	859	1876	X	629	1192	X	X				

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT COYOTE MT 10-4-67
LINE 3 HALF (N) SP. 3 DATE

PAGE

SEND	12	23	12	34	23	12	45	34	23	12
RECEIVE	0-1 N	10-20	—	20-30 S		—	30-40 S	—		—
RANGE	100	100	30	100	30	10	100	30	10	10
DC 1	362 370	378 375	100 85	440 465	106 990	358 444	852 848	191 220	762 660	352 305
DC 2	362 370	378 375	101 85	438 472	106 980	355 445	855 848	190 220	761 666	342 300
DC 3	362 370	378 375	100 85	435 475	106 970	355 442	858 850	190 220	740 670	355 298
DC 4	362 370	378 375	100 85	432 478	107 970	355 442	856 850	190 221	758 660	360 295
DC 5				430 478	107 970	352 444	855 848	189 218	760 665	360 288
DC 6				430 475	107 960	360 440	858 848	190 222	765 652	360 285
DC 7										
DC 8										
DC AVG.	73.2	75.3	18.53	90.7	20.40	7.99	17.05	41.0	14.20	6.51
AC 1	34.0	35.2	8.50	42.2	9.40	3.60	78.2	18.6	6.32	2.80
AC 2	34.0	35.2	8.50	42.2	9.40	3.60	78.4	18.6	6.32	2.80
AC AVG.	68.0	70.4	17.00	84.4	18.80	7.22	156.6	37.2	12.64	5.60
S.P.	+26.2	0	—	+19.8	—	—	+12.1	—	—	—
AC NOISE	<.1	<.1	—	<.1	—	—	<.1	—	—	—
POT RES.	1K	1K	—	500v	—	—	2K	—	—	—

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT COYOTE MT 12-4-62
LINE 3 HALF N SP. 3 DATE

PAGE

SEND	45	34	23	12	45	34	23	12	Cal	
RECEIVE	40-50	5			50-60	5				
RANGE	30	10	10	3						
DC 1	225 229	780 878	310 398	194 206						
DC 2	225 226	782 862	305 392	190 210						
DC 3	226 226	782 865	304 402	189 214						
DC 4	227 225	805 852	315 392	182 222						
DC 5	229 226	805 828	318 382	174 222					201	
DC 6		83 2830	312 398	176 225					199	
DC 7		820 838	305 390	167 232					201	
DC 8									199	
DC AVG.	45.3	16.54	7.04	3.98					400	
AC 1	20.6	7.58	3.01	1.64					189	
AC 2	20.6	7.38	3.00	1.64					188	
AC AVG.	41.2	14.76	6.01	3.28					377	
S.P.	+18.7									
AC NOISE	<.1									
POT RES.	1.5K									

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT _____

LINE #3 HALF 1/2 SP. 3 DATE _____

PAGE

SEND	1-2	2-3	1-2	3-4	2-7	1-2	4-5	3-4	2-3	1-2
RECEIVE	0-1000	1000 – 2000		2000 – 3000	→		3000 – 4000		→	
RANGE	30	→								
VOLTAGE	420	340	420	360	340	420	380	340	340	420
CURRENT	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2	CHL	
RECEIVE	4000 – 5000		→		5000 – 6000		→		24	
RANGE	30	→								
VOLTAGE	380	370	380	440	380	340	340	420	?	
CURRENT	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		

FREQUENCIES .25 _____

SENDER NO. 156728

OPERATOR W.F.

RECEIVER NO. 1561

OPERATOR [illegible]

COMMENTS:

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT COYOTE MT
LINE 3 HALF S SP. 3 DATE 10-4-67

PAGE

SEND	45	34	45	23	34	45	12	23	34	45
RECEIVE	0-10 N	10-20N	—	20-30N	—	—	38-40N	—	—	—
RANGE	100	100	30	100	10	10	100	30	10	3
DC 1	362 380	382 380	106 840	410 378	850 876	322 380	340 325	106 900	395 372	205 255
DC 2	360 380	388 380	106 840	412 395	862 878	320 372	340 320	106 880	320 372	242 286
DC 3	360 382	388 380	108 830	412 395	860 868	308 378	342 320	106 870	410 360	230 244
DC 4	360 385	390 380	107 830	412 394	862 872	320 385	350 312	108 880	412 462	232 248
DC 5			109 820	415 392	870 865	308 378	358 308	110 860	325 442	242 255
DC 6						315 380	358 310	110 850	340 438	204 282
DC 7						320 380			345 422	248 226
DC 8						6.95				255 220
DC AVG.	74.2	76.8	19.07	80.8	17.35	7.19	66.5	19.54	7.70	4.88
AC 1	34.2	35.5	8.65	37.2	7.85	3.08	30.6	8.90	3.40	2.04
AC 2	34.2	35.5	8.65	37.2	7.85	3.08	30.6	8.90	3.40	2.04
AC AVG.	68.4	71.0	17.30	74.4	15.70	6.16	61.2	17.80	6.80	4.08
S.P.	+26.8	+12.4	—	+19.3	—	—	+23.1	—	—	—
AC NOISE	<.2	<.2	—	<.2	—	—	<.2	—	—	—
POT RES.	600	1K	—	1K	—	—	1.5K	—	—	—

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT COYOTE MT
LINE 3 HALF S SP. 3 DATE 04-67

PAGE

SEND	12	23	34	45	12	23	34	45	Cal	
RECEIVE	40-50N				50-60N				300	
RANGE	10	10	3	3	10	3				
DC 1	740 922	382 455	205 238	134 131	320 406	255 224				
DC 2	862 804	372 448	208 235	131 130	306 410	245 234				
DC 3	868 805	375 448	214 235	130 134	300 421	245 228				
DC 4	878 802	378 460	216 232	129 136	318 412	242 236				
DC 5	880 795	379 459	216 231	125 142	300 420	234 240			196	
DC 6	880 792	365 460	216 226	114 151	368 358	229 254			205	
DC 7				139 125	378 340	214 264			196	
DC 8				136 125	380 315	205 274			205	
DC AVG.	16.74	8.29	4.47	2.64	7.25	4.74			401	
AC 1	7.42	3.62	1.86	1.05	3.08				186	
AC 2	7.45	3.61	1.86	1.05					186	
AC AVG.	14.87	7.23	3.72	2.10	6.16	?			372	
S.P.	+6.5				+12.6					
AC NOISE	<.2				<.2					
POT RES.	1K				900					

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT _____

LINE #3 HALF S/E SP. 3 DATE _____

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE	0-1000	1000	2000	2000	3000	→	3000	4000		→
RANGE	30									
VOLTAGE	380	360	380	340	360	380	420	340	360	440
CURRENT	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	8.0
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5	CHL	
RECEIVE	4000	5000		→	5000	6000		→	2H	
RANGE	30							→		
VOLTAGE	500	380	420	440	500	380	380	430		
CURRENT	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0		

FREQUENCIES .25 3

SENDER NO. 156735

OPERATOR MJ.

RECEIVER NO. 10661

OPERATOR Jim

COMMENTS:

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Hela - Coyote Line 3 N½ Field date 10-4/67 Data page_____ Comp. date 10/5/67. Comp by CSL

(A) Send	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2		
(B) Receive	9-10	10-20	—	20-30	—	—	30-40	—	—	—		
(C) n separation												
(D) I	7a	—	—	—	—	—	—	—	—	—		
(E) Vdc (avg)	73.2	75.3	18.53	90.7	20.40	7.99	170.5	41.0	14.20	6.51		
(F) DCcal	0.500	—	—	—	—	—	—	—	—	—		
(G) Kn x 10^{-3}	3	3	12	3	12	30	3	12	30	60		
(H) ρ dc=ExFxGx10^3/D	16	16	16	19	17	17	37	35	30	28		
(I) Vac Σ	68.0	70.4	17.00	84.4	18.80	7.20	156.6	37.2	12.64	5.60		
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	0.93	—	—	—	—	—	—	—	—	—		
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	1.5	0.9	2.8	1.3	2.3	4.6	2.7	3.9	5.9	9.6		
(O) MCF=(M-1)(10^5)/H	94	56	175	68	135	271	73	111	197	343		

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2		< A2		
(B) Receive	40-50	—	—	—	50-60	—	—	—				
(C) n separation												
(D) I	—	—	—	—	—	—	—	—		2.000		
(E) Vdc (avg)	45.7	16.54	7.04	3.98						400		
(F) DCcal	—	—	—	—						0.500		
(G) Kn x 10^{-3}	12	30	60	105	30	60	105	168				
(H) ρ dc=ExFxGx10^3/D	39	35	30	30								
(I) Vac Σ	41.2	14.76	6.01	3.28						777		
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	—	—	—	—						.943		
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)	3.7	5.7	10.5	14.4								
(O) MCF=(M-1)(10^5)/H	95	163	350	480								

HEINRICHS GEOEXPLORATION COMPANY

INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Hecla-Coyote Line 3-5½ Field date 4/4/67 Data page_____ Comp. date 10/-/67. Comp by C.S.L.

(A) Send	4-5	7-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5		
(B) Receive	1-10	10-20	—	20-2	—	—	20-1	—	—	—		
(C) n separation												
(D) I	7a	→							→	8a		
(E) Vdc (avg)	74.2	76.8	19.37	80.8	17.35	6.95 ~~7.19~~	66.5	19.54	2.70	4.88		
(F) DCcal	.499											
(G) Kn x 10^{-3}	3	3	12	3	12	30	3	12	30	60		
(H) ρ dc=ExFxGx10^3/D	16	16	16	17	15	15	14	17	16	18		
(I) Vac Σ	68.4	71.0	17.80	74.4	15.70	6.16	61.2	17.80	6.80	4.08		
(J) AC noise x 2												
(K) Vac(corr) =$\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.928											
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	0.7	0.4	2.3	0.8	2.6	4.7	0.8	1.9	5.1	11.0		
(O) MCF=(M-1)(10^5)/H	44	25	144	47	173	313	57	112	319	6.11		

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		1-2		
(B) Receive	41-50	→			20-61.5	→	→	→				
(C) n separation												
(D) I	8a	→					→			2.00		
(E) Vdc (avg)	16.74	8.29	4.47	2.64	7.25	4.74				4.01		
(F) DCcal										.499		
(G) Kn x 10^{-3}	12	30	60	105	30	60						
(H) ρ dc=ExFxGx10^3/D	13	16	17	17	14	18						
(I) Vac Σ	14.87	7.23	3.72	2.10	6.16	?				2.72		
(J) AC noise x 2												
(K) Vac (corr) =$\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	→					→				.928		
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)	4.5	6.4	11.5	16.7	9.2							
(O) MCF=(M-1)(10^5)/H	346	400	676	982	657							

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT Coyote Mtn

LINE 1 HALF N SP. 3 DATE 9/26/67

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE	140 S	130 S	—	120 S	—	—	110	—	—	—
RANGE	LO	—	—	—	—	—	—	—	—	—
VOLTAGE	300	400	300	710	400	300	600	590	350	300
CURRENT	4A	4A	4A	3.5A	4A	4A	3A	3A	3.5A	4A
SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2	Cal	
RECEIVE	100 S	—	—	—	90 S	—	—	—	4-5	
RANGE	LO	—	—	—	—	—	—	—	LO	
VOLTAGE	600	600	300	260	600	500	300	220	200	
CURRENT	3A	3A	3A	3.5A	3A	2.5	3A	3A	1A	

FREQUENCIES 0.5 3.0

SENDER NO. 6644-S

OPERATOR J. Downs

RECEIVER NO. 10661-R

OPERATOR J. King

COMMENTS:

1-2 10x(100+300) = 4A
2-3 " " " "
3-4 10x(50+300) = 3.5A
4-5 10x(0+300) = 3A.

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT COYOTE MT 9-26-67
LINE 1 HALF N SP. 3 DATE

PAGE

SEND	12	23	12	34	23	12	45	34	23	12
RECEIVE	140S	130S	—	120S	—	—	110S	—	—	—
RANGE	100	100	10	100	10	3	100	10	3	3
DC 1	34.0	360 364	582 568	320 344	638 664	269 254	298 340	630 666	300 309	196 180
DC 2	41.2	360 364	584 565	320 345	632 666	272 256	298 340	622 676	299 314	197 176
DC 3	34.0	360 364	585 570	320 344	632 666	266 265	298 340	620 678	300 301	198 175
DC 4	41.2		580 575	320 345	624 680	259 271	298 340	620 680	299 307	208 169
DC 5	34.0				620 681	258 272		622 678	300 309	207 166
DC 6	41.2				620 670	254 268		622 678	297 306	210 167
DC 7										
DC 8										
DC AVG.	75.2	72.4	11.52	66.4	12.98	5.26	63.8	12.98	6.07	3.76
AC 1	36.0	31.9	5.18	30.8	5.84	2.28	29.5	5.84	2.66	1.58
AC 2	36.0	31.9	5.18	30.6	5.84	2.29	29.5	5.84	2.66	1.58
AC AVG.	72.0	63.8	10.36	61.4	11.68	4.57	59.0	11.68	5.32	3.16
S.P.	-34.5	+2.8	—	-8.7	—	—	-2.1	+0.5	+1.2	+1.5
AC NOISE	<.08	<.06	—	<.08	—	—	<.12	—	—	—
POT RES.	6K	2K	—	1K	—	—	1K	—	—	—

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT COYOTE MT

LINE 1 HALF N SP. 3 DATE 9-25-67

PAGE

SEND	45	34	23	12	45	34	23	12	Cal	
RECEIVE	1005	—	—	—	905	—	—	—	300	
RANGE	10	3	3	3	3	1	1			
DC 1	730 734	286 316	140 153	108 98	225 234	980 960	618 582	375 378		
DC 2	725 736	284 318	144 148	112 100	226 233	775 964	586 565	378 410		
DC 3	721 738	290 318	145 146	108 102	228 280	1100 920	604 660	368 416		
DC 4	722 740	294 309	142 151	109 102	226 232	990 930	656 582	365 405		
DC 5	724 736	300 305	143 152	110 100	226 230	1100 940	720 530	338 428	100	
DC 6	722 738	296 310	142 157	108 100	227 230	990 939	640 562	342 425	100	
DC 7				106 104	230 229	999 910	609 561	320 458	100	
DC 8				104 104	230 232		625 558	395 402	100	
DC AVG.	14.60	6.05	2.94	2.09	4.59	1.962	1.209	0.775	200	
AC 1	6.62	2.66	1.26	0.86	2.06	0.835	0.502	0.318	94.0	
AC 2	6.62	2.67	1.26	0.86	2.06	0.842	0.510	0.325	94.0	
AC AVG.	13.24	5.33	2.52	1.72	4.12	1.677	1.012	0.643	188	
S.P.	-3.5	—	—	—	-2.7	—	-1.9			
AC NOISE	<1.2	—	—	—	<1.0	—	—			
POT RES.	1K	—	—	—	1.5K	—	—			

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PAGE

PROJECT Coyote Mtn

LINE 1 HALF S SP. 3 DATE 9/26/67

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE	140-150	150-160	→	160-170	→	→	170-180	→	→	→
RANGE	LO									
VOLTAGE	600	590	580	590	580	580				
CURRENT	3A	3A	3A	3A	3A	3A				
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5	Cal	
RECEIVE	180-190	→	→	→	190-200	→	→	→	1-2	
RANGE									LO	
VOLTAGE									80	
CURRENT									1A	

FREQUENCIES 0.5 3.0

SENDER NO. 6644-S

OPERATOR J. Downs

RECEIVER NO. 10661-R

OPERATOR J. King

COMMENTS:

PAGE

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT COYOTE MT 9-2567
LINE 1 HALF S SP. 3 DATE

SEND	45	34	45	23	34	45	12	23	34	45
RECEIVE	140-150S	150-160S	—	160-170S		—	170-180S	—		—
RANGE	30	100	10	30	10	3				
DC 1	279 285	280 290	370 480	255 279	302 452	153 151				
DC 2	279 285	280 290	410 438	255 280	300 454	156 149				
DC 3	279 285	280 290	410 438	254 282	300 455	156 145				
DC 4	279 285	280 290	420 436	252 284	298 458	157 150				
DC 5			424 428	250 284	298 456	155 150				
DC 6			422 430	250 285	300 456	158 149				
DC 7			422 424							
DC 8			422 425							
DC AVG.	56.4	57.0	8.54	53.5	7.55	3.05				
AC 1	26.0	26.2	3.78	24.5	3.35	1.28				
AC 2	26.0	26.2	3.78	24.5	3.35	1.28				
AC AVG.	52.0	52.4	7.56	49.0	6.70	2.56				
S.P.	-10.6	-2.5	—	-3.0	—	—				
AC NOISE	<0.1	<0.2	—	<0.2	—	—				
POT RES.	4K	3K	—	2K	—	—				

PAGE

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT COYOTE MT 9-25-67
LINE 1 HALF S SP. 3 DATE

SEND	12	23	34	45	12	23	34	45	Cal	
RECEIVE	180-190 S				190-200 S					
RANGE										
DC 1										
DC 2										
DC 3										
DC 4										
DC 5									99.8	
DC 6									99.8	
DC 7									99.8	
DC 8									99.8	
DC AVG.									199.6	
AC 1									92.0	
AC 2									92.0	
AC AVG.									184.0	
S.P.										
AC NOISE										
POT RES.										

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Hecla Line 1-53-N½ Field date_____ Data page_____ Comp. date_____. Comp by_____

(A) Send	1-2	2-3	1-2	3-4	2-3	1-2	4-5	2-4	2-3	1-2		
(B) Receive	140-130S	130-120S	→	120-110S	→	→	110-100S	→	→	→		
(C) n separation												
(D) I	4	4	4	3.5	4	4	3	3	3.5	4		
(E) Vdc (avg)	75.2	72.4	11.52	66.4	12.98	5.26	63.8	12.98	6.07	3.76		
(F) DCcal	0.500	→	→	→	→	→	→	→	→	→		
(G) Kn x 10^{-3}	3	3	12	3	12	30	3	12	30	60		
(H) ρ dc=ExFxGx10^3/D	28	27	17	28	19	20	32	26	26	28		
(I) Vac Σ	72.0	63.8	10.36	61.4	11.68	4.57	59.0	11.68	5.32	3.16		
(J) AC noise x 2												
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	0.940	→	→	→	→	→	→	→	→	→		
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	-1.8	6.7	4.5	1.7	4.5	8.2	1.6	4.5	7.3	11.8		
(O) MCF=(M-1)(10^5)/H	-64	248	265	61	237	410	50	173	281	421		

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2		CAL		
(B) Receive	100-90S	→	→	→	90-80S	→	→	→				
(C) n separation												
(D) I	3	3	3	3.5	3	2.5	3	3		1000		
(E) Vdc (avg)	14.60	6.05	2.94	2.09	4.59	1.962	1.209	0.775		2.00		
(F) DCcal	→	→	→	→	→	→	→	→		0.500		
(G) Kn x 10^{-3}	12	30	60	105	30	60	105	168				
(H) ρ dc=ExFxGx10^3/D	29	30	29	31	23	24	21	22				
(I) Vac Σ	13.24	5.33	2.52	1.72	4.12	1.677	1.012	0.643		188		
(J) AC noise x 2												
(K) Vac (corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	→	→	→	→	→	→	→	→		.940		
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)	3.7	6.7	9.7	14.2	4.7	10.0	12.3	13.3				
(O) MCF=(M-1)(10^5)/H	128	223	334	458	204	417	586	605				

HEINRICHS GEOEXPLORATION COMPANY

INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Hecla Line 1-53-5½ Field date_____ Data page_____ Comp. date_____. Comp by_____

(A) Send	4-5	3-4	4-5	2-3	3-4	4-5		CAL				
(B) Receive	140-150	150-160	→	160-170	→	→						
(C) n separation	1	1	2	1	2	3						
(D) I	3 +	→	→	→	→	→		1000				
(E) Vdc (avg)	56.4	57.0	8.54	53.5	7.55	3.05		199.6				
(F) DCcal	.501	→	→	→	→	→		.501				
(G) Kn x 10^{-3}	3	3	12	3	12	30						
(H) ρ dc=ExFxGx10^3/D	28	29	17	27	15	15						
(I) Vac Σ	52.0	52.4	7.56	49.0	6.70	2.56		184.0				
(J) AC noise x 2												
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.922	→	→	→	→	→		.922				
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	0.0	0.3	4.2	0.7	3.9	9.8						
(O) MCF=(M-1)(10^5)/H	0	10	247	26	260	653						

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send												
(B) Receive												
(C) n separation												
(D) I												
(E) Vdc (avg)												
(F) DCcal												
(G) Kn x 10^{-3}												
(H) ρ dc=ExFxGx10^3/D												
(I) Vac Σ												
(J) AC noise x 2												
(K) Vac (corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.												
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H												

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT COYOTE MT

LINE 1 HALF N SP. 2 DATE 9-25-67

PAGE

SEND	12	23	12	34	23	12	45	34	23	12
RECEIVE	70-60	60-50	—	50-40	—	—	40-30	—	—	—
RANGE	300	300	100	300	100	30	300	100	30	10
DC 1	105	162	48.8	202	37.0	14.0	184	37.6	11.0	6.00
DC 2	112	162	49.5	204	40.5	15.5	183	38.8	13.0	5.40
DC 3	105	162	48.2	202	37.0	13.9	184	37.5	11.0	5.98
DC 4	112	162	49.5	204	40.5	15.5	183	39.0	13.0	5.38
DC 5	105	162	48.5	201	37.0	14.0	184	37.6	10.9	6.00
DC 6	112	162	49.6	204	40.6	15.5	183	38.8	13.0	5.42
DC 7			48.4	201	37.0	14.0	184	37.5	11.0	5.98
DC 8			49.5	204	40.6	15.6	183	39.0	13.1	5.42
DC AVG.	108.5	162	48.98	202.7	38.77	14.74	183.5	38.21	11.99	5.70
AC 1	102	152	46.0	189	36.0	13.6	170	35.8	11.2	5.20
AC 2	102	152	46.0	189	36.1	13.6	170	35.8	11.2	5.21
AC AVG.	102	152	46	189	36.05	13.6	170	35.8	11.2	5.205
S.P.	+7.3	0	—	+9.0	—	—	+6.2	—	—	—
AC NOISE	<.01	<.01	—	<.02	—	—	<.02	—	—	—
POT RES.	1K	2K	—	1K	—	—	1K	—	—	—

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT COYOTE MT
LINE 1 HALF N SP. 2 DATE 9-25-67

PAGE

SEND	45	34	23	12	45	34	23	12	Gd	
RECEIVE	30-20				20-10				300	
RANGE	100	30	10	10	30	10	10	3		
DC 1	48.2	15.0	6.82	3.70	23.6	8.30	3.78	2.45		
DC 2	49.0	16.2	7.08	3.46	25.0	9.42	4.58	2.28		
DC 3	48.2	14.8	6.90	3.78	23.6	8.28	3.80	2.47		
DC 4	49.2	16.6	7.02	3.44	25.1	9.48	4.50	2.34		
DC 5	48.2	14.6	6.80	3.78	23.5	8.32	3.88	2.46	105	
DC 6	49.0	16.3	7.10	3.50	25.1	9.48	4.42	2.26	95	
DC 7	48.2	14.8	6.80	3.80	23.6	8.35	3.78	2.48	105	
DC 8	49.4	16.6	7.18	3.42	25.1	9.45	4.58	2.25	95	
DC AVG.	48.66	15.59	6.96	3.61	24.32	8.89	4.16	2.38		
AC 1	45.0	14.4	6.38	3.28	22.4	8.08	3.80	2.14	94.0	
AC 2	45.0	14.4	6.38	3.28	22.3	8.10	3.79	2.12	94.0	
AC AVG.	45.0	14.4	6.38	3.28	22.35	8.09	3.795	2.13	94.0	
S.P.	+2.8				+8.3					
AC NOISE	<.02				<.02					
POT RES.	11K				11K					

ORIGINAL in truck

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT _____

LINE ____ HALF ____ SP. ____ DATE ____

PAGE

SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT	5	5	5	3 A	→					
SEND									CAL	
RECEIVE									4-3	
RANGE										
VOLTAGE										
CURRENT	3 A	→							1 A	

FREQUENCIES ____ ____

SENDER NO.

OPERATOR

RECEIVER NO.

OPERATOR

COMMENTS:

PAGE 1

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT Coyote Mt

LINE 1 HALF N SP. 2 DATE 9-25

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE	70-60		50			40				30
RANGE	Hi			LOW						
VOLTAGE	340	300	340	340	186	210	480	340	180	210
CURRENT	5	5	5	3	3	3	3	3	3	3
SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2	CAL	
RECEIVE	30			20				10	4-5	
RANGE										
VOLTAGE	460	340	180	210	460	340	190	220	860	
CURRENT	3	3	3	3	3	3	3	3	1	

FREQUENCIES .05 3

SENDER NO. 66445

OPERATOR Bob

RECEIVER NO. 10661-R

OPERATOR Jim

COMMENTS:

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT COYOTE MT 9-22-6
LINE 1 HALF S SP. 2 DATE

SEND	45	34	45	23	34	45	12	23	34	45
RECEIVE	50-60	60-70	—	70-80	—	—	80-90	—	—	—
RANGE	300	100	100	100	100	30	100	30	30	10
DC 1	96.0	88.2	27.0	68.2	31.2	11.6	62.8	25.5	14.5	7.50
DC 2	93.0	91.0	30.0	67.9	30.0	12.8	63.8	24.5	16.0	5.70
DC 3	96.0	88.2	27.0	68.2	31.2	11.7	62.8	25.5	14.5	7.58
DC 4	93.0	91.0	30.0	67.9	30.0	12.8	63.8	24.5	16.0	5.70
DC 5	96.0	88.2	27.0	68.2	31.2	11.6	62.8	25.5	14.5	7.60
DC 6	93.0	91.0	30.0	69.9	30.0	12.9	63.8	24.5	16.0	5.64
DC 7						11.6	62.8			7.60
DC 8						13.0	63.8			5.62
DC AVG.	94.5	89.6	28.5	68.25	30.6	12.24	63.3	~~24.5~~	15.25	6.63
AC 1	86.0	81.8	26.2	62.2	28.0	11.2	57.6	22.6	13.6	5.85
AC 2	86.0	82.0	26.2	62.4	28.0	11.2	58.0	22.7	13.7	5.94
AC AVG.	86.0	81.9	26.2	62.3	28.0	11.2	57.8	22.65	13.65	5.90
S.P.	+18.9	+9.6	—	+8.6	—	—	+3.1	—	—	—
AC NOISE	<.02	<.01	—	<.01	—	—	<.02	—	—	—
POT RES.	1.5K	1K	—	2K	—	—	1K	—	—	—

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT COYOTE MT
LINE 1 HALF 5 SP. 2 DATE 9-22-07

SEND	12	23	34	45	12	23	34	45	Cal	
RECEIVE	90-100	—	—	—	100-110	—	—	—		
RANGE	30	10	10	10	10	10	10	3	300	
DC 1	13.0	8.96	6.38	2.28	3.85	4.60	2.10	0.60		
DC 2	13.2	9.22	5.95	3.10	5.08	3.08	3.90	2.24		
DC 3	13.0	8.82	6.38	2.38	3.84	4.78	2.08	0.59		
DC 4	13.2	9.22	5.98	3.08	5.16	3.05	3.80	2.20		
DC 5	13.0	8.90	6.42	2.30	3.80	4.80	2.18	0.61	313	
DC 6	13.2	9.22	5.82	3.14	5.18	3.06	3.81	2.21	312	
DC 7		8.82	6.50	2.20	3.76	4.80	2.18	0.62	313	
DC 8		9.22	5.84	3.18	5.20	3.02	3.80	2.20	312	
DC AVG.	13.1	9.04	6.17	2.70	4.48	3.91	2.99	1.41	312.5	
AC 1	11.6	8.12	5.40	2.38	3.95	3.40	2.56	1.20	288	
AC 2	11.6	8.12	5.42	2.38	3.95	3.42	2.58	1.20	288	
AC AVG.	11.6	8.12	5.41	2.38	3.95	3.41	2.57	1.20	288	
S.P.	+3.9	—	—	—	-0-	—	—	—		
AC NOISE	<.01	—	—	—	<.01	—	—	—		
POT RES.	1K	—	—	—	1.5K	—	—	—		

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT Coyote Mtn

LINE 1 HALF 5 SP. 2 DATE 9/22/67

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE	50-60	60-70	—	70-80	—	—	80-90	—	—	—
RANGE	Hi	—	—							
VOLTAGE	500	500	500	380	500	500	440	380	500	500
CURRENT	3A	4A	3A	6A	4A	3A	6A	6A	4A	3A
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5	Cal?	
RECEIVE	Hi	—	—	—					Hi	
RANGE	90-100	—	—	—	100-110	—	—	—		
VOLTAGE	440	380	500	500	440	380	500	500	280	
CURRENT	6A	6A	4A	3A	6A	6A	4A	3A	3A	

FREQUENCIES _____ _____

SENDER NO.

OPERATOR

RECEIVER NO.

OPERATOR

COMMENTS:

1-2 — 30 × 0 + 200 = 6A
2-3 " " " = "
3-4 30 × 33 + 100 = 4A
4-5 30 × 0 + 100 = 3A

HEINRICHS GEOEXPLORATION COMPANY

INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 1

Project ALTAR Line 1 N/2 SP 2 Field date 9-25-67 Data page 1 Comp. date 9-26-67 . Comp by HRM

(A) Send	12	23	12	34	23	12	45	34	23	12		
(B) Receive	0-10N	10-20	—	20-30	—	—	30-40	—	—	—		
(C) n separation	1	1	2	1	2	3	1	2	3	4		
(D) I	5	5	5	3A	—	—	—	—	—			
(E) Vdc (avg)	108.5	162	48.98	202.7	38.77	14.74	183.5	38.21	11.99	5.70		
(F) DCcal	1,000											
(G) Kn x 10^{-3}	3	3	12	3	12	30	3	12	30	60		
(H) ρ dc=ExFxGx10^3/D	65	97	118	203	155	147	184	153	120	114		
(I) Vac Σ	102.0	152.0	46.0	189.0	36.05	13.6	170.0	35.8	11.2	5.205		
(J) AC noise x 2												
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.940											
(M) ρ dc/ρac=ExL/K							1.5					
(N) PFE=(M-1)(10^2)	~~.01~~ 0	1.8	~~.09~~ .1	.8	1.1	1.9	~~.60~~ 1	~~.33~~ .3	0.6	2.9		
(O) MCF=(M-1)(10^5)/H	0	19	1	4	7	13	8	2	5	25		

Project Line Field date Data page Comp. date Comp by

(A) Send	45	34	23	12	45	34	23	12	CAL			
(B) Receive	40-50	—	—	—	50-60	—	—	—				
(C) n separation	2	3	4	5	3	4	5	6	1000			
(D) I	3A	—	—	—	—	—	—	—				
(E) Vdc (avg)	48.66	15.59	6.96	3.61	24.32	8.89	4.16	2.38	100			
(F) DCcal												
(G) Kn x 10^{-3}	12	30	60	105	30	60	105	168				
(H) ρ dc=ExFxGx10^3/D	195	156	139	126	243	178	146	133				
(I) Vac Σ	45.0	14.4	6.38	3.28	22.35	8.09	3.795	2.13	94.0			
(J) AC noise x 2												
(K) Vac (corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.												
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)	1.6	1.8	2.5	3.5	2.3	3.3	3.0	5.0				
(O) MCF=(M-1)(10^5)/H	8	12	16	28	9	19	21	38				

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 2

Project ALTAR Line 1 5½ SP2 Field date 9-25-67 Data page #2 Comp. date 9-26-67. Comp by HZW

(A) Send	45	34	45	23	34	45	12	23	34	45		
(B) Receive	0-10S	10-20	—	20-30	—	—	30-40	—	—	—		
(C) n separation	1	1	2	1	2	3	1	2	3	4		
(D) I	3	4	3	6	4	3	6	6	4	3		
(E) Vdc (avg)	94.5	89.6	28.5	68.25	30.6	12.24	63.3	~~24.5~~ 25.0	15.25	6.63		
(F) DCcal	.960											
(G) Kn x 10^{-3}	3	3	12	3	12	30	3	12	30	60		
(H) ρ dc=ExFxGx10^3/D	91	65	109	33	88	118	30	47	110	127		
(I) Vac Σ	86.0	81.9	26.2	62.3	28.0	11.2	57.8	22.65	13.65	5.90		
(J) AC noise x 2												
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.9216											
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	1.3	0.8	0.3	1.0	0.7	0.7	0.9	1.7	3.0	3.6		
(O) MCF=(M-1)(10^5)/H	14	12	3	30	8	6	30	36	27	28		

Project Line Field date Data page Comp. date Comp by

(A) Send	12	23	34	45	12	23	34	45	CAL			
(B) Receive	10-50	—	—	—	50-60	—	—	—				
(C) n separation	2	3	4	5	3	4	5	6				
(D) I	6	6	4	3	6	6	4	3	3			
(E) Vdc (avg)	13.1	9.04	6.17	2.70	4.48	3.91	2.99	1.41	312.5			
(F) DCcal												
(G) Kn x 10^{-3}	12	30	60	105	30	60	105	168				
(H) ρ dc=ExFxGx10^3/D	25	43	89	91	22	38	75	76				
(I) Vac Σ	11.6	8.12	5.41	2.38	3.95	3.41	2.57	1.20	~~2.88~~ 2.88			
(J) AC noise x 2												
(K) Vac (corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.												
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)	4.1	2.6	5.1	4.6	4.5	5.7	7.2	8.3				
(O) MCF=(M-1)(10^5)/H	164	60	57	51	205	150	96	109				

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT COYOTE MT 9-21-67
LINE 1 HALF N SP. 1 DATE

SEND	12	23	12	34	23	12	45	34	23	12
RECEIVE	0-10	10-20	—	20-30	—	—	30-40	—	—	—
RANGE	1000	300	100	300	100	30	100	30	10	10
DC 1	360	256	88.2	100	32.0	15.0	31.8	19.00	8.40	~~9.00~~
DC 2	368	257	87.6	102	29.0	12.0	27.0	16.2	2.90	1.40
DC 3	360	256	89.2	100	32.2	14.5	32.0	10.2	8.70	4.30
DC 4	368	256	87.0	102	29.0	11.6	26.5	16.6	4.00	0.50
DC 5	360	258	89.5	100	31.0	14.5	32.4	11.0	7.00	7.80
DC 6	368	259	87.8	101	28.0	12.0	28.0	15.8	2.50	0.10
DC 7		259	88.6	100	31.0	15.8	33.8	10.5	8.80	7.00
DC 8		258	87.8	100	32.0	11.0	26.8	15.6	0.10	@ 9.50
DC AVG.	364	257.4	88.2	100.6	30.3	13.3	29.9	13.08	5.88	
AC 1	335	237	81.5	93.0	28.0	12.0	27.4	11.7	5.32	27.0
AC 2	335	237	81.5	93.0	28.0	12.0	27.4	11.8	5.34	27.5
AC AVG.	335	237	81.5	93.0	28.0	12.0	27.4	11.75	5.33	27.25
S.P.	+6.2	+4.2	—	-1.4	—	—	+5.2	—	—	—
AC NOISE	<.04	<.04	—	<.05	—	—	<.04	—	—	—
POT RES.	6K	7K	—	2K	—	—	1K	—	—	—

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT COYOTE MT
LINE 1 HALF N SP. 1 DATE 9-20-67

PAGE 4

SEND	45	34	23	12	45	34	23	12	Cal	
RECEIVE	10-50	—	—	—	50-60	—	—	—		
RANGE	10	10	10	10	10	10	3	3	1000	
DC 1	4.90	8.20	~~7.20~~	5.90	~~2.65~~	2.20	1.30	2.25		
DC 2	8.90	3.20	1.20	1.60	3.60	2.80	1.60	0.20		
DC 3	4.60	8.20	7.00	5.80	2.30	1.90	1.35	2.00		
DC 4	8.30	3.40	1.00	1.30	3.00	3.00	2.40	0.15	317	
DC 5	4.78	8.50	7.20	6.18	1.80	1.60	1.10	2.40	316	
DC 6	8.20	3.00	0.30	1.00	3.30	3.10	1.55	0.10	317	
DC 7	5.20	9.30	7.70	5.80	1.80	1.90	1.30	2.15	316	
DC 8	8.00	2.10	0.40	1.00	3.30	~~2.60~~	2.70	0.30		
DC AVG.	6.63	~~5.82~~	4.00	2.35 ?	~~2.68~~ 2.55	2.41	1.61 1.48	1.006	316.5	
AC 1	6.00	~~5.40~~	3.30	1.90	2.20	2.20	1.35	0.85	295	
AC 2	6.02	5.40	3.28	1.98	2.38	2.20	1.35	0.85	295	
AC AVG.	6.01	5.40	3.29	1.94	2.29	2.20	1.35	0.85	295	
S.P.	+5.2	—			+1.8	—	—	—		
AC NOISE	<.06	—	—	—	<.03	—	—	—		
POT RES.	2K	—	—	—	1K	—	—	—		

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT Coyote Mtn

LINE 1 HALF N SP. 1 DATE 9-20-87

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE	0-10N	10-20	—	20-30	—	—	30-40	—	—	—
RANGE	HI	—	—	—	—	—	—	—	—	—
VOLTAGE	325V	260V	345	420	260	345	440	420	260	340
CURRENT	3A	3A	3A	3A	3A	3A	3A	3A	3A	3A.
SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2	Cal	
RECEIVE	40-50	10×50+300	10×100+300	10×100+300	50-60					
RANGE	HI								HI	
VOLTAGE	415	420	340	460	500	490	300	400	500	
CURRENT	3A	3.5A	4A	4A	3.6	3.6	3.6	3.6	3A	

FREQUENCIES 0.25 3.0

SENDER NO. 6644-5 Mk 4

OPERATOR J. Downs

RECEIVER NO. 10661-R

OPERATOR JK

COMMENTS:

1-2 = 10 × 0 + 300 = 3A

2-3 = 10 × 0 + 300 = 3A

3-4 = 10 × 0 + 300 = 3A

4-5 = 10 × 0 + 300 = 3A

30 × 20 + 100

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PAGE

PROJECT Coyote Mtn

LINE 1 HALF 5 SP. 1 DATE 9/21/67

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE	0-10	10-20	—	20-30	—	—	30-40	—	—	—
RANGE	HI	—	—	—	—	—	—	—	—	—
VOLTAGE	500	480	500	320	480	500	420	320	480	500
CURRENT	3.7A	3.7A	3.7A	3.7A	3.7A	3.7A	3.7A	3.7A	3.7	3.7
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5	Cal	
RECEIVE	40-50	—	—	—	50-60	—	—	—		
RANGE	HI	—	—	—					HI	
VOLTAGE	420	320	480	500	420	320	480	500	500	
CURRENT	3.7A	3.7A	3.7A	3.7A	3.7A	3.7A	3.7A	3.7A	3A	

FREQUENCIES 0.05 3.0

SENDER NO. L6445

OPERATOR J Downs

RECEIVER NO. 10661-R

OPERATOR

COMMENTS:

1-2 10 × 70 + 300 = 3.7A
2-3 " " " "
3-4 " " " "
4-5 " " " "

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT COYOTE MT 9-21-67

LINE 1 HALF SW SP. 1 DATE

PAGE 1

SEND	45	34	45	23	34	45	12	23	34	45
RECEIVE	0-10	10-20	—	20-30	—	—	30-40	—	—	—
RANGE	1000	1000	300	1000	300	100	1000	300	100	30
DC 1	306	455	101	518	155	48.2	392	105	43.6	153
DC 2	305	450	110	512	152	42.2	386	105	47.5	160
DC 3	308	458	101	518	154	48.0	390	105	43.2	151
DC 4	305	448	110	510	154	45.0	386	105	46.8	155
DC 5	310	458	101	515	160	46.0	392	104	43.9	149
DC 6	304	448	111	508	154	44.0	386	106	46.4	159
DC 7	310	458	101	512	156	46.5	392	104	42.0	153
DC 8	302	450	110	510	150	44.0	388	106	46.8	154
DC AVG. →	613	906	211.3	1025	309	90.8	778	209.9	88.6	30.9
AC 1	282	415	96.0	470	142	42.0	360	96.0	41.8	14.3
AC 2	282	415	97.0	468	142	42.0	359	96.0	41.8	14.3
AC AVG. →	564	830	193.0	938	284	84.0	719	192.0	83.6	28.6
S.P.	+3.4	+2.6	—	+9.2	—	—	-1.6	—	—	—
AC NOISE	<.03	<.01	—	<.02	—	—	<.02	—	—	—
POT RES.	2K	5K	—	3K	—	—	2K	—	—	—

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT COYOTE MT
LINE 1 HALF SW SP. 1 DATE 9-21-67

PAGE 2

SEND	12	23	34	45	12	23	34	45	Cal	
RECEIVE	40-50	—	—	—	50-60	—	—	—		
RANGE	300	100	100	30	100	30	30	10	1000	
DC 1	138	53.5	34.0	10.5	26.8	18.2	13.5	7.50		
DC 2	132	61.6	36.2	17.0	31.8	13.7	7.40	1.90		
DC 3	137	51.8	34.2	10.0	26.6	18.7	13.5	6.90		
DC 4	129	65.8	35.0	18.4	32.2	13.4	7.30	1.20		
DC 5	139	55.6	35.8	9.00	26.0	18.8	13.0	7.80	300	
DC 6	130	64.8	35.6	19.3	32.2	13.7	8.00	3.00	300	
DC 7	140	56.0	34.8	9.00	26.0	18.8	12.5	6.85	300	
DC 8	126	63.4	35.0	19.6	32.5	13.5	8.70	1.70	300	
DC AVG.	268.3	116.3	70.3	27.9	58.4	32.3	20.8	8.93	600	
AC 1	122	56.0	32.0	12.9	26.8	14.6	9.40	4.20	282	
AC 2	122	56.6	32.0	12.9	26.8	14.6	9.40	4.20	282	
AC AVG.	244	112.6	64.0	25.8	53.6	29.2	18.80	8.40	564	
S.P.	-5.3	—	—	—	+1.6	—	—	—		
AC NOISE	<.04	—	—	—	<.02	—	—	—		
POT RES.	1K	—	—	—	2K	—	—	—		

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 1

Project COYOTE Line 1 S1N½ Field date 9-20-67 Data page _____ Comp. date _____. Comp by _____

(A) Send	12	23	12	34	23	12	45	34	23	12		
(B) Receive	0-10N	10-20N		20-30N			30-40N					
(C) n separation	1	1	2	1	2	3	1	2	3	4		
(D) I	3	3	3	3	3	3	3	3	3	3		
(E) Vdc (avg)	364	257	88.2	100.6	30.3	13.3	29.9	13.08	5.88			
(F) DCcal	.948											
(G) Kn x 10^{-3}	3	3	12	3	12	30	3	12	30	60		
(H) ρ dc=ExFxGx10^3/D	345	244	93	95	115	126	28	49	56			
(I) Vac Σ	335	237	81.5	93.0	28.0	12.0	27.4	11.75	5.33			
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.932											
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	1.3	1.1	0.9	0.8	0.9	3.3	1.7	3.7	2.8			
(O) MCF=(M-1)(10^5)/H	4	5	3	8	8	26	61	76	50			
	2.356	1.6 246	338 1.9									

Project _____ Line _____ Field date _____ Data page _____ Comp. date _____ Comp by _____

(A) Send	45	34	23	12	45	34	23	12	Cal			
(B) Receive	40-50N				50-60N							
(C) n separation	2	3	4	5	3	4	5	6				
(D) I	3	3.5	4	4	3.6	3.6	3.6	3	300			
(E) Vdc (avg)	6.63	5.72	4.00	2.35?	~~2.68~~ 2.54	2.39	1.61 1.419	1.006	316.5			
(F) DCcal									.948			
(G) Kn x 10^{-3}	12	30	60	105	30	60	105	168				
(H) ρ dc=ExFxGx10^3/D	25	47	57	58?	20	38	45	53				
(I) Vac Σ	6.01	5.40	3.29	1.94	2.29	2.20	1.35	0.85	295			
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.									.932			
(M) ρdc/ρac =ExL/K							5.0?					
(N) PFE=(M-1)(10^2)	2.8	0.4	13.3?	12.9?	3.4	2.1	~~11.1~~	10.3?				
(O) MCF=(M-1)(10^5)/H	112	9	233?	222?	170	55	111?	194?				

0.05 $3.0 gp

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project_____ Line 1-SW½-S-1 Field date_____ Data page_____ Comp. date_____. Comp by_____

(A) Send	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5		
(B) Receive	0-10SW	10-20SW	→	20-30SW	→	→	30-40SW	→	→	→		
(C) n separation	1	1	2	1	2	3	1	2	3	4		
(D) I	3.7 amp								90.0			
(E) Vdc (avg)	613	906	211.3	1025	309	90.8	778	209.9	88.6	30.9		
(F) DCcal	0.500											
(G) Kn x 10^{-3} G.F.	3	3	12	3	12	30	3	12	30	60		
(H) ρ dc=ExFxGx10^3/D →	249	367	343	416	501	368	315	340	365	251	←	
(I) Vac Σ	564	830	193.0	938	284	84.0	719	192.0	83.6	28.6		
(J) ~~AC noise x 2~~												
(K) ~~Vac(corr) =$\sqrt{I^2 - J^2}$~~												
(L) AC-DC cal.	.940	→	→	→	→	→	→	→	→	→		
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2) →	2.2	2.6	2.9	2.7	2.3	1.6	1.7	2.8	1.2	1.6		
(O) MCF=(M-1)(10^5)/H	9	7	8	6	5	4	5	8	3	6		

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		CAL		
(B) Receive	40-50SW	→	→	→	50-60SW	→	→	→				
(C) n separation	2	3	4	5	3	4	5	6				
(D) I		120.1						→		3000ma	DC Cal Fac =	
(E) Vdc (avg)	268.3	118.5	70.3	27.9	58.4	32.3	20.8	8.93		600	$\frac{I_{DC}}{10V_{DC}}$	
(F) DCcal								→		0.500		
(G) Kn x 10^{-3}	12	30	60	105	30	60	105	168			$\frac{3000}{10 \times 600}$	
(H) ρ dc=ExFxGx10^3/D →	435	480	570	396	237	262	295	203	←			
(I) Vac Σ	244	112.6	64.0	25.8	53.6	29.2	18.8	8.40		564		
(J) AC noise x 2												
(K) Vac (corr) =$\sqrt{I^2 - J^2}$												
(L) AC-DC cal.								→		.940		
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)	3.6	~~-1.20.3~~	3.3	1.7	2.4	4.0	4.0	-0.1 ?				
(O) MCF=(M-1)(10^5)/H	8	12	6	4	10	15	14	0 ?				

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PAGE

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT COYOTE MT 9-29-67
LINE 3 HALF N SP. 1 DATE

SEND	12	23	12	34	23	12	45	34	23	12
RECEIVE	0-10N	10-20N	—	20-30N	—	—	30-40N	—	—	—
RANGE	100	100 426 431	10	100	10	3	100	10	3	
DC 1	358 322	425 435	425 500	405 422	525 540	146 156	366 384	530 428	184 126	
DC 2	360 320	422 434	416 522	409 426	540 550	154 140	370 382	540 465	174 186	
DC 3	361 320	422 436	490 422	402 426	520 550	168 132	366 388	562 462	197 142	
DC 4	362 320	422 436	492 414	402 424	542 536	170 118	370 380	498 510	170 188	
DC 5			520 408	404 422	554 522	142 167	372 384	542 520	184 146	
DC 6			492 424		560 504	134 196		532 416	195 162	
DC 7			505 402			146 166		542 460	142 202	
DC 8						112 186		552 461	162 166	
DC AVG.	34.06	42.87	4.63	41.37	5.39	1.51	37.63	5.02	1.70	
AC 1	31.8	40.0	4.1.2	38.8	4.75	1.24	35.5	45.2	1.44	
AC 2	31.8	40.0	4.1.2	38.8	4.75	1.24	35.4	45.2	1.44	
AC AVG.	31.8	40.0	4.12	38.8	4.75	1.24	35.45	4.52	1.44	
S.P.	-2.4	+9.5	—	+6.2	—	—	-3.9	—	—	—
AC NOISE	<.1	<.1	—	<.1	—	—	<.1	—	—	—
POT RES.	1K	1K	—	4K	—	—	2K	—	—	—

PAGE

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT COYOTE MT 8-29-69
LINE 3 HALF N SP. 1 DATE

SEND	45	39	23	12	45	39	23	12	Cal	
RECEIVE	40-50N				50-60N					
RANGE	10	3			3					
DC 1	422 542	183 189			205 214					
DC 2	458 542	187 184			190 202					
DC 3	436 535	176 183			187 229					
DC 4	405 566	172 183			186 196					
DC 5	542 418	171 157			200 227				201	
DC 6	522 468	158 216			170 236				200	
DC 7		186 222			175				201	
DC 8									200	
DC AVG.	4.92	1.82			2.02				200.5	
AC 1	42.6	1.46	.782		1.64				189	
AC 2	42.5	1.46			—				190	
AC AVG.					1.64				189.5	
S.P.	+6.4	—			+0.2	—				
AC NOISE	<.2	—			<.2	—				
POT RES.	2K	—			2K	—				

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT Coyote Mt

LINE 3 HALF N SP. 1 DATE 8-29

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE	0—10		20			30				40
RANGE	LOW	HI	LO	HI	HI	HI				
VOLTAGE	460	440	470	350	440	490	420	340	440	490
CURRENT	5	6	5	6	6	5	6	6	6	5
SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2	Cal	
RECEIVE	40			50				60	4-5	
RANGE	Hi									
VOLTAGE	420	340	440	480	420	340	440		140	
CURRENT	6	6	6	5	6	6	6		2	

FREQUENCIES .05 3

SENDER NO. 6644-5

OPERATOR BOB

RECEIVER NO.

OPERATOR TIM

COMMENTS: SENT 40-50-60 BY "TIME"

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Coyote Line 3 N/2 SPREAD 1 Field date 9-29-67 Data page 1 Comp. date 9-30-67 Comp by HRM

(A) Send	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2		
(B) Receive	0-10N	10-20N	—	20-30N	—	—	30-40N	—	—	—		
(C) n separation												
(D) I	5	6	5	6	6	5	6	6	6	5		
(E) Vdc (avg)	34.06	42.87	4.63	41.37	5.39	1.51	37.63	5.02	1.70	—		
(F) DCcal	.998											
(G) Kn x 10^{-3}	3	3	12	3	12	30	3	12	30	60		
(H) ρ dc=ExFxGx10^3/D	20	21	11	21	11	9.0	19	10	9.0			
(I) Vac Σ	31.8	40.0	4.12	38.8	4.75	1.24	35.45	4.52	1.44			
(J) AC noise x 2												
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.945											
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	1.2	1.3	6.2	0.8	7.2	15.1	0.3	5.0	11.6			
(O) MCF=(M-1)(10^5)/H	60	62	564	38	655	1678	16	500	1289			

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2		CAL		
(B) Receive	40-50N	—	—	—	50-60N	—	—	—				
(C) n separation												
(D) I	6	6	6	5	6	6	6	—		2		
(E) Vdc (avg)	4.92	1.82	(.762	—	2.02	—	—	—		200.5		
(F) DCcal												
(G) Kn x 10^{-3}	12	30	60.	105	30	60	105	168				
(H) ρ dc=ExFxGx10^3/D	10	9.0	(7.6)		10							
(I) Vac Σ	4.255	1.46	—	—	1.64	—	—	—		189.5		
(J) AC noise x 2												
(K) Vac (corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.												
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)	9.3	17.8			16.4							
(O) MCF=(M-1)(10^5)/H	930	1978			1640							

7.6
9.0
16.6

8.7

PAGE

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT COYOTE MT 10-18-67
LINE 3' HALF N SP. 3' DATE

SEND	12	23	12	34	23	12	45	34	23	12
RECEIVE	90-75N	75-60N	—	60-45N	—	—	45-30N	—	—	
RANGE	30	30	10	30	10	3	30	10	3	3
DC 1	155 190	136 149	500 490	195 186	462 380	250 258	250 211	300 350	142 135	129 104
DC 2	151 195	136 147	502 478	195 181	478 340	261 256	250 211	345 361	130 126	139 107
DC 3	146 194	136 149	500 500	191 186	466 350	271 265	250 212	318 321	126 140	135 90
DC 4	147 196	136 146	495 500	195 184	460 332	265 246	246 215	312 335	110 144	121 110
DC 5	145 196	139 145	501 476	195 185	475 338	264 252	245 217	338 324	122 142	124 109
DC 6	144 200	140 145	520 475	192 185	466 316	296 247	244 216	322 334	121 172	122 119
DC 7					451 350	293 242	242 215	342 320	100 160	121 104
DC 8						304 230	241 216	342 338	120 140	134 114
DC AVG.	34.2	28.4	9.91	37.8	8.01	5.28	46.0	6.64	2.65	2.36
AC 1	16.5	13.6	4.65	18.4	3.72	2.42	22.4	3.18	1.22	1.05
AC 2	16.5	13.7	4.65	18.4	3.72	2.43	22.4	3.18	1.23	1.05
AC AVG.	33.0	27.3	9.30	36.8	7.44	4.85	44.8	6.36	2.45	2.10
S.P.	-1.9	+7.5	—	+1.3	—	—	+7.1	—	—	—
AC NOISE	<.2	<.2	—	<.2	—	—	<.1	—	—	—
POT RES.	1K	1K	—	1K	—	—	1.5K	—	—	—
	2.8	3.2	5.7							

Cal 2A 3-4
300

		45	34	23	12
DC	206	216 245 315 322		136 139	115 104
	205			121 150	121 105
	206				147 104
	205				140 91?

AL	205
	205

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT COYOTE MT 10-18-67
LINE 3' HALF N SP. 3' DATE

PAGE

SEND	45	45	23	12	45	34	23	12	Cal	
RECEIVE	30-15N				15-0N					
RANGE	10	10	1	1	3	3	1	1		
DC 1	342400	310410	590730	590750	210236	97 84	44 60	98 50		
DC 2	330398	342385	595700	720490	211235	114 88	54 61	63 78		
DC 3	320400	320392	610680	680740	205241	104 72	56 58	62 60		
DC 4	320425	330376	640640	560670	207245	114 65	62 48	54 69		
DC 5	316402	305395	620620	650740	205243	125 74	52 61	53 51	205	
DC 6	327411	325385	740540	540520	196251	101 68	45 53	65 56	205	
DC 7	338412	342372	590610	760690	204246	107 65	63 68	57 47	205	
DC 8	300422	352352	650730	760500	201247	111 65	64 60	52 59	205	
DC AVG.	7.38	7.16	1.283	1.320	4.48	1.832	1.144	1.168	410	
AC 1	6.94	6.80	1.125	1.110	4.09	1.540	0.970	1.03	204	
AC 2	3.48	3.40	.560	.550	2.05	0.78	0.48	0.51	204	
AC AVG.	3.46	3.40	.565	.560	2.04	0.76	0.49	0.52	408	
S.P.	+5.5				-4.2					
AC NOISE	<.2				<.2					
POT RES.	1K				1K					

See next page for 34

45

318 398 356382
325421 322
410 320

45

245205
250197
225232
218

23 12

55 63 60
44 73
51 63

PAGE

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT _____

LINE _____ HALF _____ SP. _____ DATE _____

SEND		34								
RECEIVE										
RANGE		3								
DC 1		126 104								
DC 2		114 120								
DC 3		105 135								
DC 4		84 134								
DC 5		119 112								
DC 6		121 113								
DC 7		109 116								
DC 8		104 111								
DC AVG.		104 109								
AC 1		102 220								
AC 2		103								
AC AVG.		205								
S.P.										
AC NOISE										
POT RES.										

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT Coyote LINE 3' HALF N SP. 3' DATE 10/18/67

SEND	12	23	12	34	23	12	45	34	23	12
RECEIVE	70-75N	75-60N	—	60-45N	—	—	45-30	N —	—	—
RANGE	Hi.	Hi	—	—	—	—	—	—	—	—
VOLTAGE	517v	515v	517v	515v	515v	518v	510v	515v	515	520
CURRENT	6.0A	4.5A	6.0A	5.1A	4.5A	6.0A	6.9A	5.1A	4.5A	6.0A
SEND	45	34	23	12	45	34	23	12		CaL
RECEIVE	30-15	N —	—	—	15-0	N —	—	—		45
RANGE	Hi —	—	—	—	Hi. —	—	—	—		LO.
VOLTAGE	500v	518v	515v	508v	503v	520v	516v	509v		175v
CURRENT	6.75A	5.1A	4.5A	5.85A	6.75A	5.1A	4.5A	5.85		2.0A

FREQUENCIES .05 1.0

SENDER NO. 66445

OPERATOR F. Oviedo Jr.

RECEIVER NO.

OPERATOR T. King

COMMENTS:

1-2 — 6A 30X 0 ma + 200 ma
2-3 - 4.5A 30X 50 ma + 100 ma
3-4 - 5.1A 30X 70 ma + 100 ma
4-5 - 6.9A 30X 30 ma + 200 ma

aT. 30-15N 45 30x 250 ma + 200

aT 30-15N 12 30x 95.0 ma + 100 ma

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT COYOTE MT. 10-18-67
LINE 3' HALF S SP. 3' DATE

PAGE

SEND	45	34	45	23	34	45	12	23	34	45
RECEIVE	90-105S	105-120S	—	120-135S	—	—	135-150S	—	—	—
RANGE	30	30	10	30	10	10	30	10	3	3
DC 1	214 221	141 140	585 555	112 119	360 446	330 262	155 155	280 435	244 195	196 111
DC 2	214 222	142 144	572 575	110 119	365 448	315 265	154 154	370 358	232 229	155 170
DC 3	212 220	141 144	562 538	110 120	345 462	318 280	156 154	280 372	215 236	176 210
DC 4	212 222	141 145	570 580	109 120	341 461	340 255	158 154	322 380	245 244	215 186
DC 5	210 220	140 144	552 550	108 120	320 457	336 240	156 150	334 342	211 240	190 165
DC 6			562 570		372 430	328 254	155 153	326 380	224 219	160 196
DC 7			536 570		370 450	336 258	152 155	300 401	226 189	173 196
DC 8					352 462	365 246	154 163	338 358		150 209
DC AVG.	43.3	28.4	11.23	22.9	8.03	5.92	30.9	6.94	4.53	3.66/3.96
AC 1	20.6	13.7	5.22	11.1	3.78	2.62	14.9	3.20	2.05	1.70
AC 2	20.6	13.7	5.22	11.1	3.78	2.62	14.9	3.22	2.05	1.70
AC AVG.	41.2	27.4	10.44	22.2	7.56	5.24	29.8	6.42	4.10	3.40
S.P.	-15.5	-11.5	—	-11.4	—	—	-18.0	—	—	—
AC NOISE	<.2	<.2	—	<.2	—	—	<.2	—	—	—
POT RES.	2K	2K	—	1K	—	—	1K	—	—	—

194 195