

(35) Item 15

INDUCED POLARIZATION AND
RESISTIVITY SURVEY
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADA
FOR
CONTINENTAL OIL COMPANY
MINERALS DIVISION

mining
geophysical surveys

35

Item 15

INDUCED POLARIZATION AND
RESISTIVITY SURVEY
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADA
FOR
CONTINENTAL OIL COMPANY
MINERALS DIVISION

18 June 76

INDUCED POLARIZATION AND

RESISTIVITY SURVEY

BUCKSKIN PROJECT

DOUGLAS COUNTY, NEVADA

FOR

CONTINENTAL OIL COMPANY

MINERALS DIVISION

PROJECT 0604

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ACCOMPANYING THIS REPORT:

- 3 PROFILES: LINES C-0, C-20N, C-10E, "a" = 1000'
- 1 PROFILE: LINE C-20N, "a" = 2000'
- 1 PLAN MAP

DISTRIBUTION:

ORIGINAL AND 2 CC: Robert D. Whitman, Tucson

INDUCED POLARIZATION AND
RESISTIVITY SURVEY
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADA
FOR
CONTINENTAL OIL COMPANY
MINERALS DIVISION

INTRODUCTION:

During the period of May 10-31, 1976 an induced polarization and resistivity survey was performed on the titled property. The field survey was under the direction of Adam L. Sotelo, technician; the interpretation by W. Gordon Wieduwilt, geophysicist for Mining Geophysical Surveys.

Three lines recon' an area of known mineralization at the south end of the Buckskin Range. The district is known for its widespread alteration and associated sulfide mineralization in Cretaceous intrusive rocks.

SUMMARY:

Anomalous IP response occurs within an E-W trending elliptical-shaped zone. (Kennecott survey of September 1974 confirms the finite shape from seven lines crossing the zone.) Higher response occurs along the east and west boundaries of the trend. The anomaly characteristics reflect a relatively flat lying trend with response beginning at an average depth of 350' extending to 1000' to 1500' from surface. The response decreases rapidly below that depth. The IP response is likely variable within the zone,

reflecting a higher volume % response material at the east and west margins. The higher response areas also appear closer to surface than average and this results in locally higher apparent IP response trends.

The IP trend occurs in relatively high resistivity rock of 150-250 ohmmeters, which reflects little of the "typical" low resistivity alteration characteristics of the classic porphyry copper systems of the Southwest. Low resistivity alluvial cover occurs E'ly and W'ly adjacent to near-surface bedrock boundaries defined by resistivity contacts. There is no suggestion of bedrock resistivities at depth west of the area, but high resistivity values at depth to the east suggest bedrock lies at a depth of 1000'-1500'. The bedrock under the alluvium has a moderate to strong IP response characteristic.

A word of caution about the interpreted decrease in response with depth. The limited size of the zone and the line layout are such that lateral effects outside the zone will be observed in the data. The east-west lines are within 1000' of the north and south boundaries; therefore, at larger dipole separations the response will be reduced as we are seeing a greater percentage of the adjacent non-responsive rock in the total volume sampled. Therefore, while we feel that the layer interpretation is the best fit, a stock-like body of response material extending to depth cannot be completely ruled out.

SURVEY PROCEDURE:

The induced polarization and resistivity measurements are made in the time-domain mode of operation using a DCS model IPR-2 receiver and EGC model 45A transmitter. A conventional system of measurements which uses a time cycle of 2.0 seconds "on" and 2.0 seconds "off" - 2.0 seconds "on" and 2.0 seconds "off" (current reversed) was employed.

The commencement of the measurement of the secondary voltage is delayed by 0.45 seconds to avoid coupling and other transient effects. The integration is performed during the period from 0.45 seconds to 1.10 seconds after the cessation of current.

To conform to a standard presentation, the integral time constant is adjusted to give induced polarization readings equivalent to those obtained with transmitter cycles of 3.0 seconds "on" and 3.0 seconds "off", with integration of the secondary voltage during the first second of the "off" period.

Throughout the survey a conventional inline dipole-dipole array of seven current electrodes was used, with dipole length "a" equal to 1000'. Line C-20N was read using 2000' dipoles with data every 1000'. Measurements were made for dipole separation factors "n" of 0.5, 1 to 6. The potential-electrodes occupied positions on both sides of the current-electrode spread, thereby providing a line coverage of approximately nine times the dipole length for a standard line of seven electrodes. The total length of line is determined by the number of spreads or

additional current-electrodes used.

Apparent polarization response is in units of millivolt-seconds-per-volt, or milliseconds (ms), and apparent resistivity is in units of ohmmeters. The data from each line is plotted in quasi-section to facilitate presentation of data at all spacings used.

Data Acquisition:

A series of consecutive apparent induced polarization readings are obtained and entered in the field notes. Usually if three to five consecutive readings are of the same value, the average reading is considered acceptable. In areas where signal levels are not sufficient to override telluric noise, the readings will have considerable scatter. When this occurs, each reading is entered in the data sheet and also in a histogram form. The class interval for our histograms is five units. Consecutive readings are acquired until the density of readings about a particular value results in a "bell-shaped" display. This shape indicates to the operator that a sufficient number of readings have been taken to produce a reasonably accurate average value. A word of caution when using the histograms--in noisy conditions an operator may use a less sensitive instrument scale value to reduce the apparent scatter. Unfortunately, this increases the class interval to the product of the attenuated scale value multiplier times the original class interval of five units. The increase in the size of the class interval produces an immediate

high density of readings about a point; however, the accuracy of the average value is not improved.

The quality of the data for this survey is considered quite good, as although telluric noise interference was experienced the average values produce a good pattern of IP response.

The standard deviation and the standard error of the mean of the IP data is shown in the two columns to the right of the average IP response ("m") column on the field data sheets.

DESCRIPTION OF DATA:

LINE C-0, "a" = 1000'

Resistivity contacts occur at station 90W and at station 60E. Low resistivity material of less than 30 ohmmeters lies west and east of these contacts, respectively, and is believed to reflect deep alluvial cover well in excess of 1000'. The variable high resistivity material of 100 to 300 ohmmeters+ between these two contacts indicates shallow bedrock. The changes in rock type and/or variation in alteration of the rocks is believed to cause the complex variable resistivity pattern.

Anomalous IP response occurs over a broad area from about stations 50W to 60E. The response averages $55-65 \text{ ms}^{\pm}$, with zones of extremely high values of 150 ms^{\pm} in an irregular layer from stations 40W to 10E. The layer characteristic may be partly due to lateral effects of the line being closely parallel to the response contact on the south side of the body.

LINE C-20N, "a" = 1000'

Resistivity contacts occur at stations 85W and 65E with low resistivity alluvial material west and east of these contacts, respectively. There is a suggestion that bedrock may continue east at depth under alluvial cover east of the resistivity contact at 65E. The variable high resistivity values of 150 to 250 ohmmeters between these two contacts is interpreted

as representing bedrock of varying rock and alteration characteristics.

Variable anomalous IP response lies within the high resistivity block. A dike-like response of 100 ms^+ occurs from 35W to 55W at the western boundary of the anomalous zone. A second dike-like trend of 100 ms^+ lies near the east boundary of the zone. Rather uniform response of 55 ms^+ lies between the two dike-like zones under background response of less than 20 ms in a surface layer of variable thickness.

LINE C-20N, "a" = 2000'

A detailed study of Line 20N was made with a 2000' dipole. The larger dipole data confirms three important characteristics about the area: 1) the marked decrease in response at depth which we estimate as a bottom depth to the zone at about $1600' +$; 2) a definite bedrock characteristic under alluvial cover east of the resistivity contact (60E). This rock has anomalous IP response characteristics that could reflect a significant volume % sulfide content; 3) The dike-like zones of high response at the boundaries of the anomaly. The apparent dip of these zones should be viewed with caution as a reflection of the body shape rather than true dip.

LINE C-10E, "a" = 1000'

Variable resistivities of 100-300 ohmmeters suggest the line is entirely in bedrock. Anomalous IP response occurs in a zone

whose characteristics reflect a buried layer of response material. The top of the layer is estimated at 350', with a bottom depth in the order of 1600' or less below surface. The true response for a layer of this size is in the order of 150 ms. Dike-like characteristics are, unfortunately, similar in shape to the finite layer and some question may remain as to whether these anomalies reflect dike or layer patterns. We feel, however, that much evidence supports the layer characteristics, but a stock-like body extending to depth cannot be ruled out.

Respectfully submitted,

W. Gordon Wieduwilt
W. Gordon Wieduwilt
Geophysicist



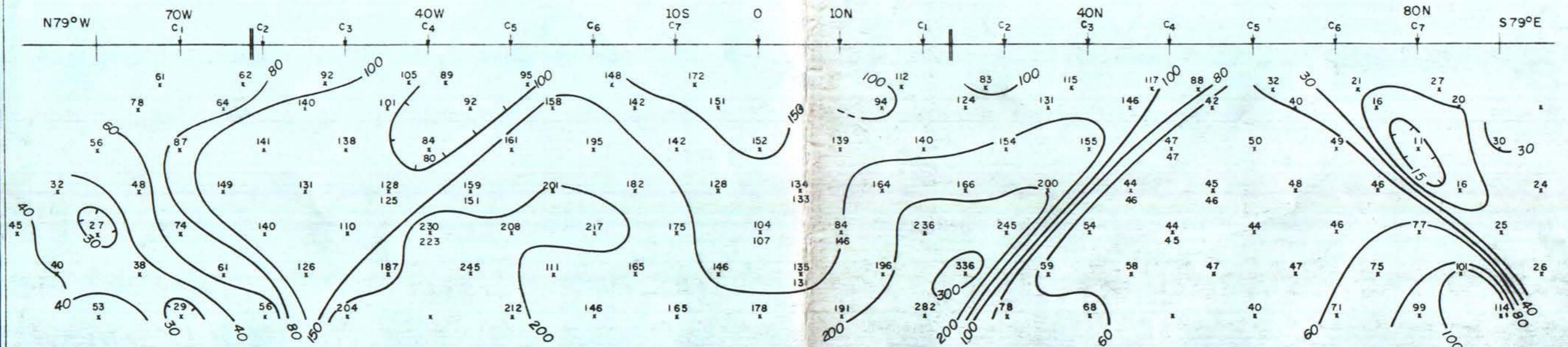
June 18, 1976
Tucson, Arizona

TIME DOMAIN INDUCED POLARIZATION AND RESISTIVITY SURVEY

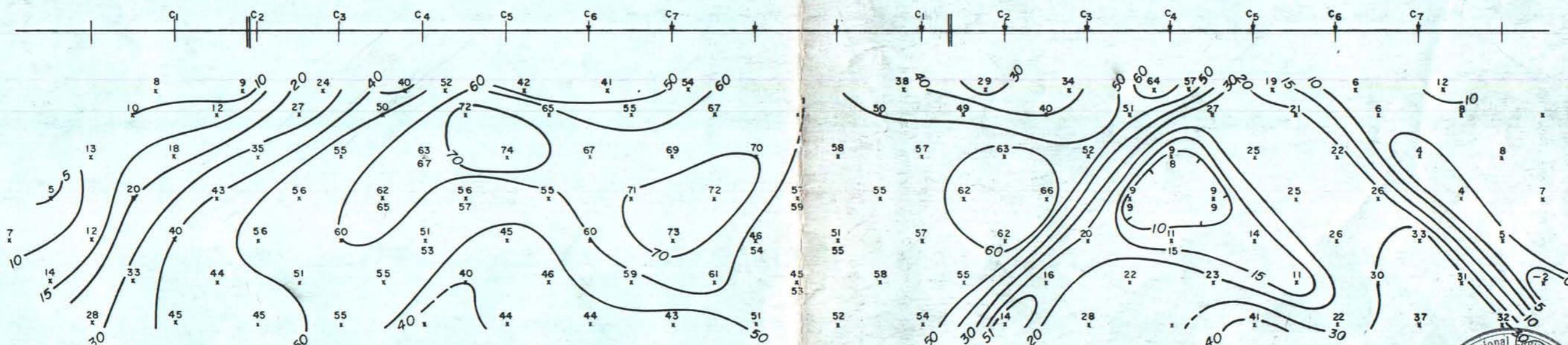
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FOR
CONTINENTAL OIL COMPANY
MINERALS DIVISION
APPARENT RESISTIVITY

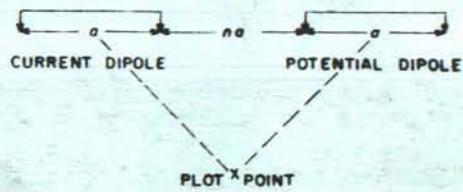
ohm meters



APPARENT POLARIZATION
millivolt seconds/volt



DIPOLE DIPOLE ARRAY



LINE... C-O

LOOKING... N LY

DIPOLE LENGTH... 1000'

DATE MAY 25, 26 / 1976

LEGEND

- FENCE... ■
- Pipeline... □
- POWERLINE... T
- ROAD, RR. = + + +

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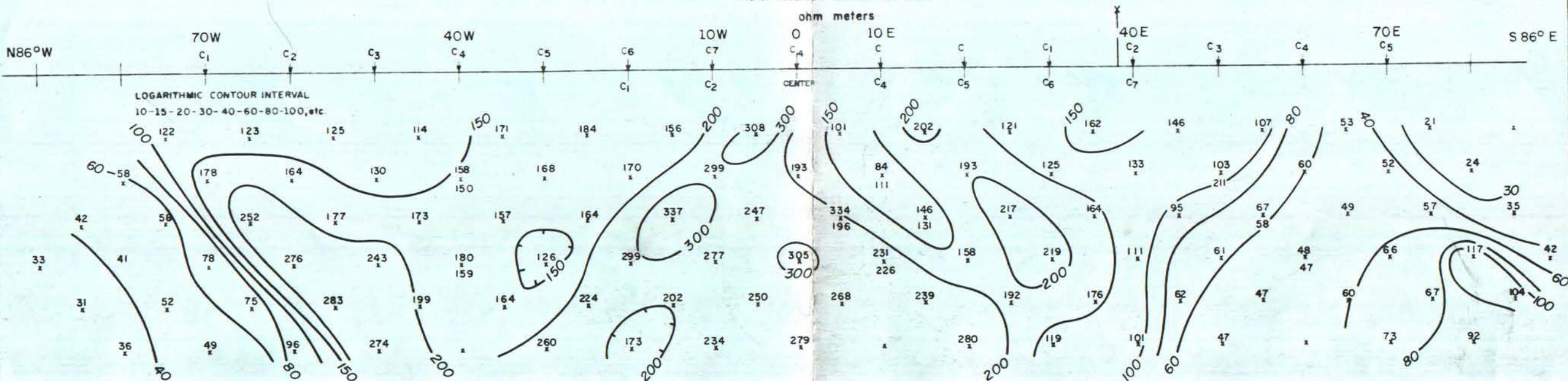
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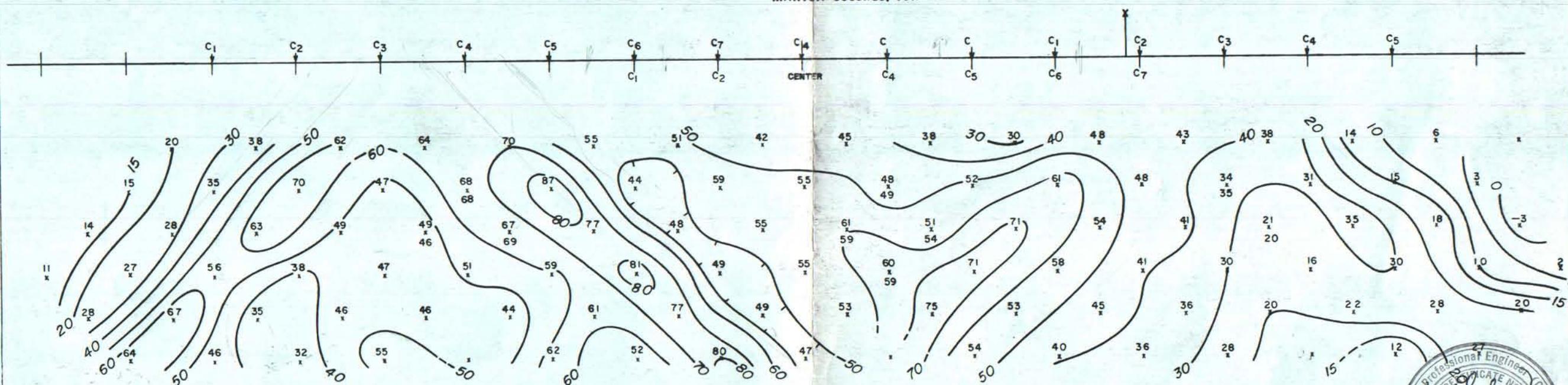
TIME DOMAIN INDUCED POLARIZATION AND RESISTIVITY SURVEY

BUCKSKIN PROJECT - DOUGLAS & LYON COUNTIES, NEVADA

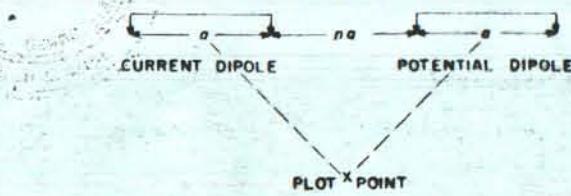
FOR
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MINERALS DIVISION
APPARENT RESISTIVITY



APPARENT POLARIZATION
millivolt seconds/volt



DIPOLE DIPOLE ARRAY



LINE: C-20 N

LOOKING: N LY

DIPOLE LENGTH: 1000'

DATE: MAY 21, 22/1976

LEGEND

- FENCE x
- Pipeline o
- POWERLINE T
- ROAD, RR. = + + +

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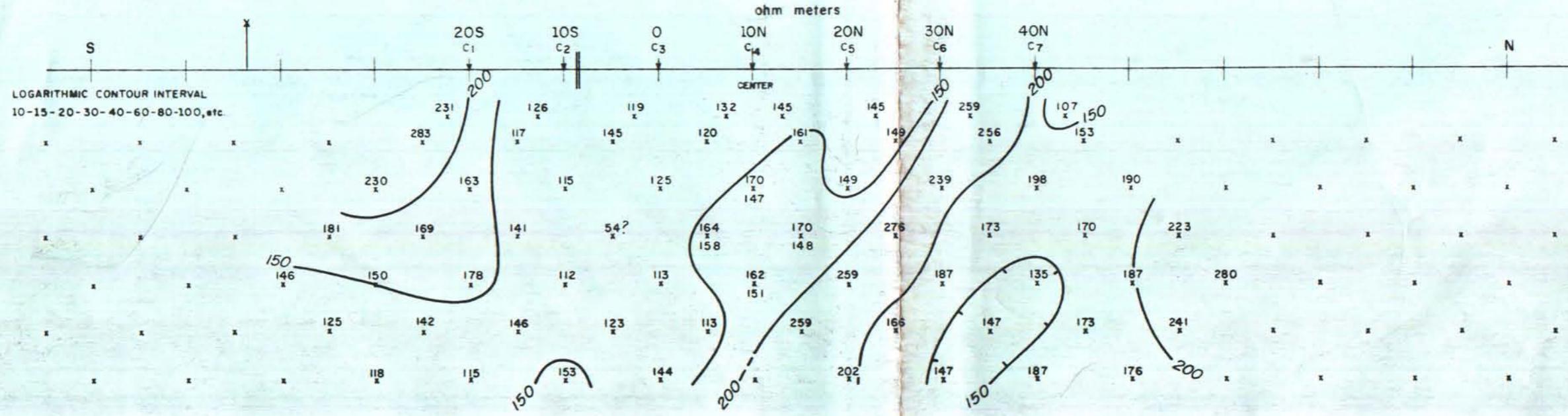


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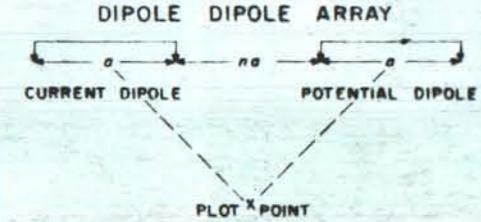
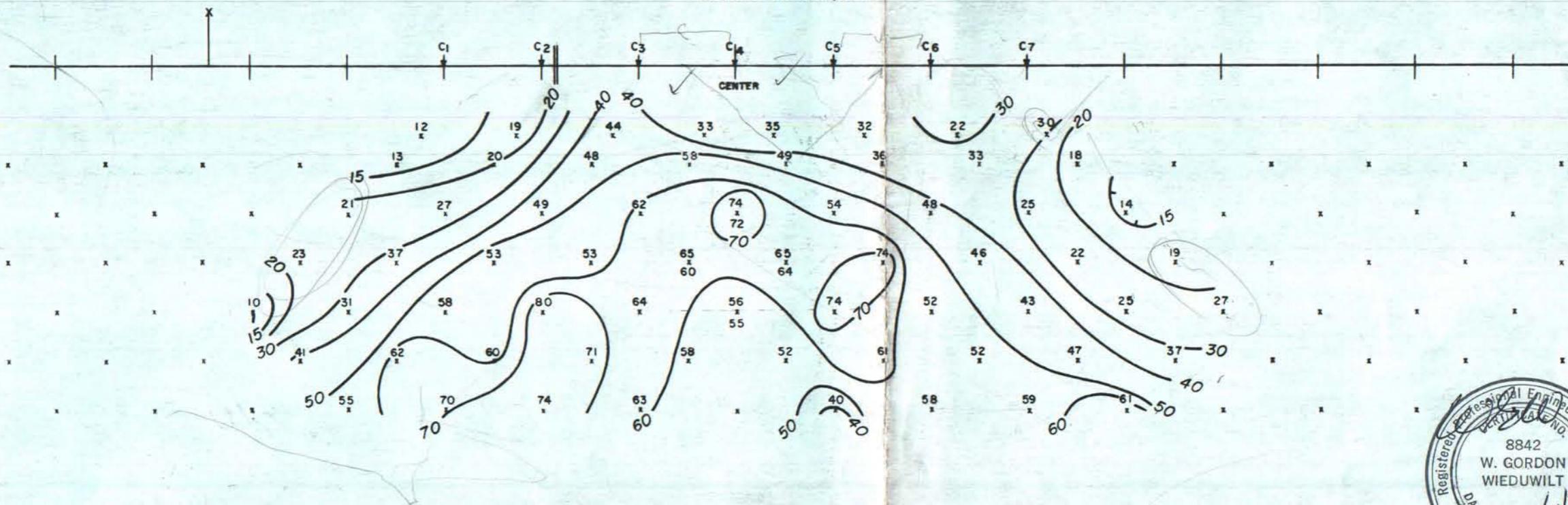
TIME DOMAIN INDUCED POLARIZATION AND RESISTIVITY SURVEY

BUCKSKIN PROJECT - DOUGLAS & LYON COUNTIES, NEVADA

FOR
CONTINENTAL OIL COMPANY
MINERALS DIVISION
APPARENT RESISTIVITY



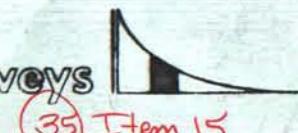
APPARENT POLARIZATION
millivolt seconds/volt



LINE: C-10 E
LOOKING... WEST
DIPOLE LENGTH: 1000'
DATE: MAY 30/1976

LEGEND
FENCE.....
PIPELINE.....
POWERLINE.....
ROAD, RR. = + + +

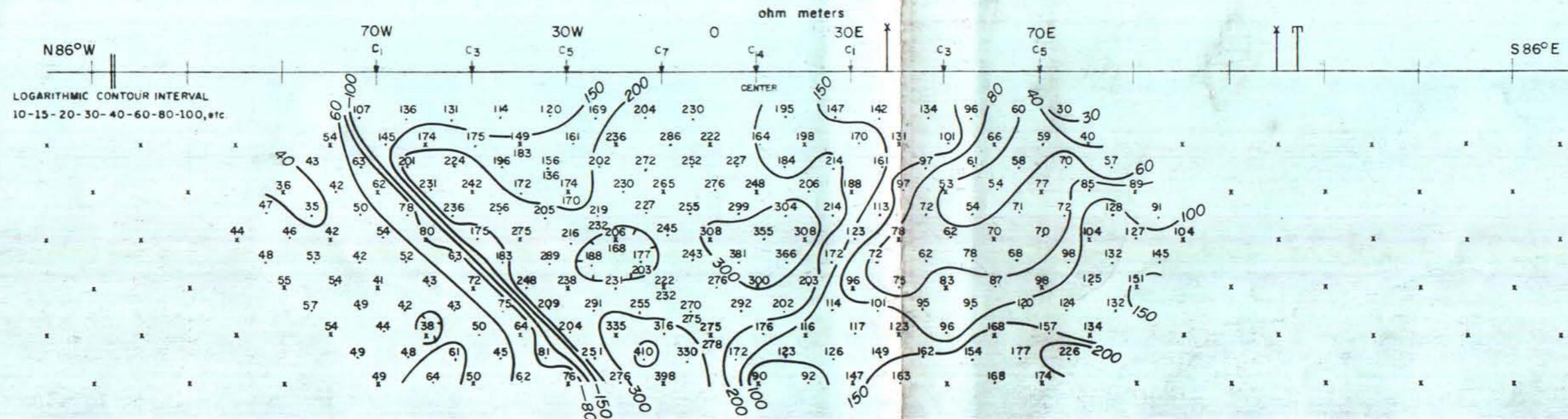
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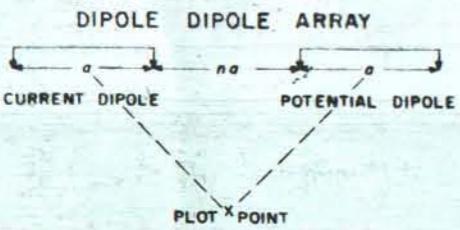
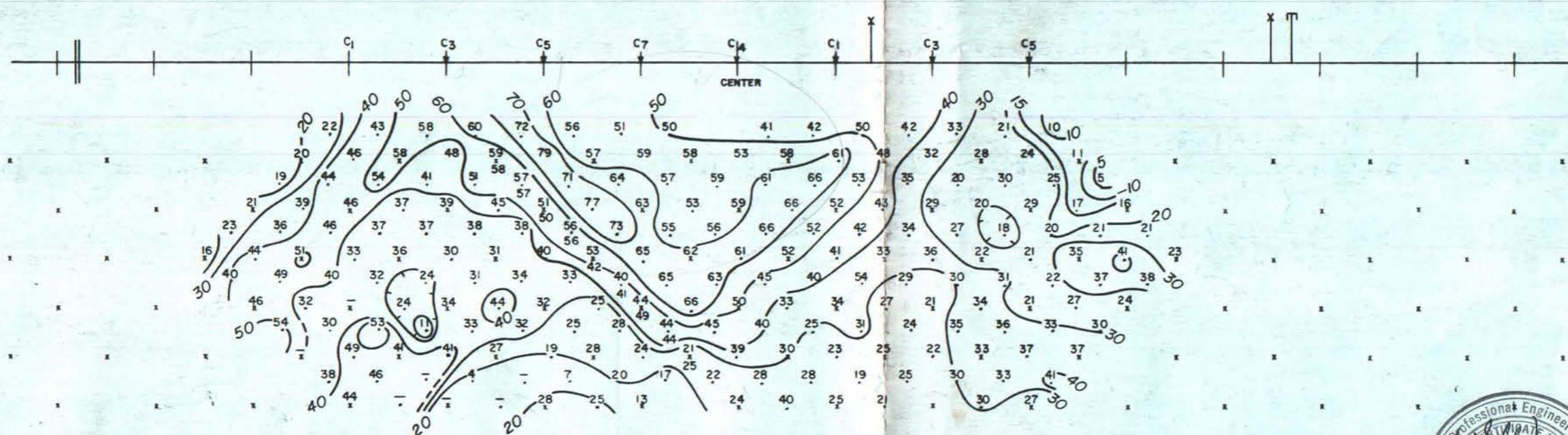
TIME DOMAIN INDUCED POLARIZATION AND RESISTIVITY SURVEY

BUCKSKIN PROJECT - DOUGLAS & LYON COUNTIES, NEVADA

FOR
CONTINENTAL OIL COMPANY
MINERALS DIVISION
APPARENT RESISTIVITY



APPARENT POLARIZATION
millivolt seconds/volt



LINE: C-20 N

LOOKING: NORTH

DIPOLE LENGTH: 2000'

DATE MAY 12, 22/76

LEGEND

- FENCE: -----
- Pipeline: |
- POWERLINE: T
- ROAD, RR: +---

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See Flat File Map 0770 0012
for Plan Map



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Item 15

Interoffice Communication

To: G. L. Pine
From: R. N. Schnepfe
Date: November 25, 1981
Subject: BUCKSKIN IP

A Conoco crew completed a dipole-dipole IP survey of the Buckskin area in 1976. Lines 30W, 10W, 10E, 30E, and 50E were surveyed using 1000-foot dipoles and Line 10W was surveyed using 2000-foot dipoles. This data has been interpreted qualitatively in the past, but important questions have remained unanswered. Recent discovery of flat faults in this area has heightened speculation that the effects of these might be recognized in the IP data, and so assist the geologic evaluation of the prospect. Analysis of this sort can only be undertaken with computer support.

Fortunately, a number of computer routines have been developed and are available to us through outside agencies. Most of these assume that the source of the anomaly is two-dimensional; that is, that its cross section extends sufficiently far in either direction from the survey line that the effects of the ends of the body can be ignored. This restriction is not severe at Buckskin, as the anomaly is suggestive of a two-dimensional source. The program selected actually performs an inversion of the observed data, using it to determine the parameters of the source. One restriction on this is that the body must be rectangular in shape.

Initially, the contractor was asked to invert the induced polarization portion of the 1000-foot dipole data from Lines 30W, 10W, 10E, and 30E and the 2000-foot dipole data from Line 10W. This inversion, without the benefit of geologic input, produced a more or less standarized interpretation with a non-polarizable surface layer overlying the target; the results are tabulated in the summary sheet provided by the contractor. Note that the resistivities of both the host and the body were assumed to be 150 ohm-m, i.e., there is no resistivity contrast.

One immediate criticism of these results is the large depth to the top of the source. Drilling in this area shows sulfide mineralization as shallow as 100 feet beneath the surface. A second item of concern was the large difference between the interpreted parameters of the source for the 1000-foot and the 2000-foot dipole data on Line 10W. One explanation of this, of course, is that the cross section of the source differs markedly from a simple rectangular

G. L. Pine
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shape. Also note that the thickness (depth extent) of the interpreted sources were either fixed, poorly determined, or overly large. In all cases, these were greater than two dipole lengths, which is generally credited as the limit of resolution of the dipole-dipole method.

These results suggested that further analysis of the data should be undertaken, this time using the known geological parameters to constrain the solution. The induced polarization portion of the 1000- and 2000-foot dipole data on Line 10W was selected for this purpose because of the presence of the two sets of data as well as the fact that this line passes near to the center of the anomaly, thereby insuring that the source is nearly two-dimensional. A number of inversions were performed on this data using different initial assumptions about the nature of the source. In all of these, this source was envisioned as a body of one polarization surrounded by a host of another, i.e., no surface layer of zero polarization. The resistivities were maintained at 150 ohm-m as before. The results of these inversions have been tabulated in the appendix.

An initial attempt to fix the top of the anomalous zone of 100 feet was unsuccessful. This was surprising inasmuch as sulfide mineralization is known to occur at this depth. Following this, the top of the source was fixed at 200 and 500 feet. It is readily apparent that the goodness of fit as measured by the RCSV (reduced chi-squared value) is much better for the deeper models. Plotting RCSV vs depth to the top of the source suggested that an optimum depth (minimum RCSV) might lie in the range between 600 and 700 feet. However, no readily identifiable geologic discontinuity between lesser sulfide content above and greater sulfide content below was apparent in the drill logs.

Thirty-seven samples from three drill holes were submitted for laboratory measurements in an attempt to discover if some unknown factor was affecting the IP response. The results of these measurements are attached to this memo. Again, there is no obvious discontinuity in the IP response down the holes. Thus, we still have no explanation for the IP anomaly.

One possibility is that we are seeing a change in the water saturation in the ground, with the region of higher saturation corresponding to the stronger IP response. (Remember that the IP phenomenon is dependent on a change from ionic

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to electronic conduction. If there is only weak or no ionic conduction, there will be very little IP effect). This would place ^{the} top of the anomalous zone at about the top of the water table in the surrounding valleys, and may be reasonable.

The models all indicate that the source has a very large thickness, in all cases greater than two dipoles. Since we cannot discriminate thicknesses greater than two dipoles, the thickness is effectively indeterminant. What is certain is that we are not seeing the effects of flat faults in the IP data. This part of the exercise, then, must be considered unsuccessful.

The IP data were filtered and contoured in a further attempt to quantify the anomaly. The resistivity pattern resulting from this operation is not too interesting, showing mainly a resistivity high of greater than 300 ohm-m lying on the northern ends of Lines 10W and 30W and a broad area of approximately 150 ohm-m in the vicinity of the IP anomaly.

The filtered and contoured IP data shows an oval-shaped anomaly peaking at 60 milliseconds on Line 10E. Analysis of the gradients on the flanks of this anomaly suggests that the source is on the order of 4000 feet wide, which is in accord with the results of the inversion. This revised anomaly outline confirms the two-dimensional nature of the source.

R. N. Schnepf
R. N. Schnepf

Enclosure
eo

PARAMETER SUMMARY
IP INVERSION
LINE 10W

1000-FOOT DIPOLES

CORRELATIONS

Free running

Depth	1200	\pm	56.1%
Width	1270	\pm	117.5%
Thickness	2250	\pm	1484%
IP body	1085	\pm	90.0%
IP host	35.6	\pm	27.9%
RCSU	88.1		

Depth fixed at 200 feet

Width	3120	\pm	8.8%	width/thickness
Thickness	7800	\pm	32.4%	width/IP host
IP Body	24.2	\pm	12.0%	thickness/IP host
IP host	25.7	\pm	6.8%	
RCSU	97.4			

Depth fixed at 200 feet, thickness at 6000 feet

Width	7180	\pm	471.5%	width/IP body
IP body	35.0	\pm	24.7%	
IP host	31.0	\pm	23.9%	
RCSU	140.9			

Depth fixed at 500 feet

Width	3930	\pm	1246%
Thickness	2620	\pm	1094%
IP body	43.0	\pm	8.9%
IP host	22.8	\pm	52.3%
RCSU	59.1		

Depth fixed at 500 feet, thickness at 6000 feet

Width	2960	\pm	33.9%
IP body	40.9	\pm	8.2%
IP host	20.3	\pm	11.3%
RCSU	59.0		

2000-FOOT DIPOLES

Free running

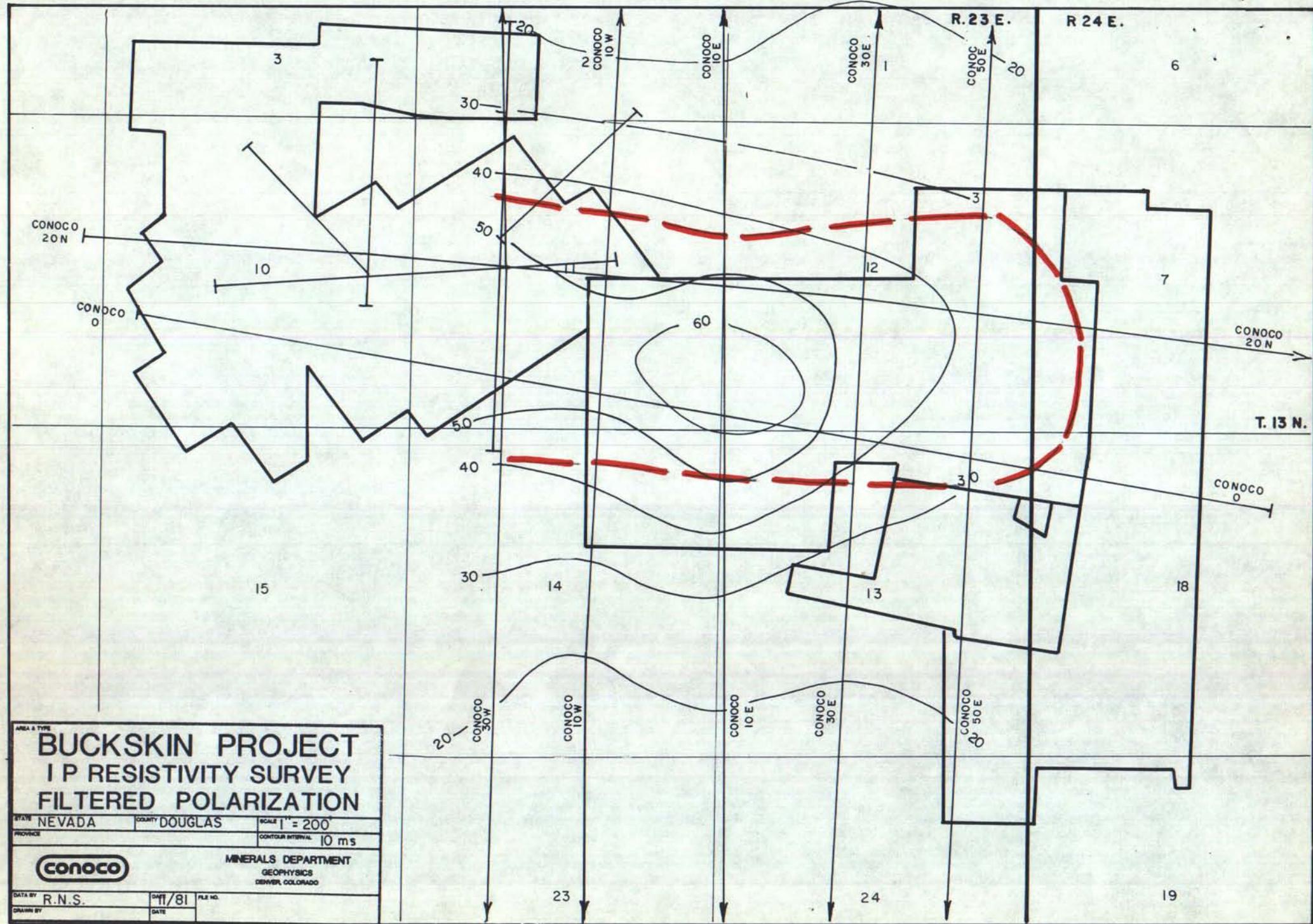
Depth	750	\pm	20.4%	width/IP host
Width	5200	\pm	7.7%	
Thickness	4600	\pm	32.0%	
IP body	40.4	\pm	23.9%	
IP host	18.6	\pm	4.9%	
RCSU	26.6			

Depth fixed at 200 feet

Width	4880 \pm 0.1%	width/IP host
Thickness	5850 \pm 1.1%	
IP body	29.6 \pm 6.8%	
IP host	16.4 \pm 6.7%	
RCSU	34.2	

Depth fixed at 500 feet

Width	4740 \pm 3.4%
Thickness	5725 \pm 8.5%
IP body	42.7 \pm 4.7%
IP host	13.8 \pm 9.5%
RCSU	20.8



**BUCKSKIN PROJECT
I P RESISTIVITY SURVEY
FILTERED POLARIZATION**

STATE NEVADA COUNTY DOUGLAS SCALE 1" = 200'
PROVINCE CONTOUR INTERVAL 10 ms

conoco

MINERALS DEPARTMENT
GEOPHYSICS
DENVER, COLORADO

DATA BY	R.N.S.	DATE	FILE NO.
DRAWN BY		DATE	



ELLIOT GEOPHYSICAL COMPANY

Mining Geophysical Engineers

4653 EAST PIMA STREET

TUCSON, ARIZONA 85712

TEL. (602)323-2421

26 October, 1981

Ref. CI28P

Gordon L. Pine
CONOCO INC.
1755 E. Plumb Lane, Suite 160
P.O. Box 7608ZIP
Reno, NV 89510

Dear Gordon:

RE: Physical Property Laboratory Determinations

The 37 samples that were received on 10-12-81 have been run in the physical property laboratory of ELLIOT GEOPHYSICAL COMPANY to determine the requested physical properties. The following physical property methods were run:

- Induced Polarization Response in the Time Domain Mode
- Resistivity Values

The physical property procedures were performed following conventional techniques of laboratory analysis and are described in the attachments. The resulting data with the specific parameters and units employed are presented on the accompanying tables.

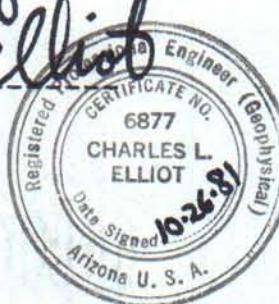
The samples are being returned to you via United Parcel Service.

Sincerely yours,

ELLIOT GEOPHYSICAL COMPANY

Charles L. Elliot

ATTACHMENTS: Tables
Physical Property Procedures
cc: R. Schnepf



ROCK PHYSICAL PROPERTY LABORATORY DETERMINATIONS

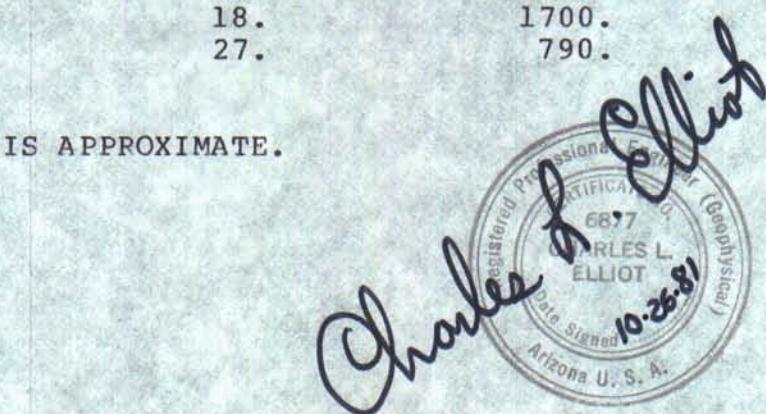
CONOCO INCORPORATED

26 OCTOBER, 1981

REF. CI28P

REF. NO.	SAMPLE DESIGNATION	IP RESPONSE millisecs	RESISTIVITY ohm-meters
1	BC-3-147-muv	170.	3900.
2	BC-3-300.5-Bhp	26.	2200.
3	BC-3-473.5-muv	26.	2100.
4	BC-3-637-muv	29.	1100.
5	BC-3-834-Pl	13.	8300.
6	BC-3-1035-Fbhp	11.	2100.
7	BC-3-1225-Gbhp	6.9	10000.
37	BC-3-1375	34.	76000.
8	BC-3-1575-a	41.	6700.
9	BC-3-1766-bhp	9.8	44000.
10	BC-3-1823-BMgd	15.	17000.
11	BC-3-1924-Fbhp	18.	9500.
12	BC-3-2125-BMgd	20.	8900.
13	BC-3-2274-BMgdbx	12.	2700.
14	BC-3-2459.5-BMgd	12.	5400.
15	BC-4-279-muv	21.	5100.
16	BC-4-834-Blp	25.	840.
17	BC-4-1103-Bmgd	200.	3100.
18	BC-4-1456-d	31.	1700.
19	BC-4-1615-Bmgd	15.	2500.
20	BC-4-1791-hd	17.	6700.
21	BC-4-1875-hbp	11.	1900.
22	BC-4-2150-hd	20.	11000.
23	BC-4-2435-bhd	9.1	3800.
24	BC-5-133-muv	18.	3800.
25	BC-5-329-bhp	25.	1200.
26	BC-5-555-muv	59.	2400.
27	BC-5-750-bx	66.	280.
28	BC-5-902-muv	18.	1700.
29	BC-5-1100-bhp	27.	790.

? = VERY UNSTABLE SAMPLE - DATA IS APPROXIMATE.



ROCK PHYSICAL PROPERTY LABORATORY DETERMINATIONS

CONOCO INCORPORATED

26 OCTOBER, 1981

REF. CI28P

REF. NO.	SAMPLE DESIGNATION	IP RESPONSE milliseecs	RESISTIVITY ohm-meters
30	BC-5-1140-muv	26.	1300.
31	BC-5-1350-d	26.	1200.
32	BC-5-1555-d	22.	910.
33	BC-5-1700-d	11.	1800.
34	BC-5-1900-bhp	13.	2300.
35	BC-5-2158-d	15.	2800.
36	BC-5-2335-d	26.	4800.



PROCEDURES FOR THE DETERMINATION OF INDUCED POLARIZATION
RESPONSE AND RESISTIVITY VALUES

The induced polarization response and resistivity determinations performed in the physical property laboratory are made in the conventional time domain mode of operation. The induced polarization responses of these samples are determined utilizing a technique developed by Newmont Exploration, Ltd. This technique is commonly employed and results in standard units for presentation of the data.

The results as reported are the average value of the integrated decay voltage for a complete 8.0 second time period (two transmitted pulses). The laboratory procedure utilizes a time delay from turnoff of the transmitter of $t_d = 500$ milliseconds followed by an integration window of $t_w = 1200$ milliseconds. The data has then been transformed to the normalized standard Newmont Exploration, Ltd. induced polarization unit (M331). The resistivity values are reported in ohm-meters to two significant figures.

If the samples, as received, are moderately dry, such as surface samples, vacuum impregnation with tap water is performed before determination of the electrical properties. As a consequence, the reported resistivities for these samples may therefore not be truly representative of the rock *in situ* but will depend on the amount of tap water ingested into the rock pores. If the samples are saturated with interstitial water upon receipt they are run without impregnation with tap water.

Rock resistivities as measured by laboratory techniques are normally not indicative of the macroscopic resistivities as inferred from surface resistivity measurements. Normally laboratory resistivities are much higher than the observed field resistivities. Laboratory measurements on small core samples do not adequately sample the large volume average resistivities which are grossly influenced by fractures and faults containing mineralized solutions. Fresh drill core samples which have not been exposed to the air or elevated temperatures will sometimes yield in the laboratory representative rock resistivities.

The induced polarization values as determined in the laboratory are not similarly affected. Laboratory measurements on small core samples are more truly representative of the macroscopic induced polarization responses and should normally correlate very well with surface measurements.

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Item 15

INDUCED POLARIZATION SURVEY

BUCKSKIN PROJECT

DOUGLAS AND LYON COUNTIES, NEVADA

JOSEPH R. ANZMAN
Consulting Geophysicist

(35)
Item 15

INDUCED POLARIZATION SURVEY

BUCKSKIN PROJECT

DOUGLAS AND LYON COUNTIES, NEVADA

by

Joseph R. Anzman
Consulting Exploration Geophysicist

for

Continental Oil Company
Reno, Nevada
February 14, 1977

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Line 30E	
Line 50E	

INDUCED POLARIZATION SURVEY

BUCKSKIN PROJECT

DOUGLAS AND LYON COUNTIES, NEVADA

INTRODUCTION

The purpose of this report is to present the results of induced polarization surveys carried out at the Buckskin Project, Douglas and Lyon Counties, Nevada for Continental Oil Company.

The work that will be described was done for the company in two stages; the first by a contractor, Mining Geophysical Surveys, and the second by a company I.P. crew. Prior to these surveys, other I.P. work had been done in various parts of the Buckskin area by Phelps-Dodge Corporation and Bear Creek Mining Company. The results of the work by these two companies are not completely available and are not described.

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CONCLUSIONS AND RECOMMENDATIONS

The results of the I.P. work at the Buckskin project area show the existence of various geologic conditions. In order to describe these conditions, the following terminologies have been defined and used:

anomaly
moderate anomaly
strong anomaly

The anomalous area has dimensions of about 9,000 feet north-south and 12,000 feet east-west. However, the limits of this area have not yet been defined on the east and north. The depth extent of this anomaly is expected to be at least 3,000 feet.

A moderate anomaly lies within the anomalous area, and is 2,000 feet north-south and 5,900 feet east-west, and possibly extending to 9,700 feet east-west. The causitive geologic mass is within a few hundred feet of the surface and has a depth extent of at least 2,000 feet.

Within the moderate anomaly, a strong anomaly is present. Lateral dimensions of the strong anomaly are 1,000 feet north-south and 4,000 feet easterly-westerly. The geologic body causing this response is near the surface and has a depth extent of about 1,500 feet.

Drilling that has been done by Conoco and others has shown that sulfide mineralization is widespread. Therefore, the various I.P. responses would seem to be due to this mineralization which may vary in quantity, form, or extent.

The results of the I.P. work can be important in helping to understand the total geologic picture at the Buckskin area. To accomplish this end, the results should be considered, evaluated, and correlated along with all other geologic information. As new information becomes available, perhaps through drilling, the I.P. results should then be looked at anew. Such procedure will lead to maximum effectiveness of the geophysical results and may assist in pointing in the most favorable direction for the location of potential economic mineralization.

SURVEY STATISTICS

The initial work done in the area was carried out by Mining Geophysical Surveys of Tucson, Arizona during May 10-31, 1976. Surveying was completed on three lines:

Line 10E
Line 0
Line 20N

Line 10E was oriented north-south while Lines 0 and 20N were oriented approximately east-west. Dipole spacing on all lines was 1,000 feet and, in addition, measurements were made on Line 20N using a 2,000-foot dipole spacing. The total coverage was 17.8 line miles.

I.P. work was done by Conoco during October-November, 1976 on:

Line 30W
Line 10W
Line 10E
Line 30E
Line 50E

All lines are oriented north-south. The dipole spacing was 1,000 feet and Line 10W was also surveyed using a 2,000-foot dipole spacing. A total of 20.5 line miles was covered.

The complete coverage by both surveys is 38.3 line miles. All measurements were made in the time domain, and a dipole-dipole electrode configuration was used throughout.

INTERPRETATION

The results of the induced polarization work show the presence of various geologic conditions. A number of these conditions can be defined on more than one survey line and so are mappable as discrete geologic entities. In order to describe these geologic conditions, certain terminologies or "names" must be used. This usage is simply a method of differentiating between the geologic conditions and is not intended to be a rating system that indicates any certain condition to be "better" or of greater exploration value than any other.

The terminologies used are:

strong anomaly or strongly anomalous
moderate anomaly or moderately anomalous
anomaly or anomalous

It is not the "names" themselves that are important but, rather, the definitions that are specified:

strong anomaly: chargeability values create a similar pattern and are greater than 50 milliseconds

moderate anomaly: chargeability values create a similar pattern and are greater than 40 milliseconds

anomaly: chargeability values are greater than approximately 20 milliseconds

In defining a geologic condition as strong or moderate, the chargeability pattern is the most important criterion.

Geologic conditions indicated by the I.P. results must be considered along with all other geologic information. Further, as additional geologic data is obtained, the I.P. results should be reviewed and reevaluated.

Strong Anomaly A strong anomaly is present at:

Line 10E: 0-10N
Line 10W: 0-10N
Line 30W: 10N-20N

The chargeability pattern on these lines indicates a geologic body that may be within a few hundred feet of the surface with a depth extent in the order of 1,500 feet. Lateral dimensions are 1,000 feet north-south and at least 4,000 feet easterly-westerly.

The strong anomaly is also seen on Line 0 at 10W-30W and on Line 20N at 40W-50W. However, these lines are about parallel to the long dimension of the geologic body as shown by the three north-south lines. Because of this, the responses on these two east-west lines are not considered as diagnostic as those from the lines crossing normal to the long dimension of the body.

The strongly anomalous response lies within a moderately anomalous zone.

Moderate Anomaly This response is located at :

Line 30E: 10N-20N
Line 10E: 0-20N
Line 10W: 0-20N
Line 30W: 10N-20N
Line 50E: 0-10N ??

The geologic body responsible for the moderate anomaly lies within a few hundred feet of the surface and has a depth extent of at least 2,000 feet. The four lines, surveyed with 1,000 foot dipoles, that best describe this moderate anomaly do not indicate that the lower limit of the causitive body has been reached.

Laterally, the dimensions of the moderate anomaly are 2,000 feet north-south and 5,900 feet east-west, with the latter dimension possibly extending to 9,700 feet.

Surrounding the moderate anomaly is a much larger area that is anomalous.

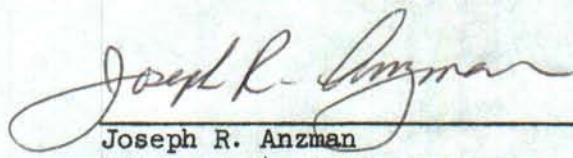
Anomaly The limits of the anomalous area have been defined on the south and west, but not on the east and north. Lateral dimensions of this anomaly at present are 9,000 feet north-south and 12,000 feet east-west.

Resistivity data on Line 0 show a strong contrast at about 60E, while the data on Line 20N show a similar contrast at 60E-70E. East of these locations, low resistivity material is present while to the west, the material is of high resistivity. These contrasts reflect the contact between bedrock and alluvium. On both lines, the contact is construed as being quite steep, meaning that the bedrock has been down-dropped; no pediment is indicated. Chargeability data on Line 20N, with 2,000 foot dipoles, show that anomalous conditions

continue within the bedrock beneath the alluvium.

Chargeability patterns on the north ends of the lines indicate that anomalous conditions are sharply cut off near the ground surface, but then increase again as the depth becomes greater. At certain locations in this area, topographic relief increases rapidly. The termination of anomalous conditions may be due to the increase in elevation, or to a down-drop in the causitive geologic body, or to some combination of these conditions. Irregardless, the anomalous conditions are not yet closed off to the north.

Line 10W was surveyed with 2,000-foot dipoles specifically to try to obtain a view of the entire volume of anomalous conditions. Results along this line suggest that the anomalous conditions extend to a depth of at least 3,000 feet, and possibly further.



Joseph R. Anzman
February 14, 1977

INDUCED POLARIZATION SURVEY
BUCKSKIN PROJECT
DOUGLAS AND LYON COUNTIES, NEVADA

Map Pocket #1

TOPOGRAPHIC MAP

See Flat File Map 0770 0200
for Topographic Map

INDUCED POLARIZATION SURVEY
BUCKSKIN PROJECT
DOUGLAS AND LYON COUNTIES, NEVADA

Map Pocket #2

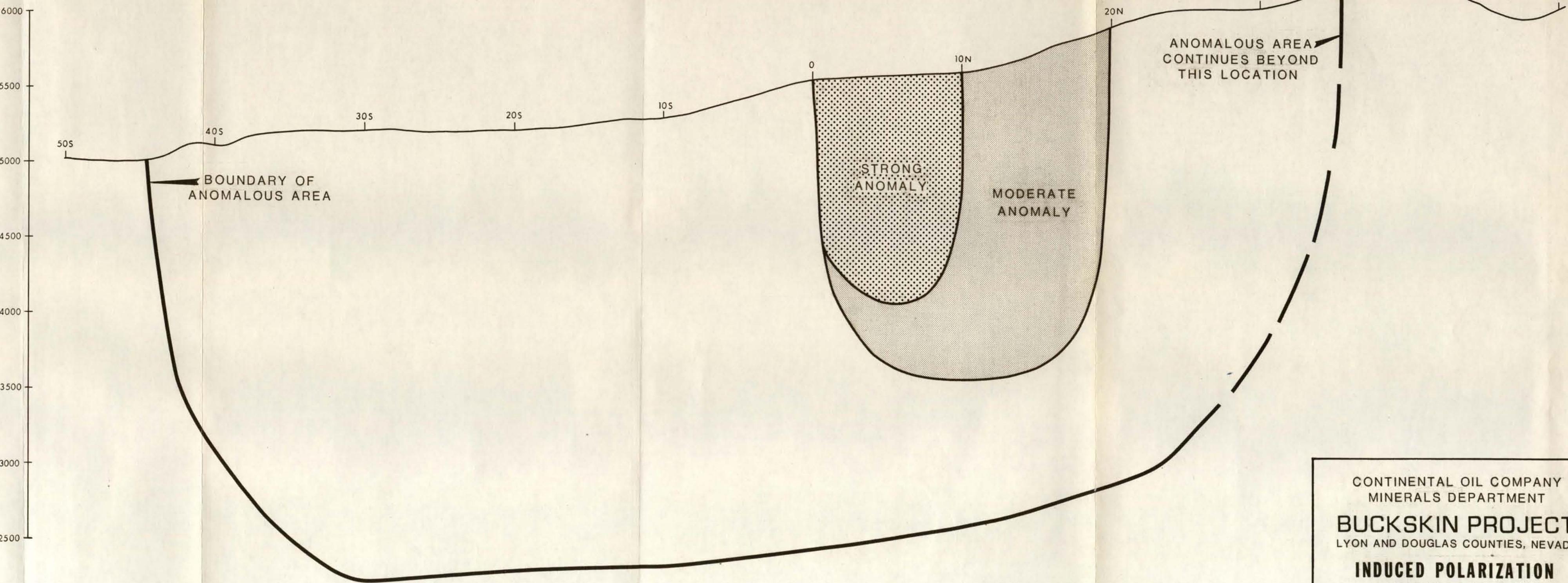
INDUCED POLARIZATION INTERPRETATION MAP

NBNG did not receive
this map with the report

SOUTH

LOOKING WEST

NORTH



CONTINENTAL OIL COMPANY
MINERALS DEPARTMENT

BUCKSKIN PROJECT
LYON AND DOUGLAS COUNTIES, NEVADA

**INDUCED POLARIZATION
INTERPRETATION
LINE 10W**

HORIZONTAL & VERTICAL SCALES: 1" = 500'
JANUARY, 1977

J. R. ANZMAN

TIME DOMAIN INDUCED PO

BUCKSKIN PROJECT -

CONT

A

INDUCED POLARIZATION SURVEY
BUCKSKIN PROJECT
DOUGLAS AND LYON COUNTIES, NEVADA

Map Pocket #3

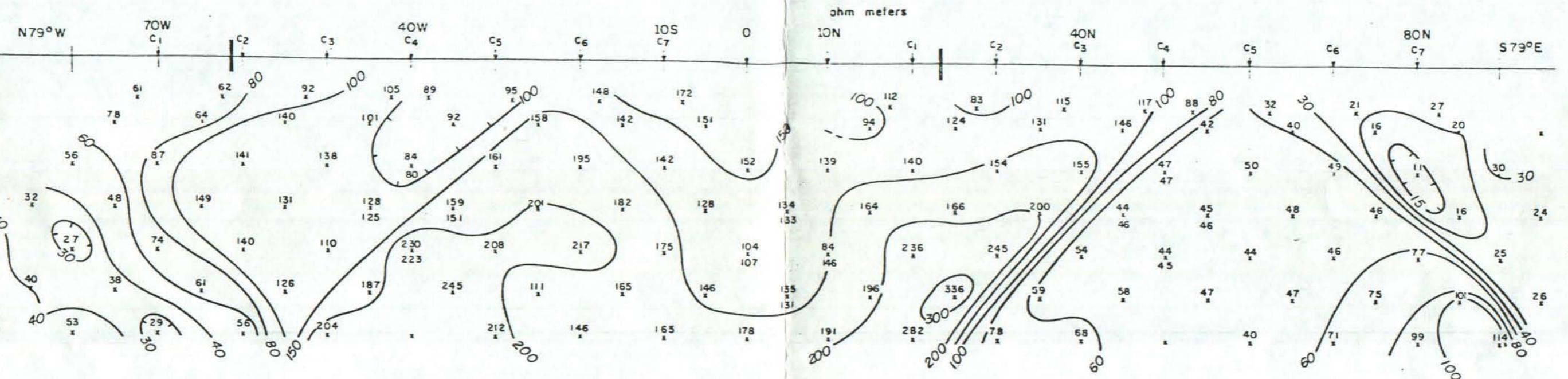
INDUCED POLARIZATION PROFILES

Line 0
Line 20N
Line 20N
Line 10E

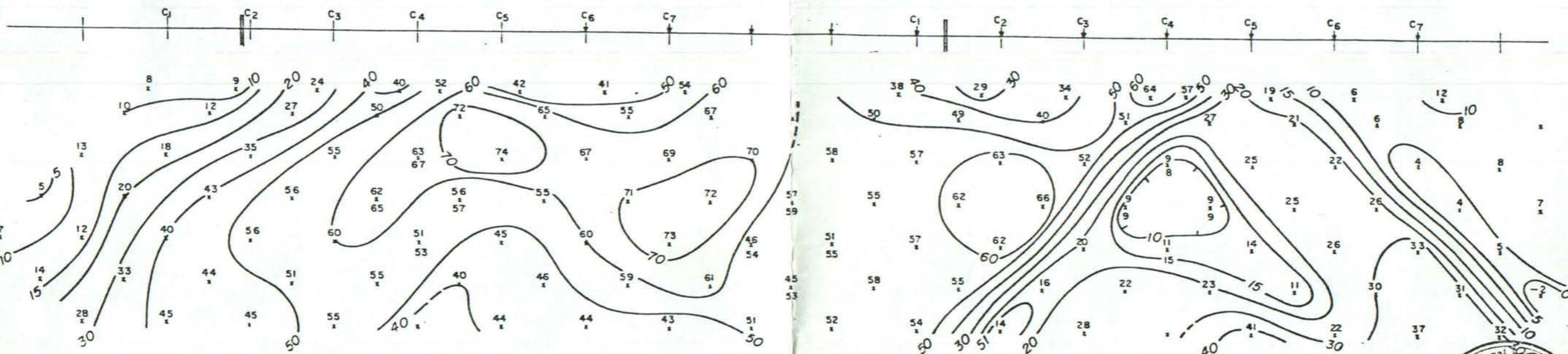
TIME DOMAIN INDUCED POLARIZATION AND RESISTIVITY SURVEY

BUCKSKIN PROJECT - DOUGLAS & LYON COUNTIES, NEVADA

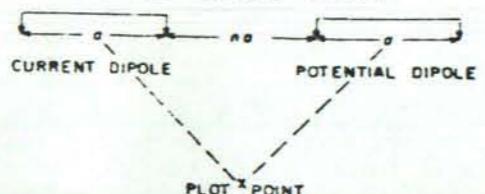
FOR
CONTINENTAL OIL COMPANY
MINERALS DIVISION
APPARENT RESISTIVITY



APPARENT POLARIZATION
millivolt seconds/volt



DIPOLE DIPOLE ARRAY



LINE C-0

LOOKING... N LY

DIPOLE LENGTH 1000'

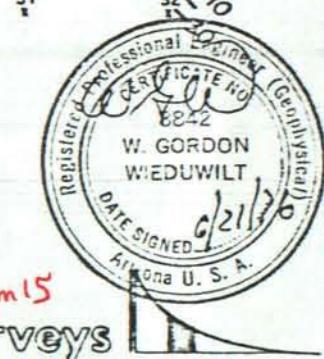
DATE MAY 25, 26 / 1976

LEGEND

- FENCE..... X
- Pipeline..... O
- POWERLINE.... T
- ROAD, RR. = + + +

mining
geophysical surveys

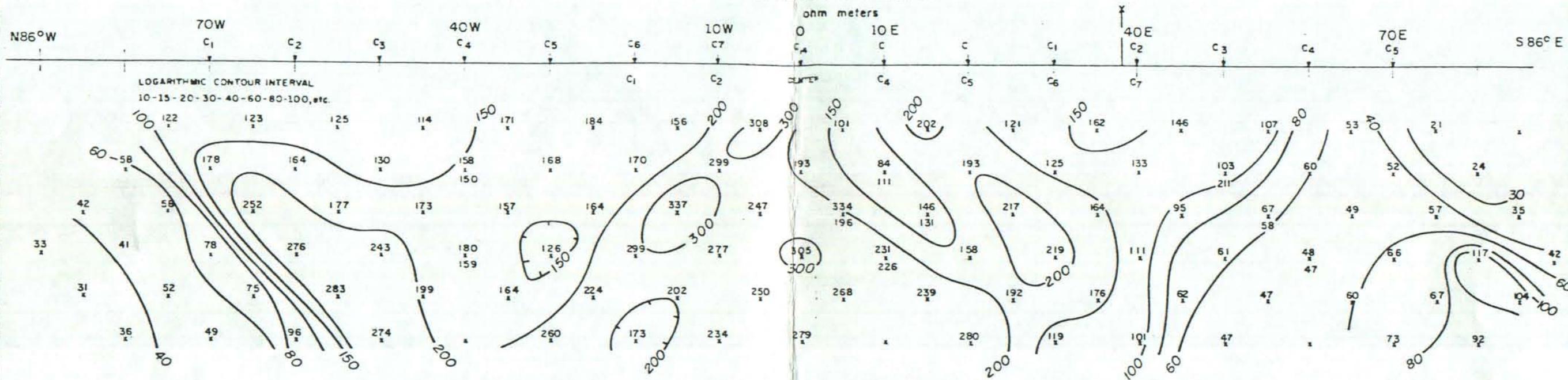
(35) Item 15



TIME DOMAIN INDUCED POLARIZATION AND RESISTIVITY SURVEY

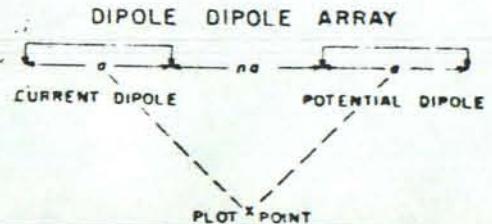
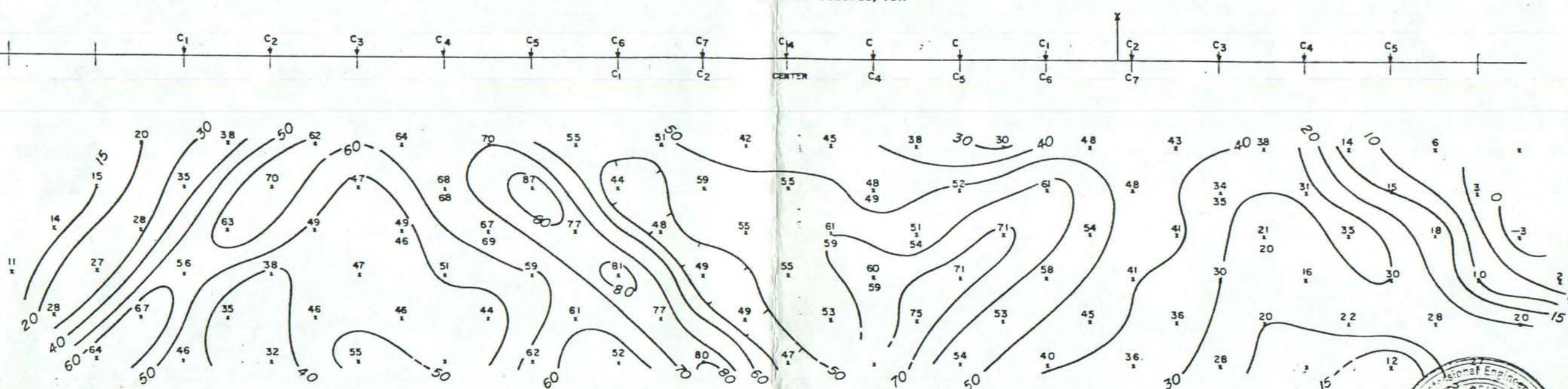
BUCKSKIN PROJECT - DOUGLAS & LYON COUNTIES, NEVADA

FOR
CONTINENTAL OIL COMPANY
MINERALS DIVISION
APPARENT RESISTIVITY



APPARENT POLARIZATION

millivolt seconds/volt



LINE: C-20 N

LOOKING . . . N LY

DIPOLE
MOMENT 1000

DATE MAY 21, 22/1976

LEGEND

FENCE

Pipeline

POWERLINE . . .

mining
geophysical surveys



TIME DOMAIN INDUCED POLARIZATION AND RESISTIVITY SURVEY

BUCKSKIN PROJECT - DOUGLAS & LYON COUNTIES, NEVADA

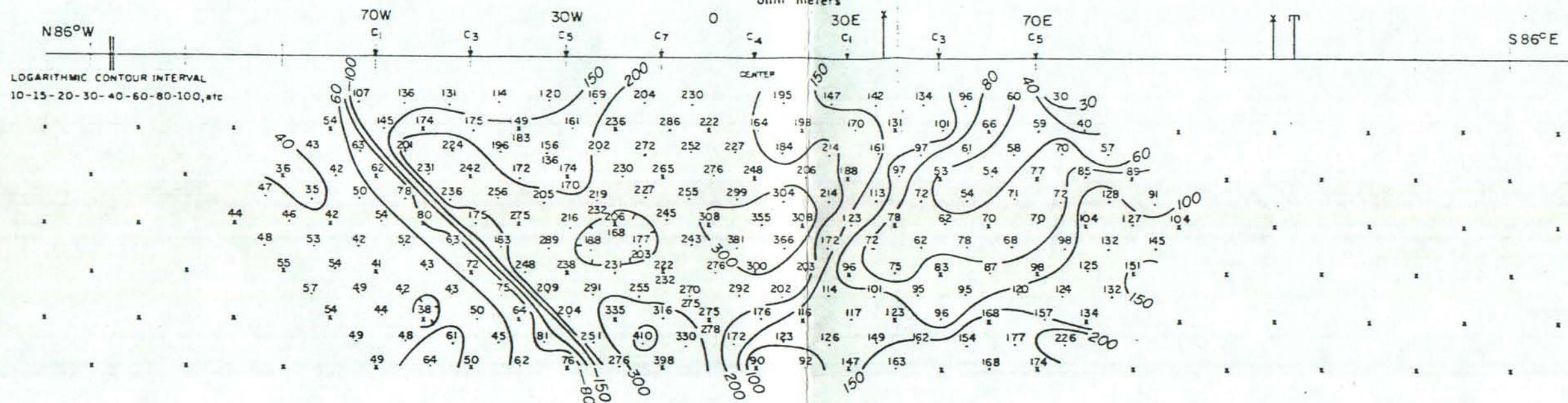
FOR

CONTINENTAL OIL COMPANY

MINERALS DIVISION

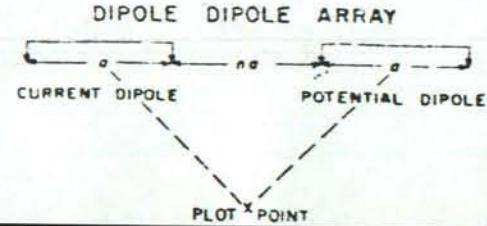
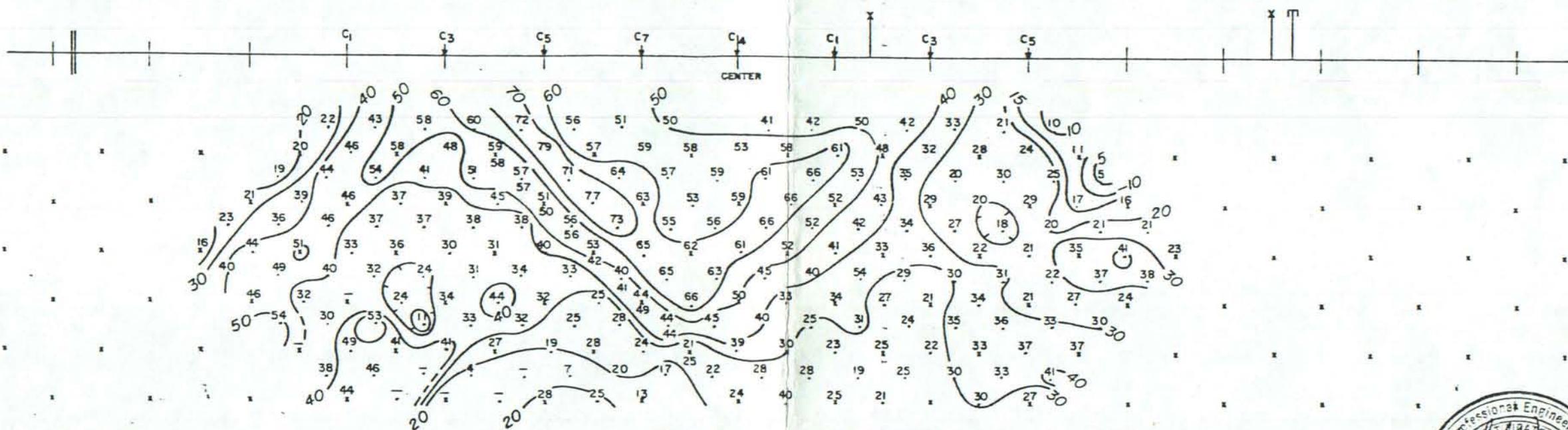
APPARENT RESISTIVITY

ohm meters



APPARENT POLARIZATION

millivolt seconds/volt.



LINE: C-20 N

LOOKING: NORTH

DIPOLE LENGTH: 2000'

DATE MAY 12, 22/76

LEGEND

FENCE: X

Pipeline: O

POWERLINE: T

ROAD, RR: +

mining
geophysical surveys



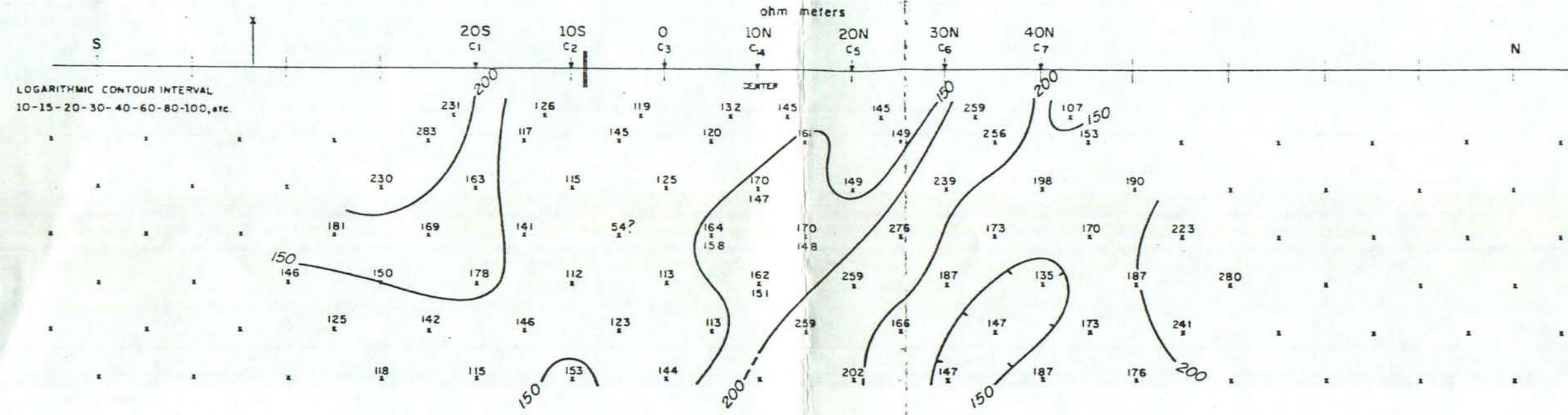
(35) Item 15

TIME DOMAIN INDUCED POLARIZATION AND RESISTIVITY SURVEY

BUCKSKIN PROJECT - DOUGLAS & LYON COUNTIES, NEVADA

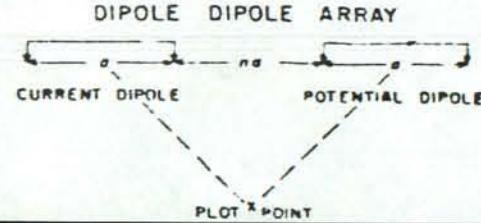
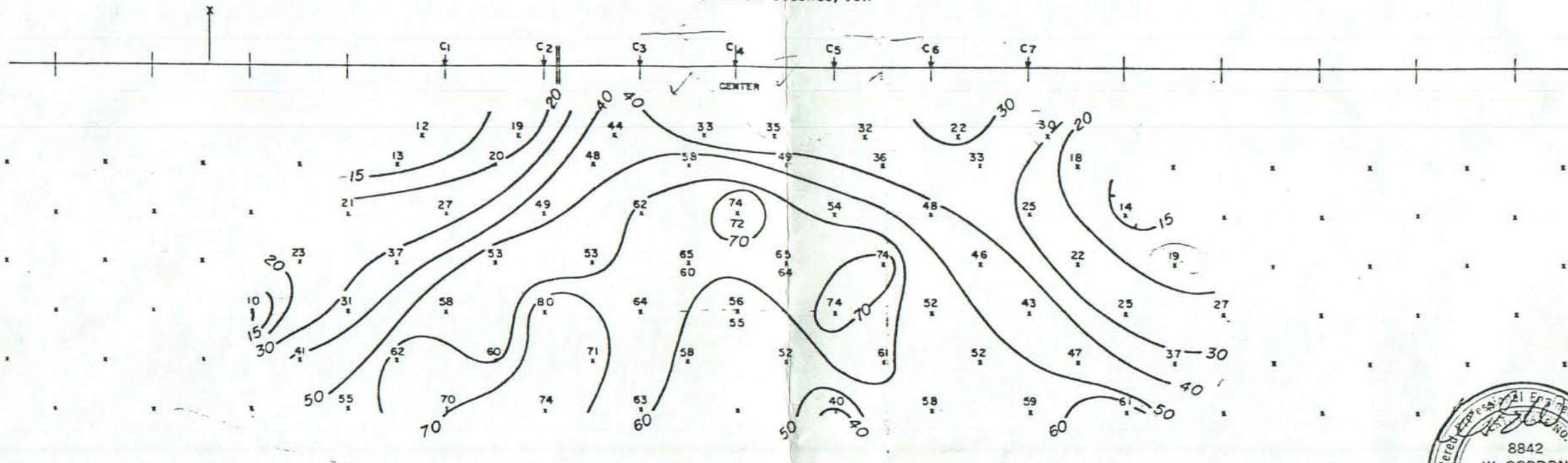
FOR

CONTINENTAL OIL COMPANY
MINERALS DIVISION
APPARENT RESISTIVITY



APPARENT POLARIZATION

millivolt seconds/volt



LINE C-10 E

LOOKING WEST

DIPOLE

LENGTH 1000'

DATE MAY 30/1976

LEGEND

- FENCE
- PIPELINE
- POWERLINE T
- ROAD, RR

mining
geophysical surveys

35 Item 15



INDUCED POLARIZATION SURVEY
BUCKSKIN PROJECT
DOUGLAS AND LYON COUNTIES, NEVADA

Map Pocket #4

INDUCED POLARIZATION PROFILES

Line 30W
Line 10W
Line 10W
Line 10E
Line 30E
Line 50E

NORTH EAST

INDUCED POLARIZATION
& RESISTIVITY SURVEY

Line C204

Line C0.0

0

10N

20N

30N

40N

50N

APPARENT RESISTIVITY
OHM-Meters

n=1

n=2

n=3

n=4

n=5

n=6

STATE Nevada

COUNTY Douglas

AREA Buckskin

LINE NO. 30W

PARTY Crew #2

DATE SURVEYED Oct. 1976

DIPOLE LENGTH 1000'

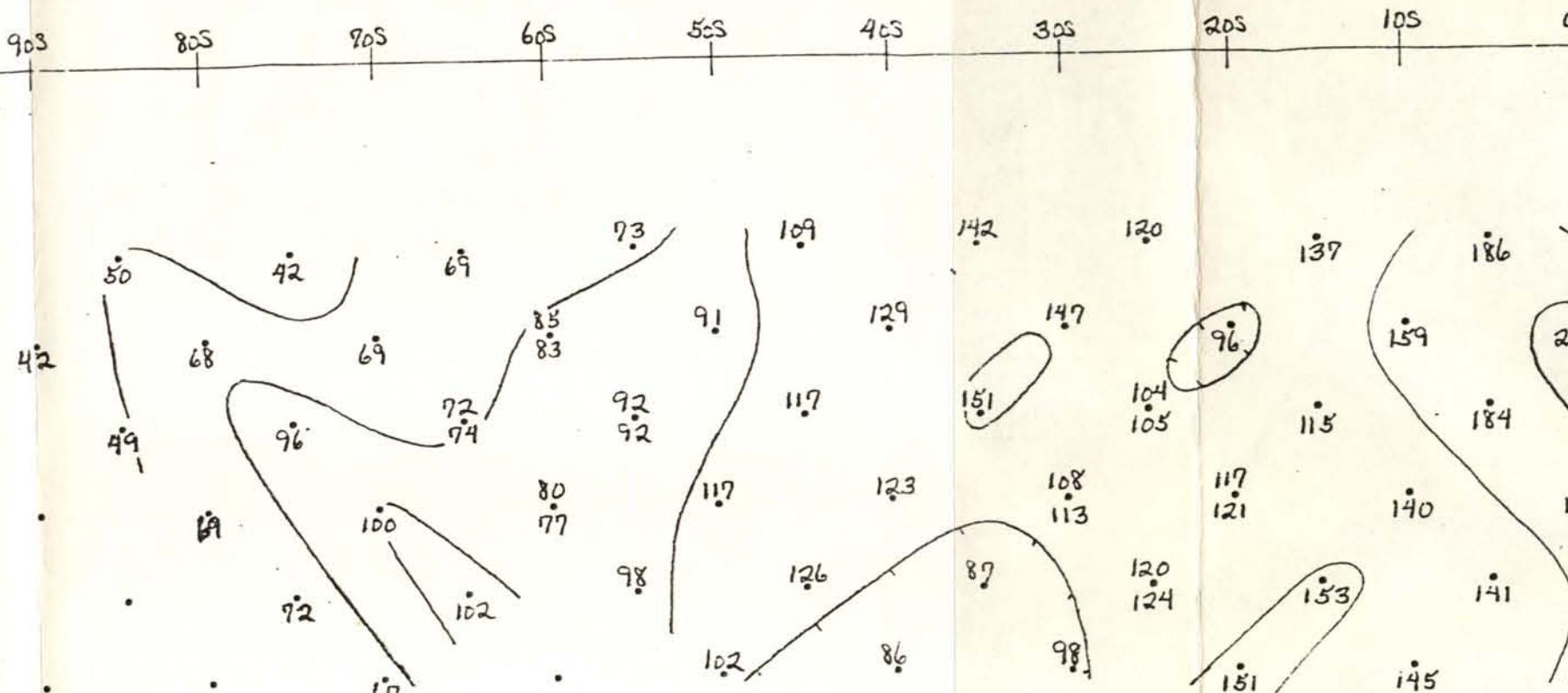
ARRAY Dipole-Dipole

LOG CONTOURS

1-1.5-2-3-5-7.5-10

15-20-30-50...00

(FOR ABOVE SECTION ONLY)



APPARENT POLARIZATION
Millivolt-Sec.

n=1

n=2

n=3

n=4

n=5

n=6

REMARKS:

T POWER LINE O PIPE LINE X METAL
FENCE
ROADWAY WOOD

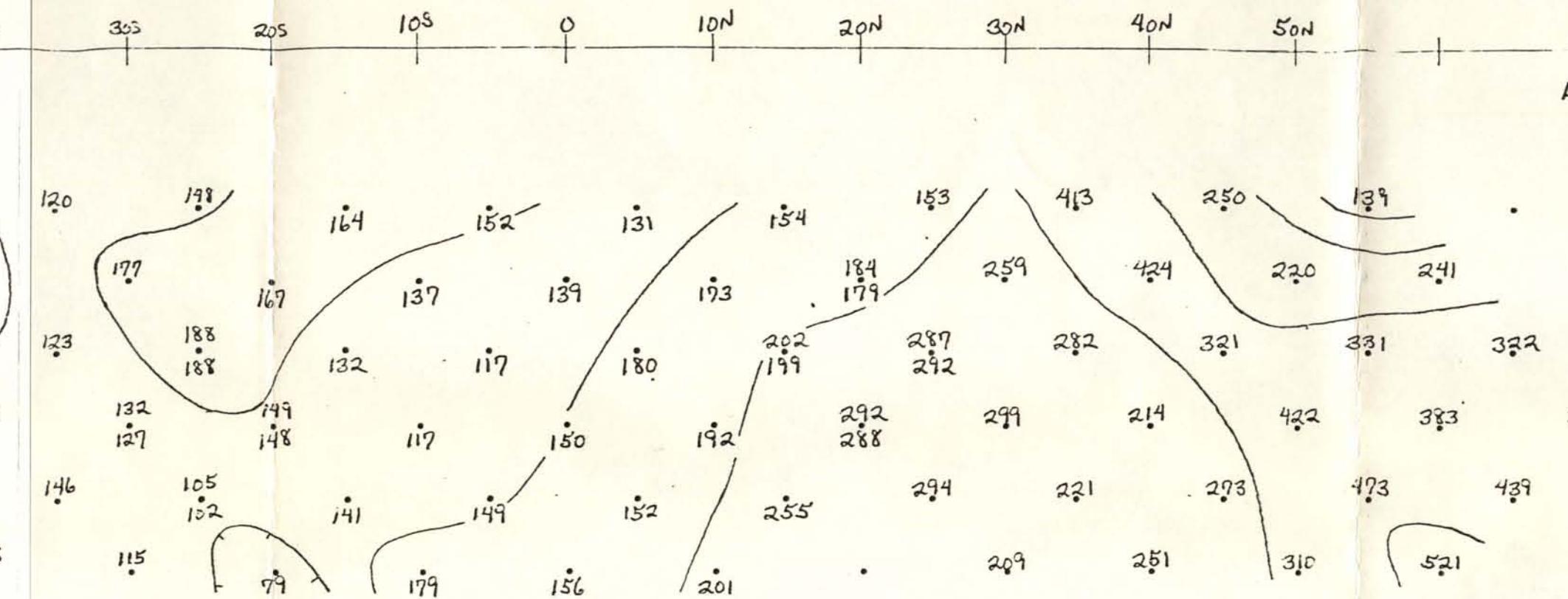
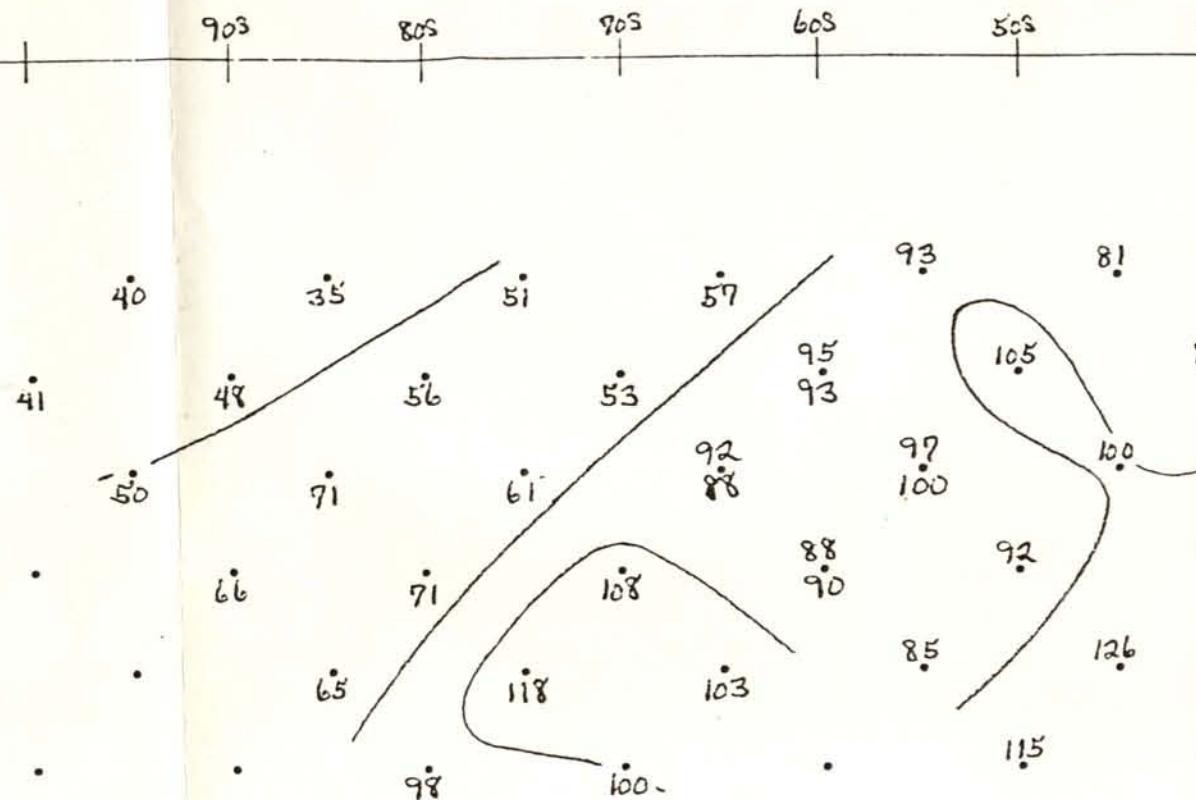
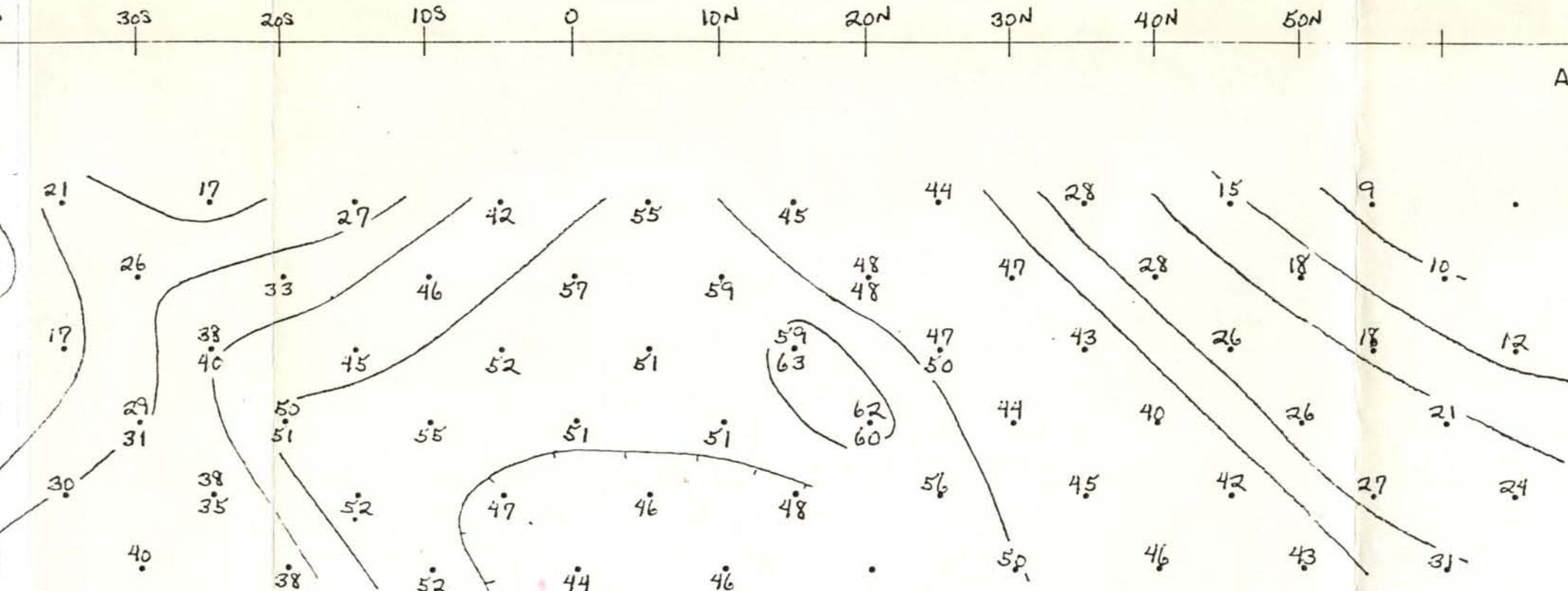
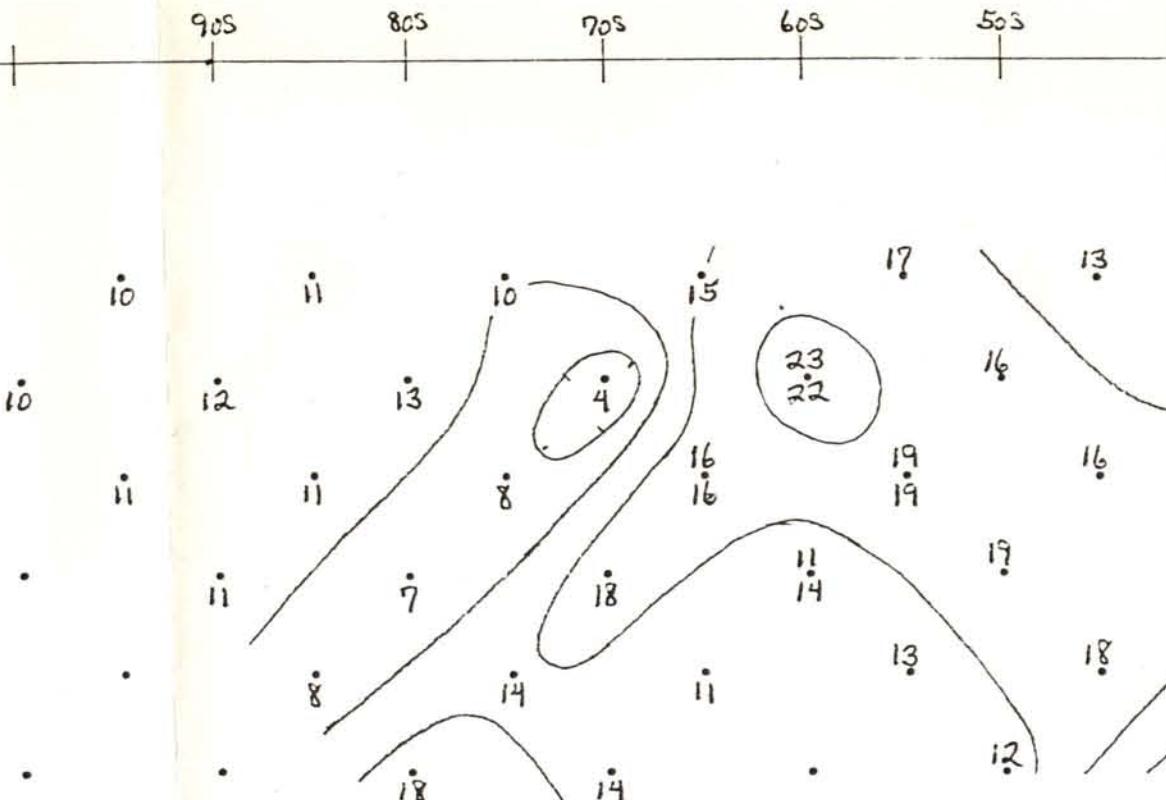
ITEM 15

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NORTH

EAST

conoco

INDUCED POLARIZATION
& RESISTIVITY SURVEYAPPARENT RESISTIVITY
OHM-MetersAPPARENT POLARIZATION
Millivolt-Sec.
Volt

REMARKS:

T POWER LINE O PIPE LINE X FENCE □ METAL WOOD

|| ROADWAY

(35)

Form 15

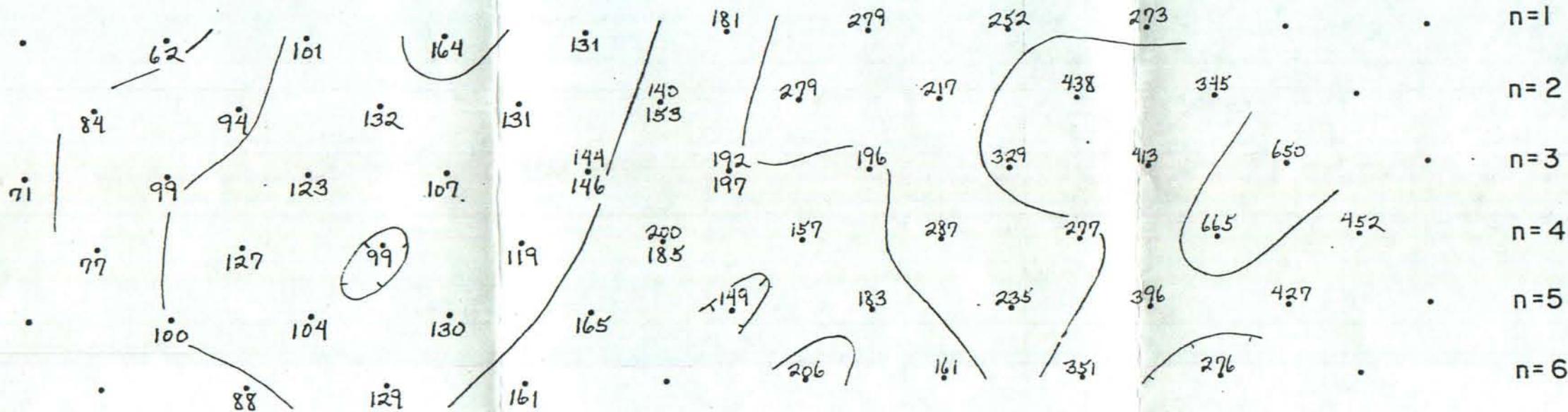
NORTH
 EAST

conoco

INDUCED POLARIZATION
& RESISTIVITY SURVEY

60S 40S 20S 0.0 20N 40N 60N

APPARENT RESISTIVITY
OHM-Meters



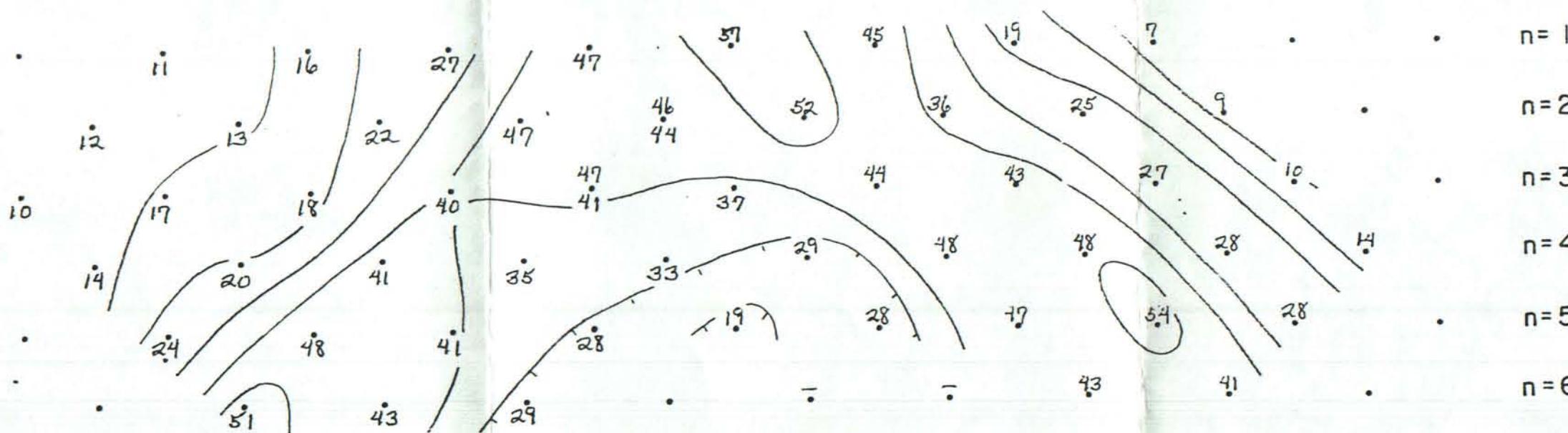
n=1
n=2
n=3
n=4
n=5
n=6

STATE Nevada
COUNTY Douglas
AREA Buckskin
LINE NO. 10W
PARTY Crew #2
DATE SURVEYED Nov. 1976
DIPOLE LENGTH 1000'
ARRAY Dipole-Dipole

LOG CONTOURS
1-1.5-2-3-5-7.5-10
15-20-30-50...00
(FOR ABOVE SECTION ONLY)

60S 40S 20S 0.0 20N 40N 60N

APPARENT POLARIZATION
Millivolt-Sec.
Volt



n=1
n=2
n=3
n=4
n=5
n=6

REMARKS:

T POWER LINE O PIPE LINE X METAL FENCE
FENCE WOOD

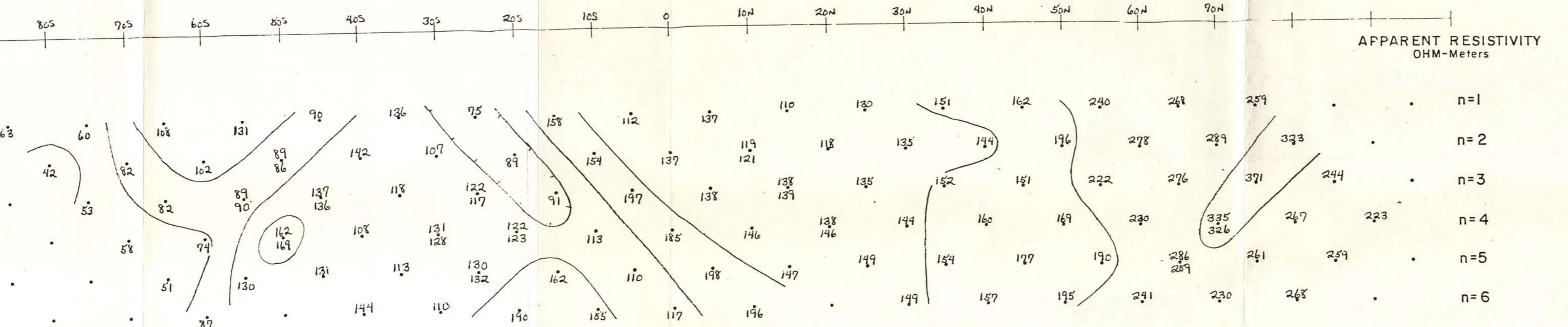
ROADWAY

(35) Item 15

TH
T

conoco

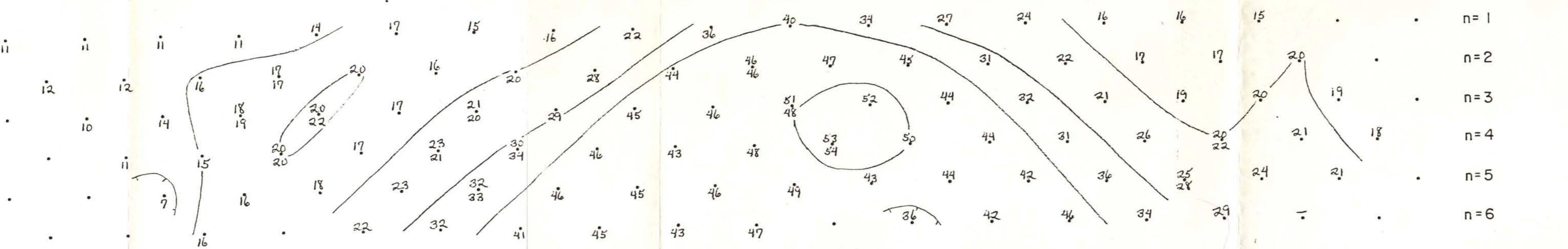
**APPARENT RESISTIVITY
OHM-Meters**



STATE Nevada
COUNTY Douglas
AREA Buckskin
LINE NO. 30E
PARTY Crew #2
DATE SURVEYED Oct. 1976
DIPOLE LENGTH 1000'
ARRAY Dipole-Dipole

LOG CONTOURS
1-1.5-2-3-5-7.5-10
15-20-30-50...00
(FOR ABOVE SECTION ONLY)

APPARENT POLARIZATION



REMARKS: _____

T POWER LINE O PIPE LINE X FENCE
— □ METAL
□ WOOD

ROADWAY

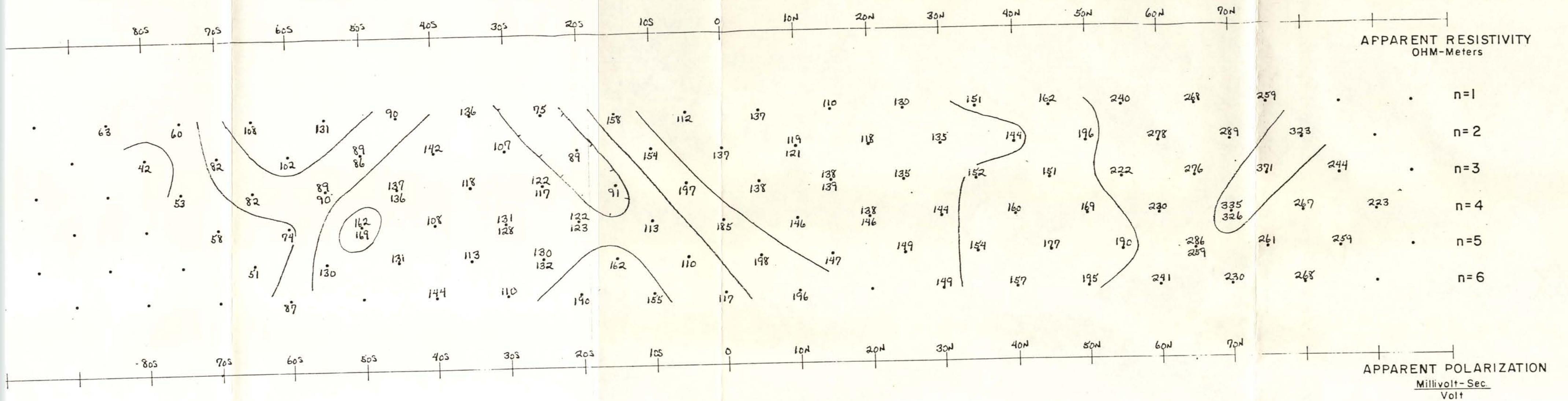
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Tentat

NORTH
EAST

conoco

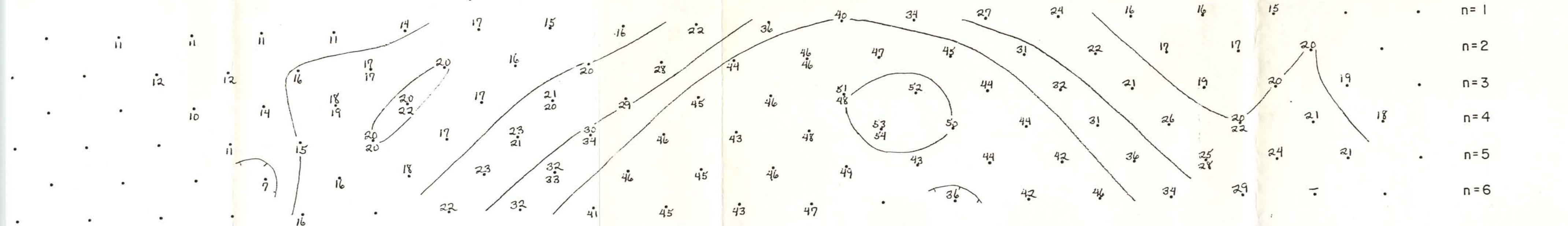
INDUCED POLARIZATION & RESISTIVITY SURVEY



STATE Nevada
COUNTY Douglas
AREA Buckskin
LINE NO. 30E
PARTY Crew #2
DATE SURVEYED Oct. 1976
DIPOLE LENGTH 1000'
ARRAY Dipole-Dipole

LOG CONTOURS
-1.5-2-3-5-7.5-10
5-20-30-50....00
FOR ABOVE SECTION ONLY)

REMARKS: _____



The diagram includes four symbols: a vertical line with a crossbar at the top labeled "POWER LINE"; a circle labeled "PIPE LINE"; a vertical line with an upward-pointing arrow at the top labeled "METAL FENCE"; and a vertical line with a downward-pointing arrow at the top labeled "WOOD FENCE".

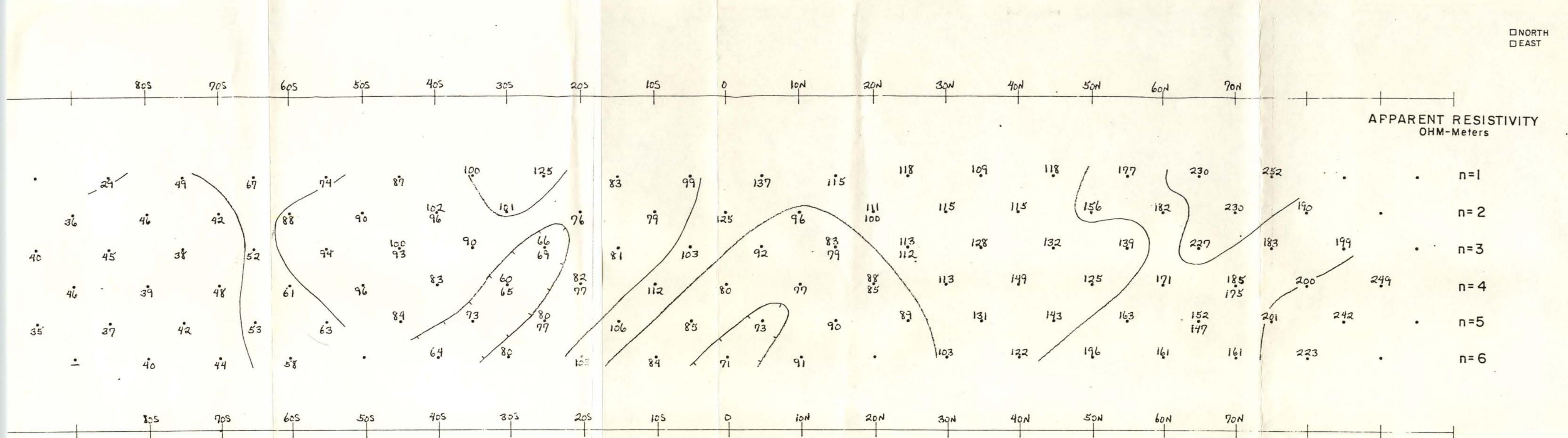
ROADWAY

35
Term 15

20
T

conoco

INDUCED POLARIZATION RESISTIVITY SURVEY



PARENT RESISTIVITY
OHM-Meters

STATE Nevada
COUNTY Douglas
AREA Buckskin
LINE NO. 50 E
PARTY Crew #2
DATE SURVEYED Oct 1976
POLE LENGTH 1000'
ARRAY Dipole-Dipole

CONTOURS
-2-3-5-7.5-10
0-30-50 ... 00
ABOVE SECTION ONLY)

PARENT POLARIZATION
Millivolt - Sec.
 Volt

REMARKS: _____

 POWER LINE
  PIPE LINE
  FENCE
  METAL
  WOOD

ROADWAY

35

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CONOCO : SUMMARY SHEET FOR IP DATA INVERSION

 $\ell = ?$

$\rho_0 = 150$	Depth		$\rho_0 = 150$	$\rho_0 = 150$
$\rho_1 = 150$	Thickness		$\rho_2 = 150$	$\rho_1 = 150$
		Width	$\rho_2 = 150$	M_1

LINE	X	Centre	Depth	Thickness	Width	M_1	M_2
30W	1000'	13+00N	917'	3000' fixed	674'	34	159
10W	1000'	5+55N	1200'	2250' poorly determined	1250'	36	109
10W	2000'	10+00N	750'	4600'	5200'	17	40
10E	1000'	19+50N	816'	3000' fixed	2500	25	88
30E	1000'	17+50N	1253'	3000' fixed	2433'	28	89.3

Buckskin Project

CONOCO LINE 30W

x = 1000'

FINAL MODEL FOR DATA SET 1

OBSEVED DATA	20S 9	10S 10	0 11	10N 12	20N 13								
	-- ----- ----- ----- ----- ----- -----												
	22.0	35.0	34.0	43.0	59.0	45.0	45.0	32.0					
	26.0	33.0	30.0	40.0	57.0	55.0	55.0	46.0	32.0				
	26.0	29.0	27.0	34.0	52.0	57.0	63.0	55.0	40.0	33.0			
	19.0	27.0	25.0	33.0	46.0	46.0	63.0	52.0	54.0	40.0	37.0		
	17.0	23.0	23.0	32.0	42.0	48.0	50.0	49.0	43.0	49.0	44.0	41.0	
	18.0	24.0	22.0	31.0	39.0	43.0	48.0	38.0	40.0	41.0	43.0	46.0	42.0

CALCULATED DATA

	-- ----- ----- ----- ----- ----- -----												
	36.1	36.1	35.1	34.5	42.2	46.3	40.3	33.0					
	32.7	32.7	31.5	30.5	44.8	54.7	53.9	38.7	29.8				
	30.9	30.9	29.6	29.0	46.1	55.2	55.4	54.0	39.3	28.2			
	29.7	29.7	28.5	28.6	47.2	52.9	51.8	51.6	52.8	40.4	27.6		
	28.9	28.9	27.8	28.9	48.2	50.8	48.0	47.5	48.4	51.6	41.7	27.5	
	29.3	29.3	27.9	29.3	48.9	49.0	45.3	44.0	44.3	45.9	50.5	42.8	27.2
	-- ----- ----- ----- ----- ----- -----												

CONOCO LINE 30W

x = 1000'

RIDGE SUMMARY

0	2.00409E+02	0.00000E+00	0.00000E+00
1	5.14367E+01	0.00000E+00	0.00000E+00
2	5.36398E+01	4.93233E+01	4.93033E+01
3	4.73629E+01	4.79645E+01	4.79493E+01
4	4.67129E+01	4.86692E+01	4.85957E+01
5	4.75502E+01	0.00000E+00	0.00000E+00

PARAMETER SUMMARY

ITER	RCSV	CEN----SPCT	DEP----SPCT	WID----SPCT
0	2.0041E+02	1.1500E+01	0.0	1.0000E+03
1	5.1437E+01	1.2202E+01	2.7	7.5710E+02
2	4.9303E+01	1.2470E+01	1.8	8.3408E+02
3	4.7363E+01	1.2362E+01	1.0	9.0196E+02
4	4.6713E+01	1.2286E+01	1.0	9.1746E+02
5	4.6713E+01	1.2286E+01	1.2	9.1746E+02
		12.3 ± 1.2%	917' ± 19%	674' ± 44%
		13±00N ± 1.2%		

PARAMETER SUMMARY

ITER	RCSV	IFBD----SPCT	IPHD----SPCT	----SPCT
0	2.0041E+02	8.0000E+01	0.0	2.5000E+01
1	5.1437E+01	1.1462E+02	62.4	3.4966E+01
2	4.9303E+01	1.6621E+02	52.5	3.3878E+01
3	4.7363E+01	1.6283E+02	18.5	3.3805E+01
4	4.6713E+01	1.5899E+02	17.7	3.3664E+01
5	4.6713E+01	1.5899E+02	34.9	3.3664E+01
FORTRAN STOP	EZ1 COMPLETE	159 ± 35%	34 ± 3.5 %	

CONOCO LINE IOW
x = 1000'

FINAL MODEL FOR DATA SET 1

OBSERVED DATA

	20S	10S	0	10N	20N								
	9	10	11	12	13								
	-- ----- ----- ----- ----- ----- -----												
	21.0	17.0	27.0	42.0	55.0	45.0	44.0	28.0					
	14.0	26.0	33.0	46.0	57.0	59.0	48.0	47.0	28.0				
	16.0	17.0	38.0	45.0	52.0	51.0	60.0	47.0	43.0	26.0			
	19.0	17.0	29.0	50.0	55.0	51.0	51.0	60.0	44.0	40.0	26.0		
	13.0	18.0	30.0	38.0	52.0	47.0	46.0	48.0	56.0	45.0	42.0	27.0	
	13.0	12.0	31.0	40.0	50.0	52.0	44.0	46.0	48.0	50.0	46.0	43.0	31.0

CALCULATED DATA

	20S	10S	0	10N	20N								
	9	10	11	12	13								
	-- ----- ----- ----- ----- ----- -----												
	37.5	37.0	35.7	41.2	40.9	41.4	35.9	36.9					
	34.8	34.2	33.5	42.9	51.1	51.1	43.6	33.7	34.1				
	33.3	32.6	32.6	44.9	54.6	54.8	54.7	45.8	32.8	32.5			
	32.3	31.6	32.4	46.7	55.1	52.6	52.6	55.0	47.6	32.7	31.5		
	31.7	30.9	32.6	48.3	54.8	50.2	49.4	50.1	54.5	49.2	32.9	30.8	
	31.9	31.1	32.8	49.6	54.1	48.1	46.6	46.5	48.0	53.8	50.4	33.2	31.0
	-- ----- ----- ----- ----- ----- -----												

CONOCO LINE IOW
x = 1000'

RIDGE SUMMARY

0	2.85905E+02	0.00000E+00	0.00000E+00
1	1.35915E+02	8.81065E+01	0.00000E+00
2	1.19847E+02	1.67908E+02	1.81713E+02
3	1.82291E+02	0.00000E+00	0.00000E+00

PARAMETER SUMMARY

ITER	RCSV	CEN----SPCT	DEP----SPCT	WID----SPCT
0	2.8591E+02	1.1500E+01	0.0	5.0000E+02
1	8.8107E+01	1.1525E+01	1.5	1.1972E+03
2	8.8107E+01	1.1525E+01	1.5	1.1972E+03
3	8.8107E+01	1.1525E+01	1.5	1.1972E+03

11.53 ± 1.5 % 1197 ± 56% 1268 ± 18%

PARAMETER SUMMARY

ITER	RCSV	THI----SPCT	IPBO----SPCT	IPH0----SPCT
0	2.8591E+02	2.0000E+03	0.0	7.0000E+01
1	8.8107E+01	2.2463E+03	1483.8	1.0853E+02
2	8.8107E+01	2.2463E+03	1483.8	1.0853E+02
3	8.8107E+01	2.2463E+03	1483.8	1.0853E+02

FORTRAN STOP 2246, poorly determined,
EZ1 COMPLETE

\$

CONOCO LINE IOW
x = 2000'

FINAL MODEL FOR DATA SET 1

OBSERVED DATA

	40S	20S	0	20N	40N								
	9	10	11	12	13								
	11.0	16.0	27.0	47.0	57.0	45.0	19.0	7.0					
	12.0	13.0	22.0	47.0	46.0	52.0	36.0	25.0	9.0				
	10.0	17.0	18.0	40.0	41.0	37.0	44.0	43.0	27.0	10.0			
	12.0	14.0	20.0	41.0	35.0	33.0	29.0	48.0	48.0	28.0	14.0		
	14.0	16.0	24.0	48.0	41.0	28.0	19.0	28.0	47.0	50.0	28.0	15.0	
	16.0	18.0	26.0	51.0	43.0	29.0	28.0	28.0	30.0	43.0	41.0	29.0	16.0

CALCULATED DATA

	19.5	18.4	25.7	39.8	45.9	39.7	25.4	18.4					
	17.7	16.9	27.6	42.3	49.4	49.3	42.2	27.2	16.9				
	17.0	16.0	28.4	42.7	45.0	34.2	45.1	42.6	28.0	15.9			
	16.4	15.3	29.0	43.0	43.2	28.3	28.5	43.3	42.9	28.6	15.3		
	15.9	14.9	29.4	43.4	42.2	25.9	23.8	26.1	42.3	43.3	29.0	14.9	
	15.7	14.9	29.8	43.7	41.6	24.5	22.1	22.1	24.7	41.8	43.6	29.4	14.8

CONOCO LINE 10W
x = 2000'

RIDGE SUMMARY

0	1.35879E+02	0.00000E+00	0.00000E+00
1	6.19417E+01	6.71200E+01	6.98342E+01
2	4.52697E+01	4.16513E+01	5.27798E+01
3	3.84173E+01	4.48939E+01	4.66926E+01
4	4.31470E+01	3.15813E+01	2.90239E+01
5	2.66011E+01	0.00000E+00	0.00000E+00

PARAMETER SUMMARY

ITER	RCSV	CEN---SPCT	DEP---SPCT	WID---SPCT
0	1.3588E+02	1.1000E+01	0.0	1.0000E+03
1	6.1942E+01	1.1619E+01	2.0	1.0594E+03
2	4.1651E+01	1.1535E+01	0.6	1.3432E+03
3	3.8417E+01	1.1478E+01	0.5	1.5025E+03
4	2.9024E+01	1.1499E+01	0.8	1.1037E+03
5	2.6601E+01	1.1491E+01	0.4	7.5232E+02
		11.5 ± 0.4 %	752 ± 20 %	5204 ± 8 %

PARAMETER SUMMARY

ITER	RCSV	THI---SPCT	IPBO---SPCT	IPH0---SPCT
0	1.3588E+02	2.0000E+03	0.0	9.0000E+01
1	6.1942E+01	2.2514E+03	62.9	1.2034E+02
2	4.1651E+01	2.4882E+03	23.9	9.6830E+01
3	3.8417E+01	2.5350E+03	17.2	8.8362E+01
4	2.9024E+01	3.6706E+03	30.3	5.4365E+01
5	2.6601E+01	4.5973E+03	32.0	4.0384E+01

FORTRAN STOP 4597 ± 32%

EZ1 COMPLETE

¶

CONOCO LINE 10E
x = 1000'

FINAL MODEL FOR DATA SET 1

OBSERVED DATA

Detailed description: This figure is a contour plot of observed data. The horizontal axis (x-axis) is labeled with values 9, 10, 11, 12, and 13, representing columns. The vertical axis (y-axis) is labeled with values 16.0, 17.0, 18.0, 19.0, 20.0, and 21.0, representing rows. The data values are represented by numbers in each cell of the grid. Contour lines are drawn through the grid, connecting points of equal value. The values generally increase from bottom-left to top-right, with a notable peak around column 11 and row 18.

	10S	0	10N	20N	30N								
9	13.0	20.0	48.0	58.0	49.0	36.0	23.0	18.0					
10	21.0	27.0	49.0	62.0	72.0	54.0	48.0	25.0	18.0				
11	18.0	27.0	53.0	53.0	60.0	64.0	74.0	46.0	22.0	19.0			
12	17.0	29.0	58.0	60.0	64.0	56.0	74.0	52.0	43.0	25.0	18.0		
13	17.0	27.0	62.0	60.0	71.0	58.0	52.0	61.0	52.0	47.0	27.0	17.0	
1	16.0	29.0	55.0	70.0	74.0	63.0	50.0	40.0	58.0	59.0	61.0	28.0	19.0

CALCULATED DATA

A contour plot showing a series of concentric elliptical contours centered at approximately (50, 50). The contours are labeled with values ranging from 20.0 to 25.9. The plot has a grid of dashed lines.

	25.9	26.2	37.2	39.0	39.1	36.6	25.9	25.9					
	23.5	26.4	45.7	58.9	62.9	58.1	44.4	25.5	23.5				
	22.0	26.8	50.5	65.5	66.7	66.8	64.4	48.7	25.5	22.0			
	20.8	27.3	53.5	68.1	63.8	54.5	64.7	67.1	51.4	25.7	20.8		
	20.0	27.9	55.7	69.4	60.5	46.4	46.9	62.0	68.6	53.5	26.1	20.0	
	20.0	28.3	57.5	70.2	57.9	41.6	38.8	42.3	59.7	69.6	55.2	26.5	20.0

CONOCO LINE 10E
x = 1000'

RIDGE SUMMARY

0	6.73794E+01	0.00000E+00	0.00000E+00
1	6.27015E+01	6.26440E+01	6.26400E+01
2	6.26218E+01	6.26207E+01	6.26206E+01
3	6.26191E+01	0.00000E+00	0.00000E+00

PARAMETER SUMMARY

ITER	RCSV	CEN----SPCT	DEP----SPCT	THI----SPCT
0	6.7379E+01	1.1000E+01	0.0	8.0000E+02
1	6.2640E+01	1.0956E+01	0.9	8.1332E+02
2	6.2621E+01	1.0948E+01	0.8	8.1545E+02
3	6.2619E+01	1.0947E+01	0.8	8.1589E+02

10.95±0.8% 816'±8.7% 2502'±71%

PARAMETER SUMMARY

ITER	RCSV	IPBD----SPCT	IPHD----SPCT	----SPCT
0	6.7379E+01	8.7000E+01	0.0	2.5000E+01
1	6.2640E+01	8.7641E+01	9.7	2.5136E+01
2	6.2621E+01	8.7909E+01	9.4	2.5095E+01
3	6.2619E+01	8.7956E+01	9.4	2.5108E+01

FORTRAN STOP
EZ1 COMPLETE

¶

CONOCO LINE 30E
 $x = 1000'$

FINAL MODEL FOR DATA SET 1

DESERVED DATA	0	10N	20N	30N	40N								
	9	10	11	12	13								
	-- ----- ----- ----- ----- ----- -----		▽										
	16.0	22.0	36.0	40.0	34.0	27.0	24.0	16.0					
	20.0	28.0	44.0	46.0	47.0	45.0	31.0	22.0	17.0				
	21.0	29.0	45.0	46.0	49.0	52.0	44.0	32.0	21.0	19.0			
	22.0	30.0	46.0	43.0	48.0	53.0	50.0	44.0	31.0	26.0	22.0		
	23.0	32.0	46.0	45.0	46.0	49.0	43.0	44.0	42.0	36.0	27.0	24.0	
	22.0	32.0	41.0	45.0	43.0	47.0	49.0	36.0	42.0	46.0	34.0	29.0	22.0

CALCULATED DATA

	-- ----- ----- ----- ----- ----- -----												
	27.5	26.9	32.4	30.5	30.3	28.9	27.4	27.6					
	25.4	26.2	35.2	39.9	41.2	36.7	29.5	25.8	25.5				
	25.4	27.4	39.0	44.6	45.3	47.3	42.1	31.7	26.4	25.6			
	25.9	29.2	42.3	47.0	43.7	41.6	48.0	45.9	34.2	27.5	26.1		
	26.3	30.7	45.1	48.4	42.5	37.4	38.5	47.9	48.6	36.3	28.5	26.6	
	27.0	31.7	46.9	49.0	41.4	35.2	34.0	36.7	47.2	50.4	37.8	29.2	27.2
	-- ----- ----- ----- ----- ----- -----												

CONOCO LINE 30E
x = 1000'

RIDGE SUMMARY

0	4.70437E+01	0.00000E+00	0.00000E+00
1	3.57691E+01	3.57720E+01	3.66943E+01
2	3.46999E+01	3.37067E+01	3.70991E+01
3	3.74506E+01	3.95924E+01	4.01835E+01
4	4.02601E+01	0.00000E+00	0.00000E+00

PARAMETER SUMMARY

ITER	RCSV	CEN----SPCT	DEP----SPCT	WID----SPCT
0	4.7044E+01	1.1000E+01	0.0	1.0000E+03
1	3.5769E+01	1.0817E+01	0.9	1.1286E+03
2	3.3707E+01	1.0763E+01	0.9	1.2530E+03
3	3.3707E+01	1.0763E+01	0.9	1.2530E+03
4	3.3707E+01	1.0763E+01	0.9	1.2530E+03

10.75±0.9% 1253±11% 2433±65%

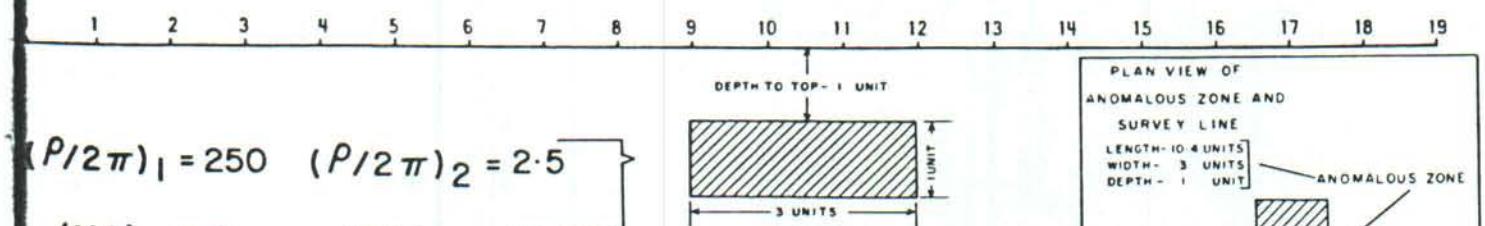
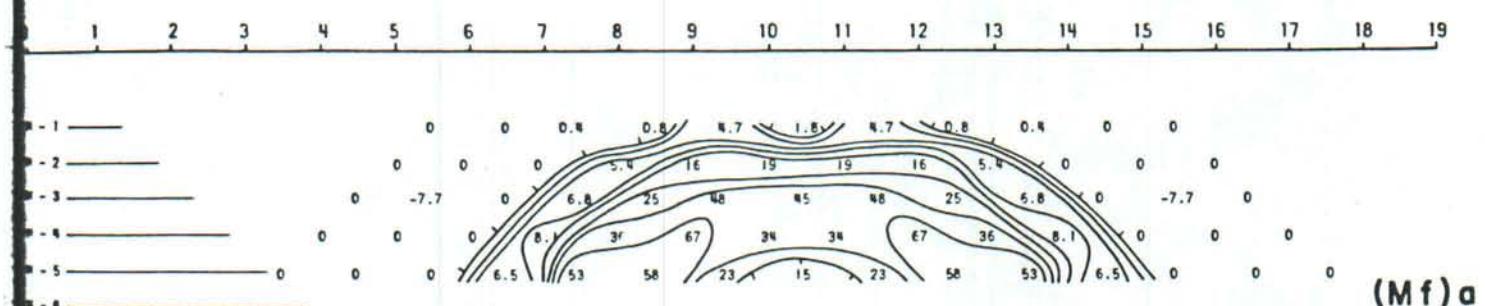
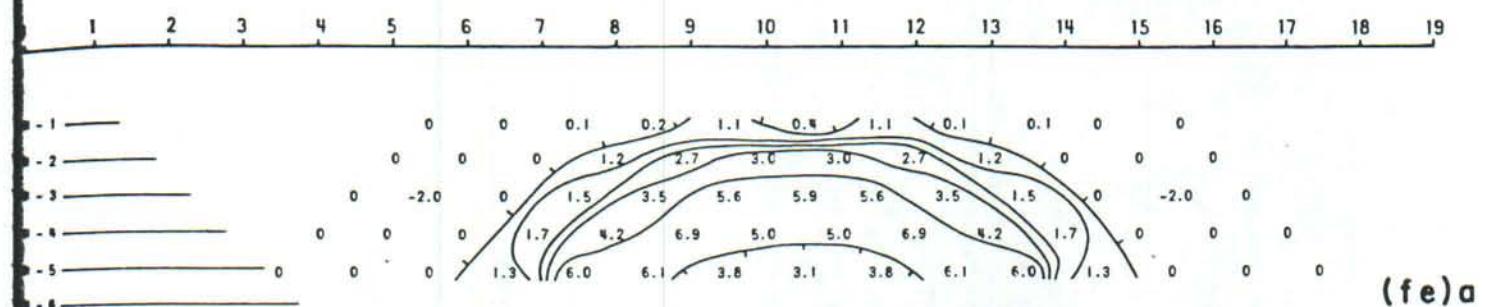
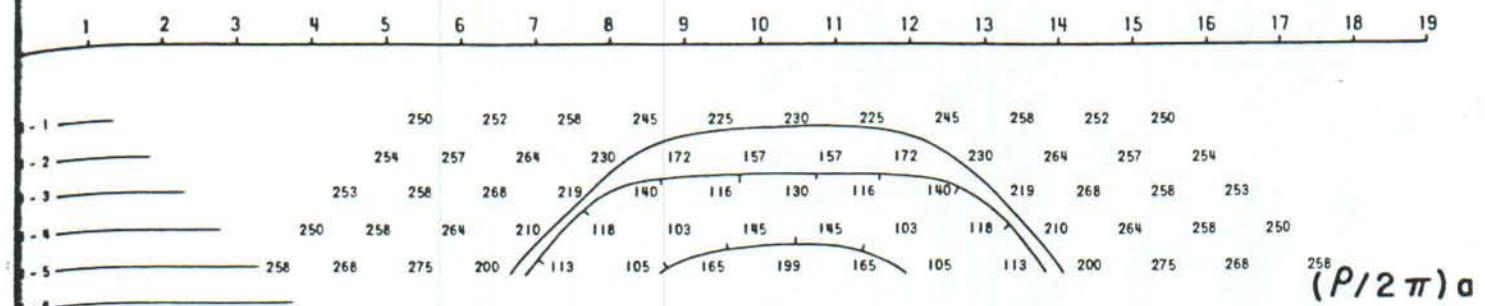
PARAMETER SUMMARY

ITER	RCSV	IPBO----SPCT	IPH0----SPCT	----SPCT
0	4.7044E+01	8.3000E+01	0.0	2.6000E+01
1	3.5769E+01	7.9029E+01	10.1	2.6306E+01
2	3.3707E+01	8.9284E+01	15.5	2.7543E+01
3	3.3707E+01	8.9284E+01	15.5	2.7543E+01
4	3.3707E+01	8.9284E+01	15.5	2.7543E+01

ORTRAN STOP
EZ1 COMPLETE

Theoretical Induced Polarization and Resistivity Studies

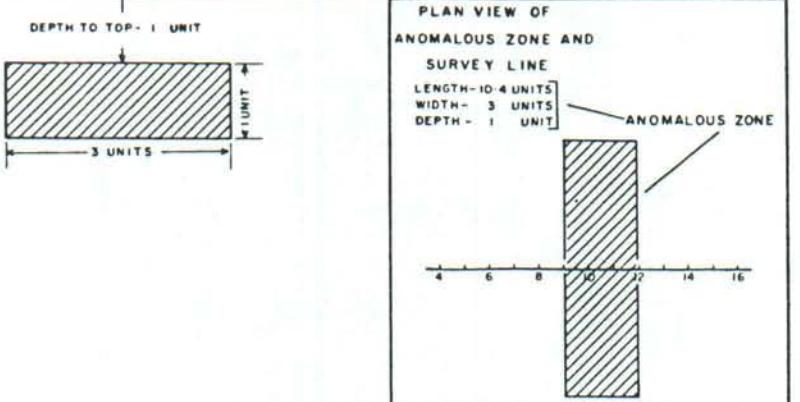
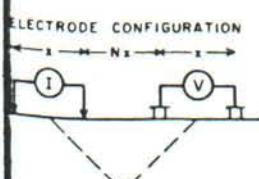
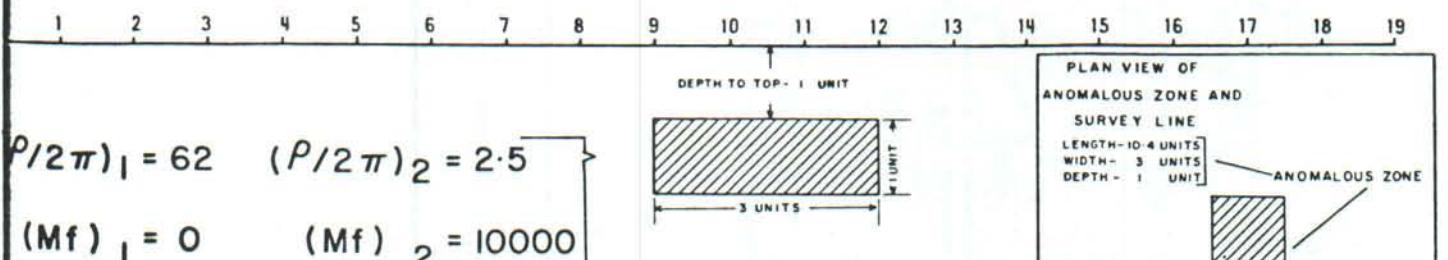
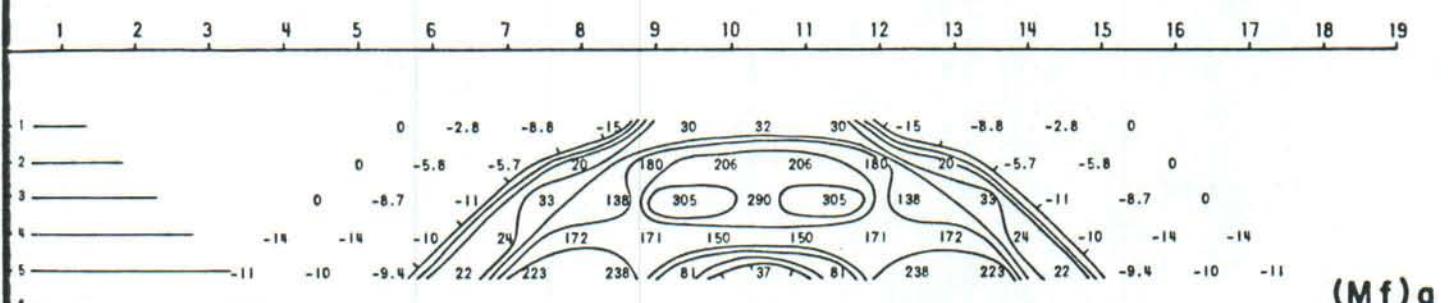
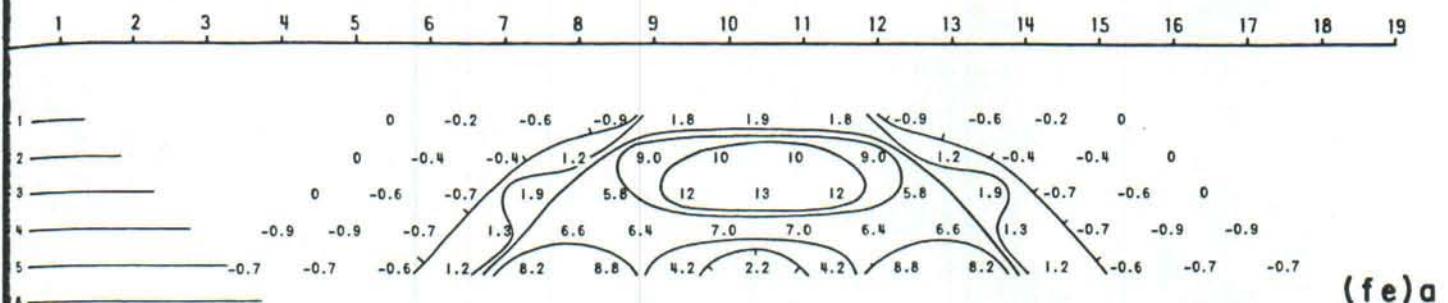
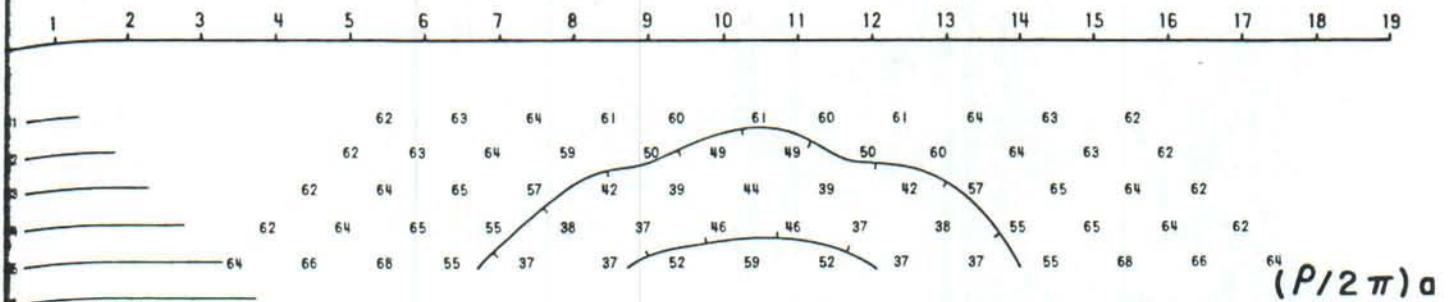
Scale Model Cases



$(\rho/2\pi)_1 = 250$ $(\rho/2\pi)_2 = 2.5$
 $(Mf)_1 = 0$ $(Mf)_2 = 10000$
 $(fe)_2 = 25\%$
 ELECTRODE CONFIGURATION

Theoretical Induced Polarization and Resistivity Studies

Scale Model Cases



(35)

Item 15

BUCKSKIN SOUTHWEST APPRAISAL
DOUGLAS COUNTY, NEVADA--
VIP SURVEY

by
W. Frangos and J. B. Hulen
June, 1974

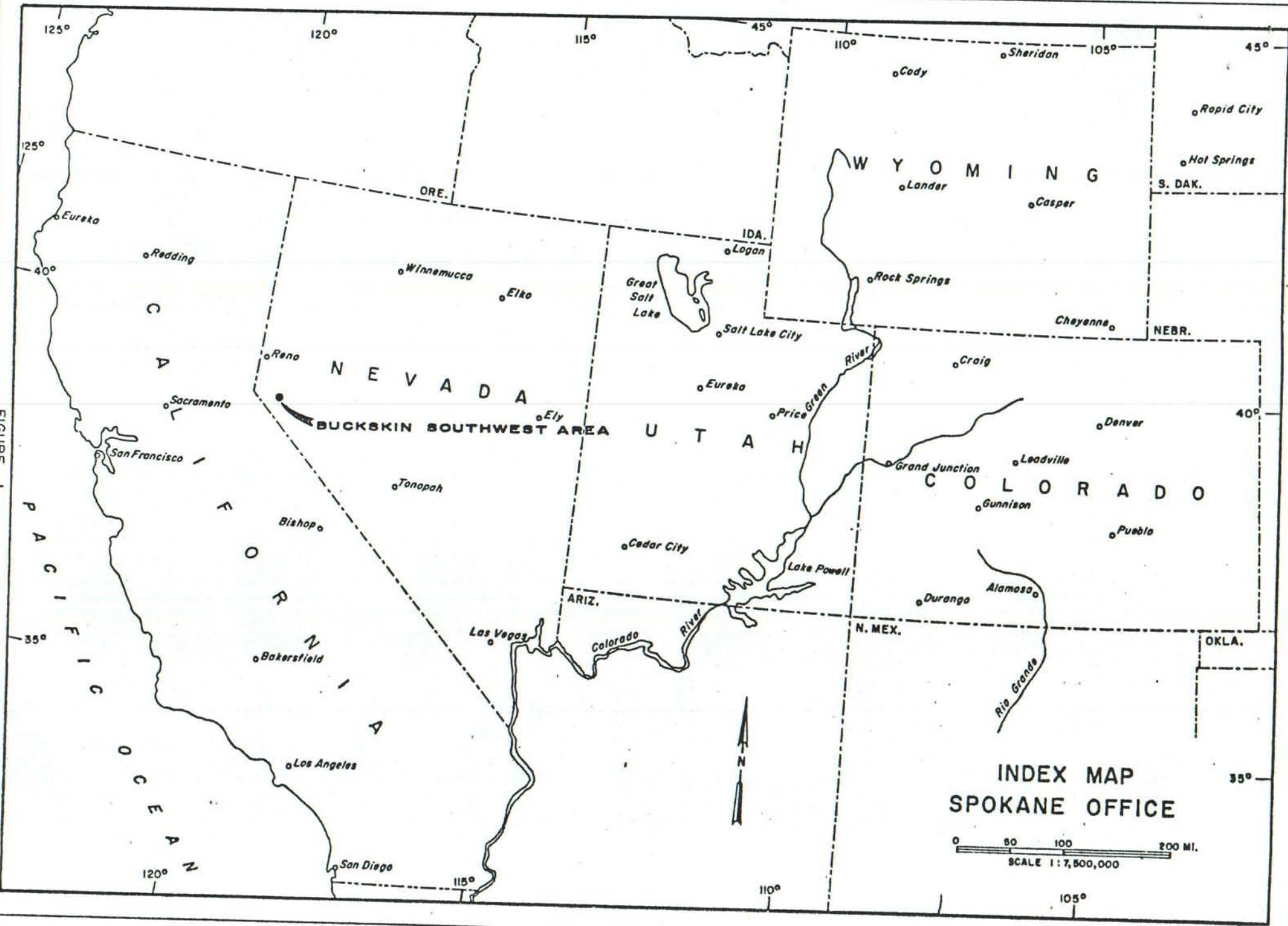
TABLE OF CONTENTS

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GEOLOGY	3
GEOFYSICS	4
DISCUSSION	5
REFERENCES	7

LIST OF ILLUSTRATIONS

Figure 1	Index Map, Spokane Office
Plate I	Topographic and Geologic Base
Plate II	VIP Line Locations
Plate III	VIP Data Profiles

FIGURE



Glose liaison between the authors was productive in expeditious use of the field time and in furthering the examination.

GEOLOGY

The Buckskin Range is an intensely mineralized and altered group of hills about 10 miles west of the Anaconda Company's Yerington copper mine. Production from the range to date is roughly \$200,000 -- \$80,000 from gold-bearing vein copper ores of the Buckskin mine; the rest from the Minnesota mine, developed on a small contact metasomatic magnetite deposit in dolomitic Mesozoic marble.

The oldest rocks exposed in the Buckskin Range are metasedimentary and metavolcanic rocks of probable Triassic and Jurassic age. The meta-flow rocks, although tuffs, tuff-breccias, and agglomerates are locally present. Metasedimentary rocks, confined to the northwestern portion of the range, comprise limestone, dolomite, shale, siltstone, and sandstone.

Metamorphic rocks in the range are cut by a variety of Cretaceous plutonic and hypabyssal rocks. Oldest among these, but of limited distribution, are fine-to medium-grained granodiorite and quartz monzonite of probable Early Cretaceous age -- almost certainly related to the multi-phase Sierra Nevada batholith. The Buckskin Range is dominated by the eastern portion of a huge, Early Cretaceous (post-plutonic), hypabyssal intrusive complex, comprising at least six textural varieties of quartz latite porphyry (Kglp) as well as quartz latitic intrusion breccia (Kib) -- the principal host rock for copper mineralization at Buckskin Southwest. Small plugs and dikes of Early Cretaceous quartz monzonite porphyry (Kgmp) and later dacite porphyry (Kdp) intrude all phases of the hypabyssal complex throughout the range.

Mesozoic rocks in the Buckskin Range are locally and unconformably overlain by a thick sequence of Tertiary volcanic and volcanic-sedimentary rocks. The oldest are quartz latitic ash-flow tuffs (Trt, Thrt) of Oligocene to Miocene age; one such tuff -- unique in bearing hornblende (Thrt) -- can be traced with ease throughout west-central Nevada. The tuff sequence is unconformably overlain by Mio-Pliocene andesite (Ta), dacite (Td), and semi-consolidated, fluvial and lacustrine, tuffaceous sedimentary rocks (Ts); feeder vents for the andesite are expressed as small dikes and plugs (Tap).

Quaternary surficial deposits conceal the flanks and much of the interior of the Buckskin Range. Gently-dipping pediments, consisting essentially of dissected pediment gravels (Qoal) and younger pediment and stream gravels (Qal), extend away from the range in all directions. Pre-Quaternary geology within the range is commonly masked by stream gravels, talus (Qt), and ferruginous breccia (Qfb).

The Buckskin Range is a tilted, structurally complex Basin-Range fault block, tipped 35-50° westward along its western normal rotational boundary fault. Mesozoic metamorphic rocks in the range strike generally north-south, and dip 60° or more eastward or westward. Tertiary volcanic rocks show a similar strike, but usually dip westward at greater than 25° to vertical. All rocks in the range are cut by north-south-trending Basin-Range normal faults; the southern Buckskin Range is modified by numerous east-west-trending wrench and normal faults, dikes, veins, and jasperoid reefs along the prominent Buckskin-Yerington structural belt (Hulen, 1971, p. 16). Gravity-slides are present in the extreme southern end of the range, where blocks of hornblende-bearing ash-flow tuff (Thrt) have slid eastward over subjacent earlier tuffs and Mesozoic rocks.

The Buckskin Southwest prospect is situated on the extreme western edge of a broad "sea" of pre-Tertiary alteration and mineralization covering roughly 15 square miles in the southern and eastern Buckskin Range. This large altered area consists of small (<300' in diameter or long dimension), interlocking, and erratically distributed patches of clay-sericitized, propylitized, quartz-sericitized, and silicified Mesozoic metamorphic and intrusive rocks. Alteration zoning is absent except at Buckskin Southwest and a similar area near the Minnesota mine.

The Buckskin Southwest prospect and its Minnesota mine alalog are expressed at the surface as relatively large (>2,000 feet in diameter or long dimension) expanses of intense quartz-sericitization and weak stockwork quartz veining, with minor "oxide" copper mineralization, developed on thoroughly shattered Cretaceous intrusive breccia. Both areas grade sharply westward into essentially barren rock, and eastward into the Buckskin alteration "sea." Drilling in 1972 at Buckskin Southwest revealed the broad quartz-sericite zone there to be vertically zoned above primary porphyry-type copper mineralization. One deep drill hole (BSW-7) penetrated, beneath 780' of quartz-sericite rock, a 510' zone of potassically and quartz-sericitically altered and quartz-veined material averaging 0.16% Cu as chalcopyrite (including an 88' zone averaging 0.36%).

GEOPHYSICS

Line locations are displayed on Plate II which overlays the topographic and geologic base map, Plate I. The complete survey comprises seven lines or about 15 line-miles of 1,000-foot dipole-dipole coverage and one complete seven-spread of 300-foot dipole detailed work. Results of the vector IP survey are presented as Plate III; an "apparent sulfide content" calculated by the method of Van Voorhis (1972) is included. Considerations of land control, topography, and the demonstrably tight sulfide zoning are responsible for the tight, apparently haphazard layout of the survey lines. Anaconda personnel apprehended us on their claims twice, causing deviations from planned lines and necessitating re-planning of others.

As noted above, the examination is situated at the western edge of a broad expanse of weak mineralization and alteration. Lines 1, 3, and 7 are placed to test for westward extensions of the mineralization beneath the Tertiary sediments and Quaternary alluvium. The primary purpose of Lines 2, 5, and 8 is the delineation of the high sulfide system within the host rocks. Line 2 should have been continued to the south, but this ground is controlled by Anaconda. Their personnel were present at the time of the survey and prevented us from working in that area. No one was around while we were doing Line 5, so we trespassed to get the data. Line 4 details a highly-responsive, small, near-surface body noted on Lines 1 and 2, thought to be the extension of a chalcocite blanket encountered in drill hole BSW-2. Line 6 tests a shallow, structurally-covered area on the intersection of N-S trending mineralized structures and the E-W Buckskin-Yerington trend.

The interpreted extent of the causative body (the "anomaly bars") shown in Plates I and II is made with respect to a qualitatively assessed variable background. Specifically, this means that bedrock to the northeast, east, and south is presumed to have an intrinsic response of about 20 mils due to the visible "sea" of alteration and mineralization. Correlating geologic observations with geophysical results suggest that the 20 mil response continues for miles. The intrusive to the north and sediments to the west obviously have near zero background IP effect.

DISCUSSION

The most impressive aspect of the survey results is the sharp contact between the highly responsive material evidenced in outcrop and the background. Steep gradients of hydrothermal activity noted in the outcrop are not merely accidents of exposure, but have a through-going importance. On the other hand, the fact that a normal sequence of peripheral alteration is telescoped into a few hundred feet in the outcrops indicates that the sharp gradients in the IP do not necessarily indicate fault contacts. Furthermore, there is not a general correlation between low resistivity and high IP values (Line 5 is an exception). Thus the eccentricities of the Buckskin Southwest sulfide system are geophysical as well as geological, and interpretation must not be over generalized from analogy with other systems.

An early objective in the IP work was to establish extensions of the sulfide system under postmineral cover. The lateral limits of the Buckskin Southwest system, as determined by VIP, are indicated on Plate II. Lines 1 and 7 show sharp cutoffs to the west and northwest. Line 2 has no southern cutoff, but none was sought due to Anaconda's land position and presence during the work. Windows of pre- and syn-mineral rocks are not so well mineralized in this direction as are the equivalents in the area of the drilling. A southern plunge of the well-mineralized rocks below Line 2 is a possibility. The deep, weak IP response noted on Line 3 is interpreted to be due to a lateral effect from the mineralization delimited by Lines 1

and 7 and a high background in the lacustrine Tertiary sediments. Thus we interpret no extensions beneath postmineral cover other than the possibility on Anaconda's ground on the south end of Line 2.

The northern bedrock limits of mineralization are well established on Lines 2 and 5. The responsive material does not extend beyond about 1.5 N on either line. Any plunge to the north would be quite steep. The sea of alteration and pyritization which encompasses most of the Buckskin Range seems to have an IP response of 15 to 25 mils and resistivity in excess of 200 ohm-meters, as evidenced by the eastern ends of Lines 1 and 8. It is encouraging that the mineralization of Buckskin Southwest stands out against such a background; there may be other fish in the sea, and IP could find them.

Line 4 was placed to test an apparent near-surface response detected on Lines 1 and 2 which includes a small chalcocite blanket encountered in BSW-2. The data are interpreted as indicative of a body buried 250 to 300 feet, being at least 3 dipole lengths (900 feet) long and having a limited depth extent. A detailed study was made of the results of three theoretical model cases calculated by Hohmann (1974) which are applicable. All of these cases are for a conductive body at a depth of 1 unit; the high diagonals only on longer separations were not found for resistive or neutral bodies, nor for those at the shallower depth of 0.5 units included in Hohmann's catalog. The resistivity data of Line 4 don't indicate a very conductive body, and the data would seem to come from a slightly shallower source than the model. Still, the agreement is good for the general aspects of interpretation. We believe that the chalcocite in BSW-2 extends laterally over several hundred feet. Additional short-dipole VIP may be warranted to further define this zone, if the small blanket is deemed worthy of further search.

Attempts at interpreting the VIP data in terms of sulfide zoning patterns within the Buckskin Southwest system have not been successful. The high sulfide zone is too small and too deep to permit resolution of variations within. Lateral effects from the less responsive host rocks can easily account for the apparent deep IP lows of Lines 1 and 5. (from Hallof, 1968). The low IP response at depth in the center of the anomaly is not due to reduced intrinsic response at depth. Similar features are noted in the results of Hohmann (1974) and Snyder (reported by Hohmann).

Line 6 reveals no anomalous response. The favorable area of structural cover and intersecting structural trends is unmineralized.

It is tempting to attribute all mineralization and alteration in the Buckskin Range to one phase of intrusive activity such as emplacement of early Cretaceous quartz monzonite porphyry. Such a model would probably assume the large Buckskin Southwest and Minnesota alteration areas to be the surface expressions of hydrothermal centers, which in turn would be responsible for the broad alteration "sea" to the east. The writers believe

that this model ignores several pertinent facts, and propose an alternate hypothesis: the two apparent hydrothermal centers, localized in selectively fractured Cretaceous intrusion breccia, are superimposed on the edge of the Buckskin alteration "sea," probably developed during several previous phases of igneous activity and related alteration and mineralization.

The Buckskin Southwest and Minnesota hydrothermal centers are the only large, exposed areas of intense hydrothermal alteration in the Buckskin Range. Both are situated on the extreme western edge of the Buckskin alteration "sea," conspicuously devoid of alteration zoning, and consisting of myriad, relatively tiny patches of diversely altered, but pervasively pyritized (a consistent 4-5 volume percent) Mesozoic metamorphic and intrusive rocks. Both areas grade sharply eastward into this broad erratic alteration zone, and even more sharply westward into essentially barren rock. It seems unlikely that these two apparent hydrothermal centers could alter and mineralize great volumes of rock to the east while leaving similar rock to the west virtually unaffected. It also seems unlikely that one pulse of mineralization could result in a fairly uniform distribution of pyrite -- regardless of alteration -- within the Buckskin alteration "sea." It seems more likely, rather, that the bulk of the "sea" was fully developed prior to generation of the Buckskin Southwest and Minnesota centers, probably in several phases, related to intrusion of various Mesozoic plutonic and hypabyssal rocks, and perhaps, in part, to syngenetic pyritization associated with extrusion of Mesozoic volcanic rocks. Sharp alteration gradients in the two centers would reflect steep pressure-temperature gradients in selectively fractured intrusion breccia.

REFERENCES

- Hallof, P. G., 1968, Theoretical induced polarization and resistivity studies, scale model cases, phase II: McPhar Geophysics Ltd. report, 1 October.
- Hohmann, G. W., 1974, Catalog of three-dimensional IP models: KES-GDR&D report, March.
- Van Voorhis, G. D., 1972, Electrical parameters of porphyry copper mineralization: KES-GDR&D report, September.

LINE 8

(35)

Item

15



KENNECOTT COPPER CORPORATION - EXPLORATION SERVICES
GEOPHYSICS DIVISION - U. S. OPERATIONS

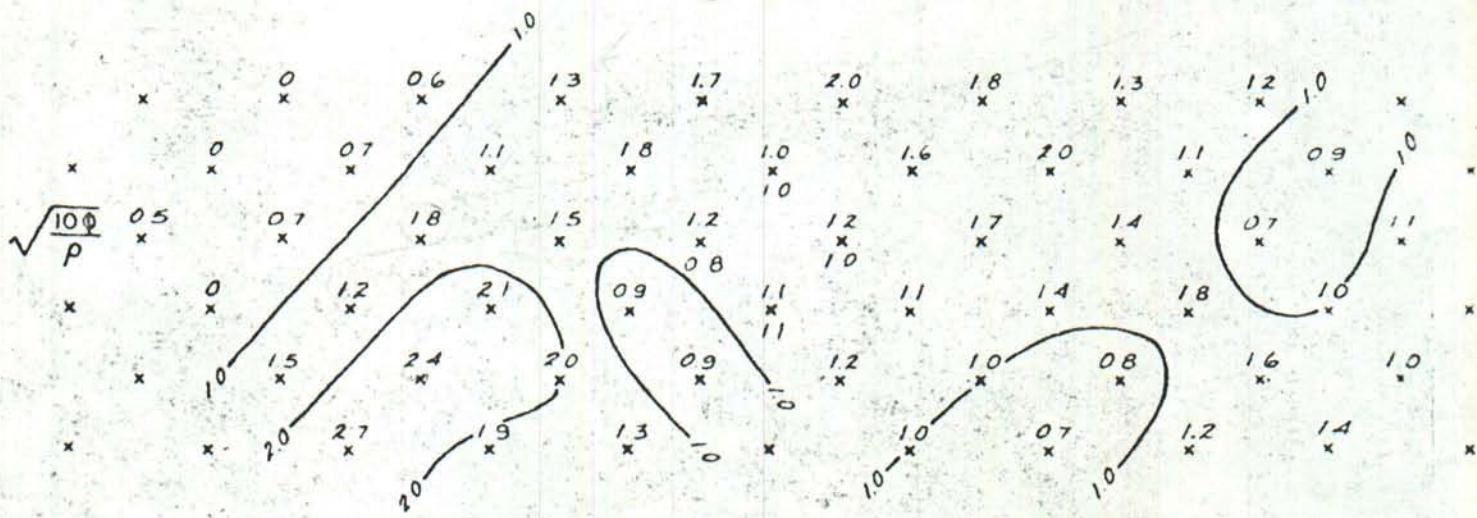
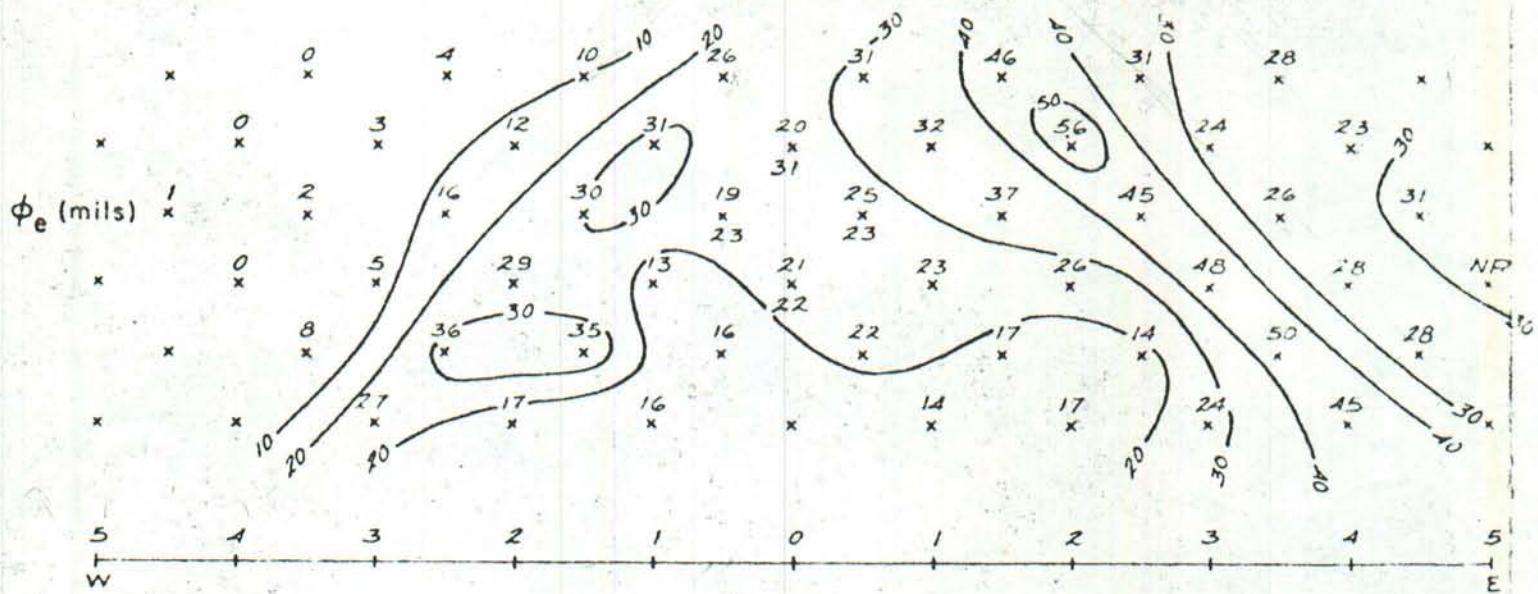
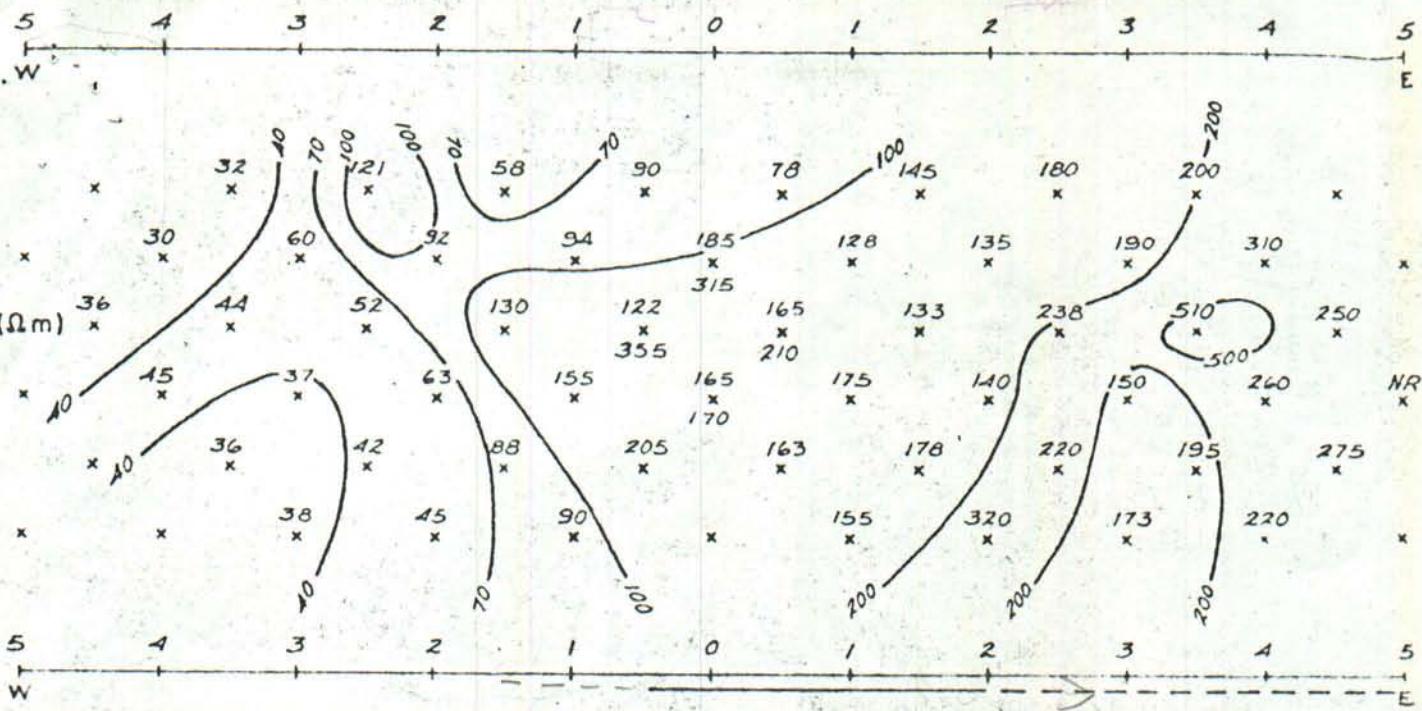
VIP PROFILES

BUCKSKIN SOUTHWEST AREA

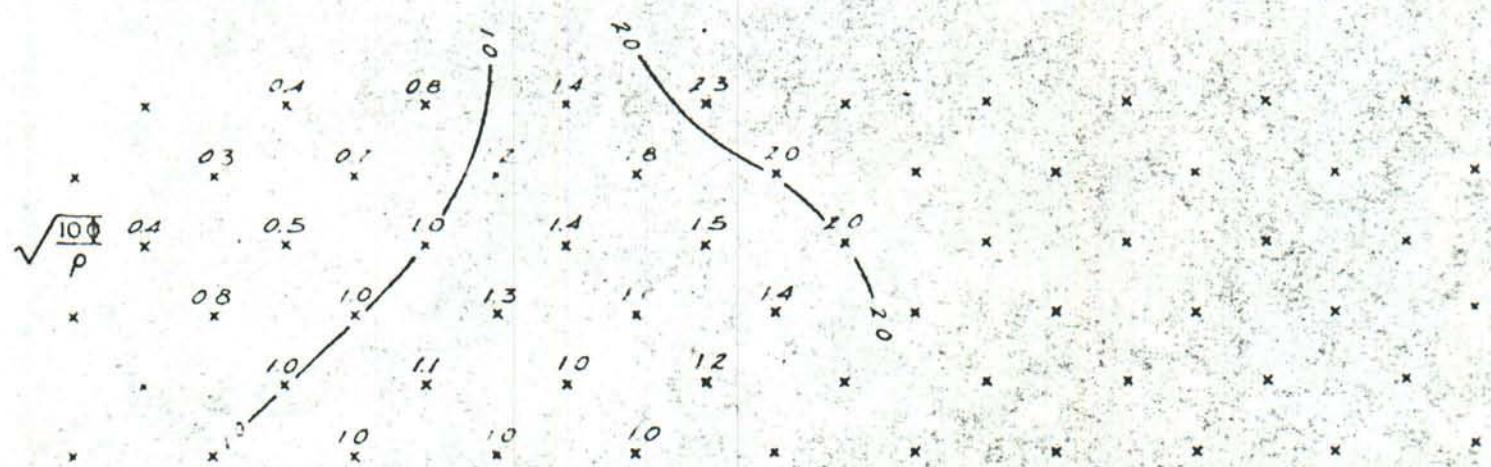
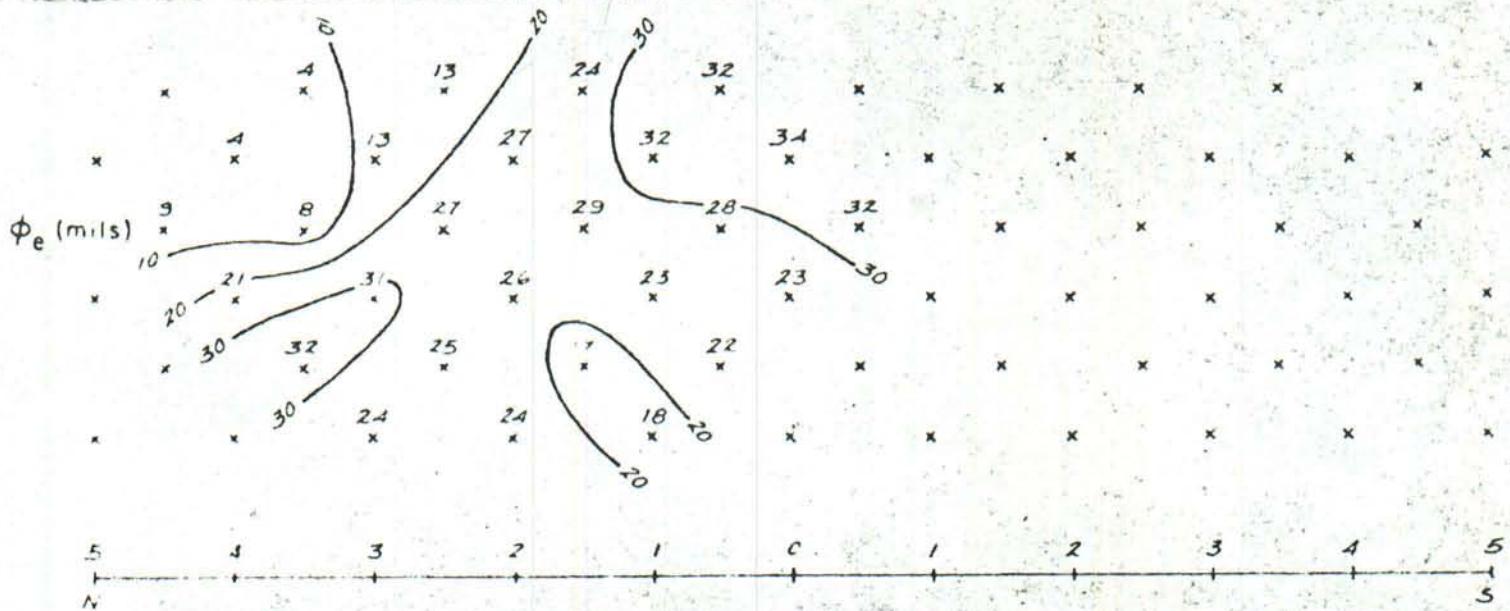
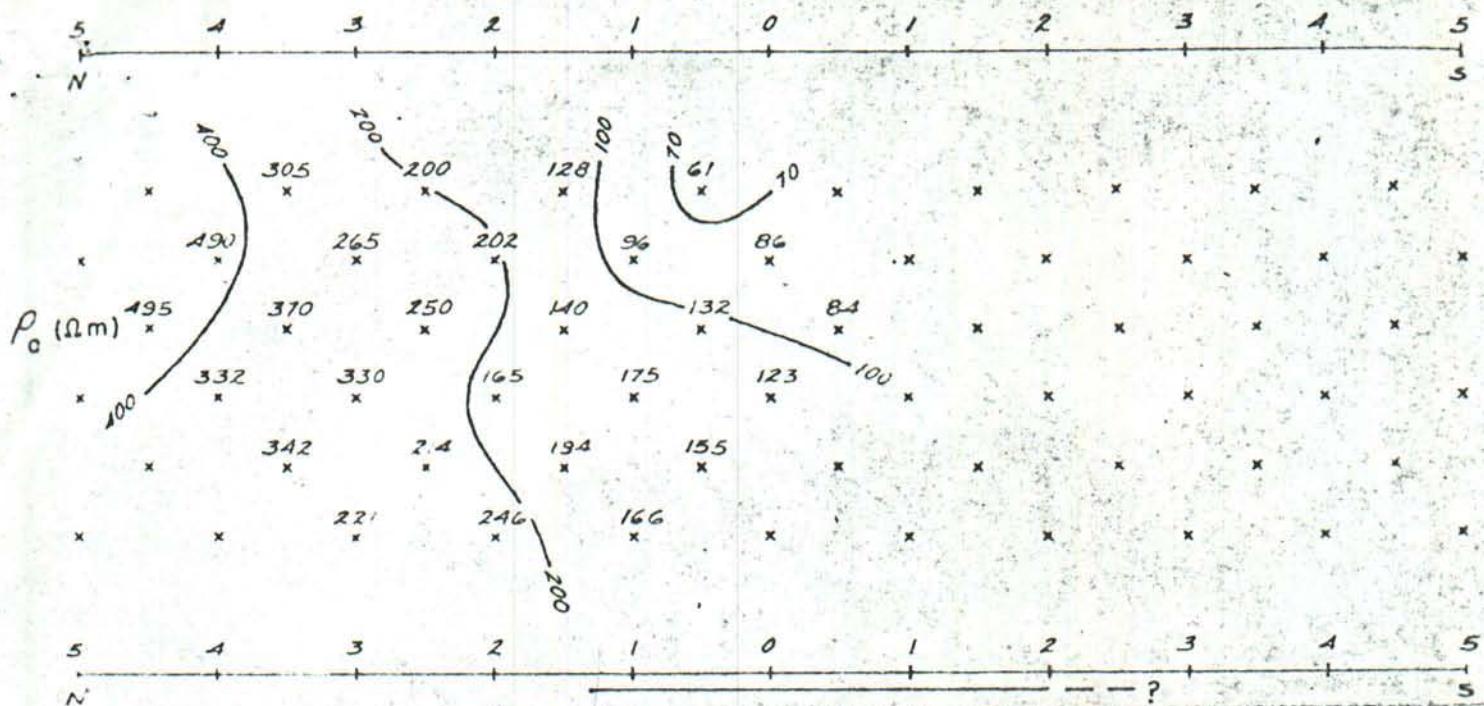
Douglas County

Nevada

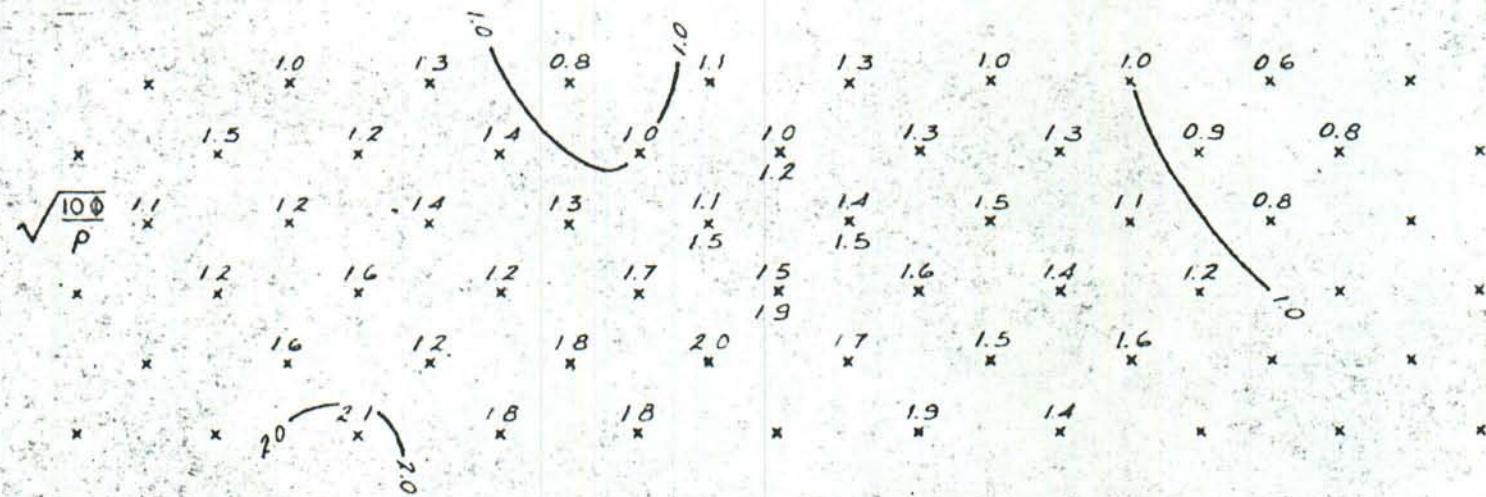
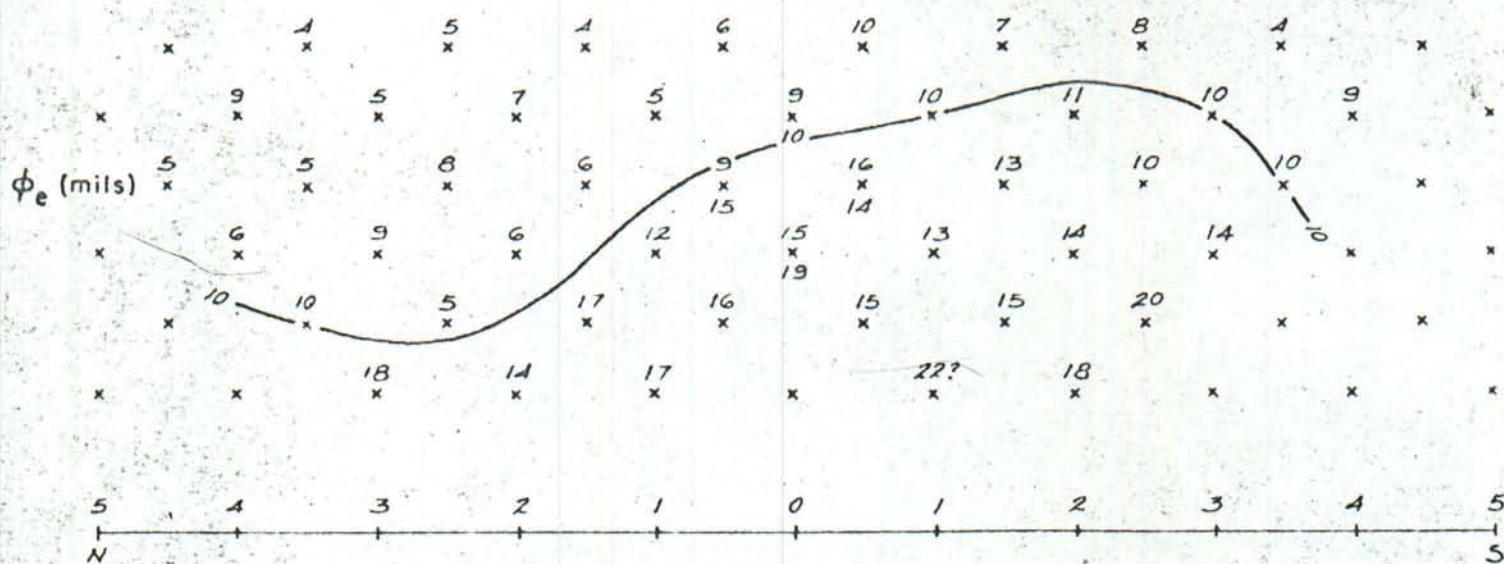
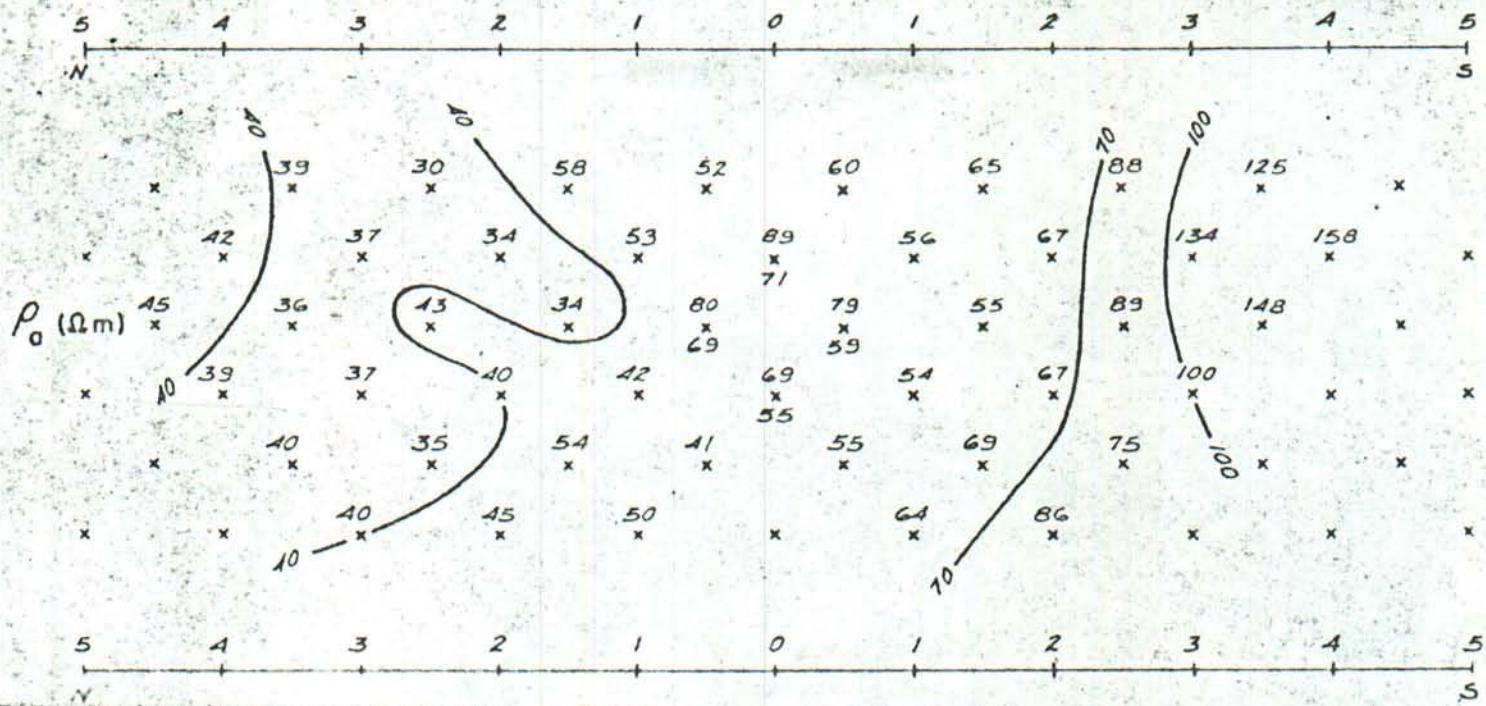
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DATE:	September, 1974	DATA BY: W. Frangos	
DRAWN BY:	R Holmer, C. Dorschel	SHEET / OF / DRAWING NO.: NV35-502	Plate III



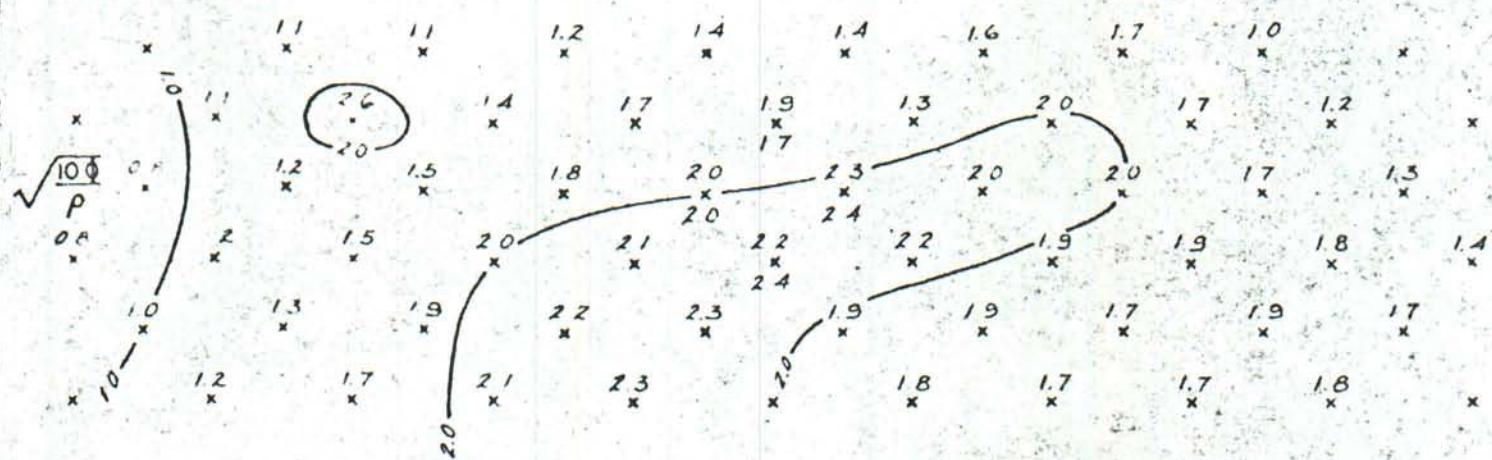
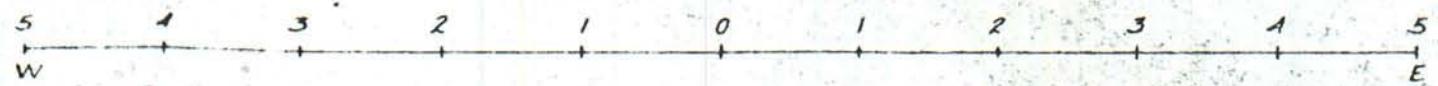
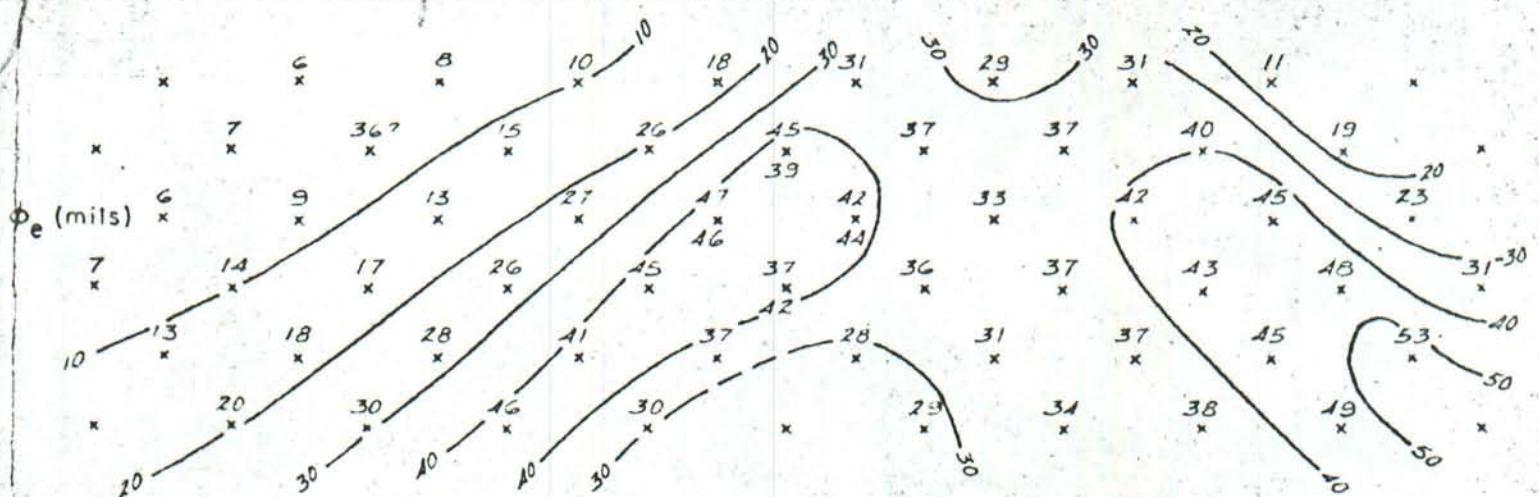
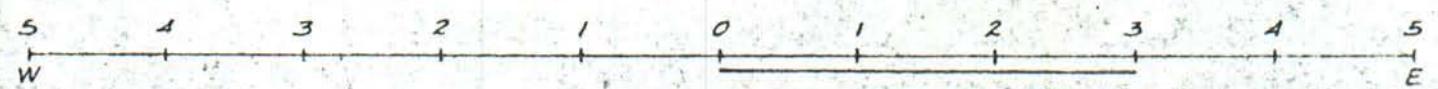
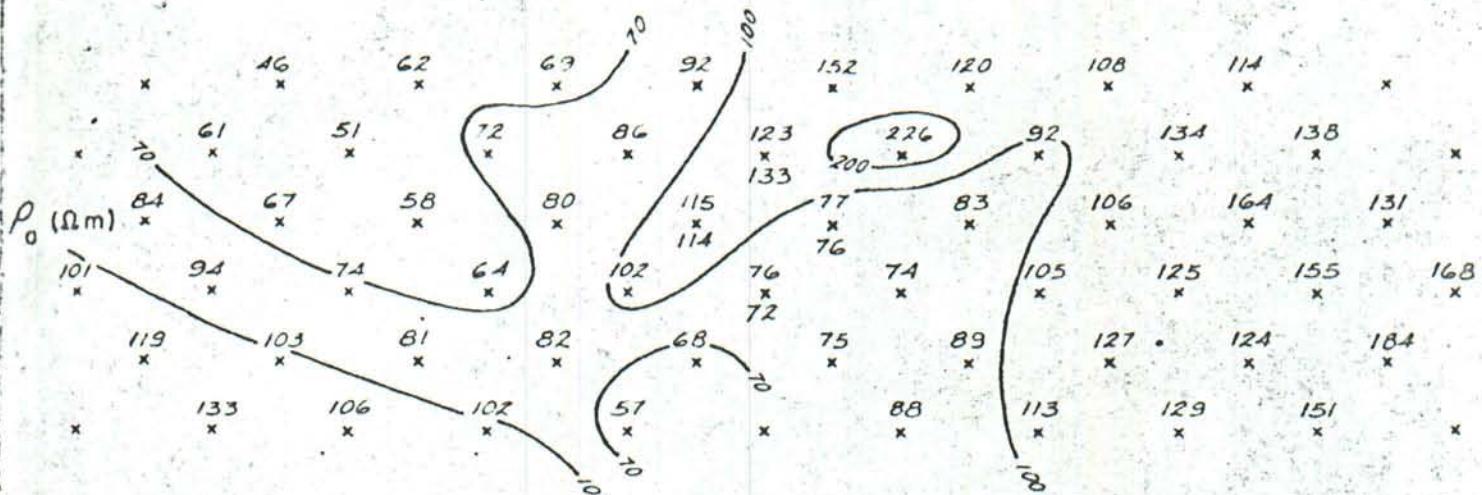
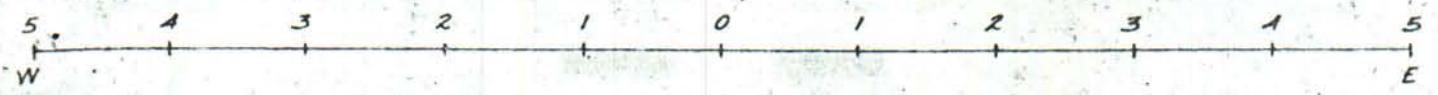
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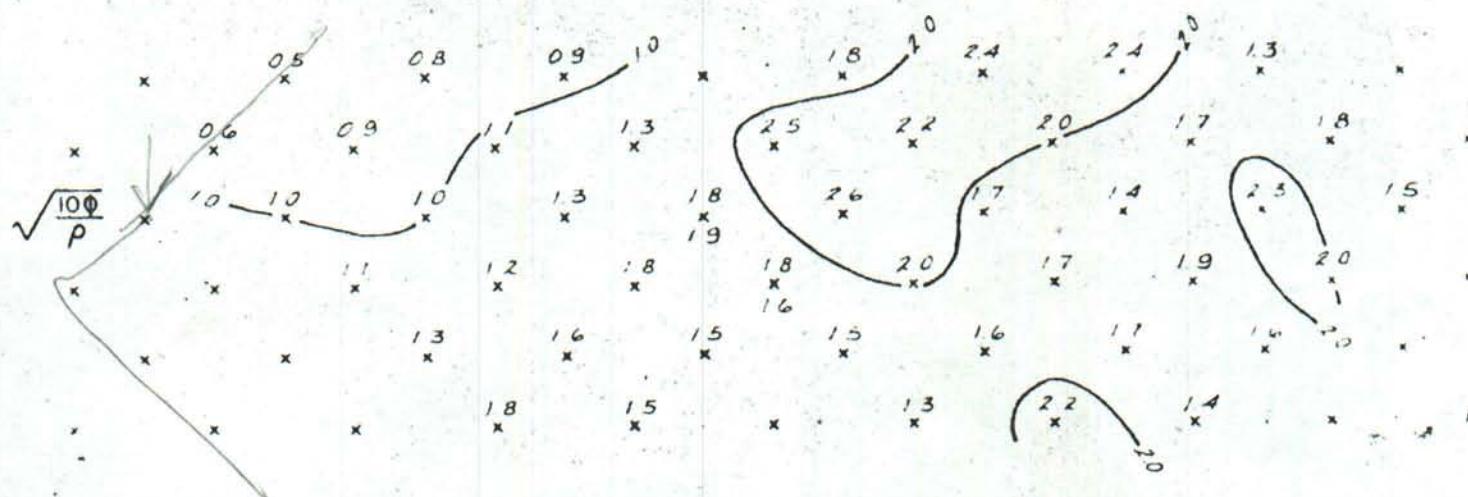
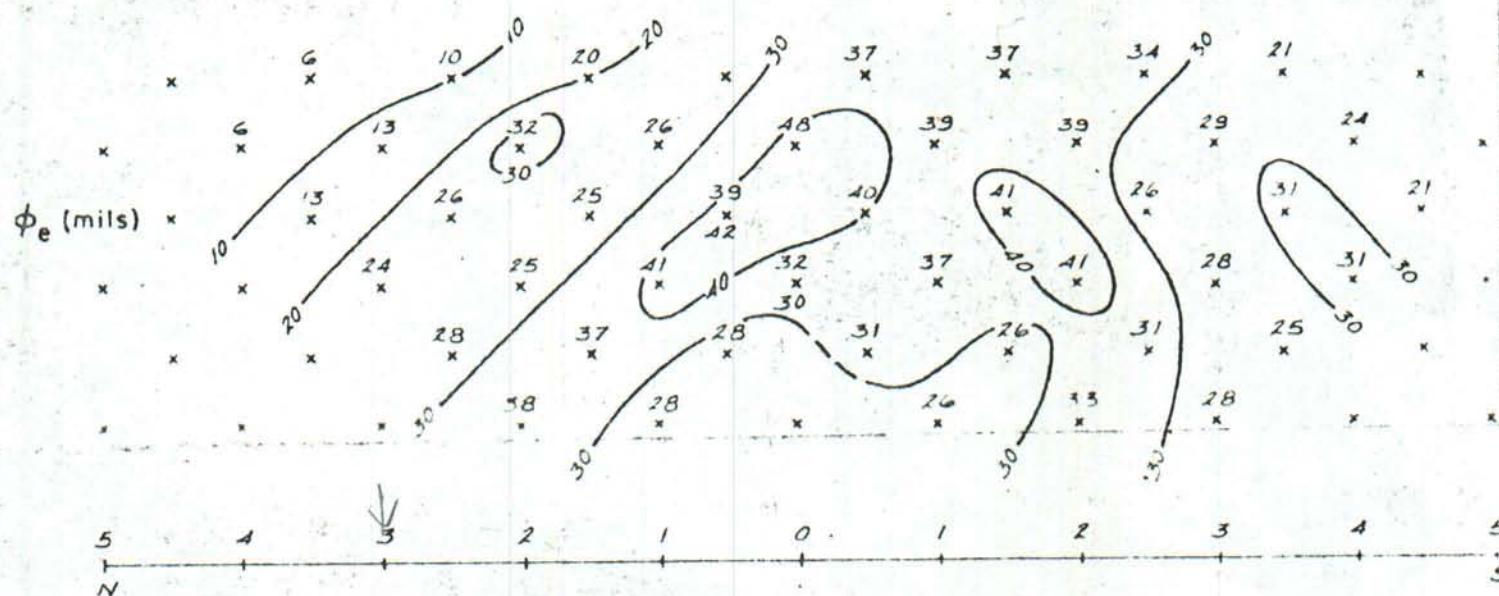
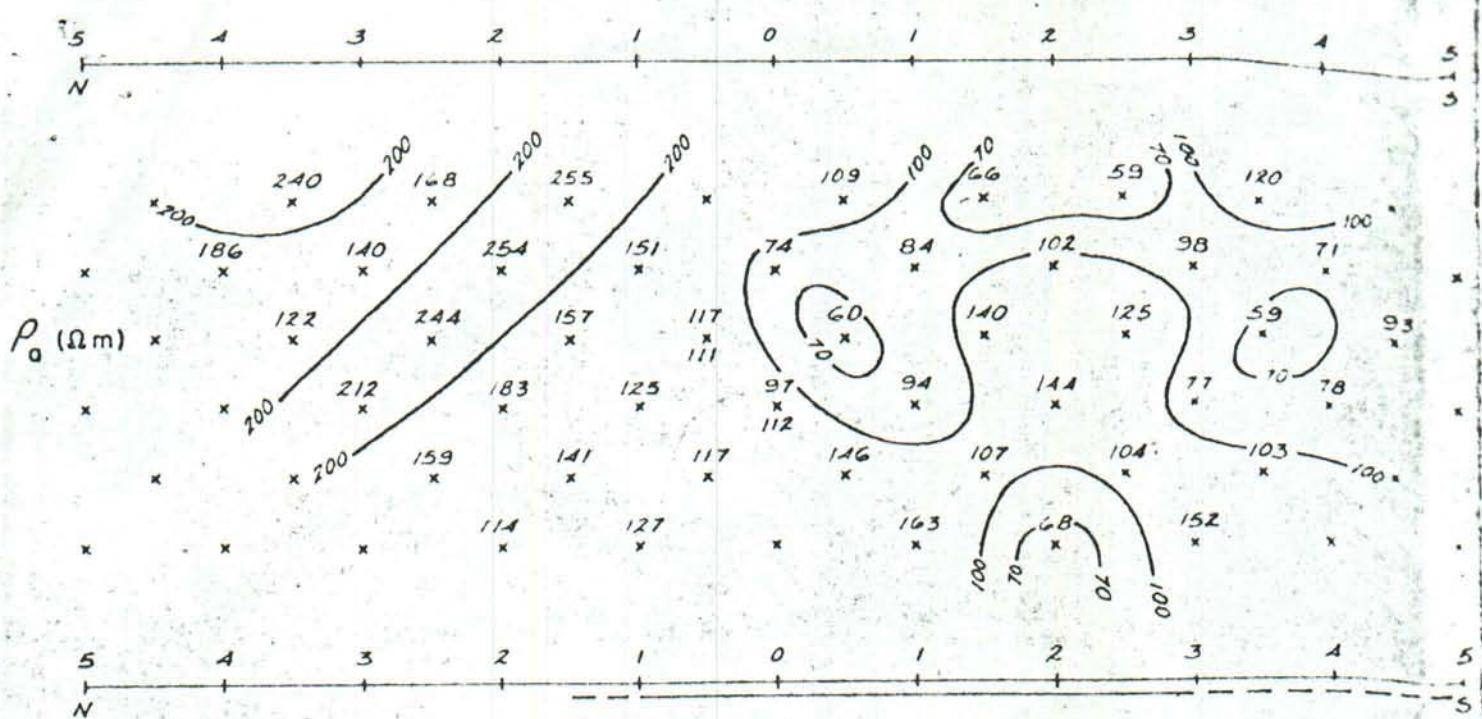
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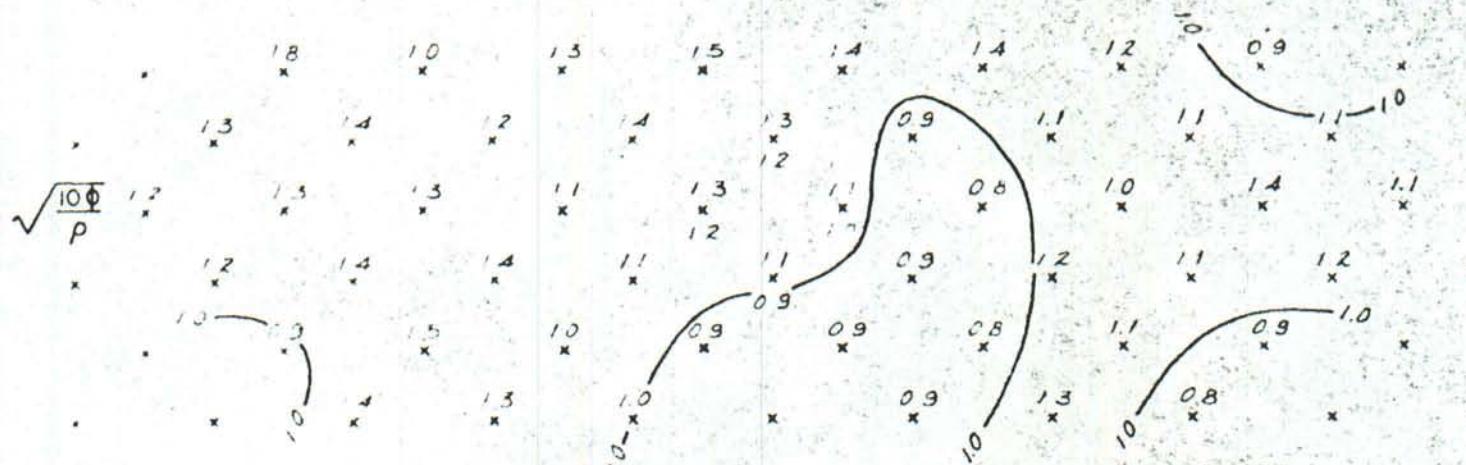
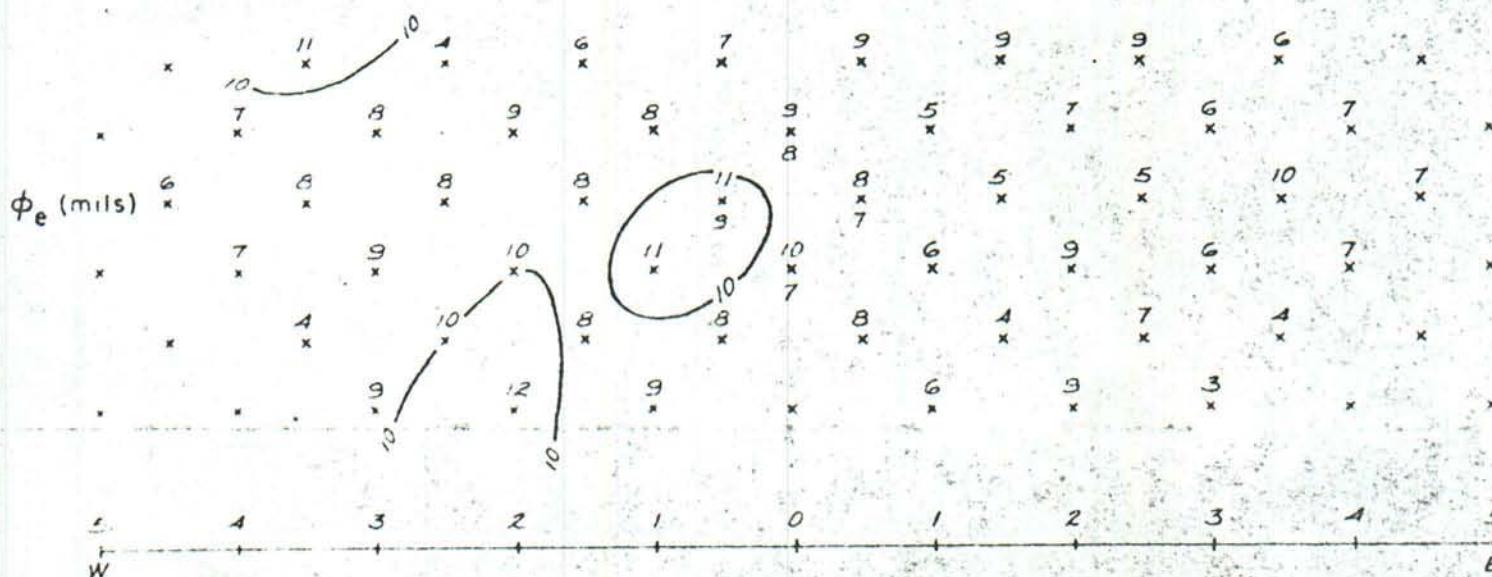
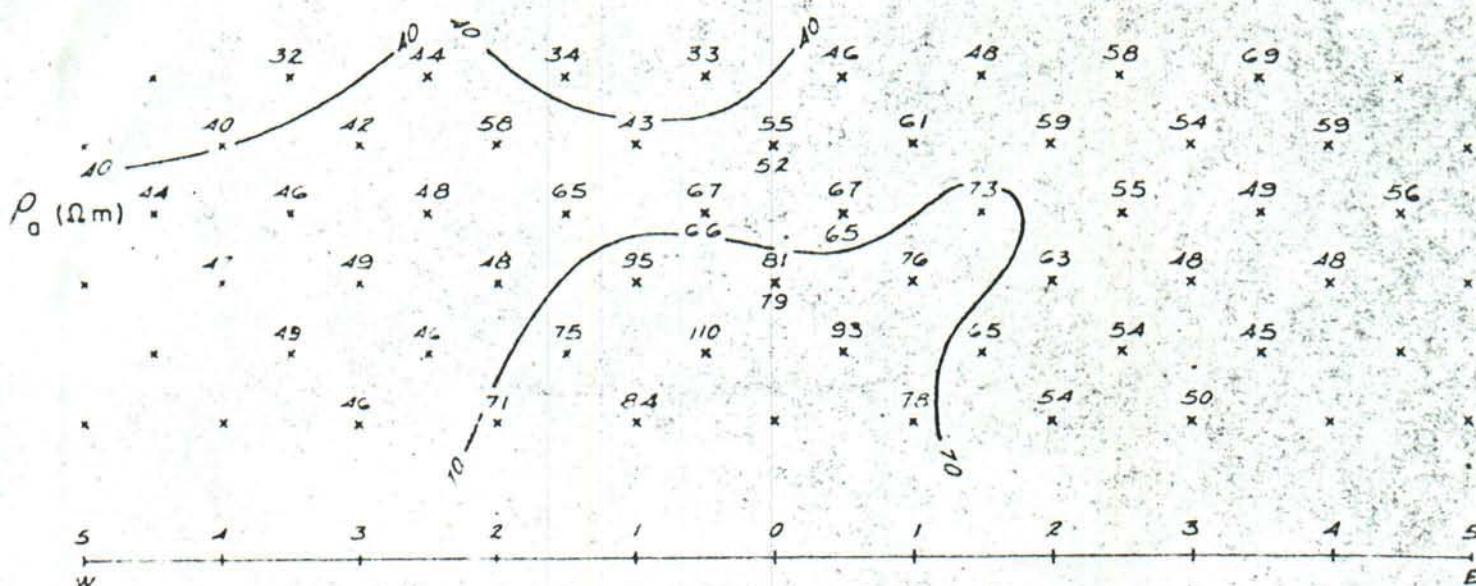
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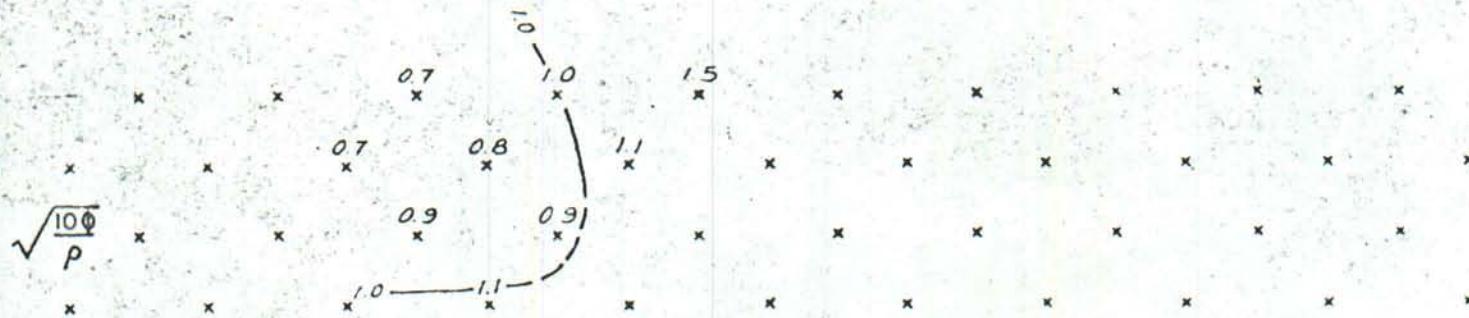
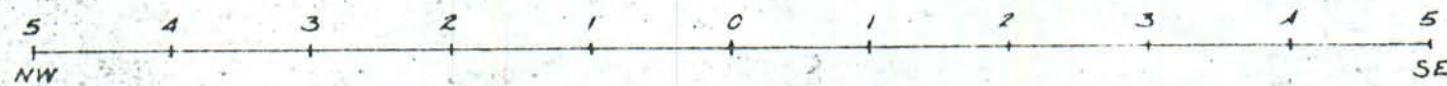
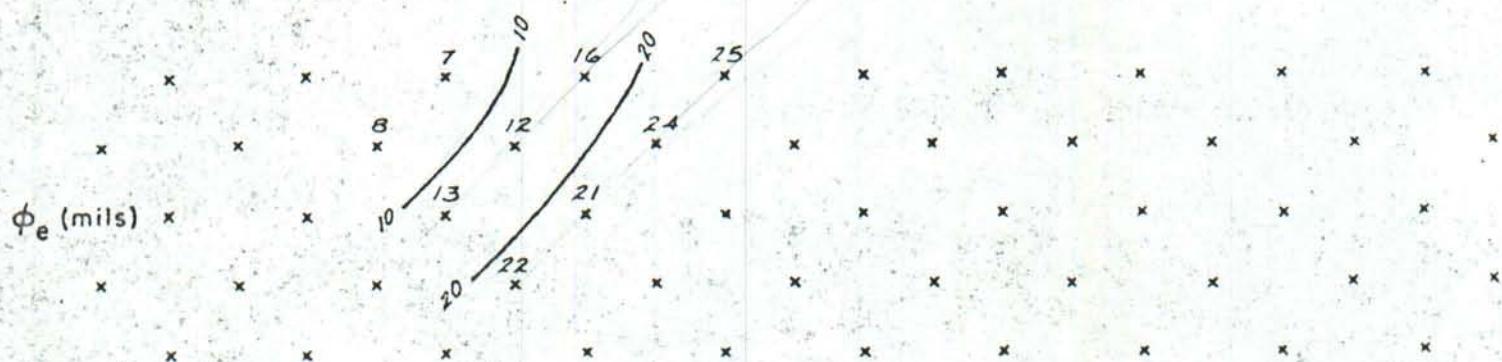
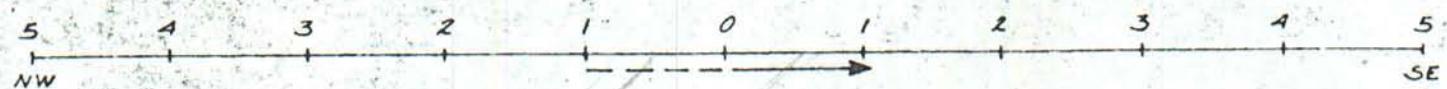
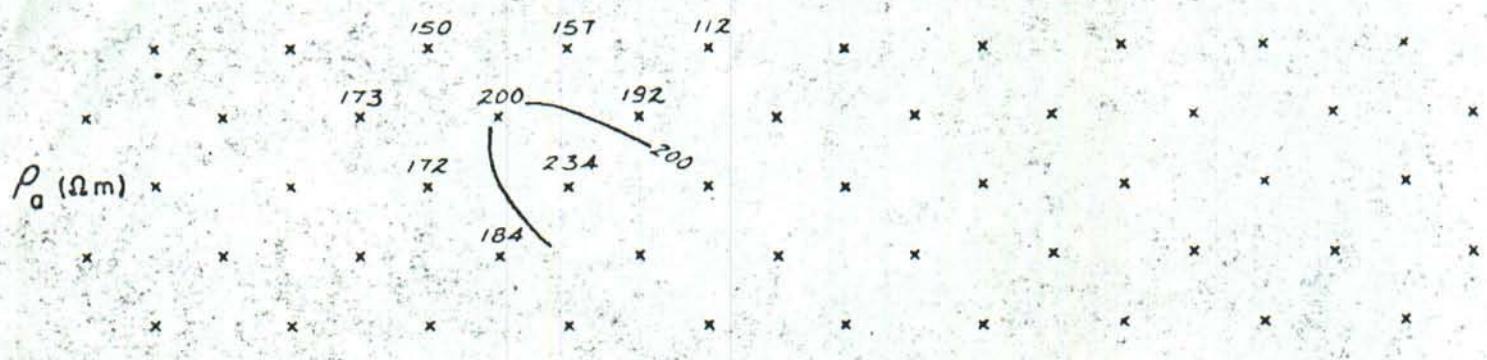
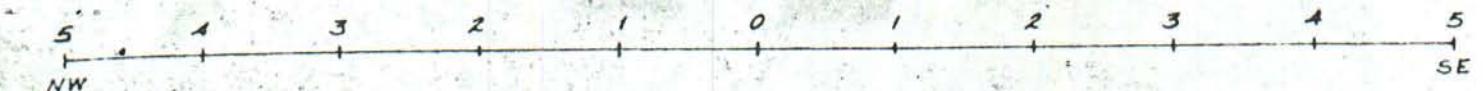
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(300' Dipoles)



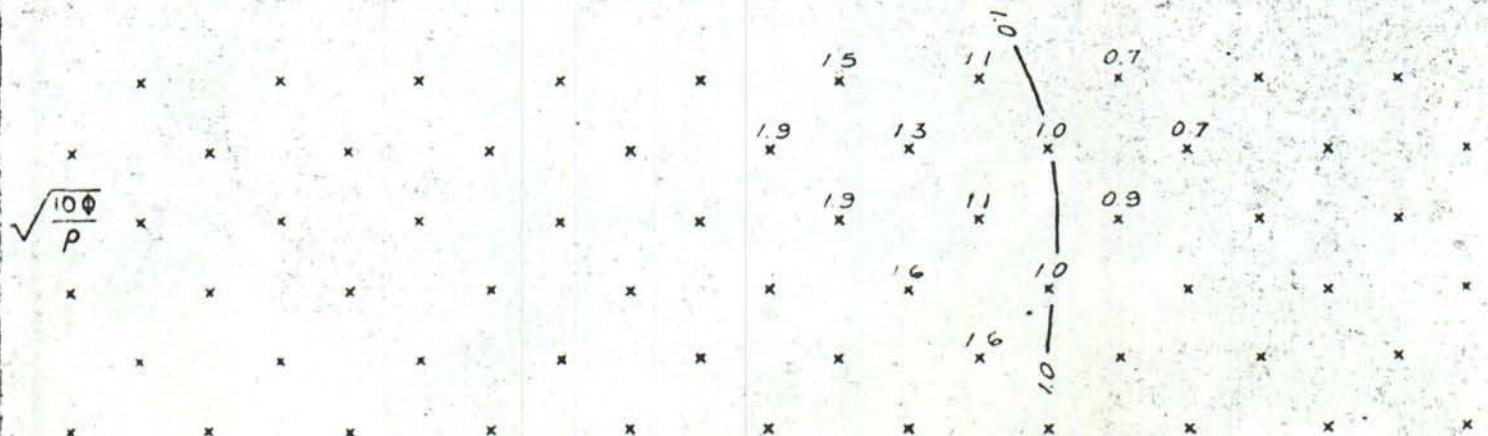
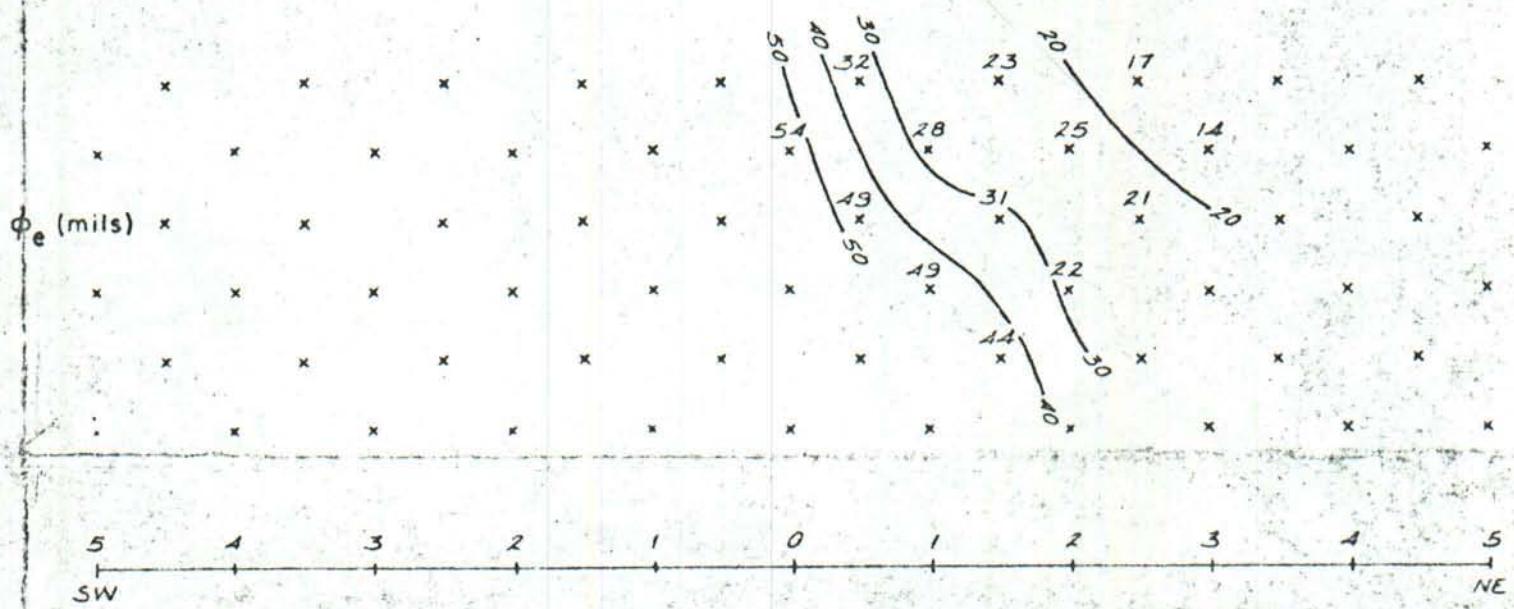
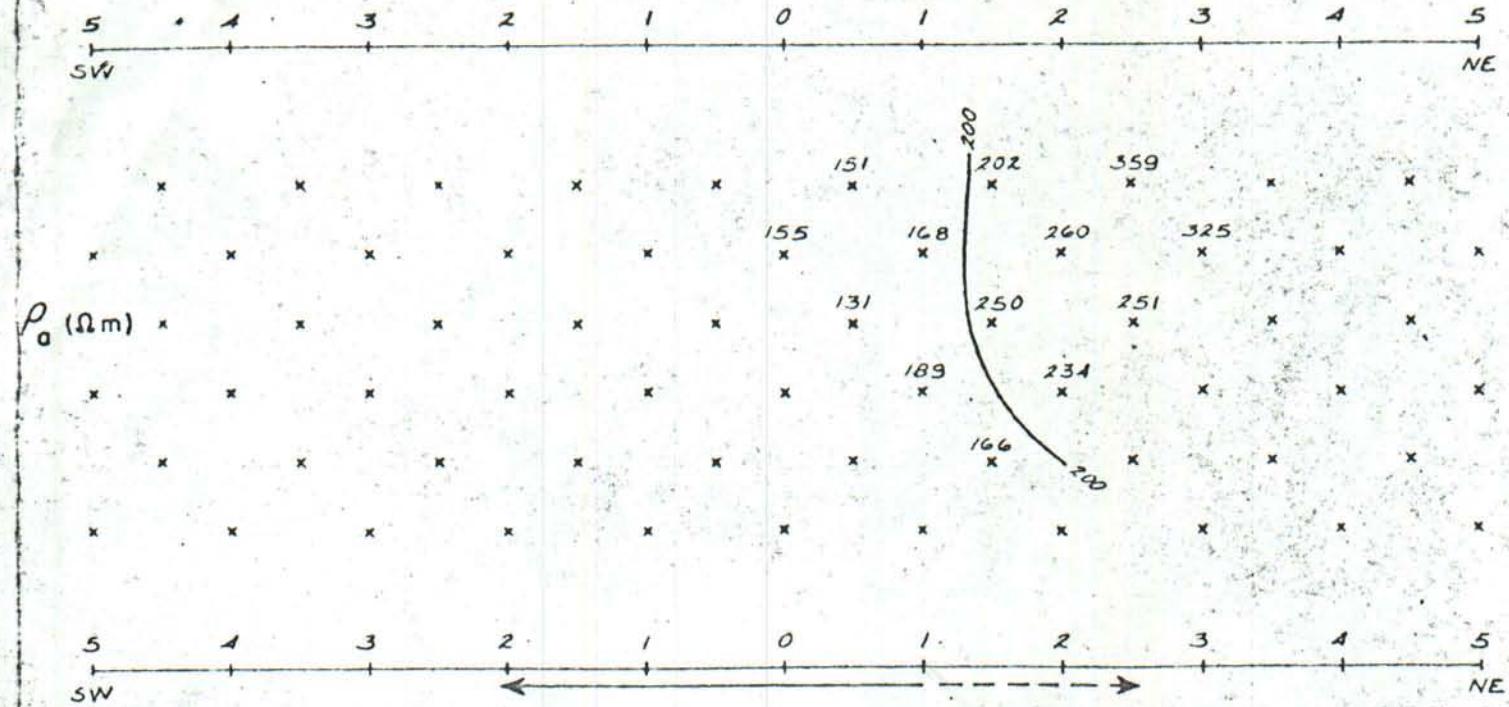
LINE 5



LINE 6



LINE 7



LINE 8

(33)
RECEIVED
OCT 30 1971
ITEM 15
NW - BCMC

MEMO TO: M.D. REGAN
FROM: J.B. HULEN

SUBJECT: PROPOSED VIP LINE ACROSS THE
SOUTHERN BUCKSKIN RANGE PEDI-
MENT

DATE: OCTOBER 27, 1972

I propose a VIP test—one east-west line, for the present—of the pediment south of the Buckskin Range. I feel this area offers good potential for the discovery of a shallow, sub-volcanic, possibly enriched, Buckskin Southwest-type porphyry copper sulfide system.

A pronounced, east-west-trending magnetic lineament through the pediment area is an obvious feature of the Mineral Peak-Buckskin aeromagnetic survey. This lineament is directly on strike with the Yerington and Mickey Pass porphyry copper deposits, and could be the subsurface expression of the master wrench fault zone of the Buckskin-Yerington structural belt. Several moderate-amplitude magnetic highs are aligned along the lineament south of the Buckskin Range. These highs might originate from magnetic plugs of dacite porphyry—inferred to be responsible for copper mineralization at Buckskin Southwest.

Gravity data show alluvial cover to be relatively thin for some distance south of the range.

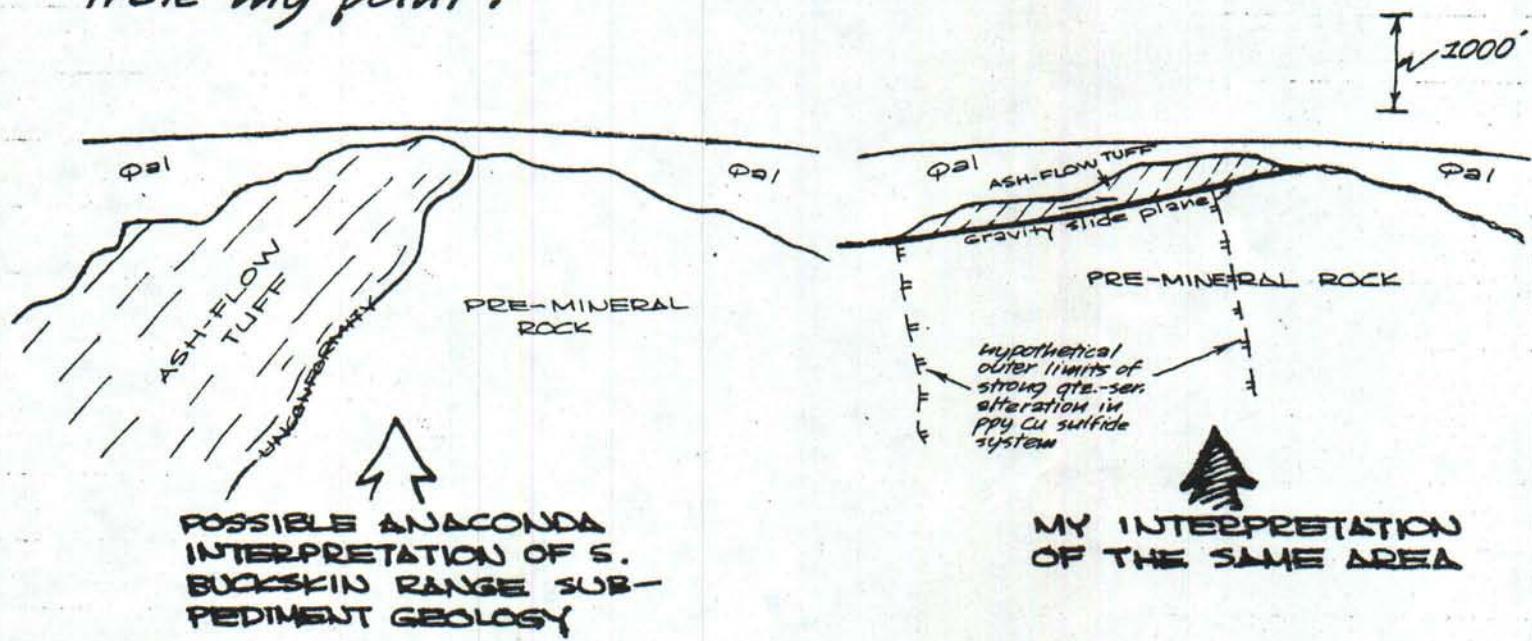
Pre-mineral rocks nearest the proposed VIP target area are thoroughly altered. Intensity of alteration varies from chlorite-epidote-magnetite (veinlet) to pervasive quartz-sericitization. A large mass of intensely quartz-sericitized intrusion breccia—known to have closely controlled mineralization and alteration at Buckskin Southwest—is exposed about 3000' north of the proposed target area at the southern edge of pre-mineral exposure in the southern Buckskin Range. The breccia mass—a large, dike-like body—is striking roughly north-south, directly for the target area.

Small, isolated copper occurrences are present throughout the southern end of the range in pre-mineral rock.

The land situation over the proposed target area is quite favorable. ^{The Southern Edge of} Anaconda's giant Buckskin Range claim block is at least 2000' north of the southern tip of the range. Much of the area is therefore open for staking. The remainder is private land—probably part of the sprawling 3-2—(Three-Two-Bar) Ranch in Smith Valley.

Anaconda apparently feels the extreme southern Buckskin Range and adjacent pediment is unworthy of exploration. Why? I shall speculate. The southern end of the range is largely covered by post-mineral ash-flow tuffs, which dip westward $> 65^\circ$.

If one assumes the tuffs were emplaced horizontally, then tilted westward along B-R rotational faults, the depth to an hypothetical, sub-volcanic sulfide system would certainly be prohibitive. I have strong reason to suspect, though, that the tuffs were emplaced from the west as a gravity slide block, with a roughly horizontal base. If one accepts this hypothesis, the depth to that sulfide system becomes quite permissible. The following sketches may help to illustrate my point:



My hypothesis can be efficiently and quickly tested with one E-W VIP line. The KEI-GDO VIP crew will be in the area during early November to survey the Buckskin Southwest sulfide system, and could complete a line over the flat target area in one or two days.

Geologic mapping in the southern Buckskin Range

is confined to a terrible 1:250,000 map by Moore, and a 1:24,000 map completed by a BCMC summer geologist. Both, but especially the latter, are totally inadequate. I therefore propose to spend several days preparing an adequate map with which we'll interpret the probable positive results of the VIP line.

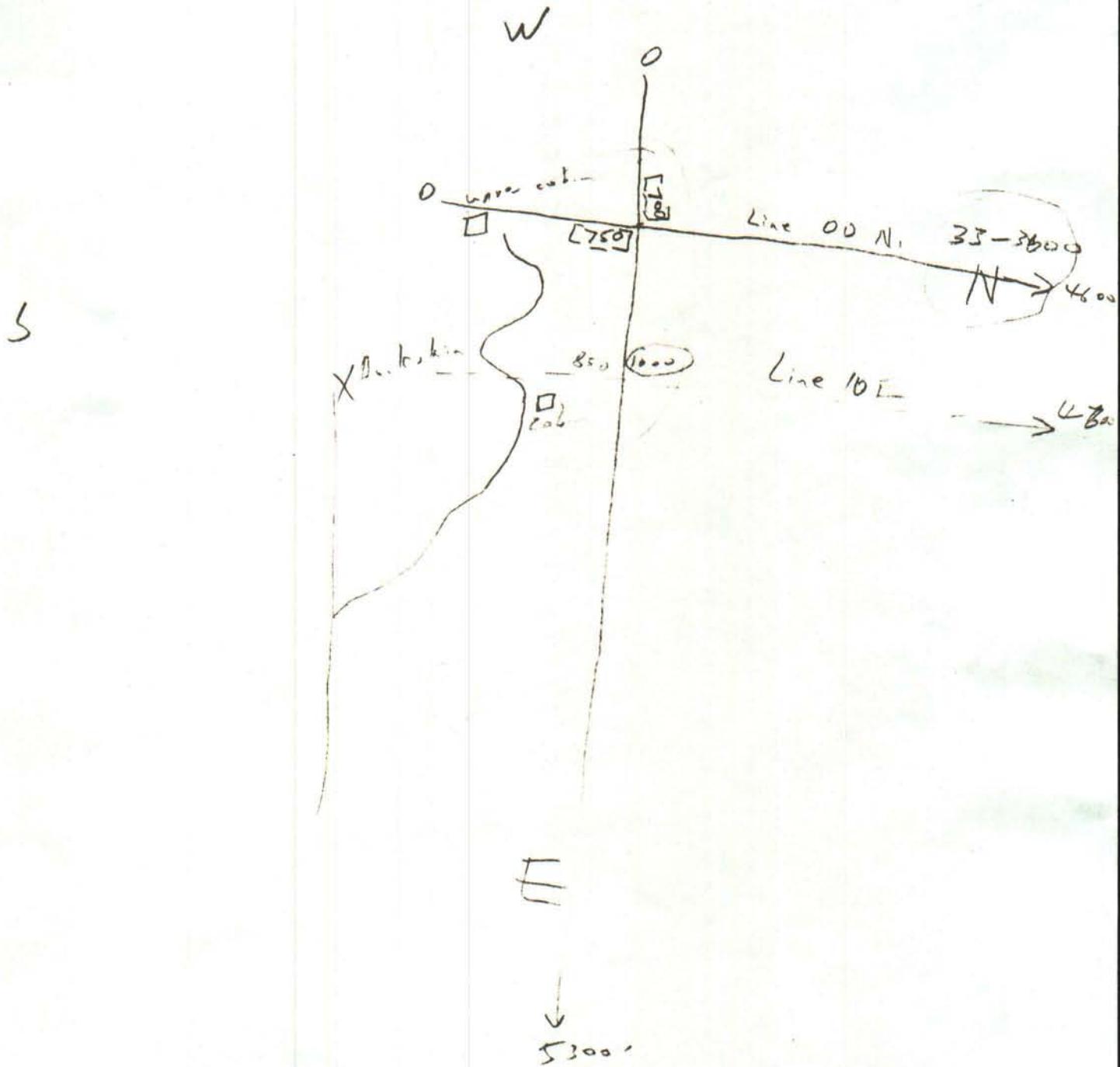
Jeff Halen

XC: KEI-GDO - P.M. Wright, W.T. Frangos

35

Item 15

Nevada Group



Nevada Group

Nev. Group

Line # III E

14-411, 65

Cougar - Martin



300	15-18-21-24	1.4		300 NA	10.9	11.1	160	10.0	50	8.75	45.6	67.3	61.4	905	8.8%
300	14-17-20-23	1.4		30 NA	23.6	23.6	250	20.7	78.2	17.9	71.3	105.2	96.0	588	8.7%
300	13-16-19-22	1.4		30 NA	62.1	61	180	52.5	133.5	44	120.9	179.8	162.5	362	9.6%
300	12-15-18-21			300 NA											
300	10-13-16-19	1.4													
300	9-12-15-18	1.3			75	→	225	58.9	143.2	50	129.6	196	174	398	11.2%
300	7-10-13-16	1.4			70	→	265	60.8	146.1	50.3	130	212	188.4	384	11.7%
300	7-13-14-25	1.4			84	→	115	65.8	153.7	55	137.5	206.5	185	358	10.4%
600	7-13-14-25	1.4			107	96	220	87.5	187	73.2	165.4	251.7	222.7	318	11.5%
500	7-12-17-22	1.4	"	30 NA	27.5	25	145	22	81.3	20	76.7	218.3	206.1	168.6	5.6%
			"		94.2	→	165	36.6	109	31.7	100.9	244.4	226	210	7.5%

Mr. Camp

2. ac # E

Ma, 17, 18 '65

													FE		
300	26-29-32-35	1,4	300	110	9.9	9	210	9.1	46.8	8.6	45	63	60.6	386	3.8%
300	27-30-33	1,4			11.7	11.3	210	10.8	52.3	10	50.1	70.4	67.5	366	4.1%
300	28-31-34-37	1,4			12.8	12.3	220	12.2	56.4	11.1	53.4	76	72	454	5.3%
300	29-32-35-38	1,4			14.5	14	200	-14.4	-	72.8	-	-	-	-	
300	29-32-35-38	1,4			15.0	14.2	200	14.2	62.3	12.9	58.5	83.8	78.8	472	8.55%
300	27-30-36-39	1,4			17.9	17.8	220	17.1	69.6	15.6	66	93.8	88.9	368	5.2%
300	31-34-37-40	1,4			20.5	20.1	230	20	76.6	17.9	71.5	103	96.3	426	6.5%
300	32-35-38-41	1,4			21.8	21.4	215	20.3	77.5	18.8	73.8	104.1	99.4	293	4.5%
300	33-36-39-42	1,4			21.1	20	225	20.5	78	18.1	71.9	104.9	96.9	491	7.6%
300	34-37-40-43	1,4			20.9	22	233	20.9	78.6	18.8	73.8	105.9	99.3	409	6.2%
500	28-33-38-43	1,4			4.0	3.9	225	4.2	29.2	4.4	30	-	40.4	-2.5%	
500	27-32-37+2	1,4			3.6	4.2	205	4.0	28.5	4.1	28.8	-	38.8	-1.0%	
500	26-31-36-41	1,4			3.8	3.8	195	3.9	28.3	4.0	28.5	-	38.4	-1.8%	
500	25-30-35-40	1,4			3.5	4.2	180	3.8	28.2	4.1	28.8	38	38.8	-2.1%	
500	24-29-34-39	1,4			3.5	3.8	235	3.4	26.4	3.9	28.3	35.6	38.1	-7.0%	
500	23-28-32-38	1,4			3.1	2.8	230	3.0	24.8	3.2	25.7	33.4	34.6	-3.6%	
500	22-27-32-37	1,4			2.7	2.3	205	2.7	22.2	3.0	24.8	29.9	33.4	-11.7%	
500	21-26-31-36	1,4			3.0	3.5	230	3.0	24.8	3.5	26.9	33.4	36.2	-8.4%	

New La Group
Line # III E

May 17, 65

Lorenzen - 142 - f. 4

300	16-19-22-25	1/4	30°NA	6.8	6.4	200	6.4	37.8	5.5		
"	"		+H ₂ O			1.25	37.5	5.9	36.1	50.5	48.6
300	17-20-23-26	1/4		7	6.6	140	6.3	37.6	5.6	35	50.6
"	1.7			8.4	8	165	8	43.3	7.3	41.0	48
300	18-21-24-27	1/4		7	6.8	120	6.8	39.4	6.0	36.6	53
"	1.7			10.5	10.2	140	10	50.1	9	46.5	55.6
300	19-22-25-28	1/3		5	5.6	255	5.2	33.6	5.0	33	48.7
500	17-22-27-32	1/6		4.	4.1	4.1 ¹⁸⁵	4.1	28.8	4.5	30.4	56.5
"	1.7	-		7.7	7.2	140	7.6 8	6.6	-	-	59.7
300	20-23-26-29	1/7		7.7	7.2	140	7.6	42	7.4	41.2	46.6
300	21-24-27-30	1/4		4.8	4.2	225	5	33.2	4.5	30.4	44.7
300	22-25-28-31	1/4		5.6	5	200	5.3	34.2	4.95	33	46
300	23-26-29-32	1/4		6.6	6.0	225	6.2	37.2	5.8	36	50
300	24-27-30-33	1/7		9.6	10	190	9.6	48.2	8.8	45.8	53.5
300	"	1/4		6.8	7.1	150	7.0	40.2	6.3	37.6	54.2
300	"	1/4		7.1	7.5	160	7.0	40.2	6.8	39.4	54.2
300	26-28-31-34	1/7		9	9	195	8.5	45	7.8	42.9	49.95
"	1.4					6.25	37.5	6.0	36.6	50.5	49.25

Project: New Group

DATA

Date: March 27 65 ①

$L_{i-e} \neq 0$

March 28' 65

2

Nevada Group
Line #0

Mar. 28, 65
Rg Louvian Rg M. Khol's.

					C	C	R.P.S. ↓	R.S.O. ↓	F.E.
200	44-42-40-38	1.2	79	30 N/A	10.1 nf.	140	166.9	310	155.7 295 48.65 324.2 4634
200	44-41-38-35	1.2	76		↓	100	1:1	228	110.3 220 357.8
"	"	1.6	98			130	177	315	158.2 296 370.9 348.3
300	43-40-37-37	1.2	81			155	1:1.5	228	111 221 358.0
300	42-37-35-33	1.2	76			110	139.5	265	126.2 240 416.2
300	41-38-35-32	1.2	84			150	160.2	300	146.1 279 471.3
300	40-37-34-31	1.2	90			185	158	295	143 268 470.3
300	38-36-33-30	1.2	90			190	14.7	289	136 260 453.6
300	38-35-32-29	1.2	86			175	126.8	241	113.7 223 378.3
300	"	"	"			"	12	242	112.4 222 379.5
"	"	1.2	88	+H ₂ O		175	130.2	250	117 231 392.5
300	27-34-31-28	1.2	84			150	135.6	254 266	121.8 248 463 362.9
500	36-33-30-27	1.2	96			205	158	295	139.5 271 463.0 426
"	1.0	83				175	124.7	238	110 220 448.5
300	35-32-29-26	1.2	80		-	184.7	329	166.2	308 516.5
300	36-33-30-27	1.2	97	+H ₂ O		205	158	295	139.5 270 463.5 424.0
300	34-31-28-25	1.2	100			220	181.3	321	154.2 300 504.8
300	33-30-27-24	1.0	83			195	140.2	267 272	124.5 251 513.0 474 448.3

~~7.62~~
10.78%

6.325%

6.77%
11.52%

8.2%

12.06%

6.41%

8.57%
12.06%

7.62%
10.78%

Project: Nevada Group

I. C. DATA

Date: May 2 '65

Line 0E

Operators

aff.	Sp	ad	Ts	S.P.	+ pot	+ DC	- DC	V	DC	V	C.S.	V	C.S.	V	S.S.	V	10	DC	V	5.2.5	S	10	MP ²	MP	MP	Remarks
300	1-4-7-10	1,2						185		311,1	501	272,8	450			787		707				88,6		10,2%		
300	4-7-10-13	1,2						215		337,0	537	295	480			845		754				89,5		10,5		
300	7-10-12-11	1,2						190		286,5	467	250,7	421			734		662				92,4		9,8%		
300	10-13-16-19	1,0						250		178,5	323	151,9	289			609,5		545				119,5		10,6		
300	13-16-19-22	1,2						160		149	289	132,85	262,5			448		412				122,7		8%		
300	16-19-22-25	1,2						175		22,5	82,8	20,9	78,8			130		123,8				385,5		4,8%		
300	19-22-25-28	1,08						270		13	588	11,7	55,1			102,6		96,3				416		6,1%		
600	1-7-13-19	1,0						260		59,9	144,3	54,2	136,4			545		514				69		5,7%		
600	4-10-16-21	1,2						210		88	187,9	187,9	172,3	172,3			590		542				93,6		8,1%	
600	7-12-17-25	1,2						180		87	186,4	80,2	176,8			586		555				62,1		5,3%		
600	10-11-22-28							170		37,4	110,5	35	106,8			345,5		335				56,4		3%		

Project: Nevada 6-on

I. L. DATA

Date: May 30 '65

Operators: _____

Line # of

a(ft)	Spread	la	S.P.	+ pot	+ DC	-DC	V DC	V 0.5	V 0.5	V 2.5	V 4.0	DC	V 0.5	V 2.5	5	10	MF 5'2.5	MF 5'3	Remarks
300	34-42-45-48	1/4		30-N4 ↓	36 33	39.8	230	36.4	108.9	32	101.6		146.1	126.8	300		6.8%		
300	41-44-47-50	1/4			33	30.5	185	30.2	98.4	26.9	92.8		132.3	124.9	284		5.6%		
300	42-45-48-51	1/4			33	30.8	200	30.2	98.4	26.9	92.8		132.7	124.9	284		5.6%		
300	43-46-47-52	1/4			33	32.2	205	31.5	100.8	28.2	94.6		134.4	127.2	291		6.1%		

Protect New Gray
LOCATION

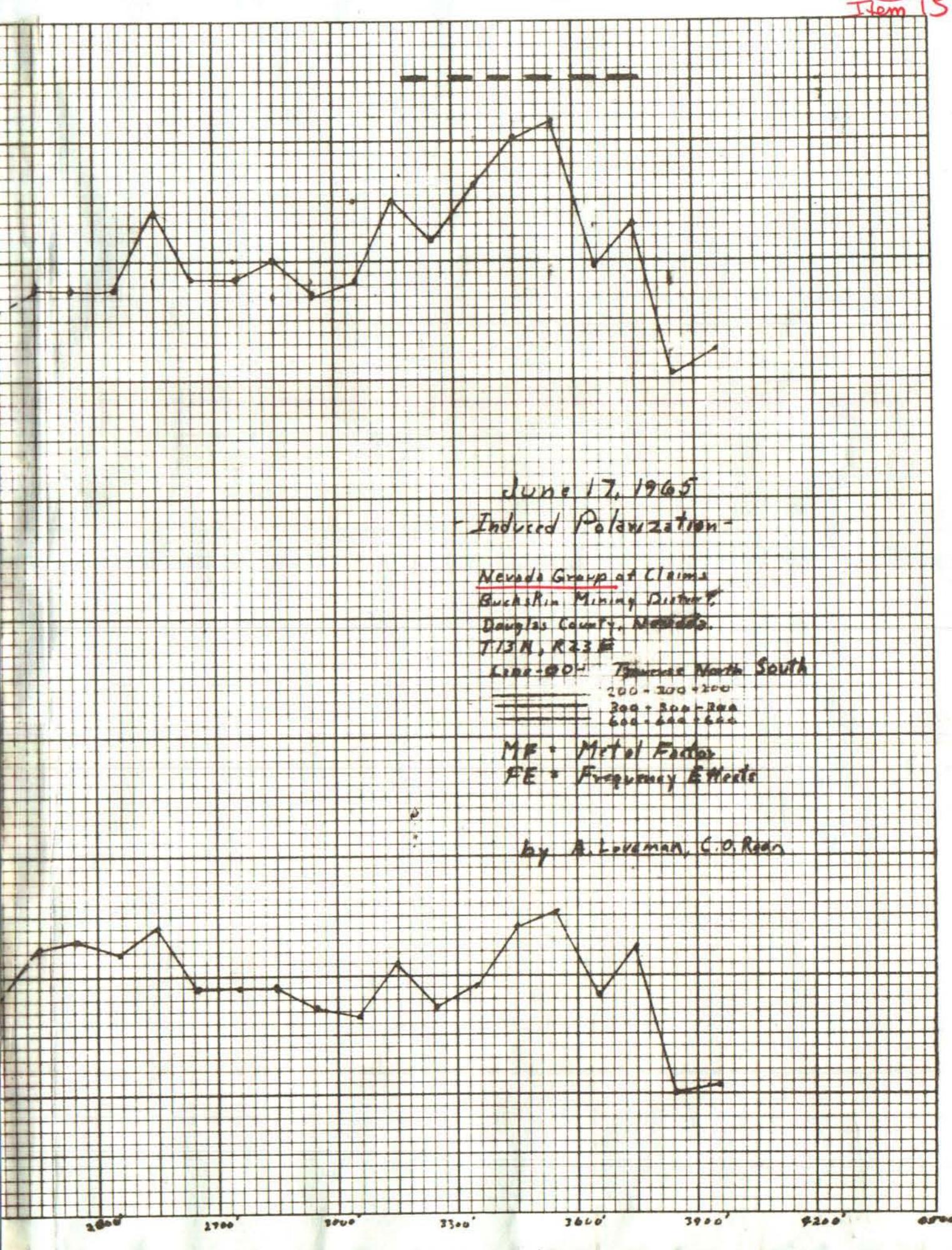
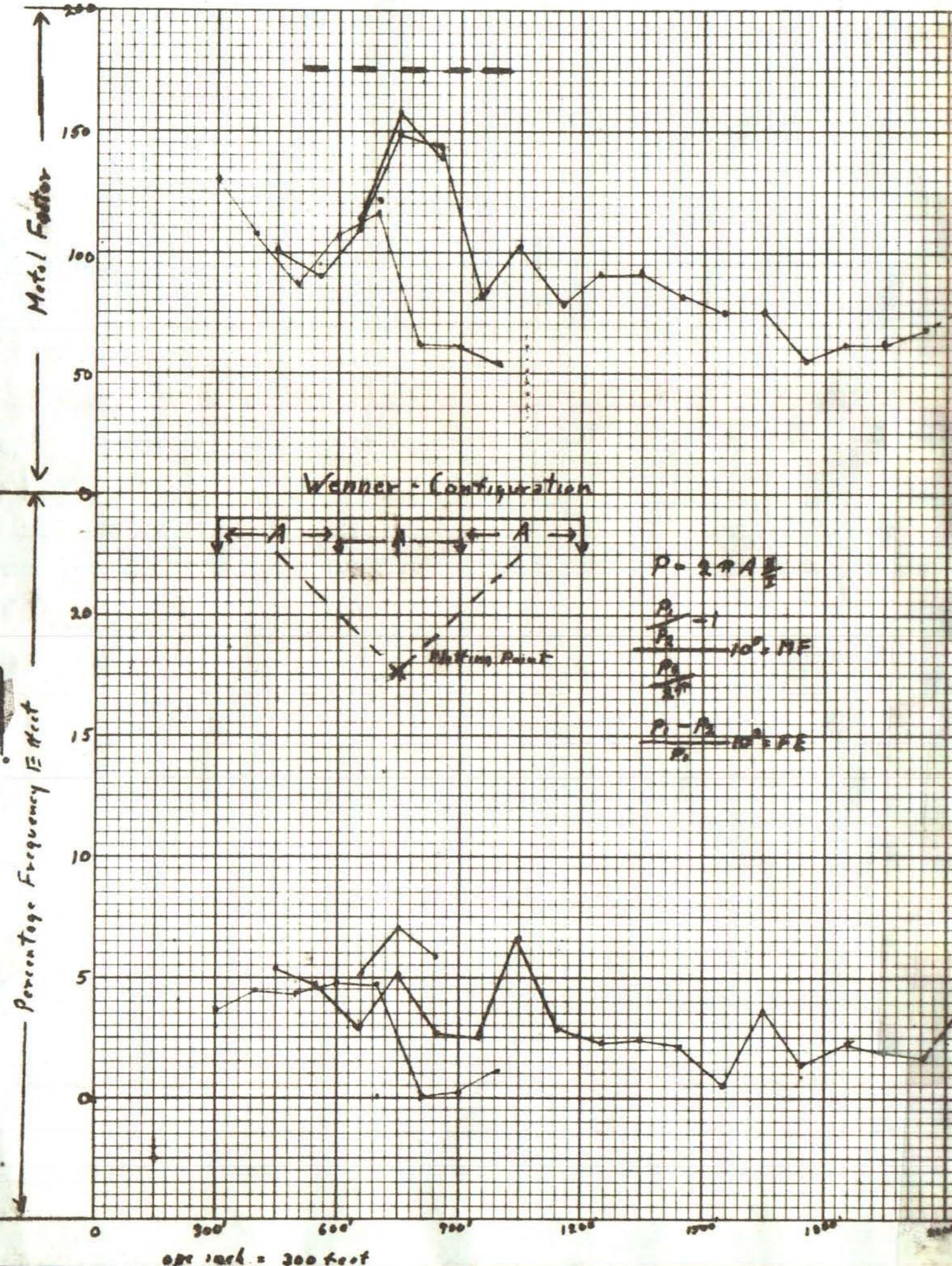
1342

Date: March 27

2

Operatore

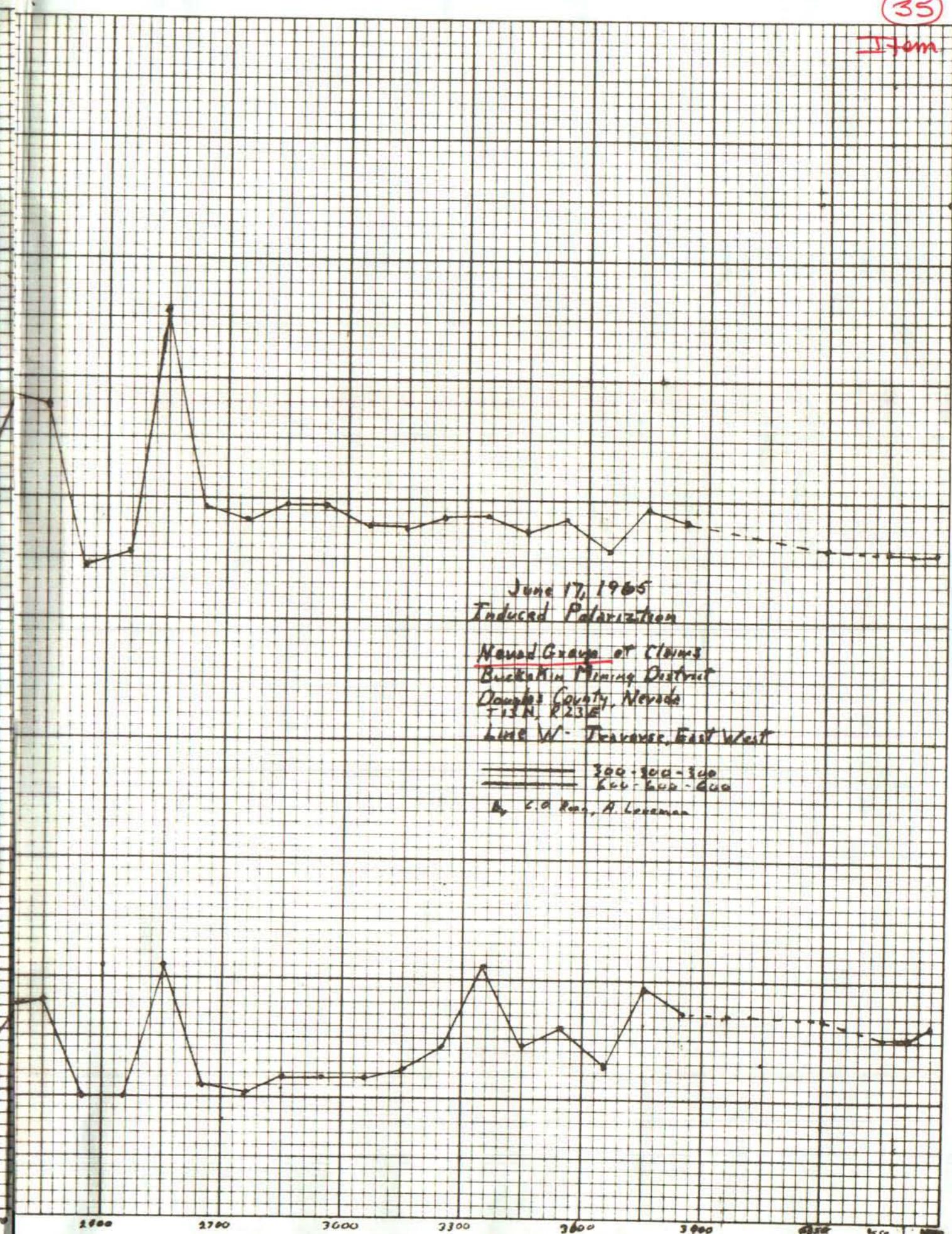
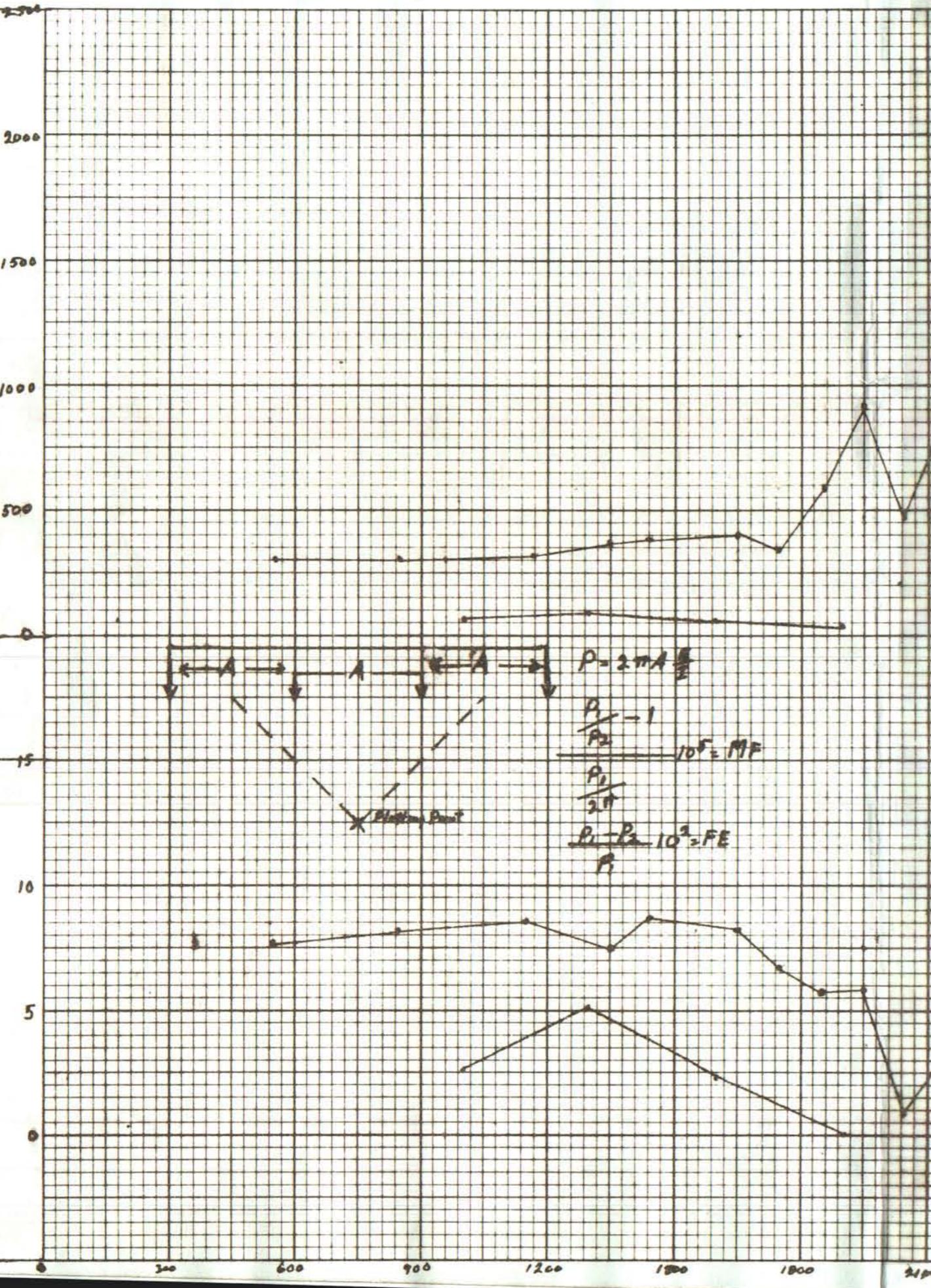
35
Item 15



35

Item 15

Metal Factor

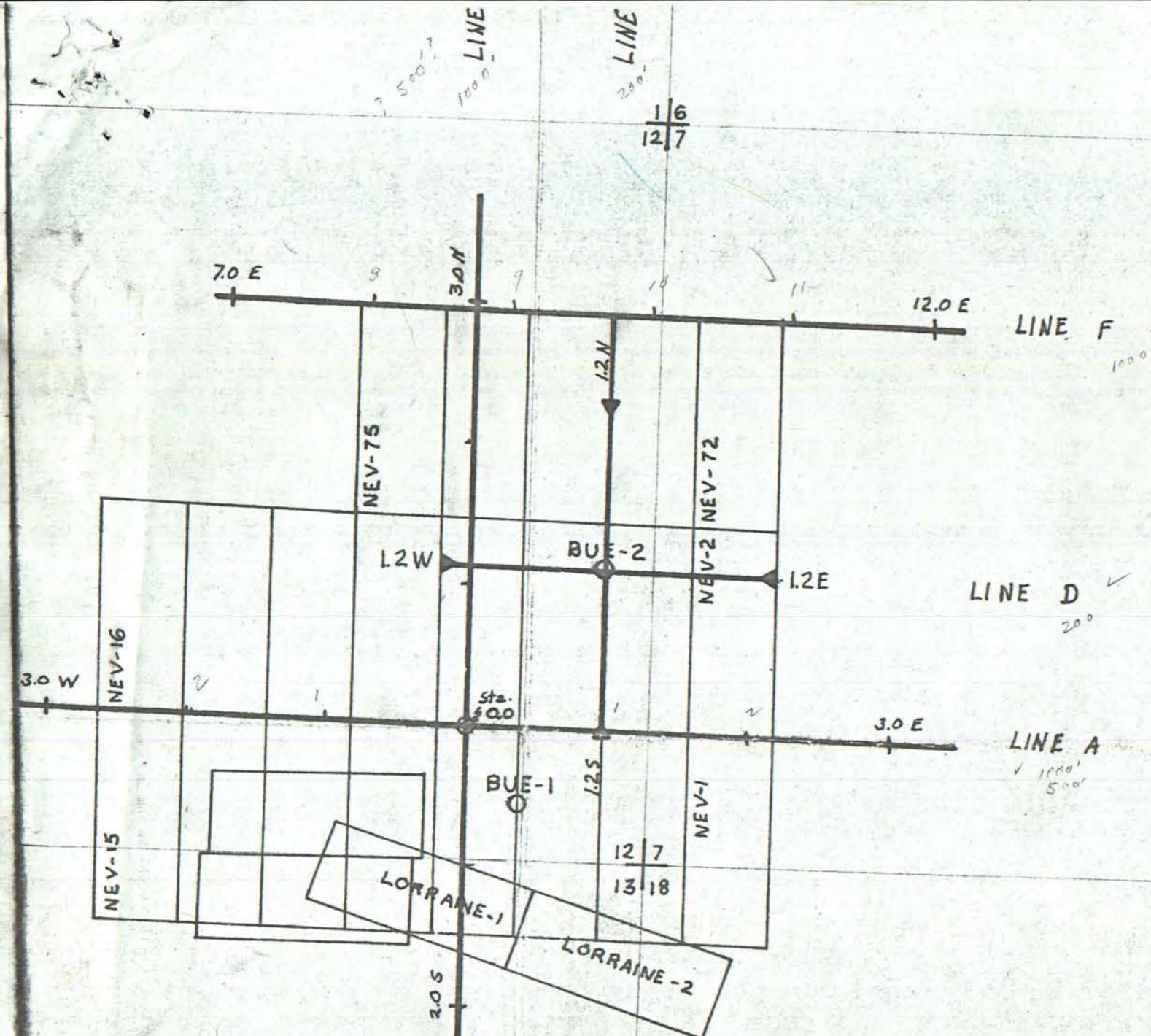


June 17, 1965
Induced Polarization

Nevad Grav & Claves
Buckskin Mining District
Douglas County, Nevada
T 13 N R 23 E
Line W - Traverse, East West
300 - 300 - 300
600 - 600 - 600
By C. O. Ross, A. Lessman

35

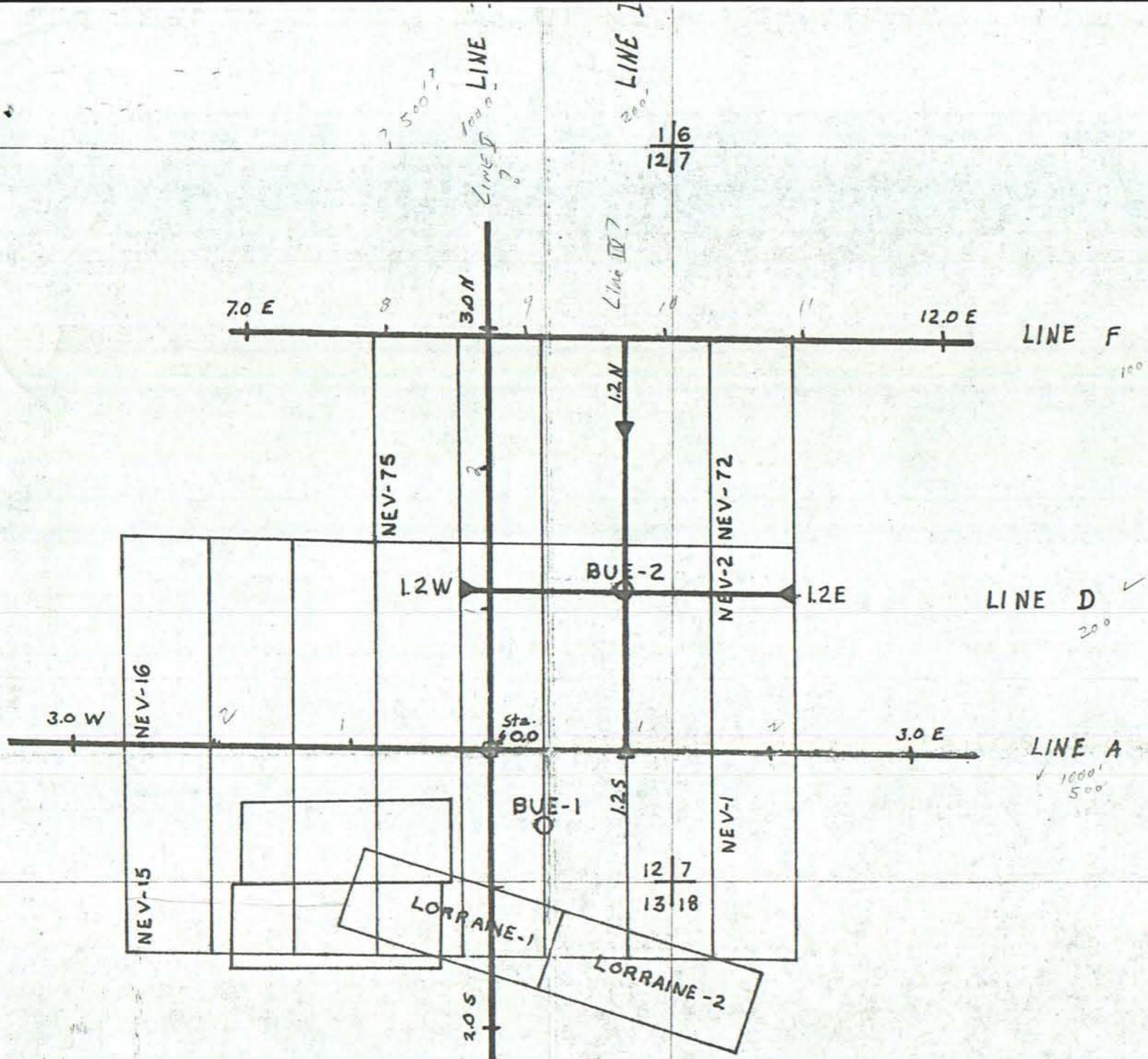
Item 15

6|5
7|8

Nevada Group
 (includes option on Lorraine Group)
 Buckskin Mng. Dist.
 Douglas - Lyon Co., Nevada

Owners & Option Holders -
 H.M. Harcourt - Tucson, Ariz.
 Wm.C. Smith - Yerington, Nevada

21
11/12



6 5
7 8

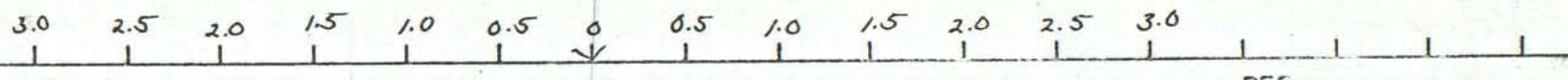
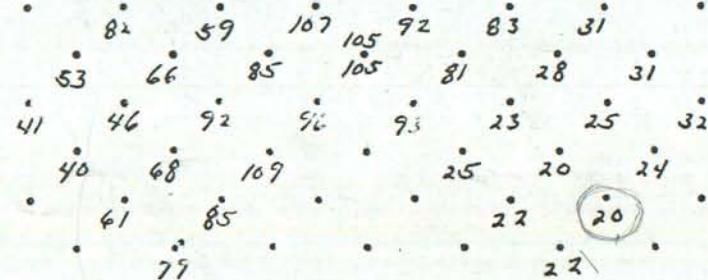
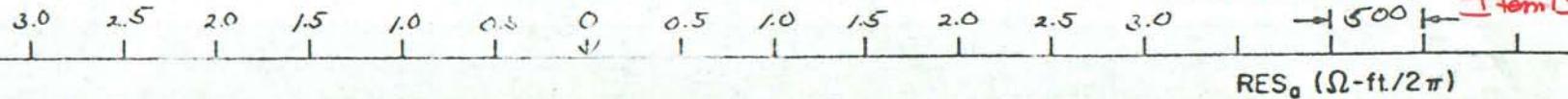
Nevada Group
Includes option on Lorraine
Buckskin Mng. Dist.
Douglas - Lyon Co., Nev.

Options & option holders -
M.M. Harcourt - Tucson Ar
Wm C. Smith - Yerington, Nev.

7 8
18 17

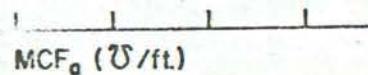
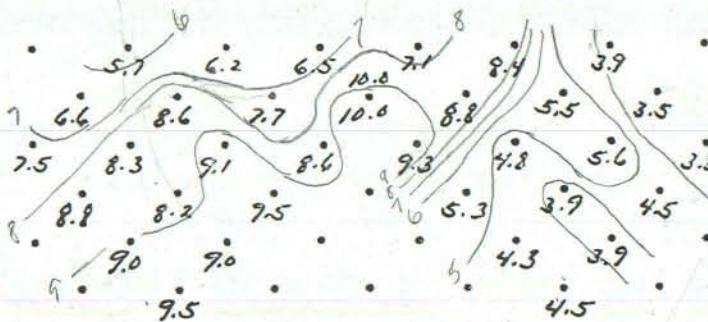
Geophysic
New-Lorraine - PD -

Nevada-Lorraine
Group -
Buckskin M. D. (35)
1500 ft. Item 15



WEST

EAST



WESTERN EXPLORATION OFFICE
PHELPS DODGE CORPORATION

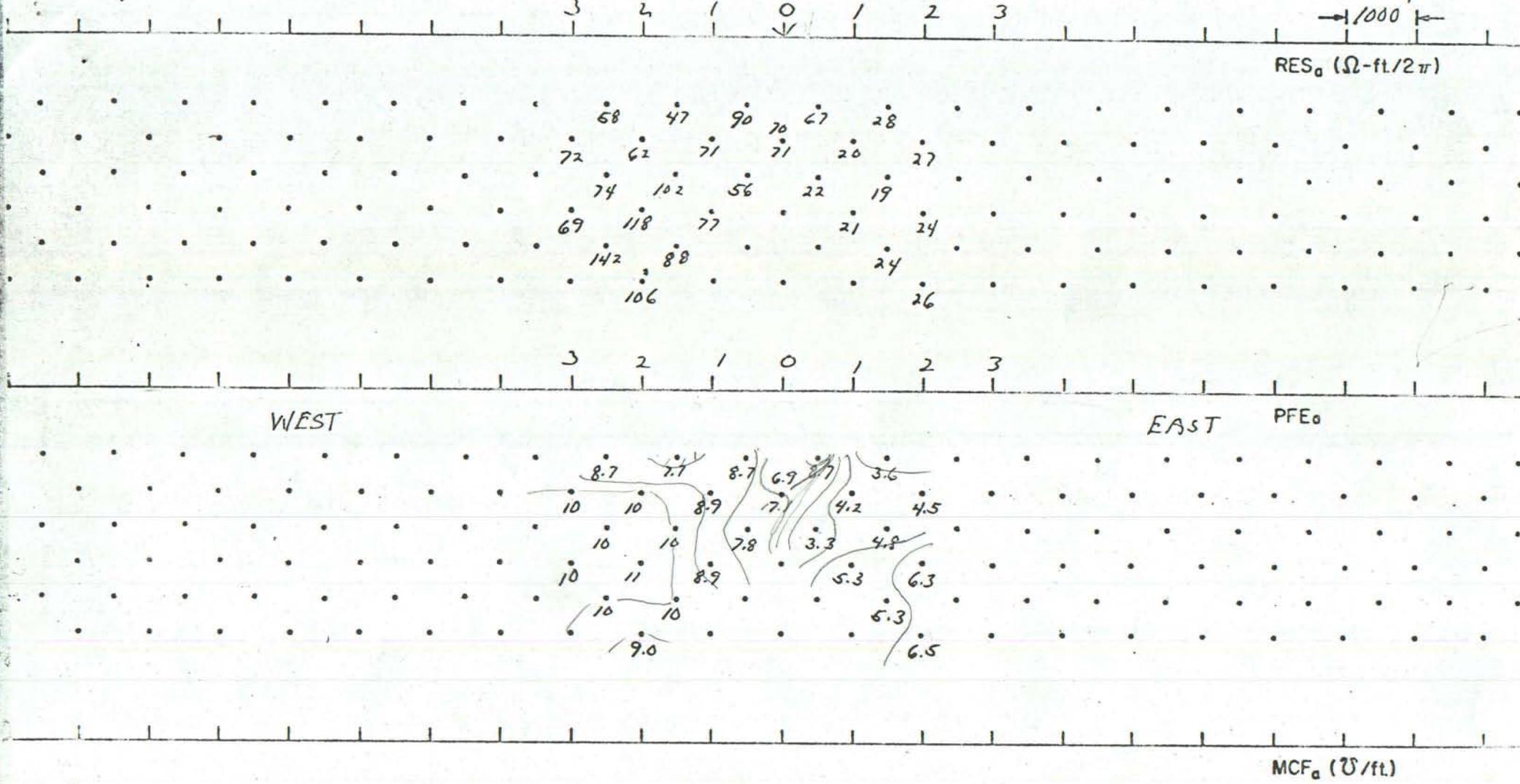
IP SECTION

Date: 9/67
By: HRE
Sheet of

$$f = 0.1 \text{ to } 2.0 \text{ cps}$$

Nevada - Lorraine Claims, Lyon County, Nevada

LINE: A



WESTERN EXPLORATION OFFICE
PHELPS DODD CORPORATION

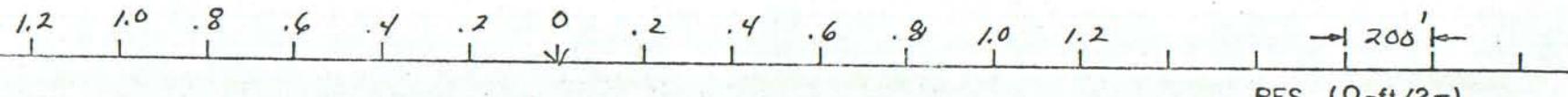
Nevada - Lorraine Claims, Lyon County, Nevada

IP SECTION

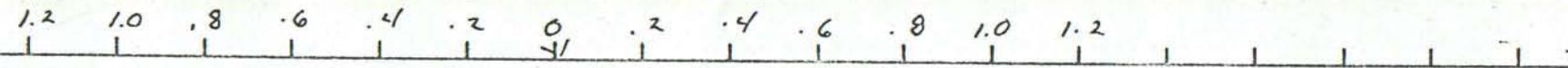
Date 9/67
By HLC
Sheet 1 of

$f = 0.1 \times 2.0 \text{ c.p.}$

LINE A



64 60 47 52 55 32 15
 66 65 59 50 37 18 18
 80 76 64 65 36 20 19 23
 85 76 71 20 21 23
 84 84 20 25
 94 24



2.4 2.1 2.8 4.1 3.3 3 3.2 1.6
 3.3 3.9 4.0 4.2 2.9 2.7 1.8
 3.9 4.7 4.9 4.6 3.4 1.7 2.9 1.6
 4.7 5.6 5.6 3.6 1.7 2.4 2.1
 6.1 5.6 7.1 2.1 2.4 2.8

MCF_a (V/ft)

7 8 9 10 11 12 13

→ 1000'

RES₀ (Ω -ft/2 in)

51 56 23 17
62 59 28 17
83 62 31 23
93 32 27
44 28
37

7 8 9 10 11 12 13

PFE₀

4.5 2.7 7.4 2.5
6.9 5.4 2.2 2.6
7.0 7.3 4.7 2.6
6.6 6.0 5.2
6.1 6.8
6.6

MCF₀ (Ω /ft.)

WESTERN EXPLORATION OFFICE
PHELPS DODGE CORPORATION

IP SECTION

Nevada - Harroldie Claims, Lyon County, Nevada.

Date: 9/67
By: HRE
Sheet 6

f = 0.1 < 2.0, 5
LINE: F

3.0 2.5 2.0 1.5 1.0 0.5 0 0.5 1.0 1.5 2.0 2.5 3.0

-1500'

$\text{RES}_a (\Omega \cdot \text{ft}/2\pi)$

83 56 59 62 63 44 54
 41 80 63 63 53 54 57
 45 46 82 63 48 64 43 58
 58 49 82 57 65 41
 63 50 58 41
 64 49

3.0 2.5 2.0 1.5 1.0 0.5 0 0.5 1.0 1.5 2.0 2.5 3.0

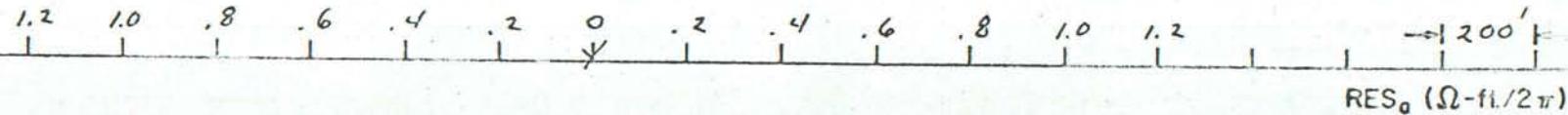
PFE_a

SOUTH

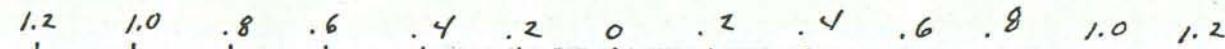
NORTH

5.4 8.0 8.6 8.6 10.6 9.0 5.2 7.4
 6.1 7.0 7.3 11.3 10.4 7.1 3.8
 7.5 7.1 7.2 7.3 11.4 7.3 7.5 7.4
 7.7 7.2 8.2 10.6 8.5 6.1
 8.2 7.5 8.5 8.7 7.0 8.4

$\text{MCF}_a (\Omega/\text{ft})$



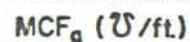
28 49 44 50 56 65 57
46 85 57 51 60 59 77
42 43 41 56 56 50 75 46
47 41 50 62 44
46 49 62 37
48 37



NORTH

1.6 2.1 2.7 3.8 2.7 3.5 3.5
2.2 1.9 3.5 4.0 4.4 6.2 4.9
3.2 2.4 2.9 3.9 4.3 5.7 6.7 6.1
3.7 3.6 4.9 5.4 5.2 5.5 7.4
5.4 4.9 7.1 4.9

SOUTH



WESTERN EXPLORATION OFFICE
PHELPS DODGE CORPORATION

Nevada, Lorraine claims, Lyon County, Nevada

IP SECTION

Date: 9/67
By: HRE
Sheet of

f = 0.1 + 2.0 cps
LINE: IV-A

3 2 1 0 1 2 3

→ 1000' ←

RES_a ($\Omega \cdot \text{ft}^{1/2}$)

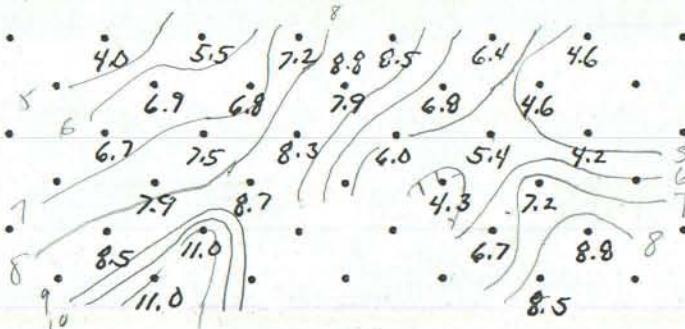
48 53 71 57 58 64 42
53 59 67 60 50
67 66 53 67 57 43
79 47 52 50
81 57 47 55
63 45

3 2 1 0 1 2 3

NORTH

SOUTH

PTE_a



MCF_a (V/ft)

WESTERN EXPLORATION OFFICE
PHELPS DOUGL CORPORATION

NEVADA-LORRAINE CLAIMS, DOUGLAS COUNTY, NEVADA

IP SECTION

Date: 9/67
By: HRE
Sheet 1 of

f = 0.1 & 2.0 cps
LINE: II

Interoffice Communication

To: Peter Kirwin
From: Olaf Aiken
Date: January 6, 1978
Subject: Buckskin Project

Introduction

A Conoco geophysical crew, under the supervision of Olaf Aiken, ran a gravity survey on the titled property. They read 186 gravity stations. The survey began on October 24, 1977 and ended on November 13, 1977. This time breaks down as follows: 12 production days, 6 travel days and 3 days down due to seismic activity. The survey progress was retarded due to periods of increased seismic activity, during the daylight hours. Subsequently a portion of the survey had to be conducted during the late evening hours.

The gravity survey was run to determine the depth to bedrock, in the area of a moderate I.P. anomaly.

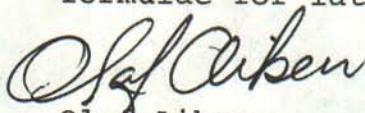
Discussion of the Data

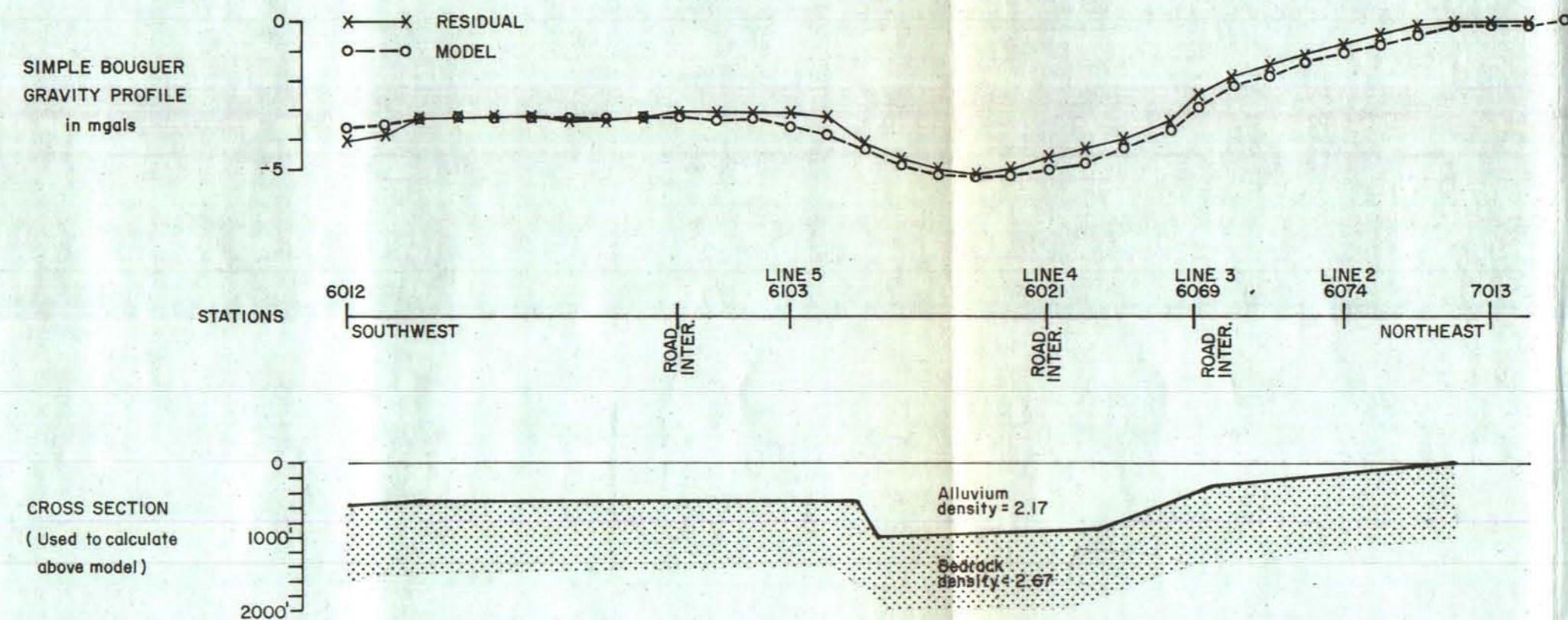
The area of interest is a shallow shelf with 500' to 600' of alluvial cover as shown on the interpretive map. The area is bordered on the west and east by pediments, the northern border is a shallow ridge with 50' to 100' of alluvium. In the south there is a deep basin, where the depth to bedrock is >1500'. A density contrast of 0.5 g/cm³ between bedrock and alluvium was used in all the depth estimates and the model profiles.

Portions of the data were recalculated again, using the density contrast of 0.2 g/cm³. This smaller density contrast shows that the maximum thickness of alluvium in the area of interest will not likely exceed 1000'. ← →

Data Reduction and Survey Procedures

The gravity survey was run with a LaCoste and Romberg Geodetic gravimeter model G-404. Elevation control was obtained by surveying between known elevations with a stadia transit. All the stations were tied to the World Relative Gravity Network base station at the Yerington airport. The observed gravity data were then reduced to the Simple Bouguer gravity anomaly for a crustal density of 2.67 g/cm³ using the standard formulae for latitude, free air, and Bouguer corrections.

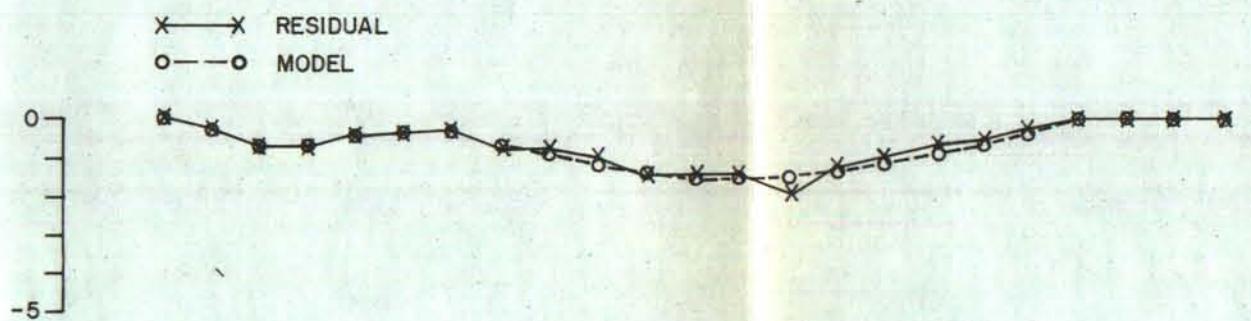

Olaf Aiken



BUCKSKIN
GRAVITY LINE I

STATE	County	Min. #	DATE
Nevada	Douglas	2000	12/77
CONTINENTAL OIL COMPANY			
MINERALS DEPARTMENT			
METALLICS DIVISION			
GEOPHYSICS			
DENVER, COLORADO			
DRILLED BY	AIKEN	TEST NO.	GB 113-2d
DRILLED BY		DATE	PRIM. PLENO

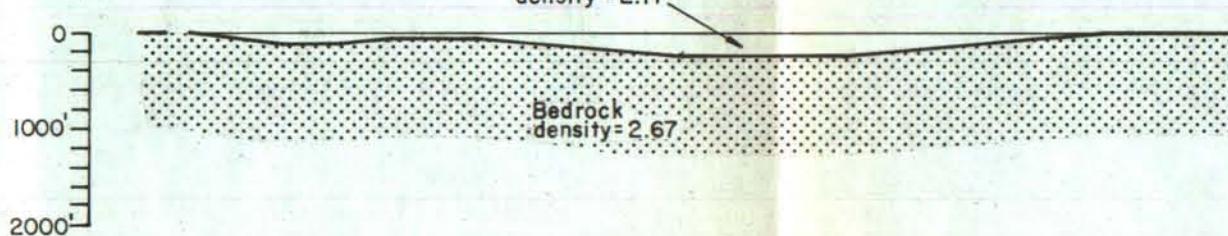
SIMPLE BOUGUER
GRAVITY PROFILE
in mgals



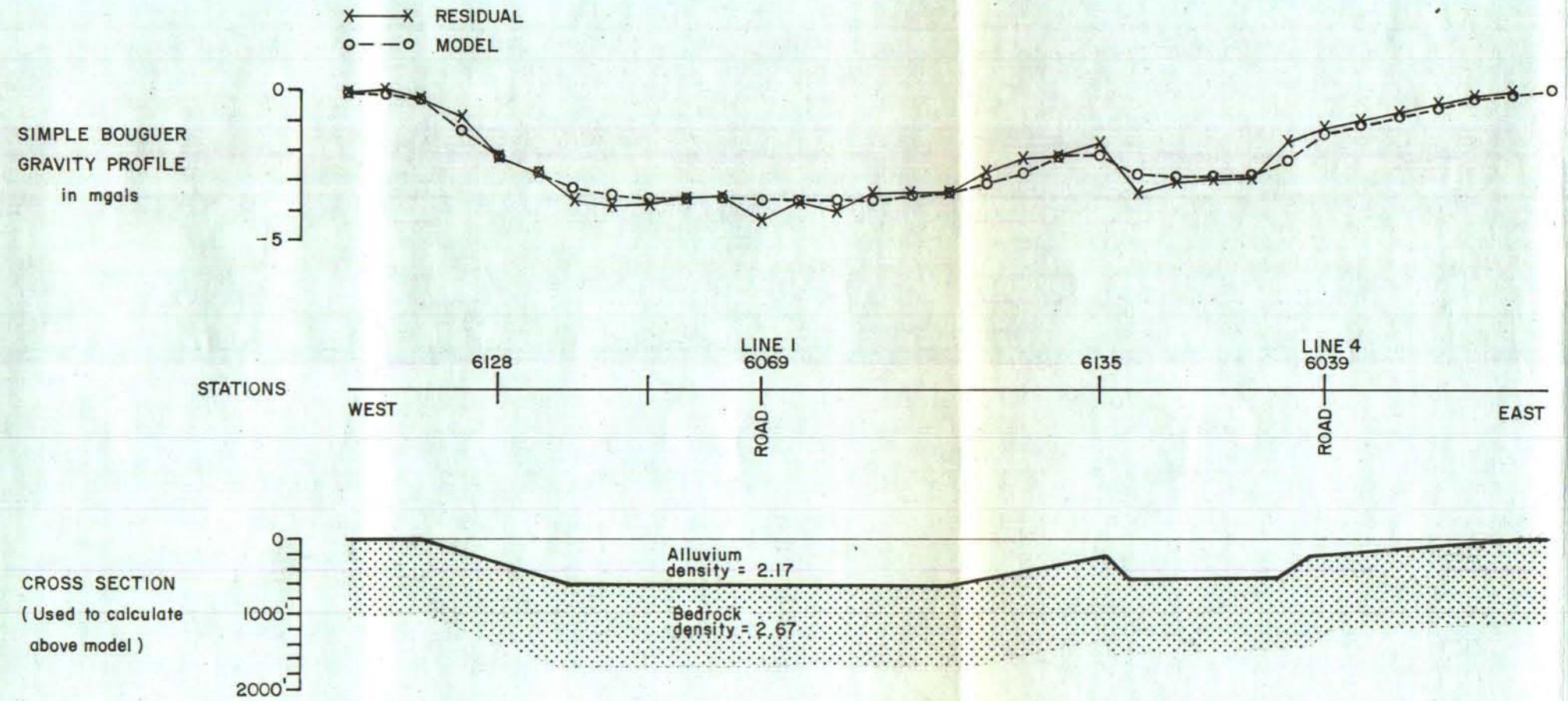
STATIONS

7009 7003 LINE I
NORTHWEST 6074 6079 SOUTHEAST
6063

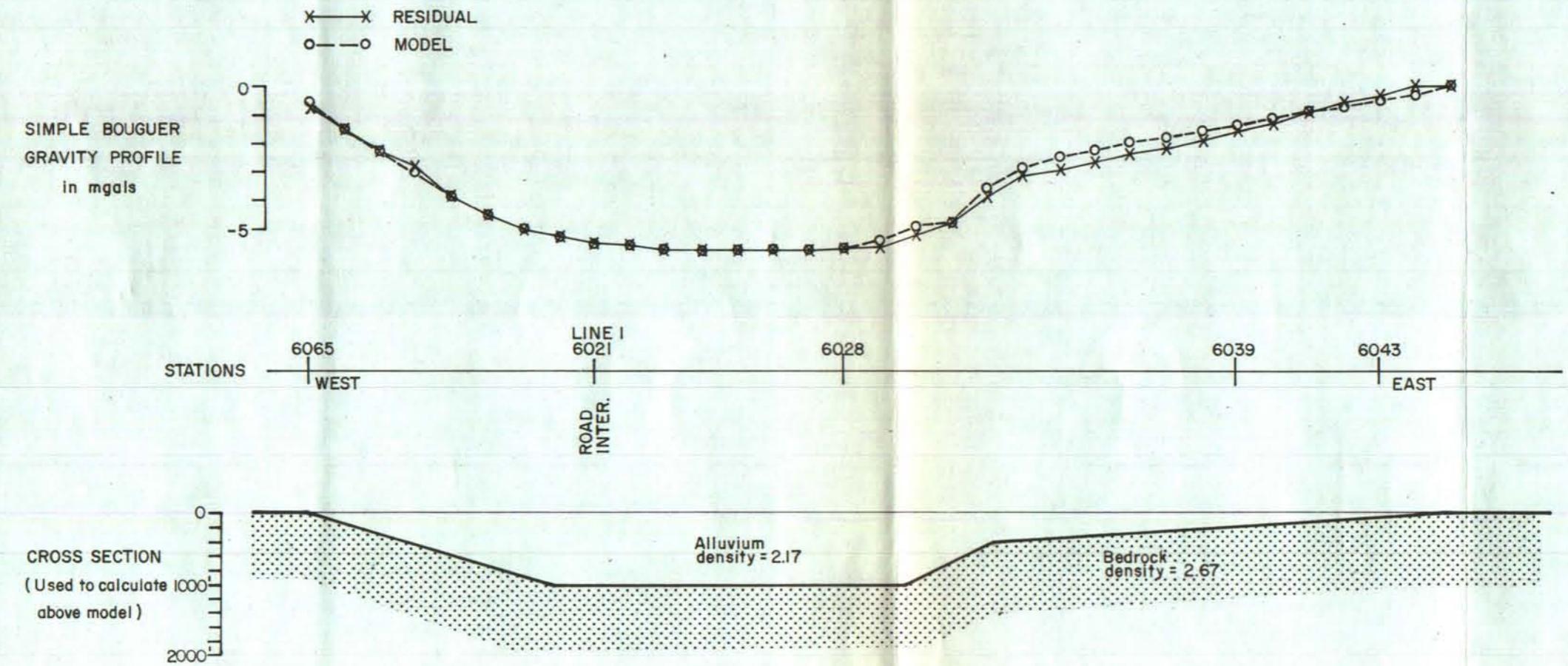
CROSS SECTION
(Used to calculate
above model)



BUCKSKIN GRAVITY LINE 2		
NEVADA	DOUGLAS	"Mr. 1" = 2000'
CONOCO	CONTINENTAL OIL COMPANY MINERALS DEPARTMENT METALLICS DIVISION GEOPHYSICS DENVER, COLORADO	
AIKEN	1778	FILE NO. GB 113-2b

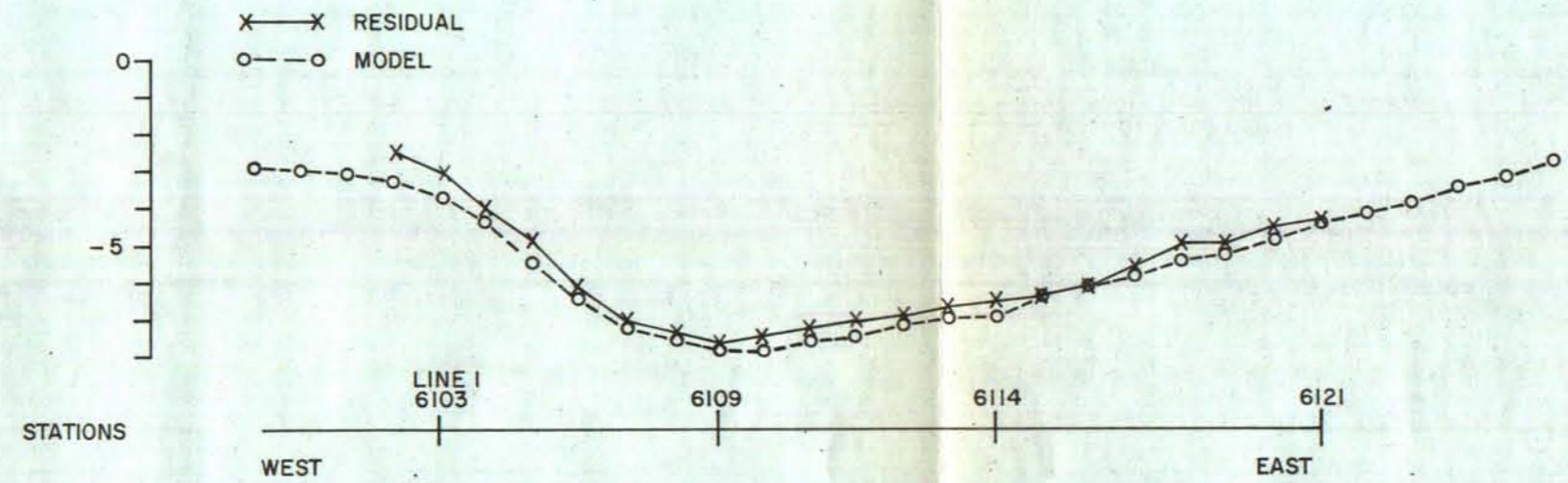


STATE: NEVADA COUNTY: DOUGLAS "Mile. 1" = 2000'		CONTINENTAL INTERNAL
CONTINENTAL OIL COMPANY		
MINERALS DEPARTMENT METALLICS DIVISION GEOPHYSICS DENVER, COLORADO		
DATA BY: AIKEN	DATE: 1/78	FILE NO: GB 113-2c
CHARGE BY:	DATE:	FILE NO:

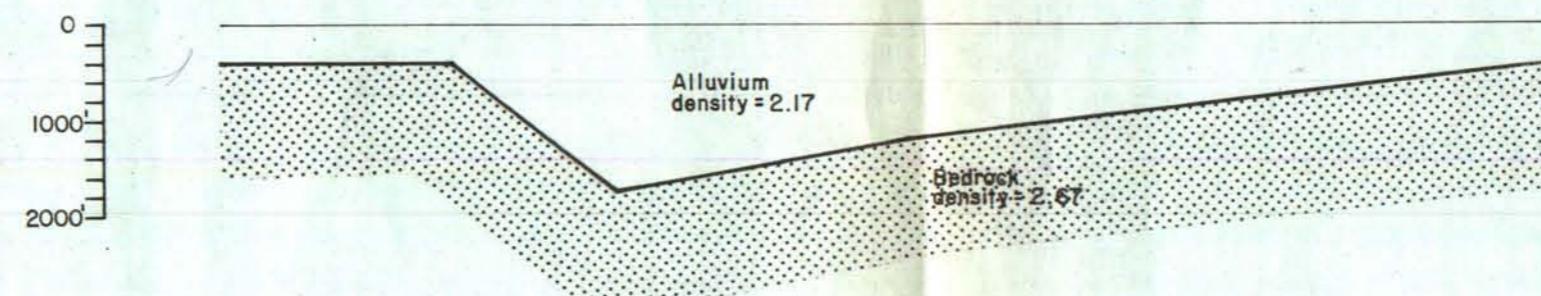


AREA AND TYPE OF MAP	
BUCKSKIN	
GRAVITY LINE 4	
Nevada	COUNTY Douglas
"M.R. I." = 2000'	
CONTOUR INTERVAL	
 CONTINENTAL OIL COMPANY	
MINERALS DEPARTMENT METALLURGICAL DIVISION GEOPHYSICS DENVER, COLORADO	
DATA BY	AIKEN
DATE	12/77
FILE NO.	PROJ. FILE NO.
GB113-2d	

SIMPLE BOUGUER
GRAVITY PROFILE
in mgals



CROSS SECTION
(Used to calculate
above model)



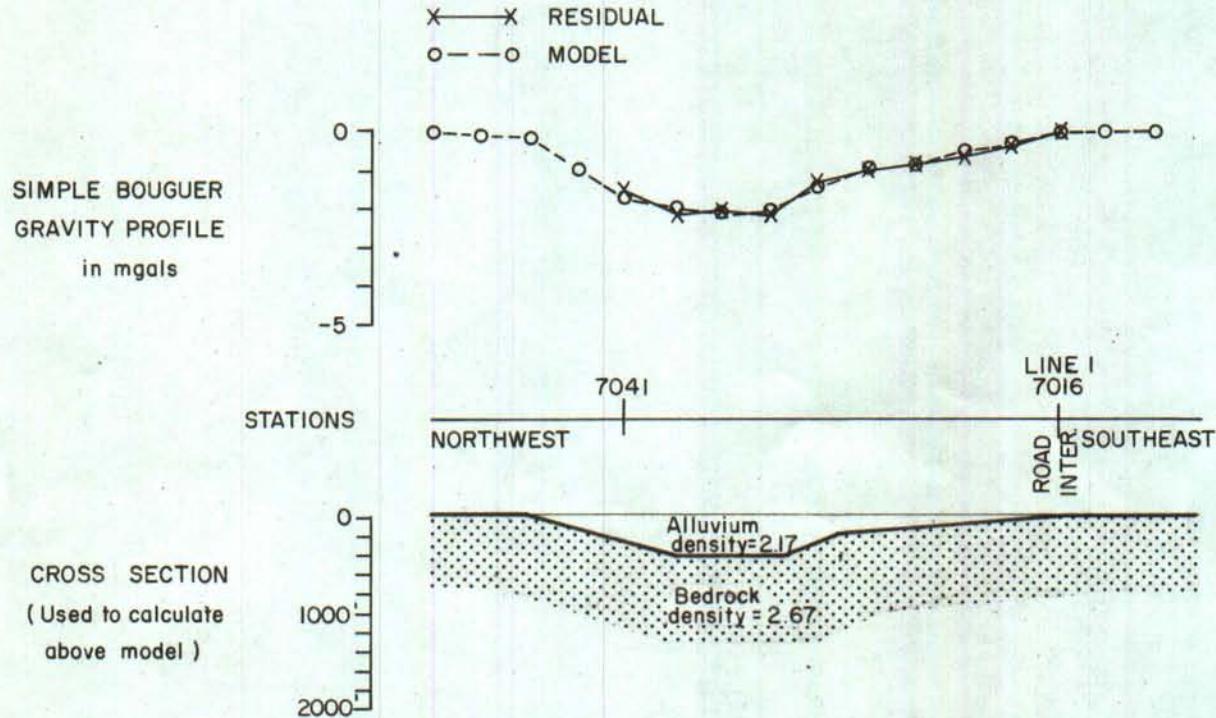
BUCKSKIN
GRAVITY LINE 5

NEVADA COUNTY DOUGLAS Hbr. 1 = 2000

CONTINENTAL OIL COMPANY

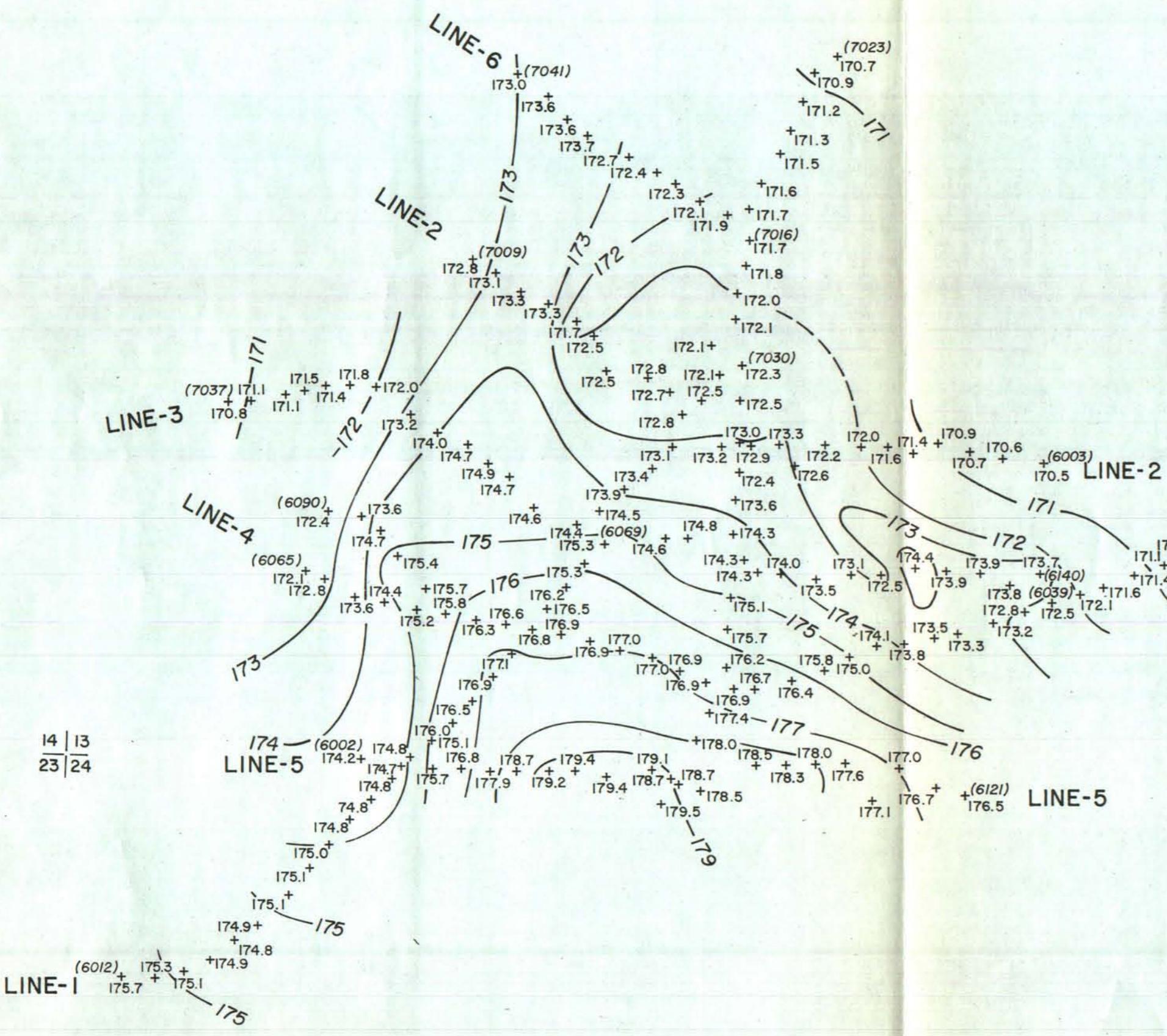
conoco

DATA BY AIKEN DATE 1778 FILE NO. GB-113-2e



BUCKSKIN
GRAVITY LINE 6

STATE: NEVADA	COUNTY: DOUGLAS	LINE NO.: 1	SCALE: 1:2000
DRAWN BY: AIKEN		DATE: 1/78	FILE NO.: GA 113-2f
SPANNED BY:		PROD. FILE NO.:	
CONOCO		CONTINENTAL OIL COMPANY	
		MINERALS DEPARTMENT MECHANICAL DIVISION GEOPHYSICS DENVER, COLORADO	



4 | 3
9 | 10

$\begin{array}{r} +170.2 \\ +169.8 \\ \hline 170 \end{array}$ $\begin{array}{r} +170.0 \\ +169.8 \\ \hline 169.8 \end{array}$ $\begin{array}{r} +169.7 \\ +169.6 \\ \hline 169.6 \end{array}$ $\begin{array}{r} +169.2 \\ +168.9 \\ \hline 168.9 \end{array}$ (6057) LINE - 384

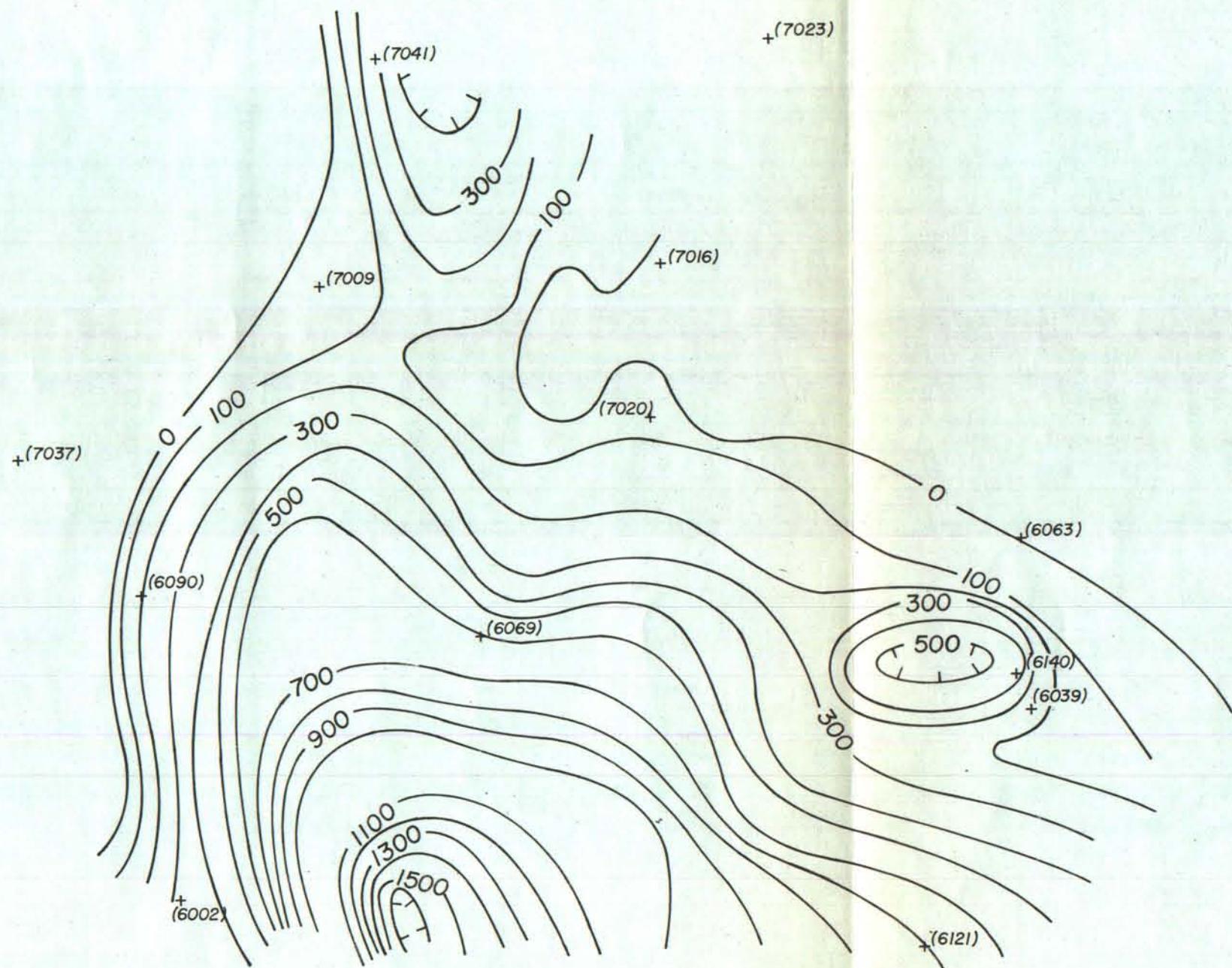
data station station number
 + (6041)
 171.6 gravity in mgals

NOTE: ALL VALUES ARE NEGATIVE

**BUCKSKIN
SIMPLE BOUGUER GRAVITY**

(35) Item 5

$\frac{14}{23} | \frac{13}{24}$



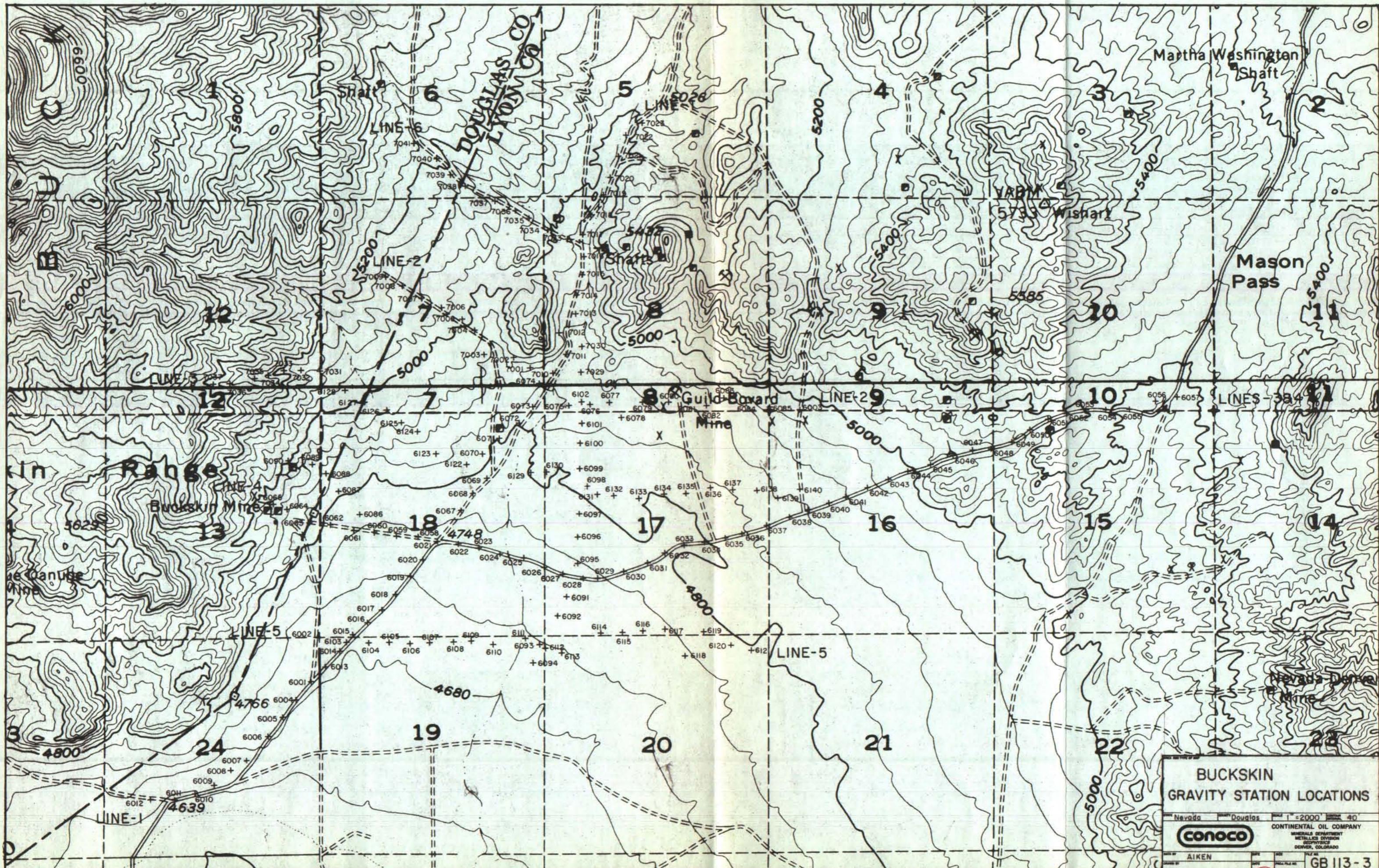
$\frac{4}{9} | \frac{3}{10}$

(6057)

NOTE: MAP SHOWS APPROXIMATE
THICKNESS OF ALLUVIUM.

NAME AND TYPE OF MAP		
BUCKSKIN		
GRAVITY INERPRETIVE MAP		
STATE: NEVADA	COUNTY: DOUGLAS	SCALE: 1" = 2000'
SHEET 100		
CONTINENTAL OIL COMPANY		
MINERALS DEPARTMENT		
METAL SURVEY SECTION		
GEOLOGIC SECTION		
DENVER, COLORADO		
DRAWN BY: AIKEN	DATE: 1/78	FILE NO.
REVIEWED BY:	DATE:	FILE NO.
GB 113-4		

(35) Item 15



**BUCKSKIN
GRAVITY STATION LOCATIONS**

Nevada Double 1 = 2000' 40'
CONTINENTAL OIL COMPANY
MINERALS DEPARTMENT
METALLICS DIVISION

DATE BY	AIKEN	DATE	RECEIVED	FILE NO.
CHARGED BY		DATE	PMRA FILE NO.	GB 113-3

(35) Item 5

35

Item 15

BUCKSKIN, NEVADA

I.P. - RESISTIVITY

(CONOCO CREW)

conoco

INDUCED POLARIZATION
& RESISTIVITY SURVEY

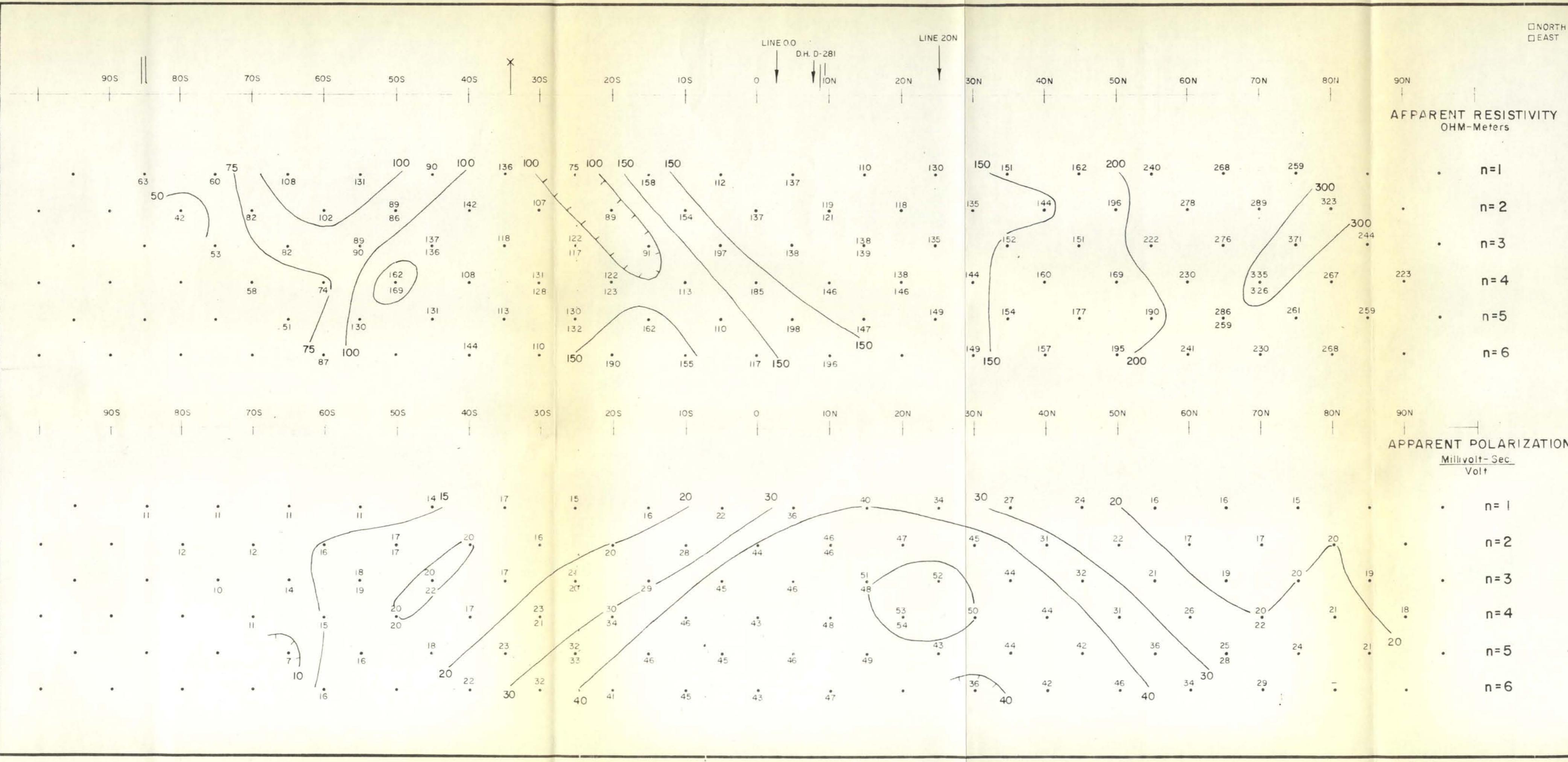
STATE NEVADA
COUNTY DOUGLAS
AREA BUCKSKIN
LINE NO. 30E
PARTY 2
DATE SURVEYED OCT. 1976
DIPOLE LENGTH 1000'
ARRAY DIPOLE-DIPOLE

LOG CONTOURS
1-15-2-3-5-75-10
15-20-30-50 .. 00
(FOR ABOVE SECTION ONLY)

REMARKS:

POWER LINE PIPE LINE METAL FENCE
PIPE LINE ROADWAY WOOD

35
Item 15



conoco

INDUCED POLARIZATION & RESISTIVITY SURVEY

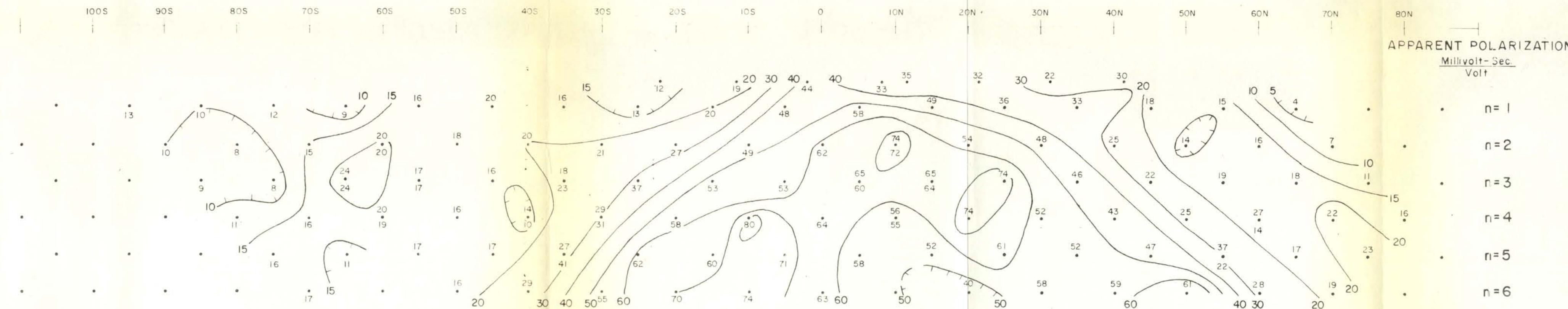
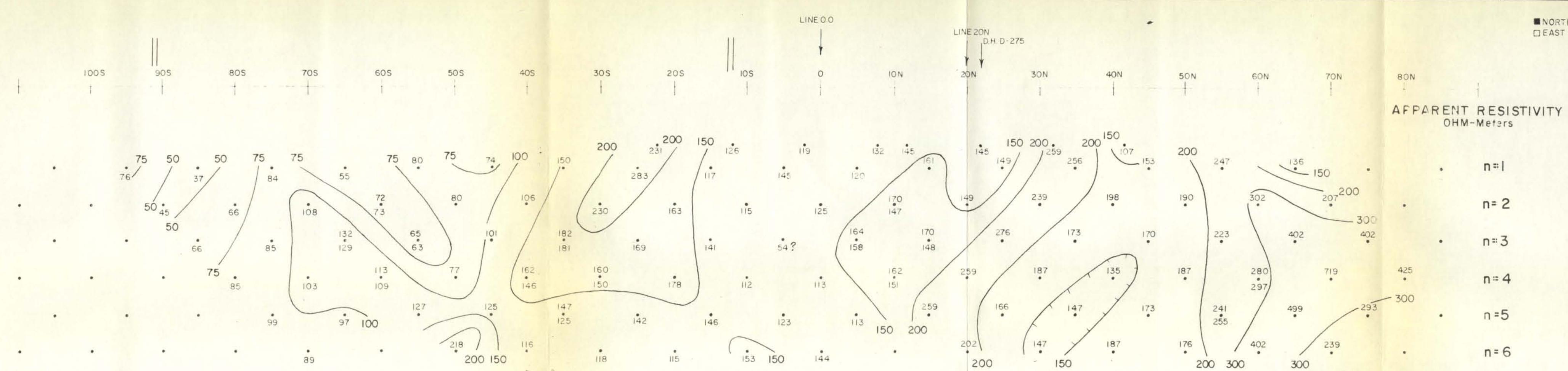
STATE NEVADA
 COUNTY DOUGLAS
 AREA BUKSKIN MTS.
 LINE NO. 10E
 PARTY 2 & MGS
 DATE SURVEYED 1976
 DIPOLE LENGTH 1000'
 ARRAY DIPOLE-DIPOLE

LOG CONTOURS
 -15-2-3-5-75-10
 5-20-30-50 00
 (FOR ABOVE SECTION ONLY)

REMARKS _____

POWER LINE
 PIPE LINE
 ROADWAY
 METAL FENCE
 WOOD

(35) Item 15



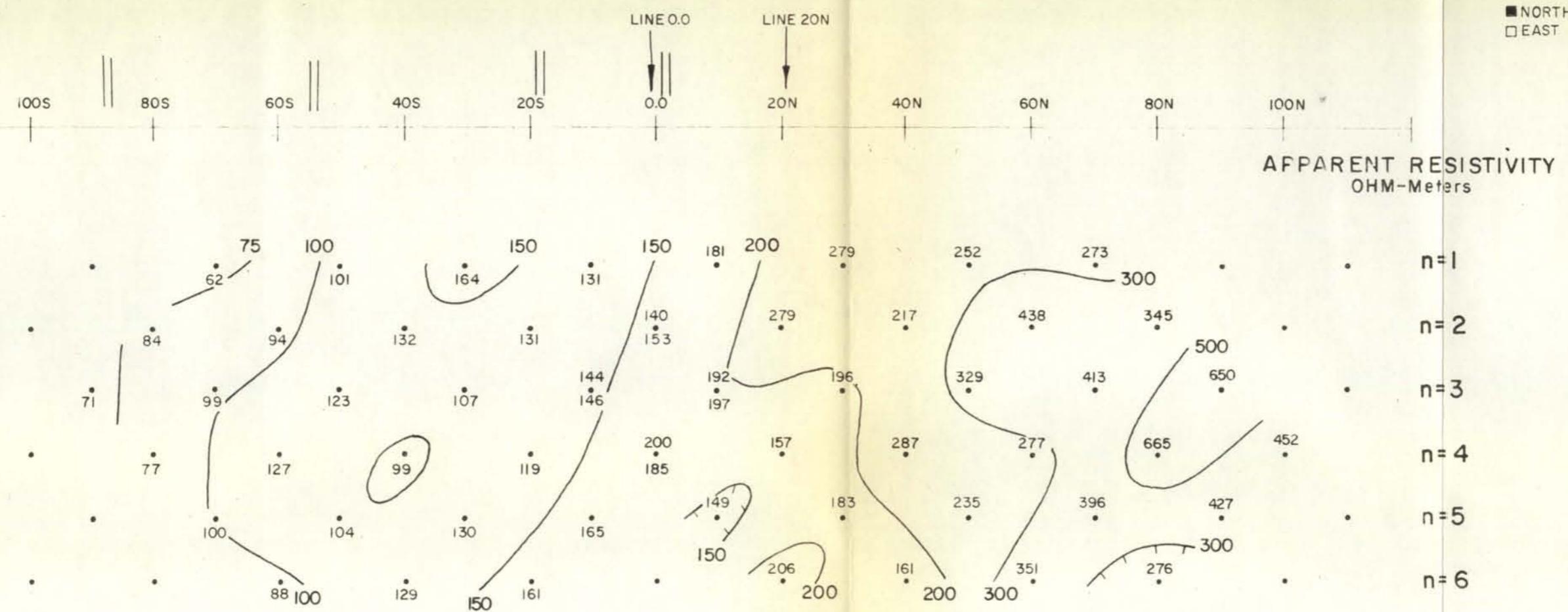
■ NORTH
□ EAST

(conoco)

INDUCED POLARIZATION & RESISTIVITY SURVEY

STATE NEVADA
COUNTY DOUGLAS
AREA BUCKSKIN
LINE NO. IOW
PARTY 2
DATE SURVEYED NOV. 1976
DIPOLE LENGTH 2000'
ARRAY DIPOLE-DIPOLE

LOG CONTOURS
1-1.5-2-3-5-7.5-10
15-20-30-50 ... 00
(FOR ABOVE SECTION ONLY)



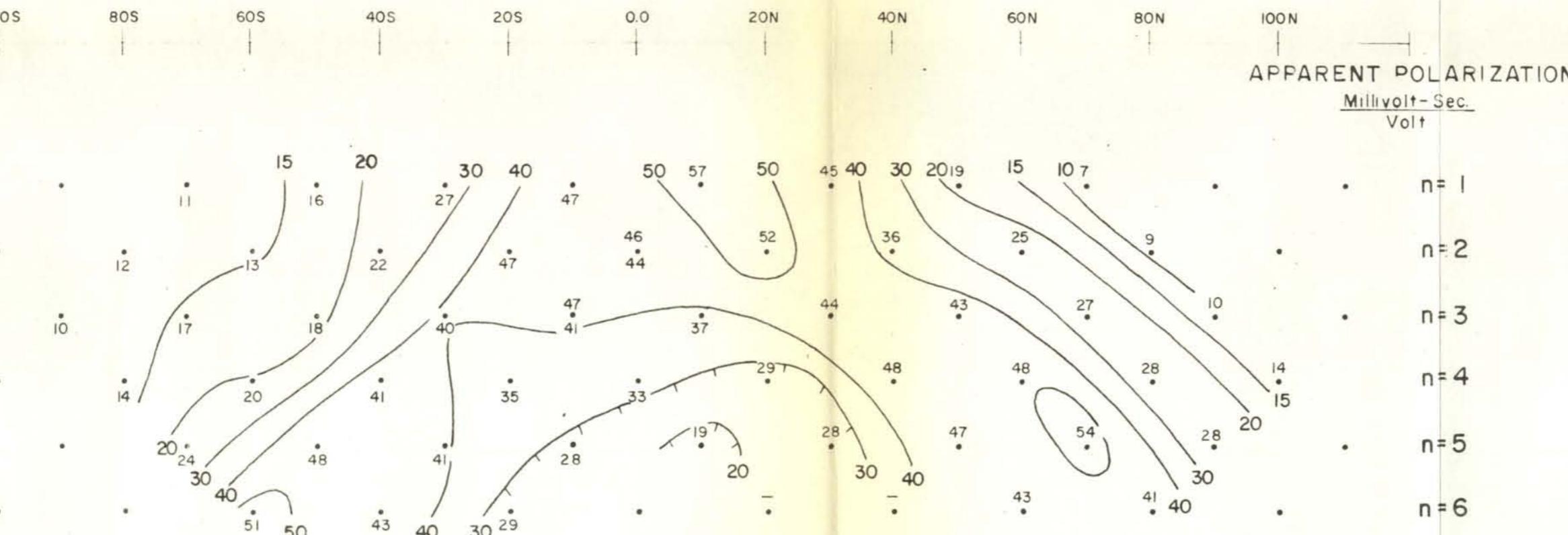
APPARENT POLARIZATION
Millivolt-Sec.
 Volt

REMARKS: _____

 POWER LINE
  PIPE LINE
  FENCE
 METAL
  WOOD

ROADWAY

—
—
—



(35) Tom 15

NORTH
EAST

conoco

INDUCED POLARIZATION & RESISTIVITY SURVEY

STATE NEVADA
COUNTY DOUGLAS
SEA BUCKSKIN
E NO. 30W
RTY 2
TE SURVEYED OCT. 1976
OLE LENGTH 1000'
RAY DIPOLE-DIPOLE

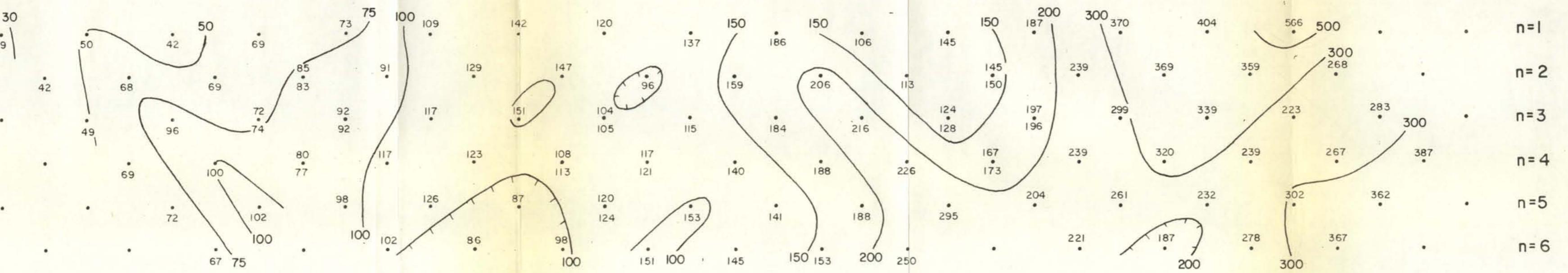
6 CONTOURS
5-2-3-5-7-5-10
20-30-50...00
(ABOVE SECTION ONLY)

MARKS: _____

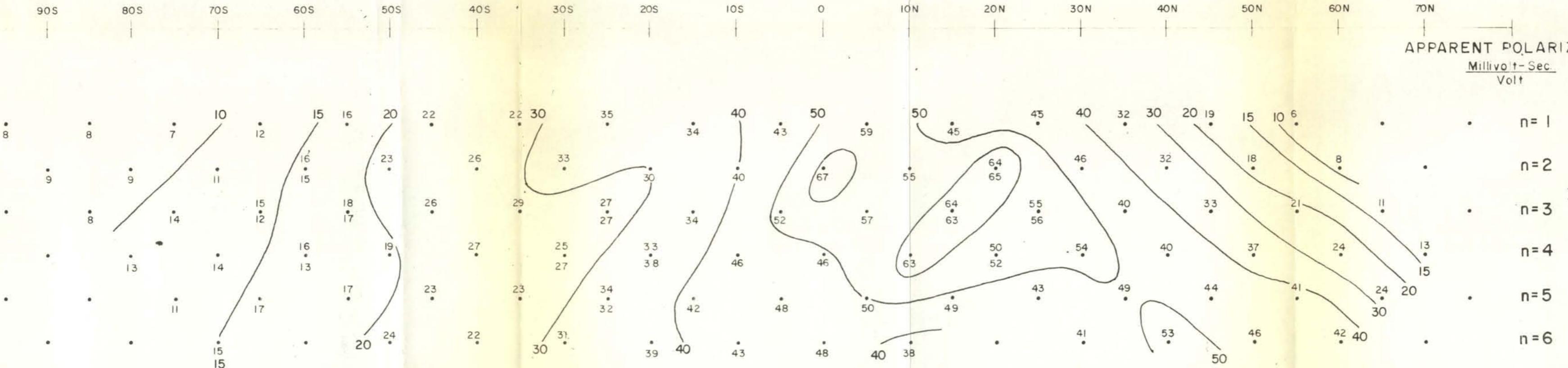
A legend containing four entries: 'POWER LINE' with a vertical line symbol, 'PIPE LINE' with a circle symbol, 'FENCE' with an 'X' symbol, and 'WOOD' with a square symbol.

D.H. BSW
LINE 20

**APPARENT RESISTIVITY
OHM-Meters**



APPARENT POLARIZATION
Millivolt-Sec.
 Volt



35
Team 1

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conoco

INDUCED POLARIZATION & RESISTIVITY SURVEY

STATE NEVADA
COUNTY DOUGLAS
EA BUCKSKIN
E NO. 10W
RTY 2
TE SURVEYED OCT. 1976
OLE LENGTH 1000'
RAY DIPOLE - DIPOLE

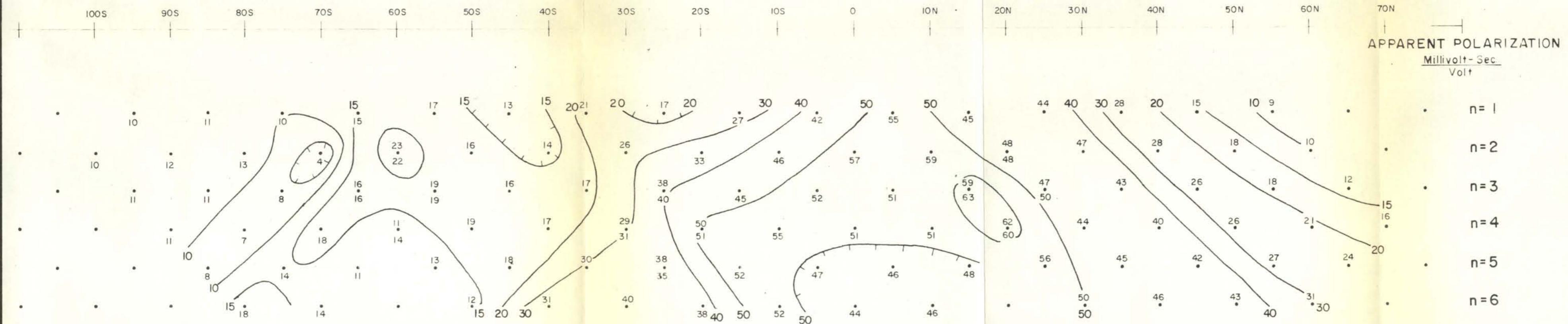
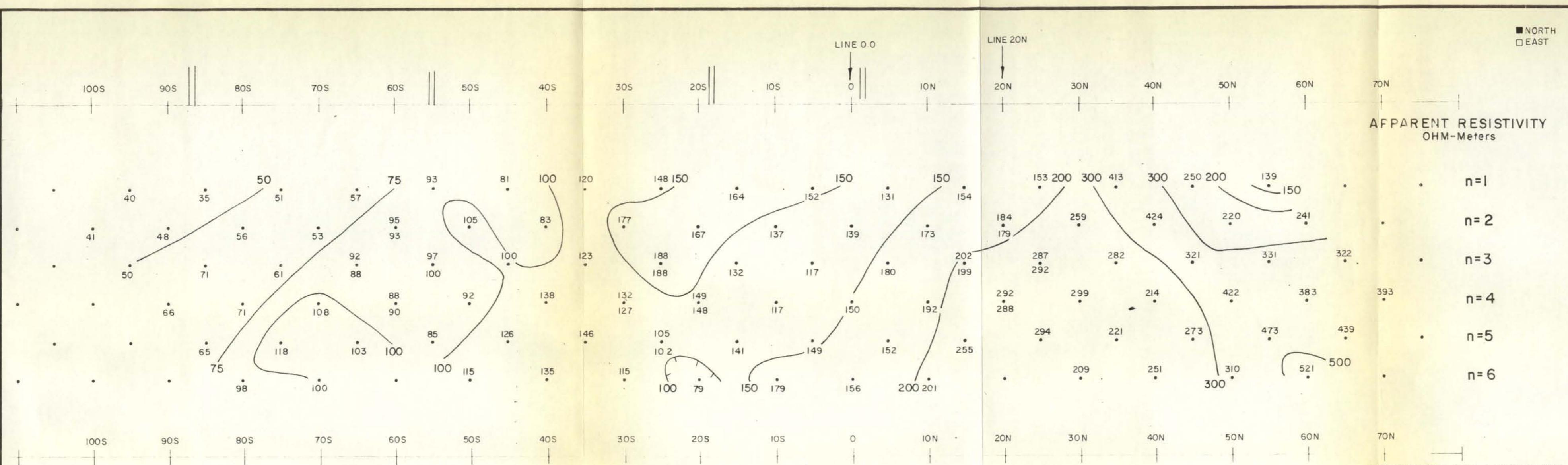
CONTOURS
2-3-5-75-10
0-30-50 : 00
ABOVE SECTION ONLY)

MARKS: _____

A hand-drawn map showing utility lines and a fence. It includes labels for POWER LINE, PIPE LINE, FENCE, METAL, WOOD, and ROADWAY. The map uses simple symbols like circles and X's.

35

Item 15



Stratigraphy

Qal Qfc Alluvium and Ferricrete.

Qal: Undifferentiated, unconsolidated, unsorted to sorted alluvial fan and fluvial gravels and sands.

Qfc: Bright orange limonite and manganese oxide cemented alluvium.

Qls Landslide deposits. Composed largely of volcanic hornblende biotite andesite porphyry with blocks of ashflow tuff exposed near the toe of the slides.

Qoal Older alluvium. Fifty feet or more of coarse unsorted gravel containing moderately rounded pebble to block sized clasts of Tertiary and Mesozoic rocks including exotic granitic boulders.

QTs Lake sediments. At least 250 feet of white to rarely green, finely to thinly bedded shales, siltstone, and fine-grained quartz arenite. Pliocene to Pleistocene lacustrine deposits unconformably overlie Miocene and older rocks.

The following group of intrusions were probably implanted after 15 MY since they appear to intrude along high angle normal faults.

Tb Basalt. Black dense aphanitic pyroxene basalt intrudes along Late Miocene or younger faults.

Thap Hornblende andesite porphyry. Dikes of dark green andesite porphyry contain 40 to 45 percent phenocrysts of about 2/3 hornblende up to 10 mm long and 1/3 subhedral plagioclase up to

15 mm long grading into an aphanitic ground mass of hornblende, plagioclase, and magnetite.

Tbhisd_p Biotite hornblende Sanidine dacite porphyry. Plugs of dacite porphyry contain about 60 percent phenocrysts grading into an aphanitic groundmass of plagioclase, sanidine, and glass. The dacite contains 4 to 6 percent biotite up to 5 mm, 4 to 6 percent zoned oxyhornblende up to 4 mm, 2 to 3 percent subhedral sanidine up to 5 mm, and zoned calcic andesine to sodic oligoclase up to 10 mm, all as phenocrysts.

Thbqpap Hornblende biotite quartz pyroxene andesite porphyry. These dikes contain 25 to 30 percent phenocrysts in an aphanitic groundmass of plagioclase, hornblende, and quartz. The andesite contains as phenocrysts about 10 percent hornblende up to 2 mm, 2 to 3 percent biotite in books up to 1.5 mm thick, 2 to 3 percent emoyed rounded quartz up to 2 mm, 2 to 3 percent anhedral augite up to 0.5 mm, and zoned sodic oligoclase up to 3 mm.

The following group of Miocene intermediate intrusions and flows where emplaced from 18 to about 15 m.y. during the developement of most of the Basin and Range faulting in the Buckskin Range. The intrusions in the northern portion of the range may be somewhat older than those in the southern portion of the range.

Tvhap Volcanic hornblende andesite porphyry. Greyish andesite contains 30 to 35 percent phenocrysts grading into a trachytic groundmass of plagioclase hornblende and glass. About half of the phenocrysts are oxyhornblende up to 3 mm and about half are andesine up to 2 mm. Occurs in angular unconformity with ash-flow tuffs north of Churchill Canyon. The same as the andesite of Lincoln Flat (Proffett and Proffett, 1976).

Thbap Thbap Hornblende biotite andesite porphyry and volcanic hornblende biotite andesite porphyry.

Thbap: Intrusive plugs contain 30 to 35 percent phenocrysts in an aphanitic groundmass of plagioclase, quartz, biotite, hornblende, magnetite, and apatite. The andesite contains 4 to 6 percent oxyhornblende, 4 to 5 percent biotite, and 20 to 25 percent subhedral zoned andesine as phenocrysts up to 10 mm.

Tvhbap: Andesite flows that are essentially identical to the intrusions but with locally strong trachytic texture.

Tbhap Biotite hornblende andesite porphyry. Dikes contain 45 to 50 percent phenocrysts in an aphanitic groundmass of plagioclase, quartz, and glass. The andesite contains 7 to 10 percent biotite in books up to 10 mm thick and 12 cm across, 2 to 3 percent hornblende up to 5 mm long, and 35 to 40 percent calcic andesine up to 10 mm, all as phenocrysts.

Tfhqdp Foliated hornblende quartz dacite porphyry. The dacite porphyry contains 25 to 30 percent phenocrysts grading into a

groundmass of plagioclase, orthoclase, and quartz. The dikes contain, as phenocrysts, 3 to 5 percent hornblende up to 2 mm, 1 to 3 percent rounded quartz up to 1.5 mm and zoned sodic andesine to calcic oligoclase up to 3 mm. Both phenocrysts and groundmass show strong flow floiation.

Tbqlph Biotite quartz latite porphyry with hornblende. Latite porphyry dikes contain 30 to 40 percent phenocrysts in a very fine grained aphanitic groundmass of plagioclase, orthoclase, and quartz. Occuring as phenocrysts are 5 to 7 percent biotite in book 3 to 5 mm thick, 1 to 2 percent rounded and embayed quartz 1 to 6 mm, and zoned subhedral calcic oligoclase 0.5 to 5 mm. The dikes locally contain up to 2 percent hornblende 0.5 to 2 mm.

Tbhp, Tbhpq, Tfbhp Biotite hornblende porphyry, biotite hornblende porphyry with quartz, fine grained biotite hornblende porphyry.

A related group of dikes in the southern Buckskin Range similar in composition but with the abundance of quartz phenocrysts decreasing from east to west. Tbhp: A dactic porphyry containing 25 to 30 percent phenocrysts in an extremely fine-grained aphanitic groundmass. The porphyry contains as phenocrysts 4 to 7 percent biotite in books 3 mm thick and 3 to 5 mm wide, 3 to 6 percent hornblende up to 3 mm, zoned sodic andesine to calcic oligoclase up to 3 mm, and locally up to 1 percent rounded quartz phenocrysts up to 1 mm.

Tbhpq: Similar to above except containing 1 to 5 percent quartz phenocrysts. Tfbhp: Similar to the biotite hornblende porphyry

except contains slightly more abundant but small phenocrysts and very rare quartz phenocrysts. Biotite separated from this porphyry yeilded a K-Ar age of 15.7 ± 1.5 m.y.

Tfqbp Fine-grained quartz biotite porphyry. These dactic dikes contain 25 to 30 percent phenocrysts of 2 to 3 mm rounded quartz, biotite books 2 mm thick and 4 to 5 mm long, and subhedral zoned calcic oligoclase up to 3 mm. in a felted aphanitic groundmass of biotite, quartz, plagioclase, orthoclase, and accessory hornblende and sphene.

Thpd_p, Thpa_p, Thpp_a, Timb Hornblende pyroxene diorite porphyry, hornblende pyroxene porphyritic andesite, intrusive matrix breccia. This group of intrusions form an intrusive complex of highly variable textures but are similar in composition. Thpd_p: Light to dark grey diorite porphyry containing 10 to 40 percent phenocrysts. The stocks have 5 to 25 percent euhedral to subhedral green and brownish zoned hornblende, 3 to 7 percent subhedral ausite, 2 to 3 percent quartz, zoned andesine, and accessory sphene and apatite. Phenocrysts of hornblende are 5 to 10 mm and are locally up to 30 mm in length. Plagioclase phenocrysts commonly reach 5 mm and are locally up to 10 mm in length. The groundmass is 0.1 to 0.7 mm. Flow foliation often occurs in the diorite. Thpa_p: Similar to above except with a dark grey aphanitic groundmass, generally smaller phenocrysts, and locally augite phenocrysts. Andesite contains 25 to 50 percent phenocrysts. Thpp_a: Similar to the andesite porphyry but contains 5 to 25 percent phenocrysts. Timb: Intrusive breccia having a matrix of hornblende pyroxene porphyritic andesite

with angular to highly rounded, pebble to boulder sized clasts of related intrusions, oligocene ash flow tuffs, meta volcanites, and granitic rocks.

Tpbd Pyroxene biotite diorite. Stocks of dense, black, fine-grained diorite contains 7 to 10 percent subhedral augite, 5 + 7 percent shreddy brown biotite, up to 2 percent quartz, and calcic andesine 0.05 to 2 mm.

The following sequence of oligocene ash-flow tuffs rest conformably on one another and rest upon gently rolling erosional surface developed on the Mesozoic rocks.

Tect Eureka Canyon Tuff. At least 50 feet of bright red-orange, poorly to nonwelded, crystal poor ash-flow tuff containing sparse pumic fragments and less than 5 percent phenocrysts of plagioclase, quartz, sanidine, and trace biotite.

Tnht Nine Hill Tuff. Up to 100 feet of deep lavender to buff, poorly to nonwelded, crystal poor ash-flow tuff and tuff breccia contains less than 5 percent phenocrysts of plagioclase, quartz, sanidine, and trace biotite. While flattened pumice fragments up to 20 cm across are abundant.

Tst Singatse Tuff. About 2500 feet of brown to red-brown, locally lavender, strongly to moderately welded, crystal rick ash-flow tuff contains 30 to 45 percent phenocrysts of plagioclase, quartz, sanidine, hornblende, and 3 to 6 percent biotite crystals up to 5 mm and sparse pumice fragments, and 1 to 4 percent lithic fragments.

Tts Tuffaceous sediments. About 75 feet of poorly sorted tuffaceous sandstones and siltstones are bright red-orange in the lower portion and yellowish-green containing abundant fragments of petrified wood in the upper portion.

Twht Tgmt Mickey Pass Tuff: Weed Heights and Guild Mine Members.

Twht: About 300 feet of lavender to reddish brown, moderately to poorly welded, moderately crystal rich ash-flow tuff containing 15 to 25 percent phenocrysts of plagioclase, sanidine, quartz, and 1 to 2 percent biotite. Abundant large white pumice fragmented are partially collapsed. Tgmt: Fifteen hundred to 2000 feet of brown to lavender to buff, moderately welded crystal rich ash-flow tuff containing 20 to 25 percent phenocrysts up to 2.5 mm of plagioclase, sanidine, quartz, and 1 to 3 percent biotite and moderately abundant pumice fragments. The upper 200 to 300 feet is buff colored vapor phase tuff with uncollapsed pumice fragments.

The following two stocks are of undetermined age and may be either Mesozoic or Tertiary.

Mpxd Pyroxene diorite. Subequigranular dark green diorite containing 10 to 12 percent augite, 2 to 3 percent quartz, and subhedral plagioclase 1 to 2 mm. The stock is partially altered to chlorite, epidote, and actinolite.

Mthd Hornblende diorite. Subequigranular ^{diorite} diorite containing 3 to 5 percent hornblende, 3 to 5 percent interstitial quartz, and

plagioclase 1 to 3 mm. Partially altered to chlorite, epidote, sercite, and clays.

All of the following Mesozoic igneous rocks are metamorphosed to the green schist facies with varying intensities of partial replacement by chlorite, epidote, clinozoisite, albite, quartz, and clays. The following descriptions are given in terms of fresh rock but all are metamorphosed.

Klp, Kqlp Latite porphyry and quartz latite porphyry. Buff colored porphyry contains 25 to 35 percent phenocrysts in an anphanitic groundmass of plagioclase, orthoclase, and quartz. The dikes have 5 to 10 percent subhedral orthoclase 5 to 30 mm and 2 to 3 percent hornblende, 3 to 4 percent biotite, 10 to 15 percent plagioclase, and accessory quartz, sphene, and apatite as phenocrysts up to 2 mm. Kqlp: Similar to above except with up to 5 percent partially resorbed and rounded quartz phenocrysts.

UPPER PLATE OF THE BUCKSKIN THRUST.

KJmgd Microgranodiorite. Buff colored subequigranular granodiorite containing subhedral to anhedral calcic oligoclase up to 1 mm but usually less than 0.4 mm, 15 to 20 percent anhedral quartz, and 10 to 15 percent anhedral orthoclase. Age is uncertain but may be pre-Buckskin Thrust.

Khdp Khdpq Kphd Kphdqb Hornblende dacite porphyry, hornblende dacite porphyry with quartz, porphyritic hornblende dacite, porphyritic hornblende dacite with quartz breccia. This group of intrusions appear to be contained only in the upper plate of the Buckskin Thrust. K-Ar ages on equivalent intrusions from the Pine Nut Range are 146 ± 8 m.y. and 124 ± 9 m.y. (Castor, 1972). The textures and compositions on the intrusions are similar to some of the flows in the Churchill Canyon Sequence and maybe in part equivalent. Khdp: Greenish to lavender porphyry with 25 to 50 percent phenocrysts of oligoclase, hornblende, and locally biotite grading into an aphanitic groundmass of plagioclase, orthoclase, and quartz. Phenocrysts are up to 3 mm and rarely up to 10 mm in length. Plagioclase phenocrysts commonly have epidotized cores. Khdpq: Similar to above but with up to 5 percent rounded and embayed quartz phenocrysts up to 3 mm. Kphd: Similar to the hornblende dacite porphyry except with 15 to 25 percent phenocrysts. A few exposures in the southern portion of the range may be Tertiary and are labeled "Kphd?" Kphdqb: Similar to the hornblende dacite porphyry with quartz but contains 15 to 25 percent phenocrysts or occurs as an autobreccia.

The Churchill Canyon Sequence and the Artesia Sequence maybe, in part, correlative to the Double Spring Formation of Noble (1962). The age of the sequences are uncertain but maybe upper Jurassic to lower Cretaceous.

KJccv Kjccs Churchill Canyon Sequence

KJccv: Dacitic to latitic metavolcanic flows and crystal rich tuffs at least 3000 feet thick. Tuffs are tan to greenish light brown containing 20 to 50 percent subhedral and broken phenocrysts up to 10 mm of plagioclase, orthoclase, quartz, hornblende, and biotite. Locally contains flattened pumice fragments. Grey to grey-green flows 5 to 30 percent are similar in composition to the tuffs 5 to 40 percent phenocrysts in a trachytic aphanitic groundmass but rarely contain biotite phenocrysts. Rounded and embayed and rarely bipyramidal quartz phenocrysts up to 10 mm are distinct of the Churchill Canyon Sequence although some flows lack quartz phenocrysts. Kccs: Discontinuous conglomerate up to 7 feet thick at the contact of the Churchill Canyon Sequence and Artsia Sequence. Contains clasts of both lithologies.

Jav Jas Jafb Artesia Sequence. Up to 6000 feet thick with the base removed by thrusting. Jav: Green to dark lavender to red-lavender andesitic to dacitic meta volcanic flows. Porphyritic to aphanitic flows contain 0 to 40 percent phenocrysts of plagioclase, hornblende, pyroxene, biotite, and occasionally small rounded quartz. Phenocrysts are usually less than 1 mm, locally

up to 3 mm, and up to 5 mm in the upper portion of the section. Thick, discontinuous, strata form silicified flows common except in the northern portion of the range. Jas: Interbedded volcanic sandstone and conglomerate. Conglomerate contains rounded clasts up to 100 mm grading into feldspathic sandstone forming graded beds 10 mm to 1 mm thick. Jafb: White to buff felsic breccia, up to 200 feet thick often flow banded and containing rounded felsic fragments up to 20 cm.

LOWER PLATE OF THE BUCKSKIN THRUST.

Jqmp Jqmb Quartz monzonite porphyry and quartz monzonite breccia.

Jqmp: Pinkish brown porphyry contains 1 to 3 percent, 15 percent quartz, 30 to 35 percent orthoclase, 50 to 55 percent plagioclase, and 1 to 2 percent magnetite and pyrite. Phenocryst up to 5 mm of plagioclase, orthoclase, and biotite make up 50 percent of the porphyry grading into a fine-grained groundmass. The stock is stockwork quartz-magnetite-pyrite veins. Jqmb: Clasts of quartz monzonite porphyry up to 30 mm in an aphanitic matrix.

Jgd Granodiorite. Fine to medium grained, equigranular granodiorite containing 2 to 5 percent biotite, 1 to 2 percent hornblende, 8 to 12 percent quartz, 10 to 15 percent orthoclase, and calcic oligoclase in subhedral to anhedral crystals 0.5 to 0.9 mm.

Jd Diorite. Black fine-grained diorite with 5 to 10 percent augit, 1 to 2 percent quartz, and calcic andesine.

Jgs Jgl Gardnerville Formation. (of Noble, 1962). Up to 1200 feet exposed in the northern Buckskin Range with upper portion removed by thrusting. Jgs: Thin to medium bedded, grey to green-grey, tuffaceous locally pyritic, calcarous siltstone. Jgl: Patchy massive grey limestone, 1 to 20 feet thick interbedded with siltstones. Limestone locally contain abundant fossil fragments and oolites and cross bedded calcarenite.

TRoc TRov TRol Oreana Peak Formation (of Noble, 1962). TRoc: Carbonate member. About 200 feet of massive to medium bedded, locally fossiliferous and oolitic, grey limestone and dolomitic limestone with grey and pink siltstone parting. TRov: Volcanic member. Over 1200 feet of interbedded waterlain tuff, tuffaceous sediments, and aphanatic amygdaloidal basalt. TRol: Massive grey limestone $\frac{1}{2}$ to 25 feet thick interbedded with volcanites. Base is not exposed and relationship with underlying andesites unknown.

TRv: Metavolcanic rocks. Greenish fine-grained porphyritic andesite up to 6000 feet thick containing 5 to 15 percent subhedral phenocrysts of plagioclase 0.1 to 5 mm, 5 to 10 percent phenocrysts of augite 0.1 to 1 mm, and 3 to 5 percent phenocrysts of magnetite. In some flows, glomeroporphyritic plagioclase laths form cluster of 2 to 5 crystals resembling chicken tracks. Lower and upper contact are not exposed. Unit strongly resembles

Triassic meta volcanites in McConnel Canyon in the Singatse Range.

STRUCTURE

Normal Faults

The dominate structural style in the Buckskin Range is low angle Basin and Range Faults. Originally high angle normal faults with the east side down thrown, the range has been tilted sharply westward so that the faults presently dip 5 to 15 degrees to the east although some of the faults on the west side of the range dip up to 15 degrees west. Fault planes are subparallel to one another with a northerly strike and frequently intersect at low angles. Individual fault blocks are 50 to 1500 feet thick and 1000 to 15000 feet long parallel to strike. Dip-slip offsets range up to 6000 feet along a single fault with displacement directed to the east. Less competent units are often folded from near vertical dips in the center of fault blocks to dips nearly parallel to the faults adjacent to the faults. Up to 50 foot thick zones of fault gouge occurs locally along the fault planes.

The low angle set of normal faults had initial offset about 10 to 17 m.y. (Proffett, 1977) and continued displacement to about 15 m.y. Biotite hornblende porphyry dikes dated at 15.8 m.y. in the southern part of the range cut the low angle faults with little or no later displacement, thus the present low angle set of faults

probably ceased activity shortly after the emplacement of the dikes. Westward rotation of the range followed. Probably by major down dropping of the Buckskin Range relative to the Pine Nut Range to the west.

Younger, high-angle normal faults have rotated the Buckskin Range westward since the Plio-Pliestocene as reflected in up to 30 degree westward dips on Late Cenozoic lake sediments.

BUCKSKIN THRUST

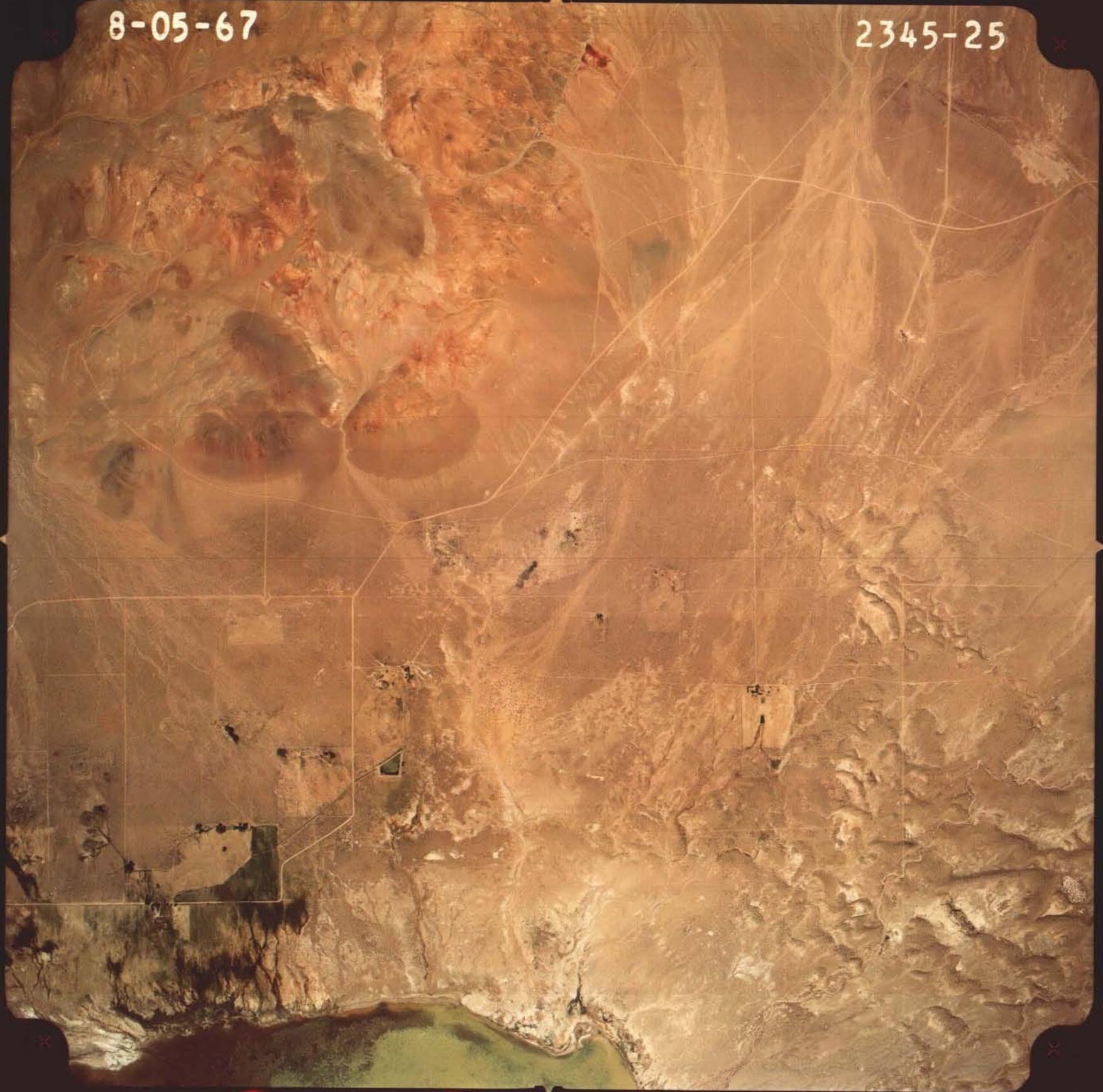
The Artesia and Churchill Canyon Sequences are thrust over the Gardnerville Formation and older units along the Buckskin Thrust. The plane of the thrust generally subparallels the bedding in both the upper and lower plate units although crosscutting relationships are observable. Usually, there is little shearing or brecciation along the fault plane. Local shearing in the Gardnerville Formation suggests eastward directed thrusting.

The thrust has removed from the lower plate in the Buckskin Range some 8000 to 12000 feet of stratigraphic section present in the Singatse Range to the southeast (E. C. Bingler, written Comm.) and the southern Pine Nut Range to the southwest (Noble, 1962).

Since the Lower Cretaceous hornblende dacite porphyry and related intrusions are apparently contained in the upper plate, the Buckskin Thrust is assumed to be middle to Upper Cretaceous.

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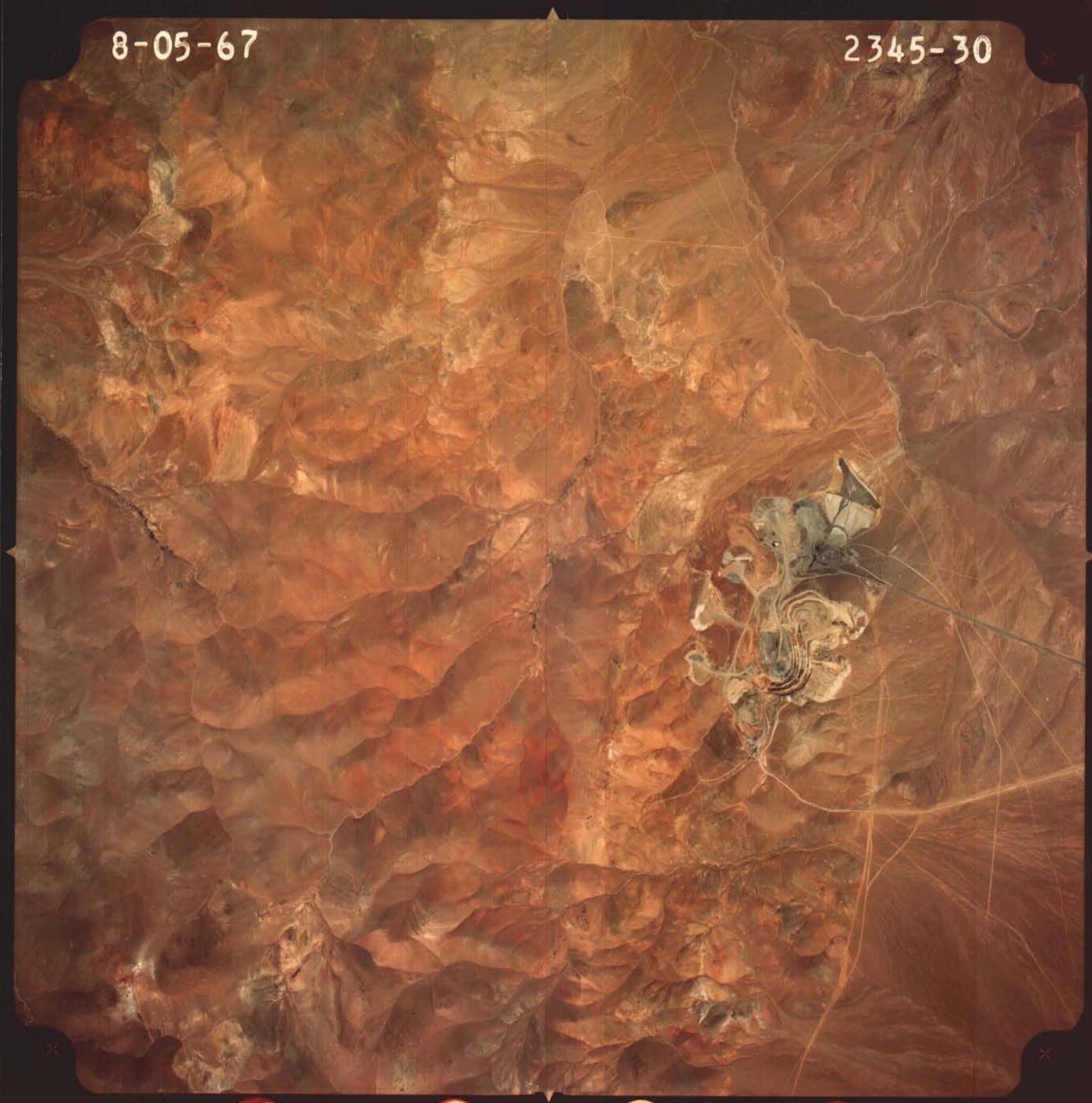
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9-10-67

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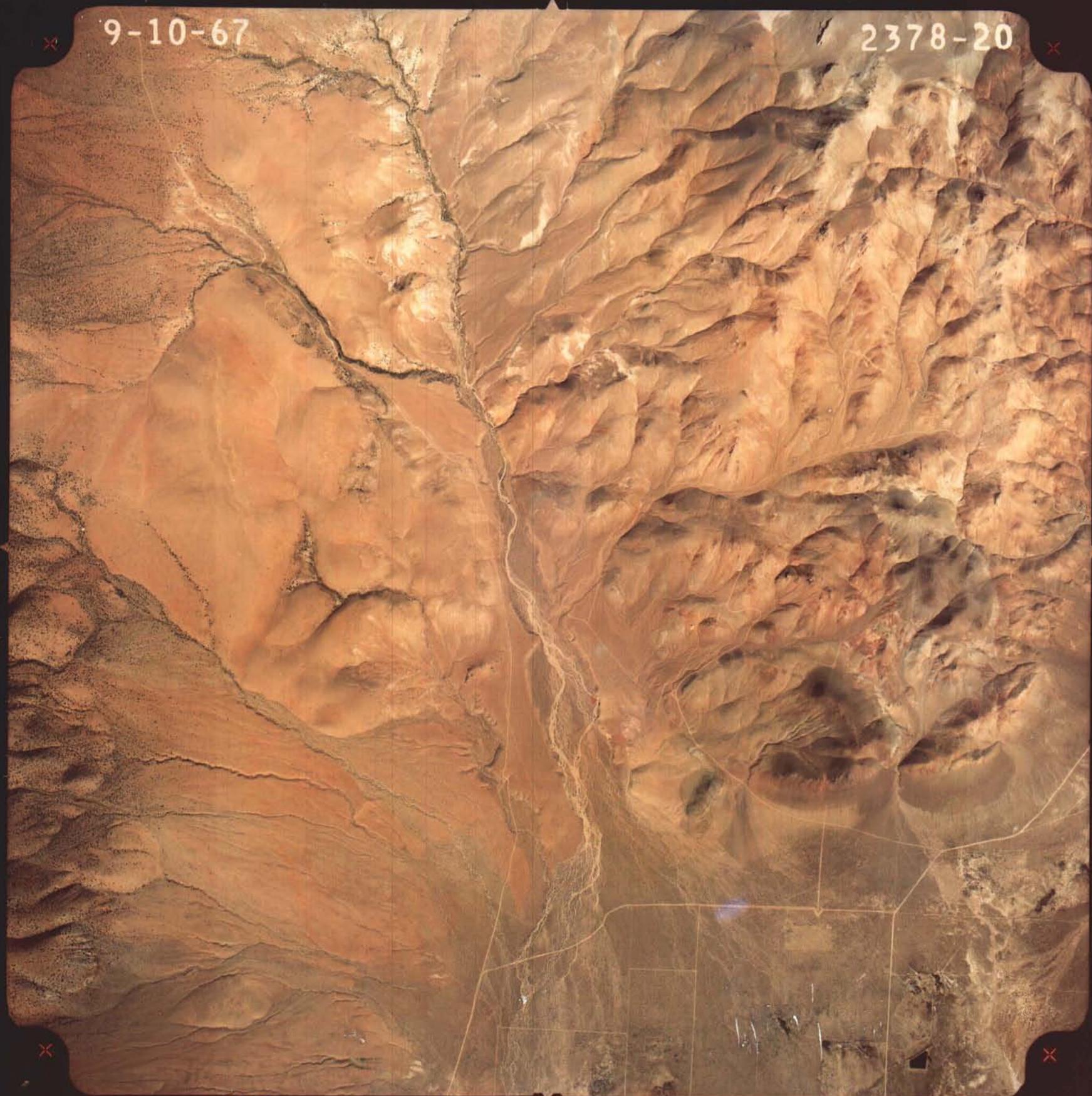


52 22
52 21



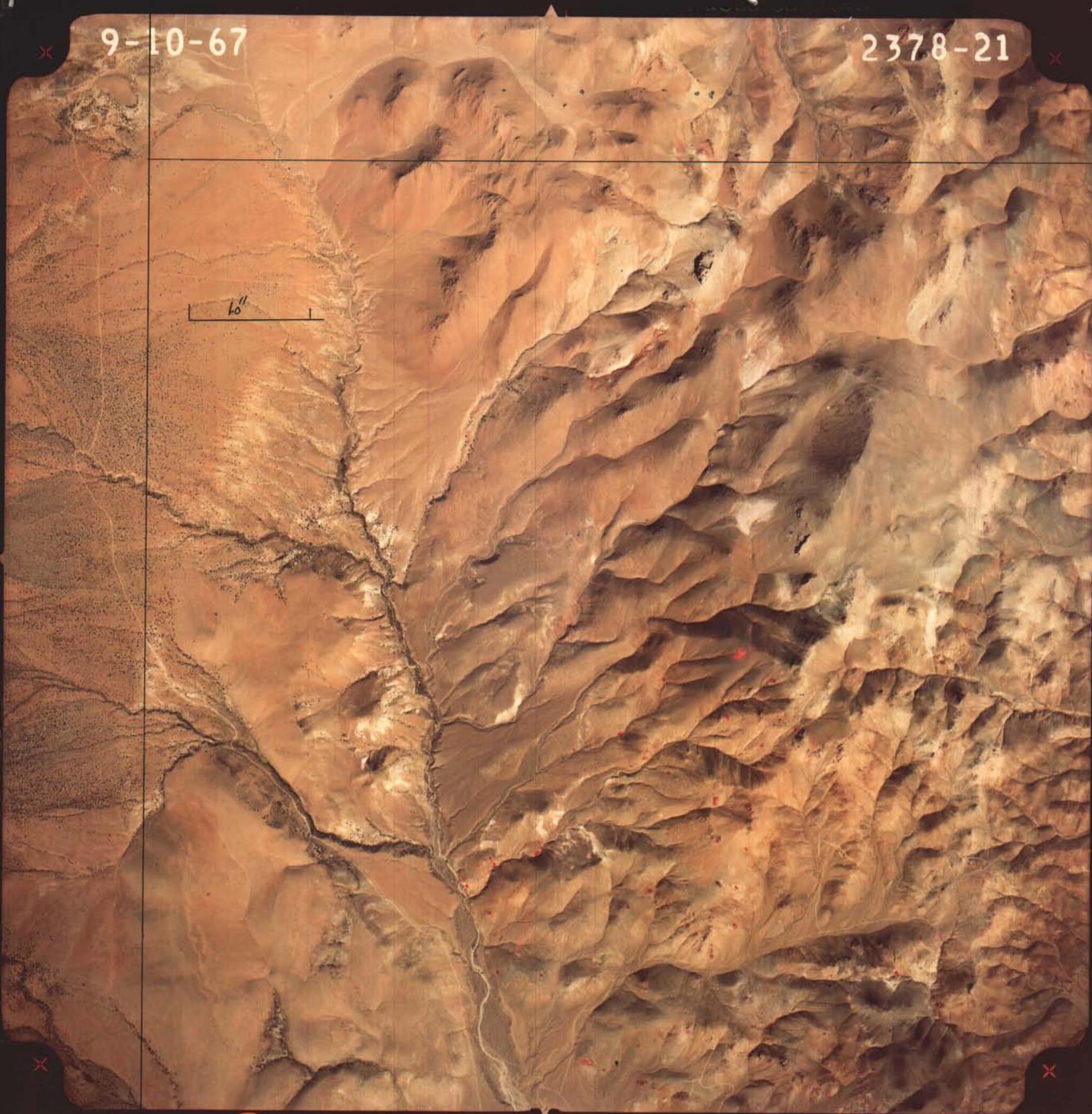
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20

CONTINENTAL OIL COMPANY
P. O. BOX 7608
RENO, NEVADA 89502 89510

T-1 S-21
① ② R-1 Q-21 P-1
T-21 R-21 Q-1 P-21



① J-1 Gecular Gecular
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① A-17 Gecular
4/13/76

① T-21 ② R-21 ① Q-1 ① P-21
H-21 ① Gecular
4/21/76

① J-1 Gecular
4/14/76

① I-1 Gecular
4/14/76

① F-1 Gecular
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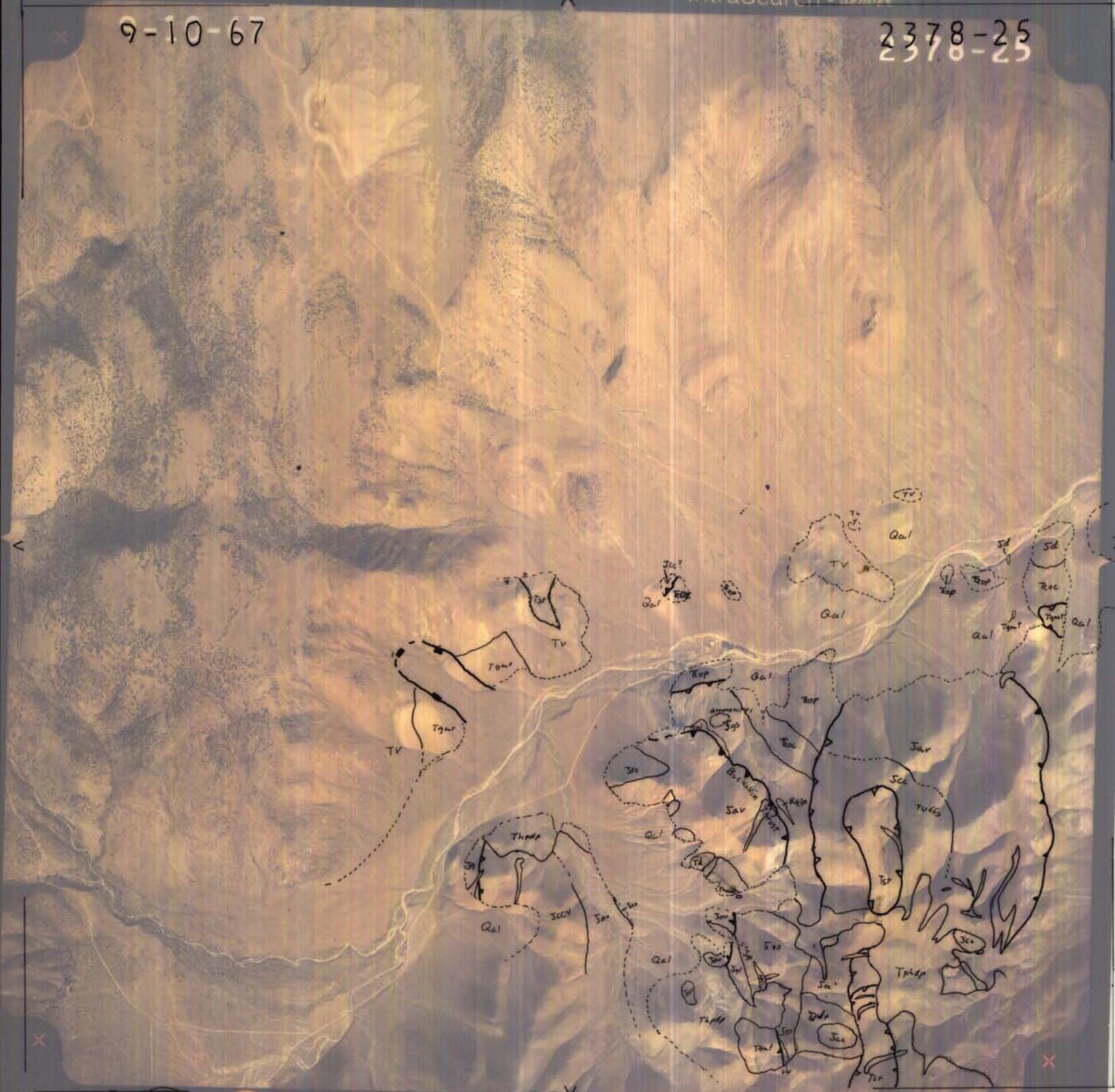


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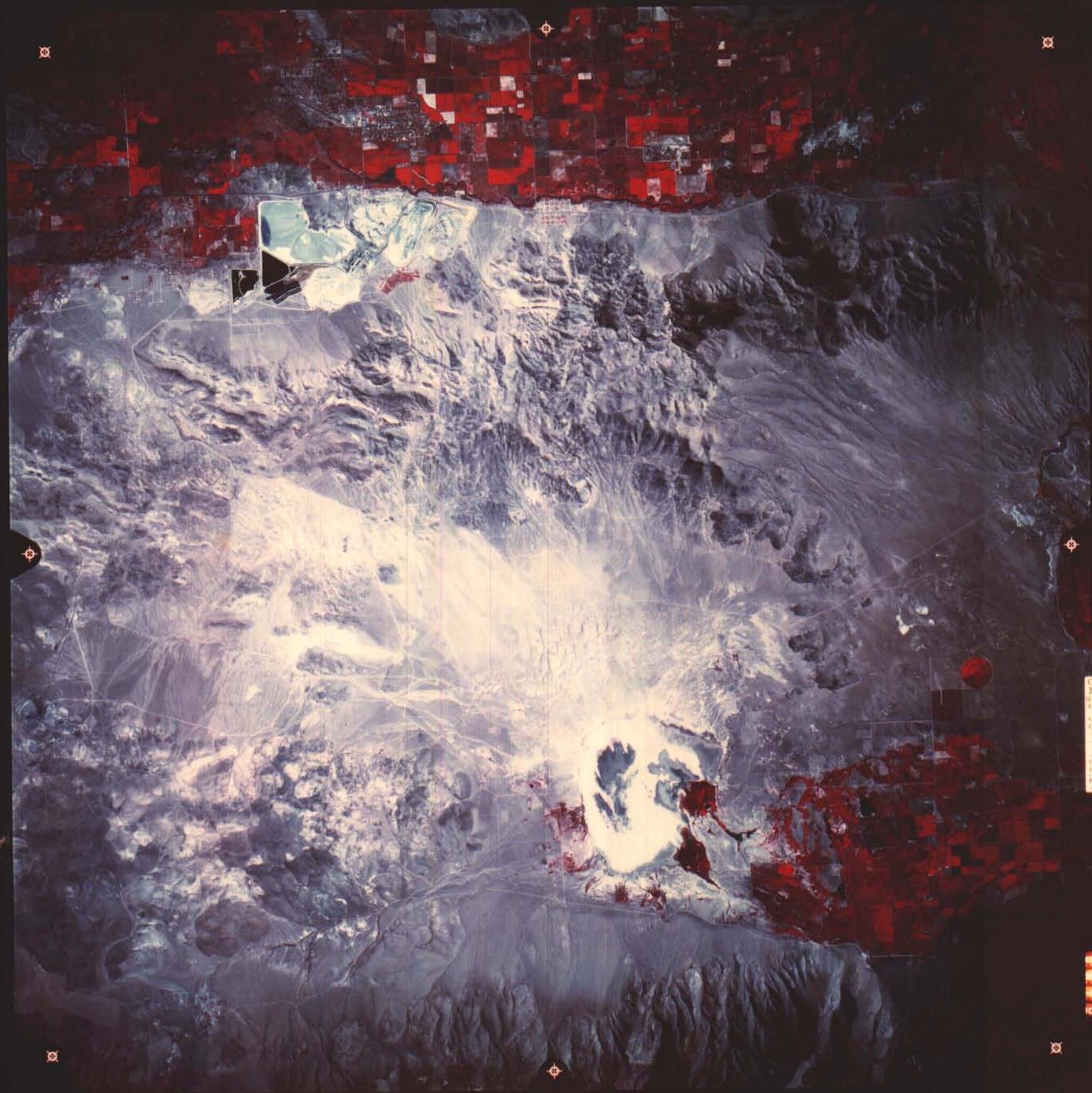
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IntraSearch - *demoversion*

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2378 - 25



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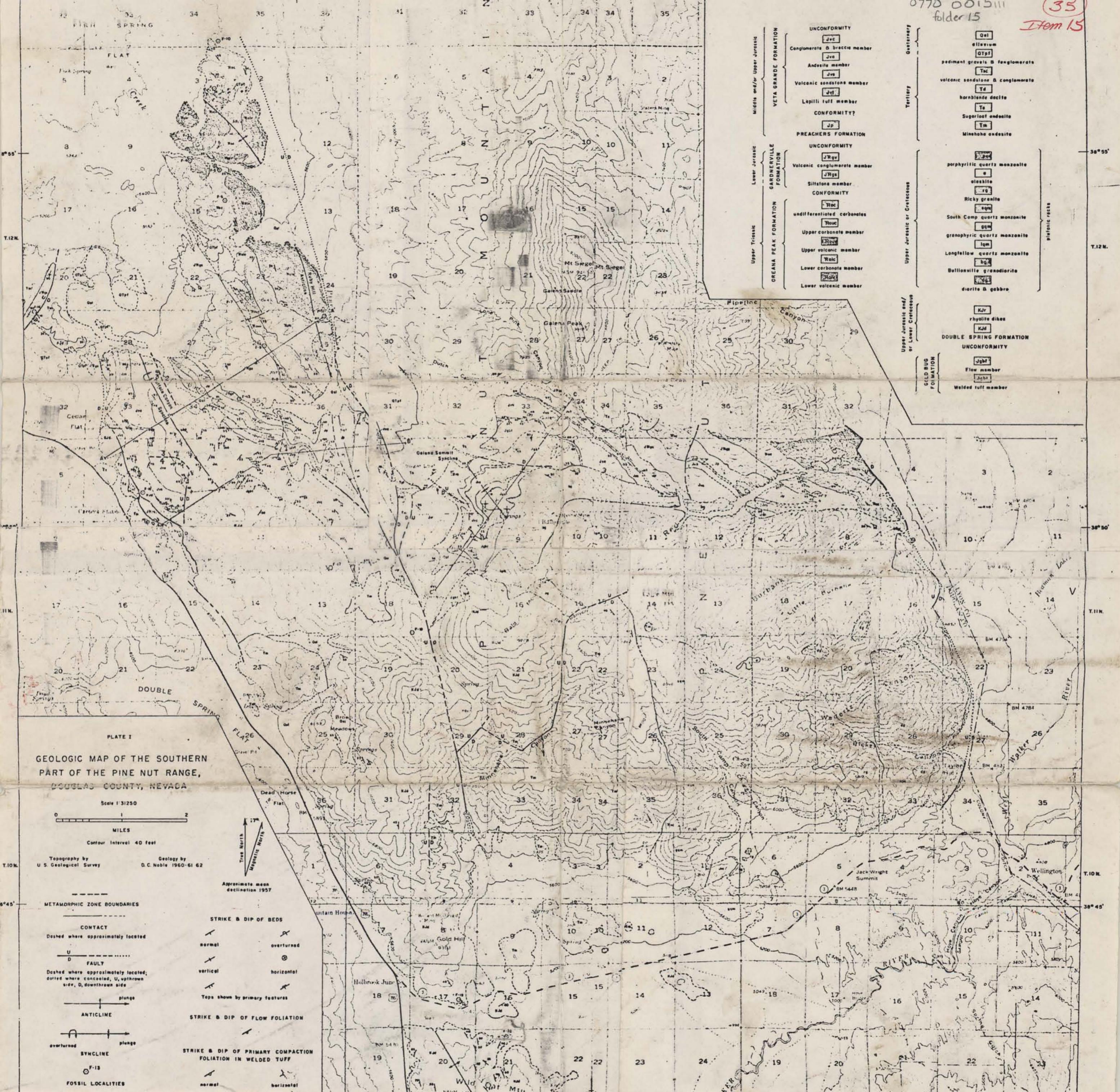
Buckskin

Mickey
pass

35
Item 15

Anacanda
(—) P.D.

yerringa



EX

137 ✓	25	53 ✓	81 ✓	109 ✓
138 ✓	26 ✓	54	82 ✓	110 ✓
139 ✓	27 ✓	55 ✓	83 ✓	111 ✓
140 ✓	28	56 ✓	84 ✓	112 ✓
141 ✓	29	57 ✓	85 ✓	113 ✓
142 ✓	30 ✓	58 ✓	86 ✓	114 ✓
143 ✓	31 ✓	59 ✓	87 ✓	115 ✓
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146 ✓	34 ✓	62 ✓	90 ✓	118 ✓
147 ✓	35 ✓	63 ✓	91 ✓	119 ✓
148 ✓	36	64 ✓	92 ✓	120 ✓
149 ✓	37 ✓	65 ✓	93 ✓	121 ✓
150 ✓	38	66 ✓	94 ✓	122 ✓
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156 ✓	44 ✓	72 ✓	100 ✓	128 ✓
157 ✓	45 ✓	73 ✓	101 ✓	129 ✓
158	46 ✓	74 ✓	102 ✓	130 ✓
159	47 ✓	75 ✓	103 ✓	131 ✓
160	48 ✓	76 ✓	104 ✓	132 ✓
161	49 ✗	77 ✓	105 ✓	133 ✓
162	50 ✓	78 ✓	106 ✓	134 ✓
163	51	79 ✓	107 ✓	135 ✓
164	52 ✓	80 ✓	108 ✓	136 ✓

35 Item 15

Q - Quartz

Al - Alunite

An - Andalusite

P - Pyrophyllite

D - Diaspore

C - Corundum

S - Sericite

Z - Zungsite

I - Illite

F - Feldspar

M - montmorillonite

Ch - Chalcocite

1	Q Al	T.S.	✓	26	Q SK	-	
2	Q P A	DARK	T.S.	✓	27	Q	
3	Q An		T.S.	✓	28	Q Al DARK	
4	Q			29	Q P An	✓ T.S.	
5	- Q Al			30	Q Al D	,	
6				31	QP		
7	- Q - D / P		T.S.?	32	QS F		
8	Q P Al D		T.S.	✓	33	QS	
9	Q Al D			34	Q CD P	? T.S.?	
10	Q S			35	Q Al		
11	Q - S			36	Q Al	T.S. ✓	
12	Q - P D?			37	Q D		
13	Q S R		T.S.?	✓	38	QP	
14	Q P D?			39	QP		
15	Q P D?			40	Q DC APP?	? T.S.	
16	Q PS			41	Q		
17	Q			42	Q DC	? ✓	
18	QS		T.S.	✓	43	QP	T.S. ✓
19	QS			44	QP		
20	Q SK		T.S.	✓	45	Q	
21	Q PD			46	Q FS		
22	Q S			47	QS K		
23	Q Al			48	Q K?		
24	Q Al		T.S.	49	QS		
25	Q Al			50	Q Al D		

51	QS		76	Q	
52	QSF	?	77	Q I	X ✓ T.S.?
53	QS		78	QS	
54	QPS K		79	Q, A.I. K ? ?	-
55	QPD		80	QP	
56	QPD		81	QS	
57	QS		82	SQ	
58	QAI D,	T.S. ✓	83	QPS	
59	QPD Z	X	84	QFS.	X
60A	QAIPD An	s	85	QS	
60B	QA _n AIP DC	?	86	QPS	
61	QPO		87	Q	
62	QPOS		88	QS	
63	QPS		89	QPS	
64	QPO		90	QS	T.S. ✓
65	QS		91	QS	
66	QPAI D	✓ T.S.	92	QS	
67	QAIPD		93	QSCh	X
68	QP		94	QSF	
69	QPD _s		95	QS	
70	QAID		96	QS	
71	QPs	✓ T.S.	97	QF	X
72	QPP An		98	QFI	
73	QAI		99	QF	
74	QAI ZD	X T.S. ✓	100	QFI	T.S. -
75	QP				

101 QS

102

103 QSI

104 QIS

105 QFSI

106 Q I

107 QFS

108 QFI

109 QS

110 QS

111 QS

112 QS

113 QF

114 QFS

115 QS

116 QSF

117 QSI

118 QFIS

119 QS 119A Q

120 QFI

121 Q I

122 QS

123 QS

124 QFIS

125 QFI

126 QFI

127

128 QS

129 QS

130 QFI

131 QS

132 QS

133 QFI

134 FQI

135 QS

136 FQI

137 QFI

138 QS

139 QFI

140 FQI

141 FQI

142 QS

143 FQI

144 FQ

145 QS

146 FQ

147 QFI

148 QS

149 QS

150 QS

✓ T.S.

✓ T.S.

151	QF	?	176	QS or F
152	QFI		177	QPS
153	QAI? Z? P?	✗	T.S. 178A	QFS 178 QS
154	QI		179	QP? P?
155	QS		180	QS
156	QC D P?	✗ T.S.	181	QS
157A	QPZ	V T.S. 157B	QSP	182 FQ
158	QP		183	FQF
159	QPS		184	QPs
160	QS		185	QS
161	QS		186	QFI
162	QK		187	F
163	Q.C.D.?	✗ T.S.	188	QPS?
164	QP		189	QPs
165	QFI	?	190	Q
166	Q I		191	QS
167	QFS		192	QS
168	Q I		193	QS
169	QI		194	QS
170	QS		195	QS
171	Q		196	FQ
172	QFI		197	QFI
173	QPS		198	QFI
174	QPS		199	QFI
175	QS I		200	QFI

201	QS		226	QFK
202	QF	T.S. ✓	227	QFI _K
203	QFI	T.S. ✓	228	QS
204	QS		229	QS
205	QS		230	Q.FI
206	QFI		231	QS _F
207	QS		232	QS
208	QS		233	FI _Q
209	QS	T.S. ✓	234	QS
210	QS	T.S. ✓	235	QS
211	QS		236	QS
212	QS		237	QS
213	QFI	T.S. ✓	238	QFI
214	QS		239	QM
215	FI		240	FQ
216	FI		241	QS _F
217	QS		242	FI
218	QS		243	FI _K
219	QF		244	QFI
220	QS.		245	QFI
221	QFT		246	QF
222	QS _F		247	QFI
223	F		248	QFI
224	QFI		249	F
225	QF _K		250	QS

251 QF
 252 QP
 253 QS 253A QS
 254 QS
 255 QFI
 256 QS
 257 QS
 258 QSK
 259 QK
 260 QFI T.S. ✓
 261 QS T.S. ✓
 262

A - Aluminite
 A/A Alumite - Alsic
 A - Alsic
 K - Kalinitic
 S - Sericitic
 SK - Sericitic - Kalinitic
 SF - Sericitic - feld.
 IF - Illite - feld.
 P - Propylitic
 Q - Siderite

Ex Gachem Samples

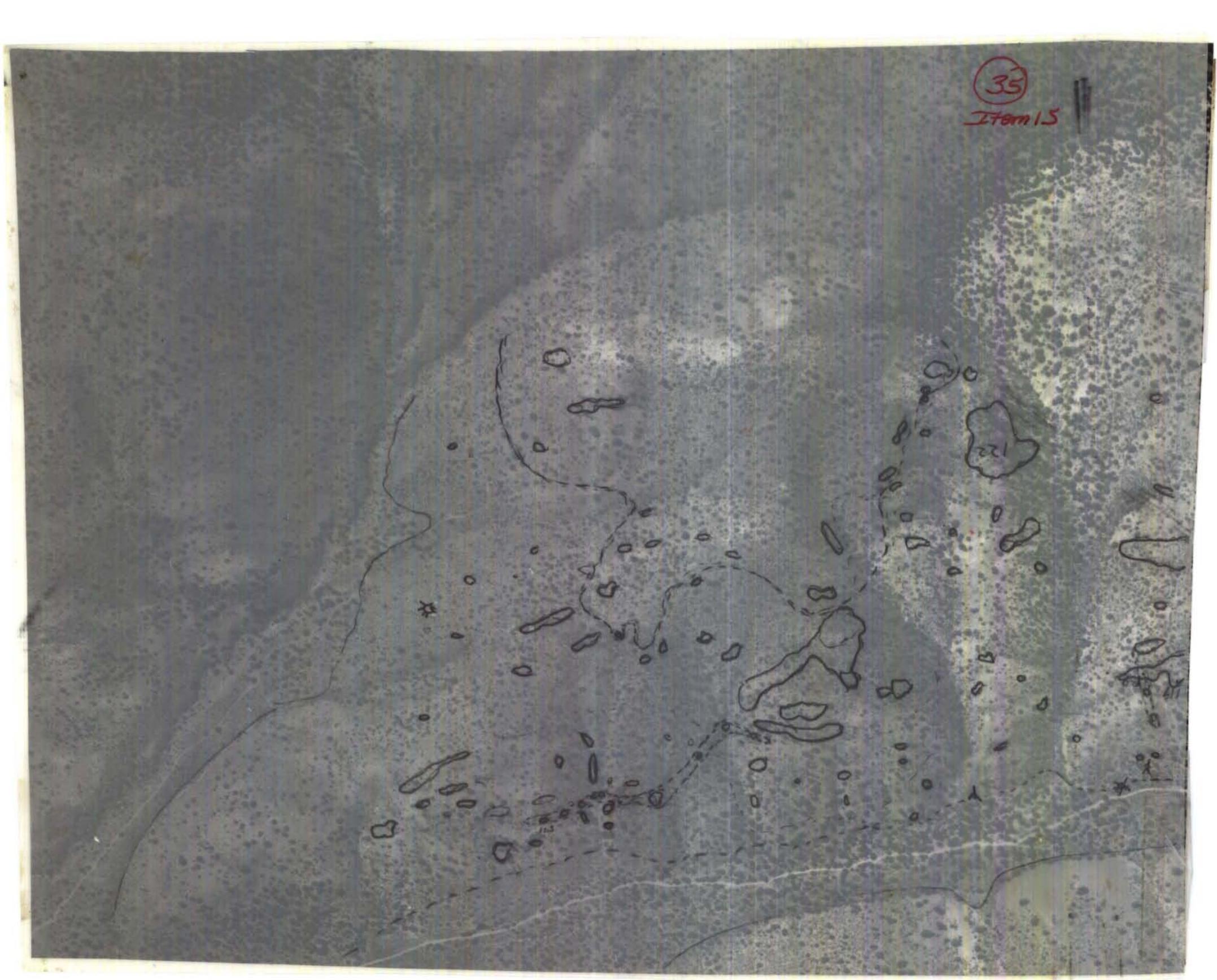
26	58	84	112	143
27	59	85	114	144
28	60	86	115	145
30	61	87	116	146
31	62	88	117	147
32	63	89	118	148
33	64	90	119	149
34	65	91	120	150
35	66	92	121	151
37	67	93	122	152
39	68	94	124	153
40	69	95	125	154
41	70	96	126	155
42	71	98	128	156
44	72	99	129	157
45	73	100	130	
46	74	101	131	
47	75	102	133	
48	76	103	134	
49	77	104	135	
50	78	105	137	
52	79	106	138	
53	80	107	139	
55	81	108	140	
56	82	109	141	
57	83	110	142	
				26 104 15 119

GT

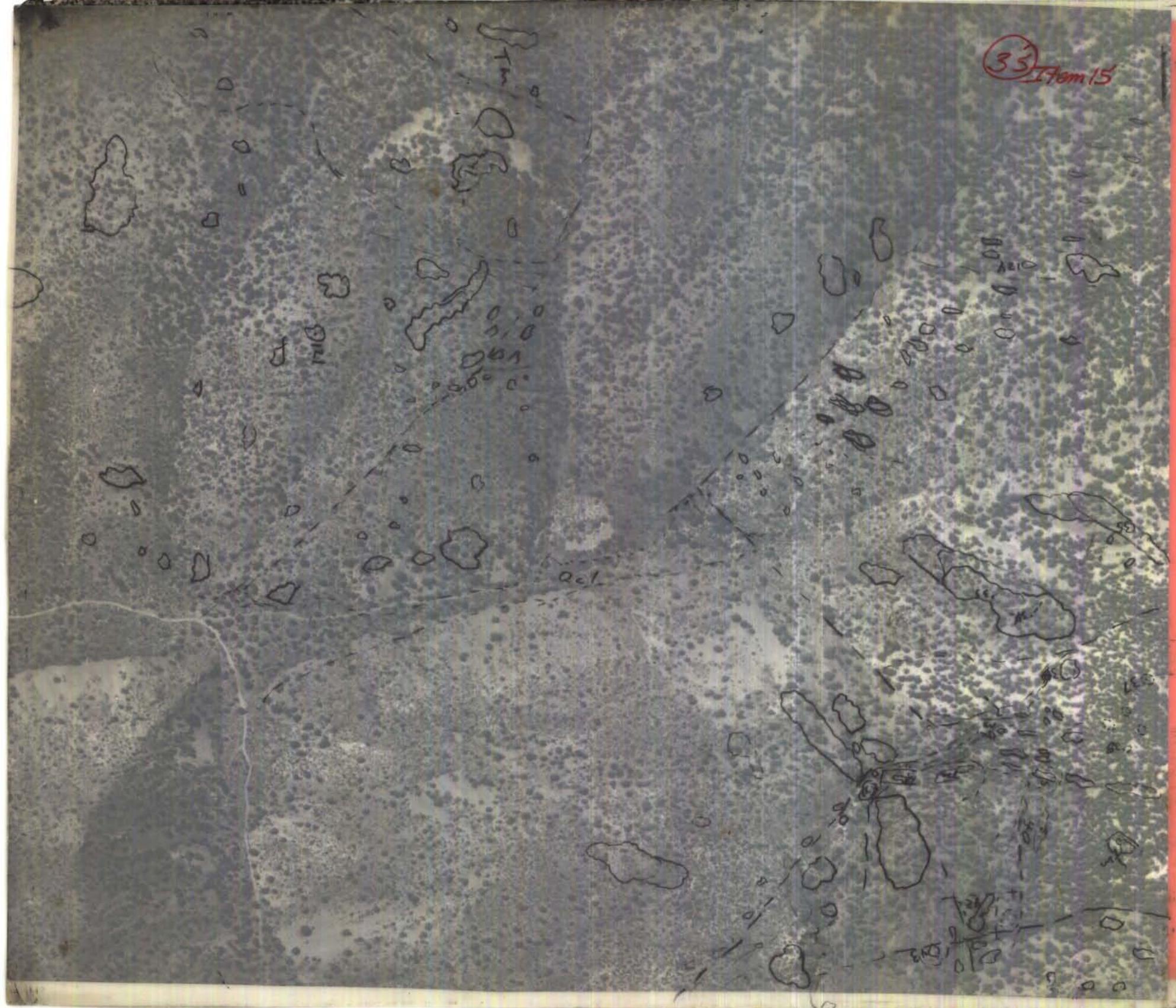
15	41 ✓	67	91 ✓
16	42 ✓	68 ✓	92
17	43 ✓	69 ✓	93 ✓
18	44 ✓	70 ✓	94 ✓
19	45 ✓	71 ✓	95
20	46 ✓	72 ✓	96 ✓
21	47 ✓	73	97 ✓
22	48	74 ✓	98
23	49 ✓	75 ✓	99
24	50 ✓	76 ✓	
<u>25</u>	51 ✓	77 ✓	
26 ✓	52 ✓	78	
27 ✓	53 ✓	79 ✓	
28 ✓	54 ✓	80 ✓	
29 ✓	55 ✓	81 ✓	
30 ✓	56 ✓	82 ✓	
31 ✓	57 ✓	83 ✓	
32 ✓	58 ✓	84 ✓	
33 ✓	59 ✓	85 ✓	
34 ✓	60 ✓	86 ✓	
35 ✓	61 ✓	87	
36 ✓	62	88 ✓	
37 ✓	63 ✓	89 ✓	
38 ✓	64	90	
39 ✓	65 ✓		
40 ✓	66 ✓		

(35)

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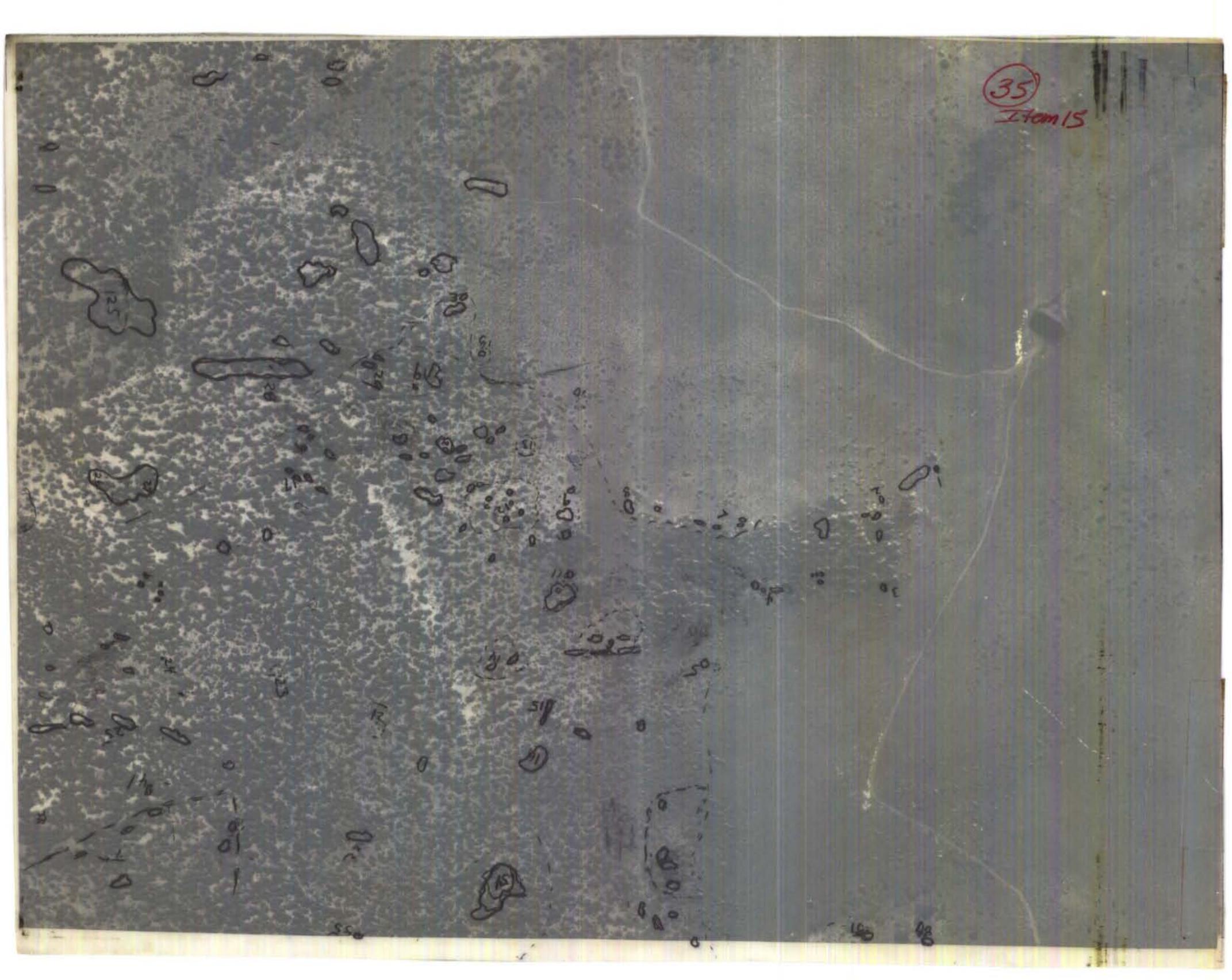


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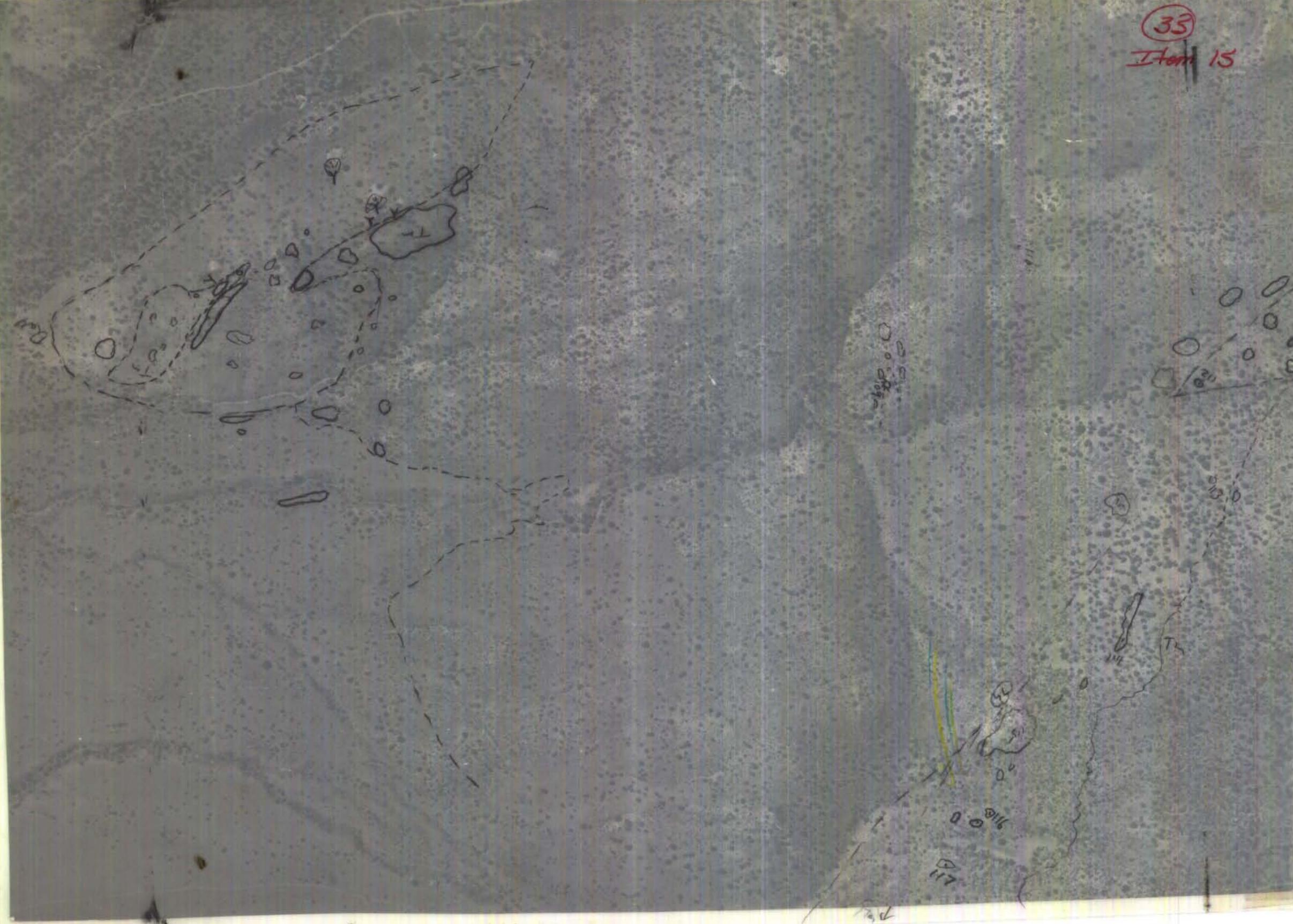
(35)

Item 15



(35)

Item 15



(35)
Item 15



Robert W. Bamford
Geologist/Geochemist

October 10, 1980

Gordon L. Pine
District Geologist
Minerals Department
CONOCO INC.
P. O. Box 7608
Reno, NV 89510

Dear Gordon:

This letter presents initial descriptions and interpretation of multi-element geochemical data for Buckskin Project DDH BC-5,5A (Figures 1/BC5-4/BC5 and original data tabulations). The data are, as in previous work, based on analysis of +3.3 specific gravity concentrates from 100-foot composite samples. As requested, the interpretation provided is largely confined to the BC-5,5A results and includes comments on possible geochemical indications of flat faults at 1200 and 1000 feet depths in BC-5,5A and BC-4, respectively. A more comprehensive review of target concepts in terms of these and previously developed geochemical data has been deferred until after we meet to review new data for the prospect area.

Several differences between the BC-5,5A data and previously generated concentrate geochemical data for the Bucksin Project should be noted. Sulfur determinations have been added to provide information on the composition and quantity of sulfides in the concentrate samples. These determinations replace routine binocular scope determinations of concentrate sample mineralogy. Sulfide contents of the BC-5,5A composite samples have been calculated from the sulfur values by assuming pyrite to be the only sulfur-bearing species present (see % CALC. PY, Figure 1/BC5). Determinations of Bi, Te, Sn, and W have been carried out for the first time by atomic absorption spectrophotometry (AAS) or colorimetry (COLOR) instead of optical emission spectrography (OES). This constitutes an attempt to improve data quality and decrease the overall time required for obtaining multielement data without increasing cost. In order to provide a basis for comparing these two groups of data, a suite of 10 samples previously analyzed by OES were submitted for repeat analyses by the new methods. The results indicate the BC-5,5A AAS-COLOR data can be adjusted for direct comparison with COORS Spectro-Chemical OES data by multiplying the BC-5,5A tin values by 0.5, the tellurium values by 3, and the bismuth values (all <0.5 ppm) by 30. Tungsten values for the two

Gordon L. Pine
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data groups are approximately equivalent. The large correction factor for the bismuth values results from apparently systematic analytical problems which should be eliminated in future work. The repeat analyses suggest these BC-5,5A bismuth data are meaningful, however. Relatively high iron values in the BC-5,5A data set compared to previous data sets probably reflect the incomplete removal of iron contamination caused by the use of steel pulverizer plates during sample preparation.

Overall geochemical signatures for the BC-5,5A samples suggest that rock penetrated by this hole was probably originally located much further from higher-grade copper-zone type mineralization than rock penetrated by DDH BC-4, which still remains one of the more encouraging holes drilled to date on this project (Re: my letter of 31 May, 1979). In the context of porphyry copper system geochemical models, the BC-5,5A geochemistry is most like that of an outer halo zone at a location near the outer limits of lead-zinc rich parts of this zone. Tellurium (adjusted values), bismuth (adjusted values of <15 ppm, not plotted), copper, molybdenum, tin (adjusted values), and tungsten values are either similar or lower in BC-5,5A than in BC-4 while manganese and arsenic values are significantly higher. As with the BC-4 and other results, however, these overall geochemical signatures are only definitive if related to a single mineralizing event. If, for example, the manganese and arsenic in BC-5,5A rocks were products of an event totally unrelated to that which gave rise to the copper and molybdenum mineralization, the interpretation provided above might be totally reversed.

Regarding geochemical indications of flat faults at or near 1200 feet and 1000 feet in BC-5,5A and BC-4, respectively, it appears that discontinuities in a few of the element distributions can be interpreted as being caused by fault offsets. Molybdenum distributions are the most convincing in this regard for both holes. In BC-5,5A molybdenum contents are relatively low in the upper part of the hole, increase sharply at 1200 feet, and remain generally higher in the lower part of the hole (Figure 2/BC5). A similar, although less well defined, geometry is observed for the molybdenum distribution in BC-4. Arsenic and possibly copper distributions in BC-5,5A (only) roughly mimic the molybdenum distribution (Figures 2/BC5 and 3/BC5) and constitute the only other reasonable geochemical evidence for the fault offsets. The presence or absence of flat faulting in BC-5,5A or BC-4 does not affect interpretation of the relative proximity of these holes to a target copper zone, since this interpretation is based on geochemical signatures which for the most part are developed throughout the holes.

Gordon L. Pine
October 10, 1980
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This, I believe, is all that can be usefully said about the BC-5,5A and BC-4 geochemical data until after we meet for a project review. Please let me know your selection of a meeting time as early as possible.

Best regards,



Robert W. Bamford

RWB:zrl

Enclosures



ROCKY MOUNTAIN GEOCHEMICAL CORP.

1323 W. 7900 SOUTH • WEST JORDAN, UTAH 84084 • PHONE: (801) 255-3558

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Certificate of Analysis

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Page 1 of

Date: September 19, 1980

RMGC Numbers:

Client: Robert W. Bamford
1138 Gilmer Dr.
Salt Lake City, Utah 84105

Local Job No.: 80-24-30-SL

Foreign Job No.:

Invoice No.: M 102003

Client Order No.: none

Report On: 23 Composite Samples

Submitted by: Robert W. Bamford

Date Received: 8/18/80

Analysis: Heavy Mineral Separation, Copper, Lead, Zinc, Cobalt,
Molybdenum, Manganese, Sulfur, Silver, Iron, Antimony,

Analytical Methods: Arsenic and Tin.

Remarks: Sulfur determined by leco induction furnace. Arsenic
determined colorimetrically. Remaining elements determined
by atomic absorption.

cc:
enc.
file (2)
GJC/lw

<u>Std Samples</u>	<u>ppm</u> <u>Tin</u>
J - 19	-5
J - 36	15
Beth - Con - 74	15
Lorn - Con - 74	10

All values are reported in parts per million unless specified otherwise. A minus sign (—) is to be read "less than" and a plus sign (+) "greater than." Values in parenthesis are estimates. This analytical report is the confidential property of the above mentioned client and for the protection of this client and ourselves we reserve the right to forbid publication or reproduction of this report or any part thereof without written permission.
ND = None Detected 1 ppm = 0.0001% 1 Troy oz./ton = 34.286 ppm 1 ppm = 0.0292 Troy oz./ton

Client

Robert W. Bamford

Date

9/19/80

RMGC Job No.

80-24-30-SL

Page 2 of 4

<u>Sample No.</u>	<u>grams Wt +3.3</u>	<u>Wt % +3.3</u>	<u>grams Sample Wt separated</u>
23-100	0.66	0.82	80
100-200	4.31	5.39	80
200-300	2.28	2.85	80
300-400	0.55	0.69	80
400-500	1.24	1.55	80
500-600	2.45	3.06	80
600-700	1.76	2.20	80
700-800	2.65	3.31	80
800-900	1.56	1.95	80
900-1000	2.02	2.52	80
1000-1100	2.22	2.78	80
1100-1200	1.45	1.81	80
1200-1300	2.41	3.01	80
1300-1400	1.39	1.74	80
1400-1500	1.45	1.81	80
1500-1600	0.97	1.21	80
1600-1700	2.02	2.52	80
1700-1800	1.08	1.35	80
1800-1900	0.24	0.30	80
1900-2000	1.02	1.28	80
2000-2100	1.26	1.58	80
2100-2200	0.60	0.75	80
2200-2338	0.83	1.04	80



ROCKY MOUNTAIN GEOCHEMICAL CORP.

SALT LAKE CITY, UTAH

RENO, NEVADA

TUCSON, ARIZONA

BY Jim Cardwell
Jim Cardwell

Client Robert W. Bamford

Date

9/19/80

RMGC Job No. 80-24-30-SL

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<u>Sample No.</u>	<u>ppm Copper</u>	<u>ppm Lead</u>	<u>ppm Zinc</u>	<u>ppm Molybdenum</u>	<u>ppm Cobalt</u>	<u>ppm Manganese</u>
23-100	865	680	305	5	385	7120
100-200	795	105	24	10	235	2620
200-300	1810	260	225	10	235	1920
300-400	685	365	140	25	400	1.10%
400-500	1340	230	39	15	515	6250
500-600	960	235	120	10	240	6250
600-700	1070	170	115	10	225	1.25%
700-800	1320	255	190	20	245	9620
800-900	740	900	250	20	415	1.66%
900-1000	920	590	560	15	360	8000
1000-1100	645	325	170	20	225	3880
1100-1200	840	275	51	25	230	3620
1200-1300	2590	120	35	90	560	6380
1300-1400	1720	200	100	60	395	7250
1400-1500	755	155	40	40	295	4620
1500-1600	630	175	40	25	255	3120
1600-1700	1080	135	31	80	290	6500
1700-1800	680	1290	705	50	300	1.18%
1800-1900	130	1670	650	10	220	1.12%
1900-2000	1120	450	380	170	290	8750
2000-2100	1790	175	64	170	415	3620
2100-2200	3200	1560	905	90	500	1.16%
2200-2338	1660	235	79	100	565	7250



ROCKY MOUNTAIN GEOCHEMICAL CORP.

SALT LAKE CITY, UTAH

RENO, NEVADA

TUCSON, ARIZONA

Client Robert W. Bamford

Date

9/19/80

RMGC Job No. 80-24-30-SL

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<u>Sample No.</u>	<u>ppm Silver</u>	<u>% Iron</u>	<u>ppm Antimony</u>	<u>ppm Arsenic</u>	<u>% Sulfur</u>	<u>ppm Tin</u>
23-100	2	21.1	-8	90	0.18	
100-200	4	51.0	-8	65	47.3	15
200-300	2	50.2	-8	205	41.3	20
300-400	11	51.5	-8	375	45.3	
400-500	2	54.8	-8	50	46.0	
500-600	4	54.4	-8	65	44.7	20
600-700	2	54.6	-8	55	45.3	20
700-800	4	54.4	-8	60	44.7	-5
800-900	81	53.5	92	135	44.7	20
900-1000	2	54.4	-8	65	45.3	15
1000-1100	2	55.6	-8	85	46.7	15
1100-1200	4	55.6	-8	125	46.0	
1200-1300	2	57.4	-8	200	45.3	15
1300-1400	5	56.6	-8	325	46.7	
1400-1500	-1	57.0	-8	95	44.7	
1500-1600	1	54.1	-8	155	46.0	
1600-1700	-1	50.0	-8	30	40.0	20
1700-1800	14	55.0	-8	1020	45.3	
1800-1900	84	52.5	-8	3250	43.3	
1900-2000	15	52.6	-8	650	44.0	
2000-2100	1	53.4	-8	115	44.0	
2100-2200	18	52.1	-8	170	41.3	
2200-2338	12	54.9	-8	185	46.0	

By Jim Cardwell
Jim Cardwell



ROCKY MOUNTAIN GEOCHEMICAL CORP.

SALT LAKE CITY, UTAH

RENO, NEVADA

TUCSON, ARIZONA

FIGURE 1/BC5

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BC-5,5A

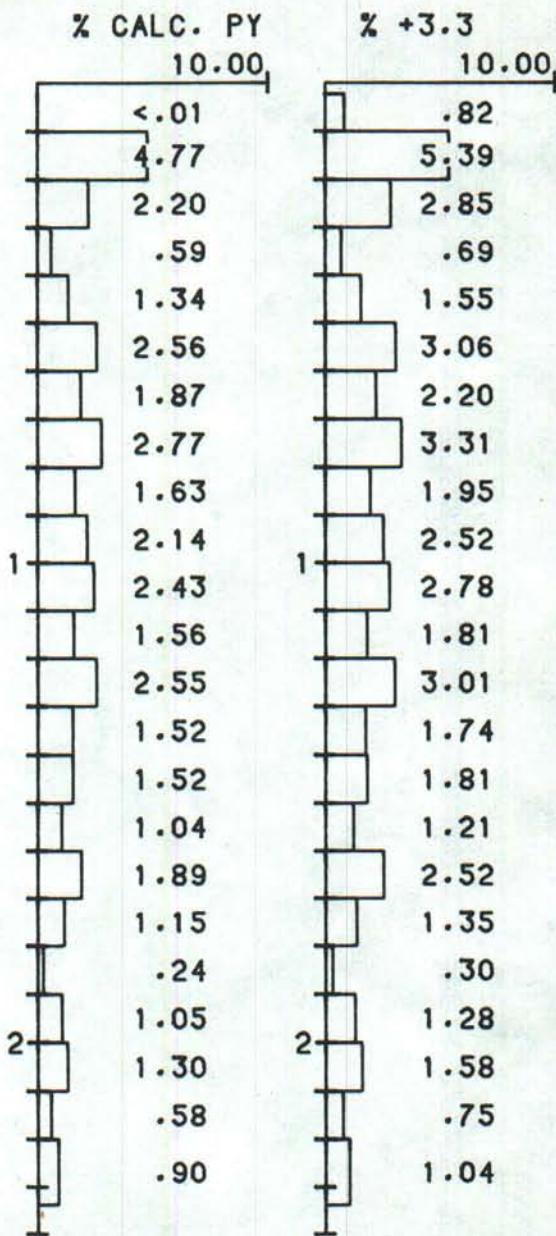
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE: WHOLE ROCK
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN 1000 FT UNITS)

FIGURE 2/BC5

BC-5,5A

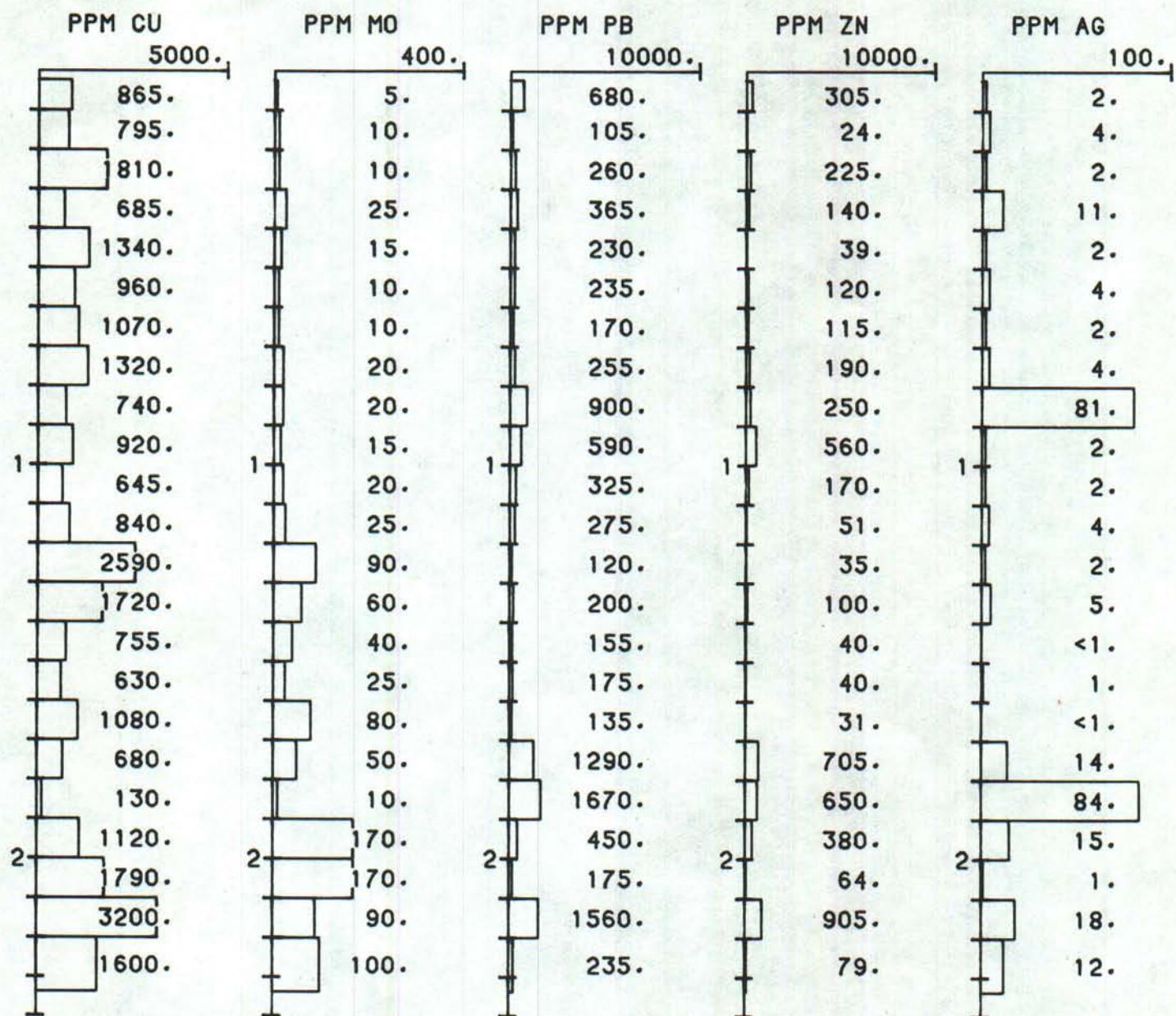
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE: +3.3 LESS MAG.
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN 1000 FT UNITS)

FIGURE 3/BC5

BC-5,5A

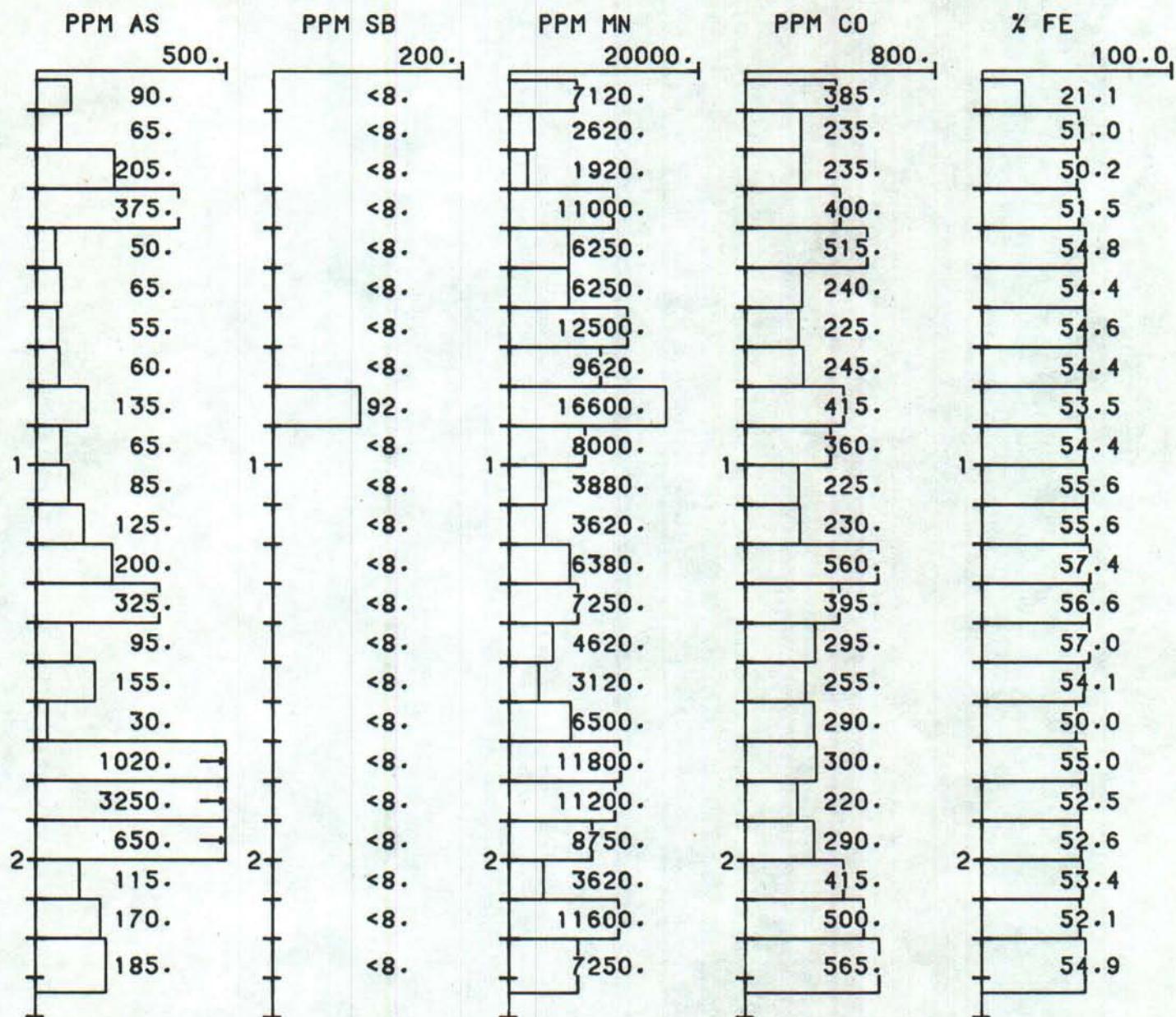
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE: +3.3 LESS MAG.
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN 1000 FT UNITS)

FIGURE 4/BC5

BC-5,5A

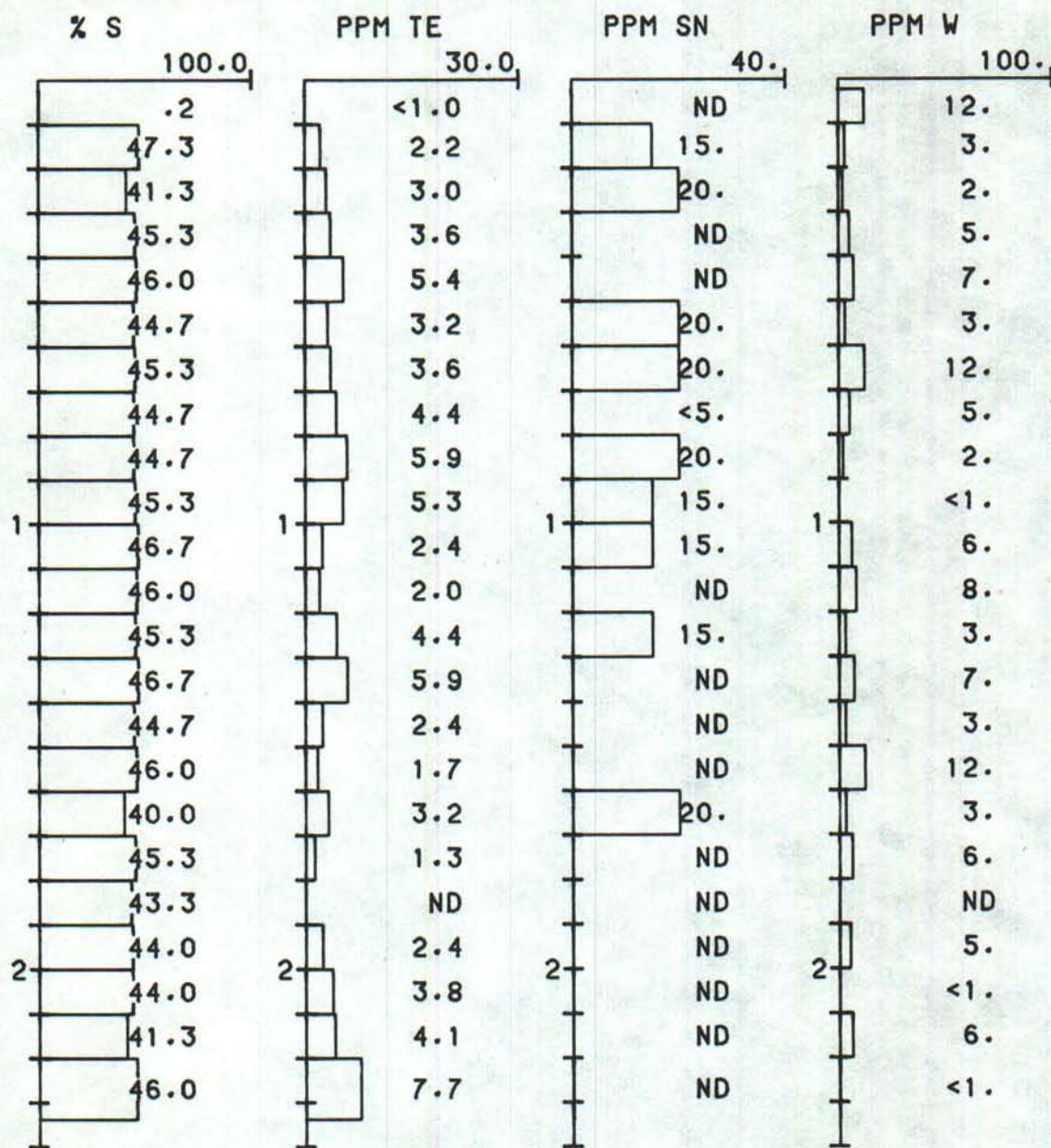
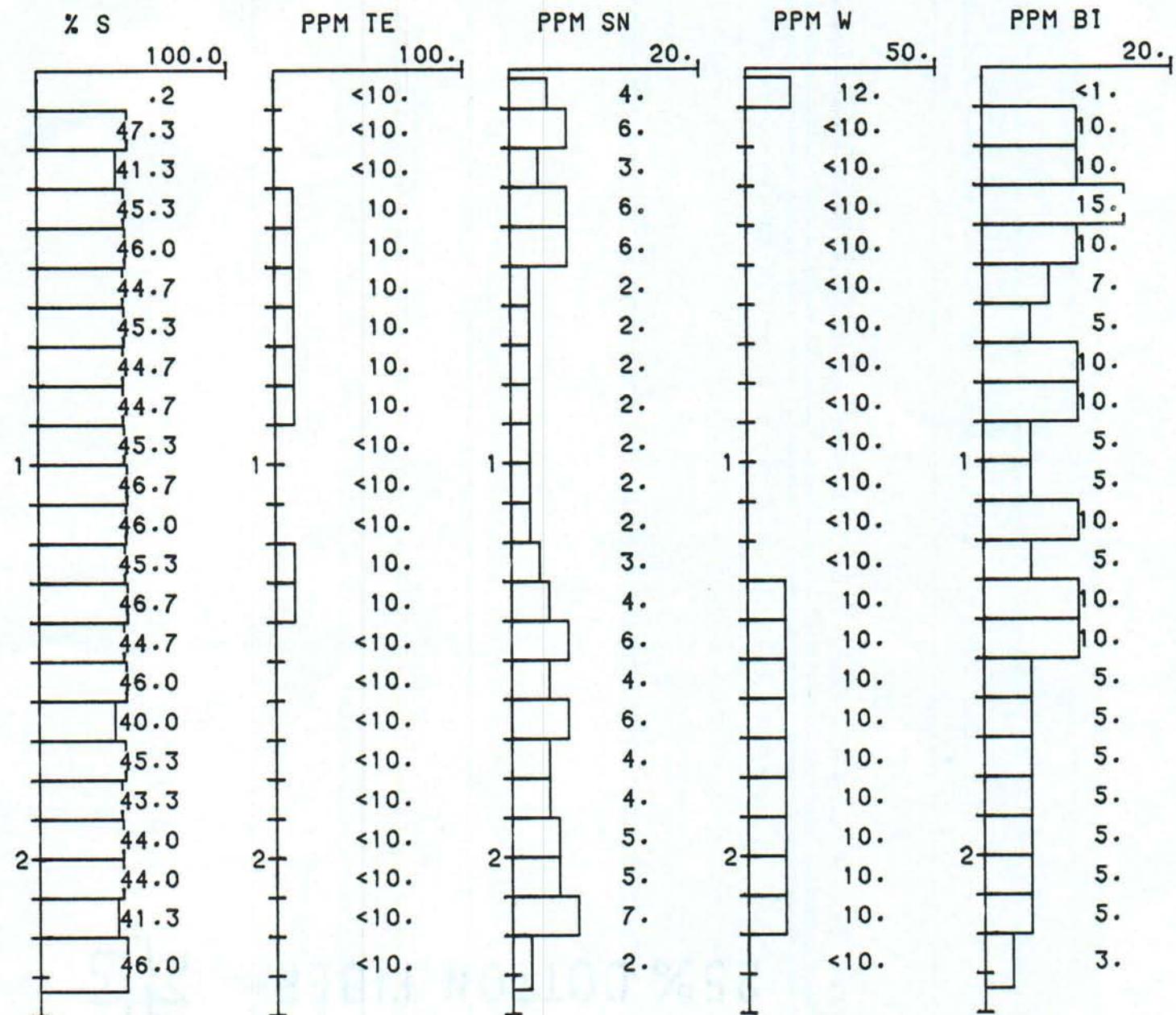
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE: +3.3 LESS MAG.
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN 1000 FT UNITS)

FIGURE 4/BC5

BC-5,5A

BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE: +3.3 LESS MAG.
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN 1000 FT UNITS)



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Minerals Department

Continental Oil Company
P.O. Box 7608
Reno, Nevada 89502
(702) 322-9164

TO: Files - BC-5A (Buckskin Project)
FROM: Gordon L. Pine
DATE: July 28, 1980
SUBJECT: DEVIATION SURVEY RESULTS - BC-5A

Two "deviation" surveys were made on BC-5A using hydrofluoric etching of test tubes. Results are shown below.

<u>Depth</u>	<u>Angle</u>
1700'	90°
2300'	82°

Gordon L. Pine

nm

Drill Hole SummaryProject: BuckskinHole Number: BC-5 and 5ALocation: BC-5 1660'S, 310'W, NE Corner 14, T13N, R23E
BC-5A 1620'S, 335'W, NE Corner 14, T13N, R23EElevation: 5465'Date Started: Rotary: Core: BC-5 3-28-70

Rotary: BC-5A 4-28-80 Core:

Date Completed: BC-5 4-28-80 BC-5A 6-30-80Oxide-Sulfide Contact: 82'

Purpose: BC-5 and 5A were drilled to evaluate porphyry potential associated with alsic alteration. Geologic mapping suggested a tilted porphyry system with a "cone-shape" zone of alsic alteration surrounded by sericitically altered rocks.

Assay Data:

<u>Interval</u>	<u>Cu</u>	<u>Mo</u>	<u>Pb</u>	<u>Zn</u>	<u>Ag</u>
23-100'	56	6	17	27	1
100-200'	100	9	17	21	1
200-300'	147	7	32	47	1
300-400'	39	6	22	50	1
400-500'	102	16	2	45	1
500-600'	109	12	29	38	1
600-700'	92	9	25	88	1
700-817'	116	7	32	98	1
812-900'	114	31	4	32	4
900-1000'	101	29	10	37	1
1000-1100'	105	13	67	125	2

<u>Interval</u>	<u>Cu</u>	<u>Mo</u>	<u>Pb</u>	<u>Zn</u>	<u>Ag</u>
1100-1200'	149	7	21	61	2
1200-1300'	899	39	12	62	2
1300-1400'	257	5	24	53	5
1400-1500'	83	3	10	24	11
1500-1600'	78	3	8	32	2
1600-1700'	119	12	5	72	2
1700-1800'	65	9	22	73	2
1800-1900'	13	4	18	82	2
1900-2000'	90	11	22	64	2
2000-2100'	156	18	17	43	1
2100-2200'	149	6	70	83	1
2200-2300'	153	15	47	78	2
2300-2338'	155	12	20	52	2

Rock Types:

<u>Interval</u>	<u>Remarks</u>
0-23'	Rock bit
23-286'	Metavolcanics; rhyolite to andesite (Jurassic Artesia Sequence).
286-346'	Biotite hornblende porphyry (Tertiary?)
346-1065'	Metavolcanics with occasional biotite hornblende porphyry dike.
1065-1125'	Biotite hornblende porphyry
1125-1282'	Mixed metavolcanics, metaigneous, and porphyritic hornblende dacite
1282-1777'	Metaigneous with interbedded biotite hornblende porphyry
1777-1927'	Biotite hornblende porphyry
1927-2165'	Metaigneous with minor interbedded biotite hornblende porphyry

<u>Interval</u>	<u>Remarks</u>
2165-2243'	Biotite hornblende porphyry
2243-2338' TD	Metaigneous

Alteration: The metavolcanic rocks above 1200⁺ feet are characterized by silica, pyrophyllite and sericite with minor chlorite. The metaigneous rocks below 1200⁺ feet are characterized by sericite and chlorite and minor epidote (particularly at depth). Secondary biotite and K spar veins are present. Occasional tourmaline breccia and tourmaline-pyrite veins occur in the lowermost 75 feet of the hole. The biotite hornblende porphyry is characterized by weak sericitic and chloritic alteration.

The alteration above 1200⁺ feet is sericitic-alsic, below 1200⁺ feet is propylitic.

Mineralization: Pyrite is ubiquitous in the metavolcanic and metaigneous rocks. Pyrite content averages about 3%, but may be up to 12% locally. Disseminated exceeds veinlet controlled mineralization by 3 to 1. Occasional traces of chalcopyrite are present.

The biotite hornblende porphyry contains only traces of pyrite.

Structure: Gouge and breccia zones are common throughout the hole. Slickensides are also common. The dip of these is generally 10° to 40°. These probably represent tilted faults.

The zone from 1186 to 1209 is a major fault zone with significant changes in alteration and rock type below the zone.

Comments: It appears that BC-5-5A apparently has drilled through the "plate" and into an underlying "plate" in the structurally complex area. The alteration assemblage in the lower "plate" has "root zone" affinities. Based on structural offsets and tilting, the ore zone, if present, should be west of BC-5-5A.

Sulfide geochemistry by R. Bamford for drill holes suggest a target

northeast of BC-4 and BC-5-5A rather than west of BC-5-5A. This disparity will have to be resolved before any additional drilling is commenced on the project.

	<u>Cu</u>	<u>Mo</u>	<u>Pb</u>	<u>Zn</u>	<u>Ag</u>
23-100	56.19	6.18	16.75	27.41	.25
100-200	99.60	8.80	16.82	20.82	BDL
200-300	146.90	7.46	31.50	47.14	.48
300-400	39.30	6.45	22.20	49.90	.96
400-500	101.60	11.48	23.80	44.60	1.41
500-600	109.20	11.56	28.50	37.60	1.09
600-700	91.50	8.64	24.80	88.00	.17
700-800	817 116.05 131.10	6.70 7.11	31.79 36.60	98.01 104.80	30 .35

Coors / **SPECTRO-CHEMICAL LABORATORY**
 DIVISION OF COORS PORCELAIN COMPANY
 GOLDEN, COLORADO, U.S.A.
 303-278-4000 Ext. 2302

Mailing Address:
 P.O. Box 500
 Golden, Colorado 80401

Analytical Report

CI-1317-A

TO: Robert W. Bamford
 1138 Gilmer Drive
 Salt Lake City, UT 84105

LABORATORY NUMBER	98417
DATE	8-3-81
CUSTOMER ORDER NO.	

Client's Sample Designation: Ore

Sample I.D.	Tin (ppm)	Tungsten (ppm)	Tellurium (ppm)	Bismuth (ppm)
23-100	4	12	< 10	< 1
100-200	6	< 10	< 10	10
200-300	3	< 10	< 10	10
300-400	6	< 10	10	15
400-500	6	< 10	10	10
500-600	2	< 10	10	7
600-700	2	< 10	10	5
700-800	2	< 10	10	10
800-900	2	< 10	10	10
900-1000	2	< 10	< 10	5
1000-1100	2	< 10	< 10	5
1100-1200	2	< 10	< 10	10
1200-1300	3	< 10	10	5
1300-1400	4	10	10	10
1400-1500	6	10	< 10	10
1500-1600	4	10	< 10	5
1600-1700	6	10	< 10	5
1700-1800	4	10	< 10	5
1800-1900	4	10	< 10	5
1900-2000	5	10	< 10	5
2000-2100	5	10	< 10	5
2100-2200	7	10	< 10	5
2200-2338	2	< 10	< 10	3

< = less than

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B. Schmitz
 BY
 LABORATORY MANAGER

(35) Item 15

Geo-Met Laboratories, Geological & Metallurgical Analyses

PAGE 1 of 2

~~See file~~

Salem Business Park • 2562 19th St. S.E. • Salem, Oregon 97302 • 503-399-0779

Conoco Inc.
1755 E. Plumb Lane
Suite 160
Reno, NV 89510

May 14, 1980

BC-5

ATTN: Gordon Pine
Invoice #: 010009

REPORT OF ANALYSES

(Unless otherwise indicated, the results are expressed in PPM)

<u>YOUR SAMPLE NUMBER</u>	<u>Ag.</u>	<u>Cu.</u>	<u>Mo.</u>	<u>Pb.</u>	<u>Zn.</u>	.....	.....	.....
BC-5 23-30	BDL	21	12	24	18			
30-40	BDL	30	5.4	22	8.6			
40-50	.74	24	8.1	9.2	16			
50-60	.25	13	5.4	14	7.9			
60-70	.25	21	5.4	11	19			
70-80	.25	110	6.8	19	24			
80-90	.25	149	2.7	26	91			
90-100	.25 ²	71 ⁵⁵	5.46	11/7	32 ²⁷			
100-110	BDL	16	9.5	11	4.4			
110-120	BDL	142	6.8	25	53			
120-130	BDL	39	15	14	23			
130-140	BDL	171	8.1	24	29			
140-150	BDL	133	5.4	29	52			
150-160	BDL	29	12	9.2	9.2			
160-170	BDL	87	9.5	12	12			
170-180	BDL	126	9.5	13	7.8			
180-190	BDL	130	5.4	15	5.8			
190-200	BDL	123 ₁₀₀	6.89	16/7	12 ₂₁			
200-210	BDL	124	6.8	15	8.1			
210-220	BDL	121	9.5	16	8.3			
220-230	BDL	146	12	27	61			
230-240	.50	89	9.5	18	32			
240-250	BDL	417	5.4	27	26			
250-260	.74	136	11	42	64			
260-270	.62	119	2.7	31	56			
270-280	1.4	175	6.8	81	92			
280-290	.99	116	6.8	32	59			
290-300	.62 _{.49}	26 ₁₄₇	4.17	26 ₃₂	65 ₄₇			

*Denotes avg. of duplicate det'n.

**Denotes avg. of triplicate det'n.

B. R. Lewis

CHIEF CHEMIST


Geo-Met Laboratories, Geological & Metallurgical Analyses

Salem Business Park • 2562 19th St. S.E. • Salem, Oregon 97302 • 503-399-0779

Invoice #: 010009

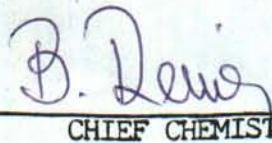
May 14, 1980

REPORT OF ANALYSES

(Unless otherwise indicated, the results are expressed in PPM)

<u>YOUR SAMPLE NUMBER</u>	<u>.Ag.</u>	<u>Cu.</u>	<u>Mo.</u>	<u>Pb.</u>	<u>Zn.</u>	.....	.....	.....
BC-5 300-310	.62	20	2.7	25	53			
310-320	1.2	29	4.1	25	71			
320-330	.64	14	4.1	20	60			
330-340	.99	24	6.8	28	62			
340-350	.74	57	8.1	29	59			
350-360	BDL	30	8.1	12	22			
360-370	.50	40	6.8	13	23			

*Denotes avg. of duplicate det'n.
 **Denotes avg. of triplicate det'n.


B. Deno
 CHIEF CHEMIST

Geo-Met Laboratories, Geological & Metallurgical Analyses

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SOLOP
File

Conoco Inc.
1755 E. Plumb Lane
Suite 160
Reno, NV 89510

May 16, 1980
Invoice #: 010010

BC-5

ATTN: Gordon Pine

REPORT OF ANALYSES

(Unless otherwise indicated, the results are expressed in PPM)

YOUR <u>SAMPLE NUMBER</u>	Ag.	Cu.	Mo.	Pb.	Zn.	.....	.....	.....
BR-5 370-380	2.0	47	13	20	25			
380-390	1.8	106	7.2	26	58			
390-400	1.2 , 9	26 ₃₉	3.6 6	24 ₂₂	66 50			
400-410	1.2	12	1.8	21	78			
410-420	1.2	12	3.6	19	69			
420-430	1.2	32	5.4	22	53			
430-440	1.5	50	11	29	27			
440-450	1.8	112	14	18	27			
450-460	1.5	262	9.0	22	33			
460-470	1.5	106	20	18	34			
470-480	1.5	206	18	50	71			
480-490	1.5	89	16	16	31			
490-500	1.2 1.4	135 ₁₀₂	16 ₁₁	23 ₂₄	23 45			
500-510	1.3	136	22	21	23			
510-520	1.2	110	13	15	26			
520-530	1.3	104	13	23	29			
530-540	1.3	64	13	22	25			
540-550	.84	55	13	16	19			
550-560	1.2	63	7.2	17	25			
560-570	1.2	56	11	28	27			

*Denotes avg. of duplicate det'n.

**Denotes avg. of triplicate det'n.

B. Pine
CHIEF CHEMIST

C&P
file
no dupe

Geo-Met Laboratories, Geological & Metallurgical Analyses

Salem Business Park • 2562 19th St. S.E. • Salem, Oregon 97302 • 503-399-0779

Conoco Inc.
1755 E. Plumb Lane
Suite 160
Reno, NV 89510

May 28, 1980

BC-5

Invoice #010013

REPORT OF ANALYSES

(Unless otherwise indicated, the results are expressed in PPM)

YOUR <u>SAMPLE NUMBER</u>	Ag...	Cu...	Mo...	Pb...	Zn...	.....	.....	.....
BC-5								
BC 570-580	1.5	423	8.5	49	66			
-590	.41	63	8.5	72	72			
-600	.68	18 ₁₀₉	6.4 ₁₁	22 ₂₉	63 ₃₈			
-610	BDL	18	6.4	14	61			
-620	BDL	14	4.3	15	65			
-630	.54	146	11	35	68			
-640	.27	86	8.5	40	173			
-650	.14	142	11	26	144			
-660	.54	117	13	27	34			
-670	BDL	122	13	28	62			
-680	.27	85	4.3	20	131			
-690	BDL	91	6.4	21	78			
-700	BDL ₁₈	94 ₉₂	8.5 ₈	22 ₂₅	64 ₈₈			
-710	.27	69	6.4	21	47			
-720	.27	141	11	33	75			
-730	BDL	151	11	28	145			
-740	.14	122	8.5	32	74			
-750	.14	59	6.4	16	51			
-760	BDL	137	6.4	33	70			
-770	.68	393	4.3	67	76			
-780	.54	110	8.5	39	76			
-790	1.1	103	4.3	90	352			
-800	.41 ₃₆	26 ₁₃₁	4.3 ₇	7.037	82 ₁₀₅			
-810	BDL	19	4.3	3.5	63			

*Denotes avg. of duplicate det'n.

**Denotes avg. of triplicate det'n.

B. Davis
CHIEF CHEMIST

Geo-Met Laboratories, Geological & Metallurgical Analyses

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Conoco Inc.
1755 E. Plumb Lane
Suite 160
Reno, NV 89510

May 28, 1980

GLP
file
no dupes

BC-5

Invoice #010022

REPORT OF ANALYSES

(Unless otherwise indicated, the results are expressed in PPM)

<u>YOUR SAMPLE NUMBER</u>	Ag...	Cu...	Mo...	Pb...	Zn...
-------------------------------	-------	-------	-------	-------	-------	------	------	------	------

BC-5

BC 810-817	BDL	21	4.3	3.5	51				
------------	-----	----	-----	-----	----	--	--	--	--

*Denotes avg. of duplicate det'n.
**Denotes avg. of triplicate det'n.

B. Davis
CHIEF CHEMIST

To: Conoco Inc.
P.O. Box 7608
Reno, NV 89510

Date: June 24, 1980
Invoice No: 010026

*TLP
file
BC-5A*

REPORT OF ANALYSIS: (all results are expressed in ppm or as noted)

Sample No:	Aq	Cu	Mo	Pb	Zn
BC-5A					
812-820	29	182	143	6.5	61
830	1.9	95	25	BDL	23
840	1.7	69	18	3.3	26
850	1.4	95	15	9.8	29
860	1.4	74	16	BDL	31
870	1.2	159	21	BDL	23
880	.71	169	14	6.5	27
890	.47	134	13	6.5	24
900	.95	52/05	1528	3.34	4035
910	.95	73	18	3.3	30
920	.24	67	16	6.5	25
930	.71	116	13	9.8	43
940	.47	322	14	13	34
950	.24	125	14	9.8	19
960	.47	70	18	13	27
970	.24	54	25	6.5	33
980	.47	85	62	6.5	41
990	.24	50	28	13	26
1000	1.2	46101	7629	1610	8937
1010	.47	42	22	9.8	54
1020	1.2	92	21	13	54

B. Davis

Chief Chemist

1 ppm = 0.0001 %
1 Tr.oz/ton = 34.21 ppm = 0.0034 %
*Denotes Replicate Determinations.

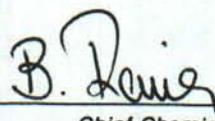
R_L Reiner Laboratories
2562 19th St. S.E.
Salem, Oregon 97302
503/363-2456

To: Conoco Inc.
P.O. Box 7608
Reno, NV 89510

Page 1 of 3 GLP
Date: July 8, 1980 (Other copy filed)
Invoice No: 010038

REPORT OF ANALYSIS: (all results are expressed in ppm or as noted)

Sample No:	Ag	Cu	Mo	Pb	Zn
BC5A					
1020-1030	1.8	66	22	8.2	72
1030-	1.8	300	14	15	80
1040-	2.4	199	18	11	68
1050-	1.3	145	7.2	52	32
1060-	1.8	72	7.2	6.2	63
1070-	1.3	63	14	124	157
1080-	1.8	38	BDL	402	568
1090-	1.8 2	29 105	BDL 13	26 67	104 125
1100-	1.3	19	BDL	20	113
1110-	1.6	25	BDL	59	123
1120-	1.8	57	18	12	47
1130-	.79	80	BDL	33	12
1140-	1.8	131	7.2	34	15
1150-	3.4	332	7.2	4.1	35
1160-	1.6	170	3.6	18	34
1170-	2.1	239	3.6	9.3	64
1180-	.79	168	BDL	15	138
1190-	1.8 2	271 149	25 1	5.2 21	28 61
1200-	2.1	167	205	5.2	32
1210-	2.4	.15 %	29	13	9.7
1220-	2.1	.14 %	22	13	80
1230-	1.3	.11 %	43	8.2	69
1240-	3.2	.13 %	25	10	58
1250-	2.4	.11 %	3.6	11	66
1260-	1.3	71	29	18	11
1270-	1.6	151	14	9.3	71


B. Reiner

Chief Chemist

1 ppm = 0.0001 %

1 Tr.oz/ton = 34.21 ppm = 0.0034 %

*Denotes Replicate Determinations.

R_L Reiner Laboratories
2562 19th St. S.E.
Salem, Oregon 97302
503/363-2456

To: Conoco Inc.
 P.O. Box 7608
 Reno, NV 89510

Date: July 8, 1980
 Invoice No: 010038

REPORT OF ANALYSIS: (all results are expressed in ppm or as noted)

Sample No:	Ag	Cu	Mo	Pb	Zn
------------	----	----	----	----	----

BC5A

1280-	1.8	.12 %	14	10	73
1290-	2.9 2	.10 % ⁸⁹⁹	7.2 39	19 12	63 62
1300-	1.6	527	11	14	70
1310-	2.4	242	3.6	20	78
1320-	2.1	329	14	12	98
1330-	1.8	374	7.2	9.3	76
1340-	2.9	423	14	15	72
1350-	28 2.8	223	BDL	132	65
1360-	1.1	16	BDL	2.1	5.8
1370-	2.4	54	BDL	14	17
1380-	1.3	98	BDL	9.3	29
1390-	1.6 2.0	286 257	BDL 5	10 ₂₄	22 53
1400-	.79	148	BDL	8.2	29
1410-	.79	55	BDL	10	24
1420-	1.6	112	3.6	5.2	26
1430-	.26	48	3.6	8.2	19
1440-	1.6	65	BDL	8.2	25
1450-	.79	75	BDL	11	22
1460-	1.6	102	BDL	20	32
1470-	1.1	119	BDL	6.2	22
1480-	1.6	77	11	7.2	27
1490-	1.6 |	26 83	7.2 3	15 10	8.6 24
1500-	.53	15	3.6	2.1	9.7
1510-	1.1	28	BDL	6.2	5.4
1520-	3.7	22	3.6	BDL	9.1
1530-	.26	181	BDL	7.2	16
1540-	1.1	172	BDL	7.2	24

B. Reiner

Chief Chemist

1 ppm = 0.0001 %

1 Tr.oz/ton = 34.21 ppm = 0.0034 %

*Denotes Replicate Determinations.

R_L Reiner Laboratories
 2562 19th St. S.E.
 Salem, Oregon 97302
 503/363-2456

To: Conoco Inc.
 P.O. Box 7608
 Reno, NV 89510

Date: July 8, 1980
 Invoice No: 010038

REPORT OF ANALYSIS: (all results are expressed in ppm or as noted)

Sample No: Ag Cu Mo Pb Zn _____

BC5A

1550-	1.1	17	BDL	9.3	24
1560-	1.1	28	BDL	30	70
1570-1580	1.6 \	32 ^{b2}	BDL \	19 ¹⁰	53 ²⁴

B. Reiner

Chief Chemist

1 ppm = 0.0001 %
 1 Tr.oz/ton = 34.21 ppm = 0.0034 %
 *Denotes Replicate Determinations.

R_L Reiner Laboratories
 2562 19th St. S.E.
 Salem, Oregon 97302
 503/363-2456

Date: July 18, 1980Invoice No: 010048

To: Conoco Inc.
 P.O. Box 7608
 Reno, NV 89510

REPORT OF ANALYSIS: (all results are expressed in ppm or as noted)

Sample No:	Ag	Cu	Mo	Pb	Zn
BC5A 1580-90	BDL	141	11	BDL	50
1590-1600	6.1	140	7.3	BDL	55
1600-1610	BDL	121	7.3	BDL	37
1610-1620	6.5	55	15	BDL	23
1620-1630	1.6	28	7.3	BDL	14
1630	BDL	143	7.3	BDL	46
1640	1.6	139	18	BDL	468
1650	6.5	20	7.3	4.6	5.8
1660	1.2	16	11	BDL	12
1670	1.6	207	7.3	BDL	38
1680	BDL	297	18	BDL	48
1690	BDL	167	119	BDL	24 72
1700	3.3	143	22	BDL	27
1710	1.6	63	11	4.6	34
1720	2.4	18	7.3	5.7	60
1730	1.6	82	7.3	BDL	52
1740	4.9	138	11	27	72
1750	2.0	31	11	35	72
1760	2.8	69	11	131	206
1770	BDL	71	7.3	BDL	47
1780	1.6	21	BDL	11	66
1790	BDL	11	65	9.1	93 73
1800	BDL	12	BDL	10	83
1810	7.7	18	7.3	50	168
1820	BDL	10	BDL	32	70
1830	BDL	16	11	8.0	81
1840	3.3	13	BDL	18	56

B. Bauer
Chief Chemist

1 ppm = 0.0001 %
 1 Tr.oz/ton = 34.21 ppm = 0.0034 %
 *Denotes Replicate Determinations.

R_L Reiner Laboratories
 2562 19th St. S.E.
 Salem, Oregon 97302
 503/363-2456

To: Conoco Inc.
 P.O. Box 7608
 Reno, NV 89510

Date: July 18, 1980
 Invoice No: 010048

REPORT OF ANALYSIS: (all results are expressed in ppm or as noted)

Sample No:	Ag	Cu	Mo	Pb	Zn	
BC5A 1850	2.0	14	BDL	25	59	
1860	1.2	12	BDL	5.7	75	
1870	BDL	11	BDL	8.0	66	
1880	BDL	13	15	13	101	
1890	2.0	2	12 13	7.3 4	9.1 18	62 82
1900 ¹⁴¹⁰	BDL	19	7.3	13	68	
1910-1923	BDL	18	BDL	8.0	56	

B. Denie
 Chief Chemist

1 ppm = 0.0001 %
 1 Tr.oz/ton = 34.21 ppm = 0.0034 %
 *Denotes Replicate Determinations.

R_L Reiner Laboratories
 2562 19th St. S.E.
 Salem, Oregon 97302
 503/363-2456

Date: 8/13/80

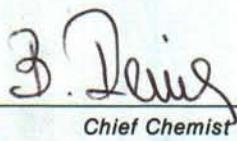
To:

CONOCO INC. P.O.Box 7608Reno, NV. 89510.

Invoice No: 010056

REPORT OF ANALYSIS: (all results are expressed in ppm or as noted)

Sample No:	Ag	Cu	Mo	Pb	Zn	
BC 5A						
1920 - 30	1.9	30	BDL	37	80	
40	2.2	127	17	17	60	
50	2.5	134	20	76	161	
60	1.6	119	35	9.2	28	
70	2.5	167	12	14	47	
80	2.2	108	14	17	46	
90	1.9	74	BDL	18	49	
2000	1.6 <u>2</u>	105 <u>90</u>	BDL <u>11</u>	9.2 <u>22</u>	41 <u>64</u>	
2010	1.6	280	23	9.3	39	
20	1.3	94	29	8.2	27	
30	BDL	86	14	15	37	
40	1.3	112	20	17	44	
50	1.6	101	26	19	35	
60	1.6	270	8.7	39	81	
70	1.3	151	14	12	60	
80	BDL	175	29	15	29	
90	BDL	157	17	14	34	
2100	BDL <u>.9</u>	130 <u>156</u>	BDL <u>18</u>	19 <u>17</u>	48 <u>43</u>	
110	BDL	100	8.8	21	54	
120	BDL	11	BDL	22	58	
130	1.3	23	BDL	28	45	
140	4.1	292	17	429	326	
150	3.1	500	14	29	56	
160	2.5	371	12	21	58	
170	BDL	136	BDL	24	52	



B. Reiner

Chief Chemist

R_L Reiner Laboratories, Inc.

2562 19th St. S.E.

Salem, Oregon 97302

503/363-2456

1 ppm = 0.0001 %

1 Tr.oz/ton = 34.21 ppm = 0.0034 %

*Denotes Replicate Determinations.

Date: 8/13/80

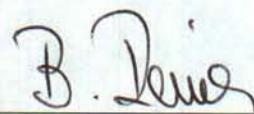
To:

CONOCO INC. P.O.Box 7608Reno, NV. 89510

Invoice No: 010056

REPORT OF ANALYSIS: (all results are expressed in ppm or as noted)

Sample No:	Ag	Cu	Mo	Pb	Zn	
BC 5A						
2170 - 2180	BDL	19	8.6	23	62	
190	BDL	24	BDL	21	58	
2200	BDL	1 20	149	6	77 70	60 83
210	1.6	24	8.7	30	78	
220	1.9	27	14	26	76	
230	BDL	24	8.7	36	71	
240	BDL	17	12	30	115	
250	2.5	274	17	226	88	
260	3.8	359	17	32	106	
270	2.5	317	20	40	48	
280	1.3	150	12	15	110	
290	1.9	173	20	19	53	
2300	1.3	2 161	153 23	15 47	37	78
310	2.8	218	20	29	51	
320	2.5	105	BDL	16	57	
330	1.3	81	14	16	52	
34038	3.1	217	155 12	17 20	49	52


B. Reiner
 Chief Chemist

1 ppm = 0.0001 %

1 Tr.oz/ton = 34.21 ppm = 0.0034 %

*Denotes Replicate Determinations.

R_L Reiner Laboratories, Inc.
 2562 19th St. S.E.
 Salem, Oregon 97302
 503/363-2456

WEEKLY DRILLING PROGRESS REPORT

To PHK 4-7-80

35 Item 5

DATE 3-28-80 TO 4-5-80
 INTERVAL 0 TO 309
 FOOTAGE DRILLED 309
 SCALE 1" = 20'

DIRECTION _____
 INCLINATION 90°
 STARTED 3-28-80
 COMPLETED _____
 DEPTH _____
 NOTES BY GCP

HOLE No BC-5
 PROPERTY Buckskin
 LOCATION ±1500' S, 450' W
NE Corner 14, T13N, R23E
 COLLAR ELEV 5450±
 CONTRACTOR Kay-Way

Log	Geology & Alteration	Mineralization	Assays				
			Ft	Cu	Mo	Zn	
	O-23' Rock bit						
-20							
23	23-60'						
	Fragmental rhyolite; silicified; pyrophyllite common	Locally strong hematitic staining					
40							
60	60-62'						
VN	flow banded rhyolite						
V							
V<	62-88'						
V	Metavolcanics; andesite; 5-10% phenocrysts;	Locally strong					
V	pyrophyllite common; gypsum veins to 1/8" common; trace chlorite.	limonitic staining					
V							
88-110							
V	88-110						
V	Metavolcanics; equigranular;	6" 2% diss PY					
7	andesite; pyrophyllite common; gypsum veins	@ 83.5'					
>1	common;						
110-114							
A	110-114						
A	Gouge and breccia						
120							
V	110-152						
A	Metavolcanics; equigranular;	Locally 3-7% fine					
A	occ. hornblende (chloritized);	diss. PY					
A	pyrophyllite common						
A	gypsum veins common.						
140							
V							
152-170							
A.A	152-170						
A	Gouge + breccia						
160							

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WEEKLY DRILLING PROGRESS REPORT

DATE 3-28-80 TO 4-5-80 DIRECTION _____ HOLE No BC-5 (2)
 INTERVAL _____ TO _____ INCLINATION _____ PROPERTY _____
 FOOTAGE DRILLED _____ STARTED _____ LOCATION _____
 SCALE _____ COMPLETED _____ DEPTH _____ COLLAR ELEV _____
 NOTES BY _____ CONTRACTOR _____

Log	Geology & Alteration	Mineralization	Assays				
			Ft	Cu	Mo	Zn	
Δ Δ Δ Δ Δ Δ	170 - 200 metavolcanics; possibly fragmental; gypsum veins common	3-10% v.f. diss. py					
180							
200	200 - 208 Metavolcanic; fragmental; frag to 1"; reaction rims; strong pyritic rinds Pyrophyllite common; gypsum veins common.	10-15% fine pyrite					
220	208 - 229 Gouge + breccia						
XX X XX X K	229 - 243 Metavolcanics; Siliceous or silica added; pyrophyllite common; gypsum veins common;	3-10% fine diss. py					
V > 1	243 - 263 Metavolcanics; hornblende- plag, andesite porphyry; pyrophyllite common; gypsum veins common;	1-5% fine diss. py.					
> L	260						
Δ A Δ Δ	263 - 286 Gouge + breccia						
280							
+	286 - (Tertiary) Biotite-hb porf.; biot+hb to chlorite;	None					
++	300 plagi to clay-sericite; no veins						
+	Drilling @ 30°'						

WEEKLY DRILLING PROGRESS REPORT

To PHIR 4-10-80

DATE	4-5-80 TO 4-9-80	DIRECTION	BC-5 (3)
INTERVAL	309 TO 547	INCLINATION	90°
FOOTAGE DRILLED	238	STARTED	3-28-70
SCALE		COMPLETED	
		DEPTH	
		NOTES BY	GCP
		PROPERTY	Buckskin
		LOCATION	#1660's + 310' w NE 1/4, T 13N, R 23E
		COLLAR ELEV	5465 ±
		CONTRACTOR	Key Way

Log	Geology & Alteration	Mineralization	Assays			
			Ft	Cu	Mo	Zn
+	286 - 336	None				
+	320	Biotite-hornblende porphyry; chloritized; plagi. to clay-sericite				
+	330					
+ +	336 - 337	None				
++	340	Gouge + breccia; 30°				
++	337 - 340	2-4% diss py				
++	350	None				
Δ	Biotite hornblende porphyry; chloritized; plagi. to clay-sericite; fewer phenos + mafics than 286-336.					
Δ	360	2% diss py				
Δ	340 - 343					
Δ	370	Metavolcanics; fragmental rhyolite; flow banding 60° pyrophyllite common.				
+	343 - 346					
+	380	Biotite hornblende porphyry; as per 286-336	1-2% diss py			
+	346 - 375	None				
^	390	Gouge + breccia; slicks 20-35°				
+	375 - 385					
+	400	Latite or hybrid bhp(?) chloritized mafics				
+	385 - 388	None				
+	410	Metavolcanics; mafics chloritized;				
+	420					
+	388 - 429					
+	430	Biotite hornblende porphyry as per 286-336				
^	429 - 537					
>	440	Metavolcanics (andesite); mixed alteration assemblage (pyrophyllite and qtz-sericite-py);	3-6% py diss = vein			
✓	450	chlorite-calcite-py and chlorite-epidote-py veinlets in pyrophyllitic zones;				
^	460					
^	470					

WEEKLY DRILLING PROGRESS REPORT

DATE 4-5-80 TO 4-9-80 DIRECTION _____ HOLE No BC-5
INTERVAL _____ TO _____ INCLINATION _____ PROPERTY _____
FOOTAGE DRILLED _____ STARTED _____ LOCATION _____
SCALE _____ DEPTH _____ COLLAR ELEV _____
NOTES BY _____ CONTRACTOR _____

④

WEEKLY DRILLING PROGRESS REPORT

TEPHK 4-18-80

5

DATE 4-10-80 TO 4-17-80 DIRECTION _____ HOLE No BC-5
 INTERVAL 547 TO 653 INCLINATION 90° PROPERTY Buckskin
 STARTED 3-28-80 LOCATION 1660's 310'w
 FOOTAGE DRILLED 106 COMPLETED _____ NE 14 T 13N R 23E
 SCALE _____ DEPTH 614 COLLAR ELEV 5465±
 NOTES BY Kay Way CONTRACTOR Kay Way



TO PHK 4-25-80 Q

WEEKLY DRILLING PROGRESS REPORT

DATE 4-18-80 TO 4-24-80 DIRECTION _____ HOLE No BC-5
 INTERVAL 653 TO 817 INCLINATION 90° PROPERTY Buckskin
 FOOTAGE DRILLED 164 STARTED 3-28-80 LOCATION 1660's 310'W
 SCALE _____ COMPLETED _____ NE 1/4 14, T13N R23E
 NOTES BY GCP COLLAR ELEV 5465±
 CONTRACTOR Kay-Way

Log	Geology & Alteration	Mineralization	Assays				
			Ft	Cu	Mo	Zn	
^	660 653-707 Metavolcanics; porphyritic andesite; silicified; possible pyrophyllite; may grade to latite(?)	Qtz-pyrite veinlets abundant; 3-8% Py; diss>veinlet					
v	670						
1	680						
1	690 707-709 Metavolcanics; andesitic sericite; chlorite; epidote; silicified	3-5% diss pyrite.					
1	700						
2	710 709-715 Gouge and breccia	3-5% diss pyrite					
A A	720 715-731 Metavolcanics; andesite; silicified; chlorite; epidote;	1-2% diss pyrite					
1	730 731-735.5 Metavolcanics; andesite; silicified;	5-8% pyrite; diss>veinlets;					
V V	735.5-739 Metavolcanics, as per 715-731						
A A	740 739-754 Gouge and breccia	5% pyrite					
A A	750						
A A	754-767 Metavolcanics; andesite qtz-sericite;	3-5% pyrite; diss>veinlet					
V V	760						
A A	770 767-771 Gouge and breccia	2% pyrite; diss					
L L	770						
A A	780 771-773 Metavolcanics; porphyritic andesite; silicified chlorite; weak sericite.	2-3% pyrite; diss					
A A	790 773-787 Gouge and breccia						
+	787-817(?) Biotite porphyry; minor chlorite; minor -trace clay-sericite	Zip					
+	800						
+	810						

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WEEKLY DRILLING PROGRESS REPORT

(6)

DATE 4-18-80 TO 4-24-80 DIRECTION _____ HOLE No BC-5
 INTERVAL 653 TO 817 INCLINATION _____ PROPERTY Buckskin
 FOOTAGE DRILLED 164 STARTED _____ LOCATION _____
 SCALE _____ COMPLETED _____ COLLAR ELEV _____
 NOTES BY _____ CONTRACTOR _____

Log	Geology & Alteration	Mineralization	Assays				
			Ft	Cu	Mo	Zn	
+ 817 820	Hole cored to 817; core logged to 813; night shift driller uncoupled bit and reamer at core barrel; pulled rods; left inner tube in hole; day driller tried to drill (rods pulled back $50\pm'$ by night shift) on top of inner tube; inner tube at $785\pm'$; will never be able to fish it out; hole will be abandoned; will use rotary rig on offset hole; see what happens when you put inexperienced people doing project work.						

WEEKLY DRILLING PROGRESS REPORT

TO PHK 5-5-80

6

DATE 4-25-80 TO 5-4-80 DIRECTION 90° HOLE No BC-5A
 INTERVAL 0 TO 780 INCLINATION 0° PROPERTY Buckskin
 STARTED 4-28-80 LOCATION 1620's 335W
 FOOTAGE DRILLED 780 COMPLETED 780 NE $\frac{1}{4}$ 14 T13N R23E
 SCALE 1:1000 DEPTH 780 ft COLLAR ELEV 5465±
 NOTES BY GCP CONTRACTOR Cissell

Log	Geology & Alteration	Mineralization	Assays				
			Ft	Cu	Mo	Zn	
100	Rotary Drilling.						
200	Hole not logged.						
300	Drilling @ 780'; very slow.						
400							
500							
600							
700							
800							

WEEKLY DRILLING PROGRESS REPORT

To. PHK 5-8-70

DATE 5-5-80 TO 5-7-80 DIRECTION 90° HOLE No BC-5A
 INTERVAL 780 TO 812 INCLINATION PROPERTY Buckskin
 FOOTAGE DRILLED 32 STARTED 4-28-80 LOCATION 1620'S 335'W
 SCALE COMPLETED 5-7-80 DEPTH 812 COLLAR ELEV 5465±
 NOTES BY GCP CONTRACTOR Cissell

Log	Geology & Alteration	Mineralization	Assays				
			Ft	Cu	Mo	Zn	
	<p>800 Rotary Drilled 780-812' and set casing. Core rig moving onto hole <u>5-8-80.</u> Not logged</p>						

(35) Item 15 TO PHK
5-20-80

WEEKLY DRILLING PROGRESS REPORT

DATE 5-12-80 TO 5-16-80 DIRECTION _____ HOLE No BC-5A
 INTERVAL 812 TO 1053 INCLINATION 90° PROPERTY Buckskin
 FOOTAGE DRILLED 241 STARTED 5-13-80 LOCATION 1620'S 335'W
 SCALE _____ COMPLETED _____ NE 14, T3N, R23E
 NOTES BY GCP DEPTH _____ COLLAR ELEV 5465±
 CONTRACTOR KayWay

Log	Geology & Alteration	Mineralization	Assays				
			Ft	Cu	Mo	Zn	
~1 VV	812-817 Metavolcanics; andesite; strong silicification; mod. sericite- pyrophyllite(?)	5-8% pyrite; diss>> vein?					
~A	820 817-821 Gouge + breccia 5-10° dip	2-3% pyrite, diss.					
A V	830 821-840 Metavolcanics as per 812-817						
A V	840 840-852 Metavolcanics; porphyritic andesite; strong silicification.	3% pyrite, diss.					
V A	850 852-853 Gouge and breccia						
A L L	853-888 Metavolcanics; porphyritic andesite. silicified; chlorite + epidote	1-2% Pyrite, diss.					
A A	860						
>	870						
A	880						
A A L	890 888-911 Metavolcanics; andesite; strong silicification.	3-5% pyrite, diss.					
A	900						
> A	910 911-925 Gouge + breccia; slicks 20°	1-3% pyrite, diss.					
A A A	920						
A A	930 925-997 Metavolcanics; porphyritic andesite; trace pyrophyllite(?)	1% pyrite, diss; occ. vein					
V A	940 mafic sites now pyrite sericite-chlorite(?)						
A V	950						
> A	960						
A	970						

WEEKLY DRILLING PROGRESS REPORT

DATE 5-12-80 TO 5-16-80 DIRECTION _____ HOLE No BC-5A
INTERVAL _____ TO _____ INCLINATION _____ PROPERTY _____
FOOTAGE DRILLED _____ STARTED _____ LOCATION _____
SCALE _____ DEPTH _____ COLLAR ELEV _____
NOTES BY _____ CONTRACTOR _____

Log	Geology & Alteration	Mineralization	Assays			
			Ft	Cu	Mo	Zn
V	997-1005 Andesite; porphyritic; Tertiary (?); silicified; biotite to sericite + chlorite (?)					
^	990					
^	1000					
V	1005-1012 Gouge + breccia upper contact dips 45°					
A	1010					
A	1012-1043 Metavolcanics. as per 925-997; numerous brecciated zones					
L	1030					
A	1043-1045 Gouge + breccia					
V	1040					
A	1045-1051 Metavolcanic as per 1012-1043					
L	1051-1053 Gouge + breccia, top contact dips 40-45°	5-8% pyrite, diss.				
AA						



WEEKLY DRILLING PROGRESS REPORT

DATE 5-17-80 TO 5-22-80 DIRECTION _____ HOLE No BC-5A
 INTERVAL 1053 TO 1325 INCLINATION 90° PROPERTY Buckskin
 FOOTAGE DRILLED 272 STARTED 5-13-80 LOCATION 1620' S, 335' W
 SCALE _____ COMPLETED _____ NECor. 14 T13N, R23E
 NOTES BY GEP COLLAR ELEV 5465±
 CONTRACTOR KayWay

Log	Geology & Alteration	Mineralization	Assays				
			Ft	Cu	Mo	Zn	
△ △ △△ △	1053-1065 Gouget breccia lower contact 60°	5-8% py, diss.					
- 1060							
+ + + +	1065-1124½ Biotite- hornblende porphyry; trace sericite; mafics to chlorite						
+ + + +	1070						
+ + + +	1080						
+ + + +	1090						
+ + + +	1100						
+ + + +	1110						
+ + + +	1120						
^ - v -	1124½-1158 Metavolcanics; andesite; silica + pyrophyllite; trace sericite.	5-10% pyrite; trace cpy diss.					
^ - v -	1130						
^ - v -	1140						
^ - v -	1150						
^ - v -	1160 1158-1168 Metavolcanics? silicified; 80%	½% py; ½% cpy diss.					
- 1170	1168-1186 Porphyritic hornblende dacite; trace sericite + chlorite.						
+ + + +	1180						
^ - v -	1190 1186-1201 Gouget breccia	1% py, diss.					
^ - v -	1200						
^ - v -	1201-1207 Breccia silicified.	3% py, diss.					
^ - v -	1207-1209 Gouget breccia	3-5% py, diss.					

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WEEKLY DRILLING PROGRESS REPORT

DATE 5-17-80 TO 5-22-80 DIRECTION _____ HOLE No BC-5A
 INTERVAL _____ TO _____ INCLINATION _____ PROPERTY _____
 STARTED _____ COMPLETED _____ LOCATION _____
 FOOTAGE DRILLED _____ DEPTH _____ COLLAR ELEV _____
 SCALE _____ NOTES BY _____ CONTRACTOR _____

Log	Geology & Alteration	Mineralization	Assays				
			Ft	Cu	Mo	Zn	
1209	1209-1248 Metigneous; diorite; weak sericite + chlorite.	3% py, diss > vein.					
1220							
1230							
1240							
1250	1248-1260 Metavolcanics, moderate chlorite, minor sericite	1-3% py, diss.					
1260	1260-1273 Metavolcanics, strong silicification; minor pyrophyllite.	1-2% py, diss.					
1270							
1280	1273-1282 Metavolcanics, andesite; moderate- minor sericite + chlorite.	1-2% py.					
1290	1282-1325 Metigneous; chloritized; minor sericite	3-5% py, diss = vein; trace cpy.					
1300							
1310							
1320							
1330							

WEEKLY DRILLING PROGRESS REPORT

To PHK 6-2-80

DATE 5-23-80 TO 5-30-80 DIRECTION _____ HOLE No BC-5A
 INTERVAL 1325 TO 1671 INCLINATION 90° PROPERTY Buckskin
 FOOTAGE DRILLED 346 STARTED 5-13-80 LOCATION 1620' S 335' W
 SCALE _____ COMPLETED _____ NE Cor. 14, T13N, R23E
 NOTES BY DmH DEPTH _____ COLLAR ELEV 5465±
 CONTRACTOR Kay Way

Log	Geology & Alteration	Mineralization	Assays				
			Ft	Cu	Mo	Zn	
11	1325-1341 Metaigneous; 1330 diorite; chloritized.	1-4% pyrite.					
11	1340	5% pyrite					
△△	1341-1349 Gouge and breccia; chlorite+ clay						
11	1350 1349-1361 Metaigneous; diorite?; chlorite; minor qtz;	4% pyrite; diss> vein;					
11	1360 1361-1372 Metavolcanics; silicified (very strong).	4% pyrite					
vv	1370 trace chlorite;						
11	1372-1557 Metaigneous;	1-4% pyrite; diss>					
11	1380 diorite(?); chloritized; locally silicified. locally	vein.					
11	1390 secondary biotite(?); occ. K-spar veins (indistinct), some						
11	1400 qtz-pyrite veins:						
11	1410						
11	1420						
11	1430						
11	1440						
11	1450						
11	1460						
11	1470						
11	1480						

WEEKLY DRILLING PROGRESS REPORT

DATE 5-23-80 TO 5-30-80 DIRECTION _____ HOLE No BC-5A
 INTERVAL 1325 TO 1671 INCLINATION _____ PROPERTY _____
 FOOTAGE DRILLED _____ STARTED _____ LOCATION _____
 SCALE _____ COMPLETED _____ COLLAR ELEV _____
 NOTES BY _____ CONTRACTOR _____

Log	Geology & Alteration	Mineralization	Assays				
			Ft	Cu	Mo	Zn	
-	1490						
-	1500						
-	1510						
-	1520						
-	1530						
-	1540						
-	1550						
+	1560 1557-1585 Biotite hornblende porphyry; weak chlorite; plagioclase slightly altered.	Trace pyrite					
+	1570						
+	1580						
+	1590 1585-1617 Metamorphic; granodiorite; chloritized; trace secondary biotite; trace K-spar veining.	1-2% pyrite; trace chalcopyrite.					
-	1600						
-	1610						
1	1620 1617-1649 Metamorphic; diorite; chloritized; minor secondary biotite; minor K-spar veins.	2-5% pyrite; dissolve vein					
-	1630						
-	1640						

WEEKLY DRILLING PROGRESS REPORT

DATE 5-23-80 TO 5-30-80 DIRECTION _____ HOLE No BC-5A
INTERVAL 132.5 TO 1671 INCLINATION _____ PROPERTY _____
FOOTAGE DRILLED _____ STARTED _____ LOCATION _____
SCALE _____ DEPTH _____ COLLAR ELEV _____
NOTES BY _____ CONTRACTOR _____

WEEKLY DRILLING PROGRESS REPORT

DATE 5-30-80 TO 6-3-80 DIRECTION _____ HOLE No BC-5A
 INTERVAL _____ TO _____ INCLINATION _____ PROPERTY _____
 FOOTAGE DRILLED _____ STARTED _____ LOCATION _____
 SCALE _____ COMPLETED _____ COLLAR ELEV _____
 NOTES BY _____ CONTRACTOR _____

Log	Geology & Alteration	Mineralization	Assays				
			Ft	Cu	Mo	Zn	
++							
+	1840						
++	1850						
++	1860						
+	1870						
++	1880						
+	1890						
++	1900						
++	1910						
++	1920						
		Night shift driller burned in bit. Rods stuck. Will have to shoot off core barrel and wedge hole.					

WEEKLY DRILLING PROGRESS REPORT

DATE 5-30-80 TO 6-3-80

DIRECTION _____

HOLE No BC-SH

INTERVAL 1671 TO 1923

INCLINATION 90°

PROPERTY *Buckskin*

FOOTAGE DRILLED 252

COMPLETED _____

NE Cor. 14, T 13 N, R 23 E

SCALE

NOTES BY *[Signature]*

COLLAR ELEV 5765
CONTRACTOR Kenneth Way

SCALE _____

NOTES BY SJ

CONTRACTOR Kay-Way

Log	Geology & Alteration	Mineralization	Assays				
			Ft	Cu	Mo	Zn	
	1669-1694 Metaigneous;						
	1680 diorite?; chloritized;	1-2% diss py;					
	weak sericite; local silica						
	flooding w/assoc. secondary						
	biotite?; occ gtz-chlorite						
	vein.						
AA	1694-1699 Gouge + breccia	1-2% diss py					
	dip 10°-20°						
	1699-1714 Metaigneous						
	as per 1669-1694						
AA	1714-1719 Gouge + breccia	1% diss py					
	sticks 60°						
	1719-1737 Biotite-						
+	Hornblende porphyry; weak						
+	chlorite + sericite						
	1737-1749 Metavolcanics	Trace Pyrite					
	(andesite?); silicified;						
	minor chlorite						
	1750						
+	1749-1759 Biotite						
+	hornblende porphyry						
+	as per 1719-1737						
	1759-1764 Metavolcanics;						
	v.f. grained. silicified(?)						
	1764-1770 Biotite						
	Hornblende porphyry						
	as per 1719-1737; 1"						
	gouge + breccia 1769,						
	1% py.						
	1770-1777 Metavolcanics	2-4% diss py					
	silicified.						
	1777-1923 Biotite						
	hornblende porphyry						
	weak sericite and						
	chlorite						
	1820						
	1830						

WEEKLY DRILLING PROGRESS REPORT

DATE 6- 80 TO 6-12-80 DIRECTION _____
 INCLINATION 90°
 INTERVAL 1923 TO 1923 STARTED 5-13-80
 FOOTAGE DRILLED 0 COMPLETED _____
 SCALE _____ DEPTH _____ NOTES BY GCP

HOLE No BC-5A
 PROPERTY Buckskin
 LOCATION 1620' S 335' W
NE Cor. 14 T 13 N R 23 E
 COLLAR ELEV 5465±
 CONTRACTOR KayWay

To PHK
6-12-80

Log	Geology & Alteration	Mineralization	Assays				
			Ft	Cu	Mo	Zn	
	Could not shoot off casing; dynamite didn't fire; wire broke; fished out wire and dynamite; cut casing at 1880; going in with wedge and got hung up at 1550'. wedge broke off; fishing for wedge. MFC !!						

WEEKLY DRILLING PROGRESS REPORT

To PHK 6-20-80

DATE 6-13-80 TO 6-20-80 DIRECTION _____
 INCLINATION 90°
 HOLE No BC-5A
 INTERVAL 1850 TO 1927 STARTED 5-13-80 PROPERTY Buckskin
 LOCATION 1620'S 335'W
 FOOTAGE DRILLED 77 COMPLETED _____ COLLAR ELEV 5465±
 SCALE _____ DEPTH _____ CONTRACTOR Key Way

Log	Geology & Alteration	Mineralization	Assays				
			Ft	Cu	Mo	Zn	
+	1850 - 1926	Trace diss pyrite					
+	1860 Biotite hornblende						
+	porphyry; chloritized						
+	and sericitized.						
+	1870						
+	1880						
+	1890						
L	1900						
+	1910						
+	1920						
1927	1926-1927 gouge; 60° dip; Below fault metaineous; diorite?; chloritized; weakly sericitized; slightly magnetic.	2% diss pyrite					
	Wedge set at 1850						

WEEKLY DRILLING PROGRESS REPORT

DATE 6-20-80 TO 6-27-80 DIRECTION _____
 INCLINATION 82°
 INTERVAL 1927 TO 2238 STARTED 5-13-80
 FOOTAGE DRILLED 331 COMPLETED _____
 SCALE _____ DEPTH _____ NOTES BY DmH
 HOLE No BC 5 A
 PROPERTY BUCKSKIN
 LOCATION 1620's 335'W
NE cor 14 T13N R23E
 COLLAR ELEV 5465 +
 CONTRACTOR Kagway

Log	Geology & Alteration	Mineralization	Assays				
			Ft	Cu	Mo	Zn	
1930	1927 - 2056 medium grained hornblende quartz diorite faults: 1928, 1933, 1946 1968, 1973, 1980, 2015, 2032 all 20° ± 1984 - 70°	3-4% py 70-80% diss					
1940							
1950							
1960	alteration: moderate diss. Chlorite, weak to moderate sericite - Illite. Chlorite - pyrite veins 1 to 4/ foot 45°, 70°.						
1970							
1980	Kspar selvages on some chlorite veins. Kspar veins 2042-2044, 70°.						
1990	Mineralization: 3-4%						
2000	Pyrite throughout, 70-80%						
2010	diss. trace chalcopyrite in chlorite veins. Some chlorite veins with magnetite.						
2020							
2030							
2040							
2050							
2056	2056-2059 - Breccia dike, 200 contacts, fragments of	pyrite veins cut breccia 3-4% py					
2060	diorite and metavolcanics Chlorite and weak sericite						
2059	- 2103 medium						
2070	grained hornblende quartz diorite as above. alteration as above	3-5% Pyrite trace chalcopyrite and magnetite in chlorite veins					
2080							

WEEKLY DRILLING PROGRESS REPORT

DATE _____ TO _____ DIRECTION _____ HOLE No BC-5A
 INTERVAL _____ TO _____ INCLINATION _____ PROPERTY _____
 STARTED _____ COMPLETED _____ LOCATION _____
 FOOTAGE DRILLED _____ DEPTH _____ COLLAR ELEV _____
 SCALE _____ NOTES BY _____ CONTRACTOR _____

Log	Geology & Alteration	Mineralization	Assays				
			Ft	Cu	Mo	Zn	
	- 2090						
	- 2100						
++	2103 - 2129 Biotite hornblende porphyry dike	trace pyrite no veining					
++	- 2110 upper contact 45°. nearly fresh, weak						
++	2120 chlorite and sericite						
++							
	- 2130 2129 - 2165 diorite as above	3 to 5% pyrite					
	- 2140 fault: 2139, 20°. Alteration: moderate	60 - 70% diss.					
	Chlorite, weak sericite, weak epidote	galena - chalcopyrite vein 30° at					
	- 2150 Chlorite-pyrite veins 2 to 5 feet 20-30° and	2138. Diss					
	- 2160 60-70°. Secondary Biotite(?) 2146 - 2160 with epidote	galena 2138-2139					
++	- 2170 2165 - 2238	trace pyrite					
+	Biotite hornblende	all Diss.					
+	- 2180 porphyry dike as above.	no veining					
+	upper Contact 45°.						
++	Alteration: weak chlorite						
++	strong sericitization of plagioclase only 2180 to						
++	2190						
	- 2200						
++	- 2210						
+	- 2220						
++	- 2230						
++							

WEEKLY DRILLING PROGRESS REPORT

DATE 6-28-80 TO 7-2-80 DIRECTION 82° HOLE No BC 5A
 INTERVAL 2238 TO 2338 INCLINATION 82° PROPERTY Buckskin
 STARTED 5-13-80 LOCATION 1620' S 335' W
 FOOTAGE DRILLED 100 COMPLETED 6-30-80 NE Cor 14 T13N, R23E
 SCALE 1:250000 DEPTH 2338 COLLAR ELEV 5465'
 NOTES BY DMH CONTRACTOR Kayway

Log	Geology & Alteration	Mineralization	Assays				
			Ft	Cu	Mo	Zn	
	2238-2243 Biotite hornblende porphyry dike. weak Chlorite + Sericite	trace Pyrite no veining					
++	2240 Lower contact 200						
	2243-2338 medium grained hornblende quartz diorite	2-4% pyrite 50-90%					
	2260 Faults: 2254, 2283, 2294, 2301, 2335-25° to 30°, 2264-400, 2317- 100	DISS.					
	2270 Alteration: moderate Chlorite, weak epidote, weak sericite	trace chalcopyrite in some chlorite veins. Magnetite in some chlorite veins					
	2280 Kspar flooding 2313- 2317						
	2300 Chlorite-pyrite veins 0 to 5 /foot 60-70°						
	2310 Kspar veins 2294, 2301, 2335 - 35°						
	2310 4" tourmaline breccia at 2268, Tourmaline -						
	2320 Pyrite veins 2281, 2282, 2278, 2289, 2290, 2292, 2294, 2300, 2329 - 60-70° cut by occasional quartz vein						
	2340 and also chlorite veins						
	T.D. at 2338 on 6-30-80. Acid bottle tests at 1700' ~90° 2300' 82°						

SCALE _____
START _____
REMARKS _____

LOGGED BY SCP
COMPLETION _____

COORDINATES _____
DRILLER KayWay

LOCATION $\pm 1660'$ S $\pm 310'$ W NE 14
BEARING 90° DIP _____

PROJECT Buckskin
ELEVATION 5465 ±

Page 1 of
DRILL HOLE # BC-5
TOTAL DEPTH _____
INTERVAL _____ to

ASSAYS					
	Cu	Mo	Pb	Zn	Ag
5	21	12	24	18	BDL
7	30	5.4	22	8.6	BDL
12	24	8.1	9.2	16	.74
1	13	5.4	14	7.9	.25
2	21	5.4	11	19	.25
6	110	6.8	19	24	.25
4	149	2.7	26	91	.25
14	71	5.4	11	32	.25
7	16	9.5	11	44	BDL
8	142	6.8	25	53	BDL
7	39	15	14	23	BDL

LITH.	GEOLOGY Rock Type, Alteration, Mineralization, Structure	ALTERATION PERSPECTIVE Si Py Ch Gyp
10		
20		
30	23-32 Crushed + broken 32-38 1 fract / ft. $60^\circ \pm 25^\circ$ 38-48 Crushed + broken 70° 48-62 1 fract / ft $70^\circ - 80^\circ$ 62-65 Crushed + broken 65-79 Broken, many fractures 79-92 4-6 fract / ft. $20^\circ - 70^\circ$; cross cutting fract. 23'-60' Light grey fragmental; rhyolite; silicified w/ pyrophyllite 38-40' strong hematitic staining; one halloysite vein @ $49\frac{1}{2}$ $\frac{1}{2}$ " 20° 48' + 50' 6" zone strong hematite 60'-62' Flow banded rhyolite,	7. Rhyolite 744 ^ And 742 ++ light pink 743
40		
50		
60		
70	62'-88' Meta volcanics; quodesite. 5-10% phenocrysts. Gypsum veins common; some with hematite; veins $\frac{1}{2}"$.	
80	73-79' Strong limonitic staining;	
90		
100	88-110 Meta volcanics. equigranular; fine grained; grey-green; grain 83.5 6" zone 2% v.t. diss. pyrite size varies; 97-99' Gouge + breccia;	
110	110-114 Gouge + breccia; dip of slicks $20^\circ \pm ?$; 2-5% pyrite Moderate limonite staining to 110';	92-106 3-4 fract / ft $20^\circ - 50^\circ$ 106-156 1-2 fract / ft.; $106-135^\circ$ $20^\circ - 35^\circ$; $135^\circ - 156^\circ$ $40^\circ - 50^\circ$
120	At 116' Flow banding; dip $60^\circ - 70^\circ$; crude textural banding (grain size); 110-152 Alternating gray + green, meta volcanics; equigranular; gray zones 3-7% pyrite; fine; diss; green zones trace pyrite; 144'-147" getting hornblende xls; with chlorite alteration	
130		

(35) Item 15

SCALE _____ LOGGED BY _____
START _____ COMPLETION _____
REMARKS

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DRILL HOLE # BC-5
TOTAL DEPTH _____
INTERVAL to

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— PROJECT _____
— ELEVATION _____

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DRILL HOLE # BC-5
TOTAL DEPTH
INTERVAL to

ASSAYS					GEOLOGY					ALTERATION								
	Cu	Mo	Pb	Zn	Ag	SLITH.	Rock Type, Alteration, Mineralization, Structure					Pervasive	Vein					
						A						Si	Py	Ch	Ser	Gyr		
7						A	263 - 283 Gouge + breccia; 2-3% fine diss. pyrite;											
6	119	2.7	31	56	62	A	270											
2.5						A	280											
1	1756.8	81	92	1.4		A	283 - 286 Broken metavolcanics as per 243-263											
1	1166.8	32	59	99		A	290											
2	264.1	2665.62				A	286 - 336 Biotite-hornblende porphyry; biotite + hb to chlorite; plagioclase to sericite-clay; no veining; plagioclase 1-10 mm; av 5 mm; biotite 1mm-10 mm; av 2-3 mm; hb 1mm; 7-10% biotite, hb 1-2%; plagioclase 20-25%; trace pyrite; weakly magnetic; 1% magnetite in matrix + diss:											
1	202.7	25	53.62			A	300						309-319	2-3 fract/ft.				
2	294.1	2571	1.2			A	310						28-50°					
1½						A	320						319-323	Broken				
2	144.1	2060.64				A	330						322-327	3 fract/ft				
3						A	Plag. very soft; in some places plagioclase washed out by drilling mud.						20°					
3	246.8	2862.99				A	340						327-350	Broken				
1	578.1	2959.74				A	336 - 337 Gouge + breccia; dip 30° (top)									1?		
2	308.1	1222	BDL			A	337 - 340 Biotite-hornblende porphyry; mafics to chlorite, plagioclase to sericite-clay; plagioclase 1-4 mm, 10-15%; biotite 1-3 mm, 5%; hornblende 1 mm, <1%; trace magnetite									?		
1	406.8	1323.50				A	340 - 343 Metavolcanics; fragmental rhyolite; flow bending 60°; pyrophyllite, 2-4% diss py; 5-10% frags to 30 mm; chlorite(?)									?		
1½	47	1320	25	2.0		A	343 - 346 Biotite-hornblende porphyry; as 337-340 but as 286-336 lower one foot; foliated 40-50°									?		
2						A	346 - 375 Gouge + breccia; slicks @ 346 20°; slicks 348 35°, 348.5 60°; probably bhp; 2-3% diss py; occ zones of bhp <1°; slicks 368 10°; 369 30°; strong sericite; 350-394 Broken									?		
1	1067.2	2658.1.8				A	380						373	20° 374 20°		?		
1½						A	390									?		

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ASSAYS	SLTH.	GEOLOGY Rock Type, Alteration, Mineralization, Structure	INTERVAL to					
			Si	Lynch	Sor	Epi	PERSISTIVE	VEIN
Cu Mo Pb Zn Ag								
3 117 13 27 34 .54	N	652-653 Gouge + breccia						
4 122 13 28 62 BDL	V	653-707 Metavolcanics; porphyritic andesite; 5% pleg; av 3mm; strong silicification; gtz-pyrite veinlets abundant; gray; diss pyr; 3-8% pyrite; diss > veinlet; less pyrite 670-707 light green wavy mineral pyrophyllite(?) possibly grading to latite;	654-660	Broken				
1/2 854.3 20 131 .27	L	660-662 3 fractures ft. 40°						
1/2 91 6.4 21 78 BDL	L	Very hard; introduced or original silica(?)	662-669	Broken				
1/2 94 8.5 22 64 BDL	L	707-709 Gray green metavolcanics (andesitic); equigranular; 3-5% diss pyrite; sericite, chlorite, epidote; silicified.	669-699 2-4 fractures ft. 20°-50°; occ 70°					
1/2 69 6.4 21 47 .27	N	699-704 Broken						
1/2 141 11 33 75 .27	D	704-707 8 fractures 1 ft. 20°-60°						
1/2 151 11 28 145 BDL	D	709-715 Gouge + breccia; 3-5% diss pyrite						
1/2 122 8.5 32 74 .14	A	715-731 Gray-green metavolcanics; andesite; equigranular 1-2% diss pyrite; silicified; chlorite; epidote; mixed equigranular + porphyritic; 10-20 phano- 2-5 mm av. 3 mm; epidote net at base;	707-715	Very Broken				
1/2 59 6.4 16 51 .14	A	731-735.5 Gray metavolcanics; equigranular; andesite; 5-8% pyrite diss > veinlet. 20-300 gtz-pyrite veinlets common; silicified; 6" gouge 734.5 20-30°; metavolcanics as per 715-731	715-725	Broken				
1/2 137 6.4 33 70 BDL	D	735.5-739 Gouge + breccia; some solid pieces as per 731-735.5 but fewer gtz-pyrite veinlets.	725-735	5 fractures/ft 20°-60°				
1/2 893 4.3 67 76 .68	A	739-740 1-2 fracture						
1/2 110 8.5 39 76 .54	V	739-754 Gouge + breccia; some solid pieces as per 731-735.5 but fewer gtz-pyrite veinlets.	735-739	Broken				
1/2 754-767 Gray metavolcanics; andesite; equigranular; sericite-gtz; 3-5% pyrite; occ veinlet (gtz-pyrite); 4" gouge 757, 35°; 3" gouge 762.5 20°	V	740-747 Broken						
1/2 767-771 Gouge + breccia; 2% diss pyrite	V	747-753 3						
1/2 771-773 Gray green metavolcanics; porphyritic andesite; fractures/ft 20°	V							
1/2 773-787 Gouge + breccia; lower contact 20°; occ pieces metavolcanics as per 754-767	V	753-783 Very Broken						

SCALE _____
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DRILL HOLE #00-5
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INTERVAL to

SGALE
START 5-13-80
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DRILL HOLE # EC-5A
TOTAL DEPTH _____
INTERVAL to

ASSAYS						
	Cu	Mo	Pb	Zn	Ag	
2	182	143	7	61	29	
5	95	25	cl	23	2	
7	69	18	3	26	2	
3½	95	15	10	29	1	
6	74	16	cl	31	1	
7	159	21	cl	23	1	
9	169	14	7	27	1	
4	134	13	7	24	cl	
3½	52	15	3	40	1	
3	73	18	3	30	1	
4	67	16	7	25	cl	
5	116	13	10	43	1	
8	322	14	13	34	cl	

GEOLOGY							ALTERATION					
Rock Type, Alteration, Mineralization, Structure							Pervasive		Vein			
	Lith.						Si	Ph	Scr	Ch	Pyr	Si
Start coring 812'.							812-826	3	fractz/ft.			
812-817	820	Metavolcanics: grey; strong silicification; moderate sericitic-pyrophyllite; occ chlorite					20°-40°					
		5-8% pyrite, diss >> veinlet; cubes to 1-2 mm;					826-827	Broken				
817-821	830	Gouge zone: 818-819 silica; 2-3% pyrite; diss: 5-10° dip;					827-835	5 fractz/ft.				
821-840	840	Metavolcanics: as per 812-817. occ qtz-pyrophyllite(?) - sulfide vein (1mm); dip > 70°					30°-60°					
840-852	850	Metavolcanics: porphyritic andesite; strong silicification; traces pyrophyllite (veins); 3% pyrite, diss; 852' breccia, 20°;					852-854	Broken				
852-853	860	Breccia green;					854-865	3-5 fractz/ft				
853-888	870	Metavolcanics: porphyritic andesite; chlorite+or epidote clots to 3mm; 1-2% pyrite; diss; 856 6" clast or bed, 20°. finer grained; silicified; occasional "bleached" zones with 2-3% pyrite, diss,					20°-70°					
888-911	880	Metavolcanics: gray; strong silicification; trace pyrophyllite(?) on fractz. 3-5% pyrite, diss, fine; several slicks 30° near top; occasional qtz-pyrite vein 1-2mm;					865-868	Broken				
	890						868-881	5-7 fractz/ft.				
911-925	890	Gouge + breccia: 1-3% pyrite; diss, fine; slicks common; 20°; occasional 50°					20°-40°					
925-997	900	Metavolcanics: gray; andesite(?) ; strong silicification; trace pyrophyllite(?) on fractz; @ 930 5-6 1-2mm pyrite veins) dip 50°; 1% pyrite, diss, fine; andesite is porphyritic: pheno to 2 mm; 5-10% pheno (plag?) Mafic sites now pyritized sericitic(?) - chlorite(?)					925-932	3 fractz/ft.				
	910						10°+50°					
	920						932-933	Broken				
	930						933-953	3-5 fractz/ft				
	940						ft; 10°+40-50°					
							953-958	Broken				
							958-967	3 fractz/ft.				
							10°-60°					
							967-969	Broken				
							969-975	3 fractz/ft.				
							30°-40°					

Item 15
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SCALE _____
START _____
REMARKS

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Page 2 of
DRILL HOLE # DC-5A
TOTAL DEPTH _____
INTERVAL to

ASSAYS						GEOLOGY Rock Type, Alteration, Mineralization, Structure	ALTERATION				
	Cu	Mo	Pb	Zn	Ag		Si	Phy	Ser	Ch	Vein
6	125	14	10	19	<1	^ V					
1/2						^ V					
6	70	18	13	27	<1	L	950				
4						^					
4	54	25	7	33	<1	L	960				
7						^					
4	85	62	7	41	<1	V	970				
7						^					
2	50	28	13	26	<1	V	980				
6						^					
6	46	76	16	89	1	V	990				
7						^					
4	42	22	10	54	<1	V	1000				
7						^					
6 1/2	92	21	13	54	1	V	1010				
7						^					
6 1/2	66	22	8	72	2	V	1020				
5						L					
8	300	14	15	80	2	V	1030				
8						L					
7	199	18	11	68	2	V	1040				
3						L					
8	145	7	52	32	1	V	1050				
3						D					
8	72	7	6	63	2	V	1060				
						D					
						D					
						D					
						+ +	1070				

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DRILL HOLE # BC-5A
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ASSAYS	Cu	Mo	Pb	Zn	Ag	LITH.	GEOLOGY			ALTERATION	PERVERSIVE	VEIN
							Si	Phy	Scrch			
8	63	1.4	124	151	1	+ +				1" gouge @ 1087 45°		
10	38	<1	402	568	2	+ +	1080			1091-1094 5 fract/ ft. 20° + 80°		
5						+ +	1090			1094-1103 2-3 fract/ ft.; 20-30°		
6	29	<1	26	104	2	+ +	1100	1098	6" gougy zone; 70° + 20°	1103-1110 5 fract/ ft; 50-80° (slicks)		
2						+ +	1105½			1110-1121 5-10 fract/ ft; 40°		
3						+ +	1120	3" gouge 55°				
3						+ +	1121	1" gouge 50°				
5	19	<1	20	113	1	+ +	1124½ - 1158	Metavolcanics: andesite? original texture obliterated: silicat pyrophyllite; 5-10% pyrite; occ vein; locally rock in gougy + broken; getting chlorite at 1151 and traces cpy;		1121-1147 2-3 fract/ ft. 30°-50°		
4	25	<1	59	123	2	+ +	1130			1147-1160 mixed, 5-10 fract/ft + Broken, 40°-50°		
5						+ +	1140	1" gouge				
6	57	18	12	47	2	+ +	1150	1158-1068 very silicified: 80% silica; 1/2% pyrite; 1/2% cpy; trace sph?		1160-1167 3 fract/ ft; 20°-40°		
5						+ +	1154	6" gouge 45°				
6	80	<1	33	12	1	+ +	1160	1168-1186 fault 25°-30°; Porphyritic hornblende dacite; 3' chilled zone on top + bottom; 5-10% plagiopheno; upto 10 mm; trace sericite; chlorite; some plagi pink (picidmantite);	1124 1" breccia 45°;			
7	131	7	34	15	2	+ +	1170			1167-1186 5-10 fract/ft; 20° + 60°		
5½						+ +	1180					
3	332	7	4	35	3	+ +	1186-1201	Gouge + breccia; dips-slicks 30°-90°; 1% disse pyrite.	1186-1202 Gouge occ fract 1-2/ft. 40°			
2						+ +	1190			1202-1215 3 fract/ ft; 30°-40°		
2	170	4	18	34	2	+ +	1200					
4	239	4	9	64	2	+ +						
5	168	<1	15	138	1	+ +						
3						+ +						
4						+ +						
6	271	25	5	28	2	+ +						
5						+ +						

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DRILL HOLE # BC-5M
TOTAL DEPTH _____
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ASSAYS	Cu	Mo	Pb	Zn	Ag	LITH	GEOLOGY					ALTERATION					
							1201-1207	Silicified breccia; 3% pyrite, diss;					1213-1228	Broken.			
6	167	205	5	32	2	1210	1207-1209	Gouge + breccia; 3-5% pyrite; lower contact 70°;					1228-1240	3-4 fract/s/ ft; 20°+60°			
6	1500	29	13	97	2	1220	1209-1248	Metasedimentary: fine grained dolomite; weak sericite + chlorite; 3% pyrite; diss = vein; acc qtz-chlorite-pyrite vein; trace cpy below 1245; 6" gouge 1242-150°;					1240-1242	Broken			
5	1400	22	13	80	2	1230	1248-1260	Slicks 1256 20°					1242-1261	3 fract/s/ ft; 10°+40°-60°;			
7	1100	43	8	69	1	1240	1260-1273	Metavolcanic: fine grained; 1-3% pyrite; trace cpy; chloritized, minor sericite					1261-1266	Broken			
6	1300	25	10	58	3	1250	1273-1282	Metavolcanic: fine grained; 1-3% pyrite; trace cpy; chloritized, minor sericite					1266-1273	3-5 fract/s/ft; 10°-60°			
8	1100	4	11	66	2	1260	1282-1290	Metavolcanic: fine grained; strong silification; locally brecciated; some pyrophyllite; 1-2% pyrite; diss: fine					1273-1281	2 fract/s/ ft.; 10°-40° + 80°			
6	151	14	9	71	2	1270	1290-1300	Metavolcanic: andesite; sericite + chlorite; minor silica; 1-2% pyrite;					1281-1325	2-3 fract/s/ft.			
4	71	29	18	11	1	1280	1300-1310	Metavolcanic: fine grained; chloritized; minor sericite; blotches (to 10 mm) of pyrite; trace cpy; 3-5% pyrite diss = vein;					1281-1289	40°+60°			
4	151	14	9	71	2	1290	1310-1320	Metavolcanic: andesite; sericite + chlorite; minor silica; 1-2% pyrite;					1289-1325	20°-30° occ 60°-70°			
8	1200	14	10	73	2	1300	1320-1330	Metasedimentary: fine grained; chloritized; minor sericite; blotches (to 10 mm) of pyrite; trace cpy; 3-5% pyrite diss = vein;					1294	slicks 30° local clots of halloysite; 1% magnetite			
7	1000	7	19	63	3	1310	1330	1312 1" gouge 45°					1318	3" gouge 45°			
8	527	11	14	70	2	1320											
8	242	4	20	78	2	1330											
7	329	14	12	98	2												

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DRILLER _____LOCATION _____
BEARING _____PROJECT _____
ELEVATION _____Page 6 of 1
DRILL HOLE # _____
TOTAL DEPTH _____
INTERVAL to _____ASSAYS

Cu Mo Pb Zn Ag

2	51				
5	53				
2	58	C1	11	22	1
3	60				
3½	63				
3½	67	102	C1	20	32
9	76				
3½	76	119	C1	6	22
3	80				
7	83	77	11	7	27
90					
5	95	26	7	15	9
8	103				
5	108	15	4	2	10
10					
6	116	28	C1	6	5
5½					
72	122	22	4	1	9
25					
2	27				
29					
30					
33					
5	138	181	C1	7	16
38					
8	147	172	C1	7	24
5					
3½	151				
55	155	17	C1	9	24
½	58				
5	163	28	C1	30	70
10	173				
9	182	32	C1	19	53
82					

GEOLOGY
Rock Type, Alteration, Mineralization, Structure

LITH.	1450	1450-1460	2-4/ft	2-3
60	1464-1485	diorite as above	10°, 30°, 60°	
70	che weak Silica	1467-1474 w/ qtz pyren 5-15/ft	broke 50-51	
75° + 25°	- 1483-1485 - strong Ser Ksp?	75° + 25° - 1483-1485 - strong Ser Ksp?	50°, 30°, 10° 2-4/ft	2-4
rest che w/ minor Ser Ksp? + weak veining	py	rest che w/ minor Ser Ksp? + weak veining	broke 64.5-65.5, 66.5-67.5	
80		1470-1480 2-4/ft	1470-1480 2-4/ft	
83		30°, 50°, 70°	30°, 50°, 70°	2-4
90	1485-1514	diorite ?? textures obscured	1480-1490 2-3/ft	2-4
95	Gouge	1495-1497, 1502-1504	20°, 50°, 70°	2-3
103	Silica	1485-1496, 1506-1514	low py in Silica 2-3/ft	
108	Ser	1490-1506	1490-1500 Gouge	2-3
116		high py trace Cpy	4-5/ft	
122			1500-1510 Gouge + broke	4-5
20	1514-1550	Diorite 1-2 mm felds	1510-1520 2-3/ft	4-5
25	Silicified	1523-1536 4-290 py	40°-60°	
27	mod Ser - weak che	1514-1523 pyren 5-7/ft	1520-1530 3-6/ft	
29	che wch Ser Ksp?	1523-1549 very few vein	50°-70° 10°, 60°-70°	
30	Qtz-py 30°		broke 25-27 28-30	1-2
40	Gouge 1549-1550	, 1528 20°	1530-1540 2-3/ft	4-3
50			20°, 65°	
55	1550-1557	diorite ?? Gouge 1550-1554, 1555-1557	1540-1550 1-3/ft	1-3
58	55	55 + silicified 1-7% py	10°-20°, 65°	
60	1557-1585	Bhp 7% well stacked Bio 5 mm	1550-1560 1-2/ft	
63	28	2-3% hb 1-3 mm	50°-70°	1-2
70	weak che	25% Play to 7 mm	broke 50-57	
73		weakly altered	1560-1570 1-4/ft	
80	tr py		30°, 70°	+ tr
82			1570-1580 0-4/ft	tr
			30°, 70°	+ tr

SCALE _____
START _____
REMARKS _____

LOGGED BY _____
COMPLETION _____

COORDINATES _____
DRILLER _____

LOCATION _____
BEARING _____

PROJECT _____
DIP _____
ELEVATION _____

Page 7 of
DRILL HOLE #BC-5A
TOTAL DEPTH _____
INTERVAL to

ASSAYS					
	Cu	In	Pb	Zn	Ag
82					
5½	141	11	BOL	SO	BOL
88					
5	93				
4	140	7	BOL	55	6
2	97				
1600					
5	05	121	7	BPL	37
4	09				
5½	15	55	15	BOL	23
3	19				
4	23				
3	26	28	7	BDL	14
1½	28				
3	31				
7	143	7	BDL	46	BDL
3½	38				
6½	44	139	18	BOL	468
8	50				
3½	54				
4	58	20	7	5	6
2	60				
½	61				
3	63				
½	65				
6½	69	16	11	BDL	12
2	71				
7½	72				
4	77	20	7	BDL	38
7	85	291	18	BOL	48
3½	89				
5	94	167	18	BDL	24
5	99				
8	143	22	BDL	27	3
4	07				
-1					

LITH.	GEOLOGY						ALTERATION
	Rock Type, Alteration, Mineralization, Structure						
1580	1585-1617	fine 6d w/ chl atta mafic to 3mm gouge 1585-1587				1580-1590 1-3/ft 30°, 70°	
1	90	chl with min. See Kspce locally diss See Bio?? 10% diss rare chl py vein tri. cpy				broke 83-88 1590-1600 10°, 30°, 70°, 3-5/ft broken 95-1600	1-2
1	1600					1600-1610 3-6/ft 10°, 30°, 70°-90° broke 03-05	1-2
1	10					1610-1620 5-6/ft	
1	20	1617-1628 Diorite Very sougy except 1524-1525 sticks 15° chl with late halloysite cement				70°, 50°, 100° broke 17-20	1-2
1	30	1628-1649 - Diorite chl py vein 1-2/ft 200, 500 See Bio? 1628-1634				1620-1630 3-7/ft 70°, 10° 1630-1640 1-2/ft	3-4
1	40	Kspc vein 1-4/ft 1634-1642 py V: Sm 1:5 - 1:10				500, 30°	2-3
1	50					1640-1650 2-4/ft 30°, 50° broke 41-42, 49-50	2-3
1	60	1649-1669 Diorite ?? very sougy See min chl with prp (halloysite) cement Gouge				1650-1660	
1	70	breaks mainly 60-800 4-5% py				1660-1671 Gouge to 65	4-5
1	80	1669-1694 Dio - Chl 1-2% py meta igneous; chloritized; mod-weak sericitic to plagi; occ chlorite-pyrite vein; 1-2% diss py; at 1674 1/2" gouge				3-4/ft 10°, 50° 1671-1679 5-10 frag ft, 40°-50° + 80°	4-5
1	90	zone 50°; texture quite variable local silica flooding 1679-1682, 1686; some secondary biotite in some zones;				1679-1706 2-9 frag ft. 20°-30°; occ 70°	
1	100	qtz-chlorite veins dip 15-25°; weakly magnetitic; 1' gouge + breccia 1688 1/2" dip 10°-				1706-1707 Broken	
1	110	1694-1699 Gouge + breccia; 1-2% diss py; dip 10-20°				1707-1709 3-9 frag ft; 20°	
1	120	1699-1714 Metaigneous as per 1669-1694				1709-1714 5-10 frag/ft; 20-40°	

SCALE _____
START _____
REMARKS

LOGGED BY _____
COMPLETION _____

COORDINATES _____
DRILLER

LOCATION _____
BEARING _____ DIP _____

PROJECT _____
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Page 9 of
DRILL HOLE #BC-5A
TOTAL DEPTH
INTERVAL to

SCALE _____
START _____
REMARKS _____

LOGGED BY _____
COMPLETION _____

COORDINATES
DRILLER _____

LOCATION
BEARING _____
DIP _____

Redrill
PROJECT _____
ELEVATION _____

Page / of _____
DRILL HOLE # BC-51A
TOTAL DEPTH _____
INTERVAL to _____

ASSAYS

Cu Mo Pb Zn Ag

8 14 BDL 25 59 2.0

2 38 60 12 BDL 5.7 75 1.2

8 68 10 11 BDL 8.0 66 BDL

10 78 13 15 13 101 BDL

8 87 12 7.3 9.1 62 2.0

4 92 19 7.3 13 68 BDL

5 97 18 BDL 8.0 56 BDL

4 102 30 BDL 37 80 1.9

LITH.

1850

1860

1870

1880

1890

1900

1910

1920

1930

GEOLOGY
Rock Type, Alteration, Mineralization, Structure

Hole lost; wedge set at 1850

1850-1885 1 frac/ft.
30°-40° >> 60°

Biotite hornblende porphyry: ~5% plagi 2-4 mm.
10-15% biotite (chlorite-sericite); 1-2% hb (altered);

1885-1889 5-10 frac/
ft.; 60°

Trace diss pyrite; qtz? w/purple rind??

1889-1926 1-2
frac/ft. 30°-40°>>60°

1878 - textural change; indistinct plagi x/s;
to 4 mm. 30-40% of rock; x/s more distinct
lower down; also larger, some to 10 mm;
1887 3" ± qtz vein; 1-2% diss pyrite;

1907+1907½ two 1" slicks + gouge 15° + 25°;
Locally ½% pyrite diss;
Below 1910± rocks appear less altered.

1926-1927 Gouge; no sulfide; probably bhp;
dips top bottom 50°-60°?;

1927 - Meta igneous, diorite, 2%
diss pyrite; chloritized;
weak sericite?; slightly magnetic

ALTERATION
PERVERSIVE VEIN

S. Ph. Scrch Epi Gyph Epi

?

?

?

?

?

?

?

?

?

?

?

?

?

ITEM 5
ITEM 5

SCALE _____
START _____
REMARKS

LOGGED BY _____
COMPLETION _____

COORDINATES _____
DRILLER _____

LOCATION _____ BEARING _____ DIP _____

PROJECT _____
ELEVATION _____

Page _____ of _____
DRILL HOLE # _____
TOTAL DEPTH _____
INTERVAL to

SCALE _____
START _____
REMARKS _____

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COMPLETION _____

COORDINATES _____
DRILLER _____

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BEARING _____

PROJECT _____
DIP _____

Page ____ of ____
DRILL HOLE # _____
TOTAL DEPTH _____
INTERVAL to _____

ASSAYS			LITH.	GEOLOGY Rock Type, Alteration, Mineralization, Structure				ALTERATION PERVERSIVE	VEIN
	Cu	Mn		Pb	Zn	Ag	Py		
2708.7	13981	1.6	2050					2050-60	
15114	1260	1.3	3-4	2056-2059	Bx dike	Upper contact	20°?	30°, 45°, 70°	1-3/ft
17529	1529	BDL	40	frags of gd, mv, & light gd?	700	chl. weak se	cut by py vein	2060-70	
15717	1434	BDL	60	2059-2103	diorite as above			10°, 45°, 70°	1-5/ft
130	1948	BDL	70	4" bx dike at 2090-400					
1008.8	2154	BDL	5-6	mod chl weak se		mod Kspgrn	1995-1996	2070-80	
11	BDL	2258	BDL	chl py vein	20-30° + 60°-70°	1-4/ft		30°, 45°, 70°	1-3/ft
23	BDL	2845	1.3	5-10/ft	2070-2083	tr cpy in chl vein			
22217	429326	4.1	4.5	tr py mt in some veins		70% diss py	2080-90	1-2/ft	
500	142956	3.1	4.5	bif chl cherts				10°, 45°, 70°	
37112	21582.5		10	2129-2165	diorite as above			2090-2100	
136	BDL	2452BDL	3-5	5" Bhp dike at 2163				45°, 70°	1/ft
19	8.62362	BDL	40	fault 2189 20°					
500	142956	3.1	3-4	mod chl weak ser w/epi					
37112	21582.5		40	slc bin? 2146-2160? w/epi					
136	BDL	2452BDL	2150	calc-py vein 20-30° + 60°-70°	2-5/ft				
19	8.62362	BDL	3-5	gn-cpy vein 30° - 2138 diss gn to 2138-2139					
500	142956	3.1	60	70-60% diss py					
37112	21582.5		3-4	2165-21	Bhp 5-7%	biz to 1cm	3-4%	45°, 70°	1-2/ft
19	8.62362	BDL	45°	to 3mm 50% play to 7mm		grades to 25%			
500	142956	3.1	70	please near contact		upper contact ~45°		2170-78	
37112	21582.5		70	tr to 1% py diss no veins				10°, 45°, 70°	1-3/ft
19	8.62362	BDL	80	weak chl per play slt & chg strong					

SCALE _____
START _____
REMARKS _____

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COMPLETION _____

COORDINATES _____
DRILLER _____

LOCATION _____
BEARING _____
DIP _____
ELEVATION _____

Page ____ of ____
DRILL HOLE # _____
TOTAL DEPTH _____
INTERVAL to _____

Lith.	Assays	Py	GEOLOGY			Fractures	ALTERATION	
			Lith.	Rock Type, Alteration, Mineralization, Structure	Fractures		Pervasive	Vein
4	31	Cu Mo Pb Zn Ag	2180	2178-2243 Bhp as above	2180-90			
5	86	24 BDL 21 58 BDL	tr	mod chl (in plaq) grades to fresh plaq	30°, 50°, 70° 2-3/ft			
10	96	20 BDL 77 60 BDL	90	break seen 2230-2243	2190-2200			
10	06	24 8.7 30 78 1.6	tr	no veins tr diss Py	Sane			
5	11		2200	lower contact ~20°	2200-10			
10	21	27 14 26 76 1.9	tr		Sane			
8	29	24 8.7 36 71 BDL	10		2210-20			
9	38	17 12 30 115 BDL	20					
6	44	274 17 26 88 2.5	tr		2220-30			
10	54	359 17 32 106 3.8	3-4	2243-2290 med ground 66 diss. aplite 1" 50° int 2261 cut by qtz-py vein	30°, 50°, 70° 2-3/ft			
8	62		2250	Faults 2254-30° + 2264-40° 2283-30°	2250-60			
9	71	317 20 40 48 2.5	3-4	4" tour 6x at 2268-45°	30°, 50°, 70°			
10	79	150 12 15 110 1.3	60	mod chl weak epi weak ser	2-3/ft			
6	81	173 20 19 53 1.9	2-3	che Py vein 0-5/ft 30°-50° some w/ tr cpy	2260-70			
6	87		2-3	mt vein 5° 5 vein from 2273-2274	Sane			
7	94	161 23 15 37 1.3	70	tour py vein 60-70° 2281+2282, 2278	2270-60			
5	99	218 20 29 51 2.8	tr	2281, 2290	30°, 70° 10-8/ft			
10	13		80	60-70% diss. py after bary. qtz vein 30°	2280-90			
6	37		tr		30°, 70° 2-4/ft			
7	90		90	2290-2338 hd as above	2290-2300			
5	99		3-4	Kspar qtz vein 1/2" 2294, 2301, 2335-35°	30°, 50°, 70°, 90°			
10	13		2300	94 cuts tour 0° has tour.	2-10/ft			
10	13		2-3	Kspar flooding 2313-2317 in bands	2300-10			
			10	1-4" wide 40°-50° pegmatite 1"	30°, 50°, 70°			
				40° at 2319	2-6/ft			
				mod chl weak epi weak ser				

SCALE 1
START _____
REMARKS

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COORDINATES _____
DRILLER _____

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Page ____ of ____
DRILL HOLE # _____
TOTAL DEPTH _____
INTERVAL to _____

ASSAYS

Cu Mo Pb Zn Ag
105BDL16 572.5

81 K4 16 521.3

21712174931

GEOLOGY
Rock Type, Alteration, Mineralization, Structure

LITH.

		LITH.	ALTERATION
			PERVASIVE
			VEIN
8	13	2319	cont
	21	2-3	tour vein w/ py 2272, 2294, 2300 2310-2320 2329 - 600 ~1/2" wide 30° 45° 85°
10	31	20	gt vein 1/ft 70° 1-2 mm 2-5/ft
	6 1/2	2-3	chl vein 0-4/ft w/ py 30° & 70° 2320-30 diss py 50-70% 30° 45° 70°
	38	30	green ser. vein 75° at 2329 1 trc py 2-5/ft
		3-4	cuts tour vein 2330-38 faults - 2317-10°, 2333 30°, 100° 70° 3-4/ft broken 31-34
			TD 2338

(35) Item 15

REQUEST FOR DRILLINGEXPLORATION
DELINEATION

PROSPECT BUCKSKIN DISTRICT Reno
 BLOCK Buckskin Area #54 CHARGE NO. 8182-7071773
 BUDGETED? YES NO \$ EXPENSE \$ CAPITAL, AFE'D?
 CONOCO WI 100 % PARTNERS %
 REQUESTED SCHEDULING February-March, 1980 PRIORITY High
 SPECIAL CIRCUMSTANCES

DRILLING PROGRAM

TYPE RIG Longyear 44 ANGLE 90 ° HOLE SIZE H, N, B
 TOTAL FOOTAGE 3500' MAXIMUM DEPTH 3500'
 NO. OF RIGS One NO. OF HOLES One
 SOURCE OF WATER Local ranch five miles south of project.
 CONTRACT COSTS \$ 131,000
 CASING \$
 ROADS, CULVERTS, AND BRIDGES \$ 4,000
 SITE PREPARATION \$ 1,000
 MUDPITS \$
 DOWNHOLE SURVEYS \$
 ENVIRONMENTAL \$ 500
 ESTIMATED PROGRAM COSTS \$ 136,500
TOTAL

OBJECTIVES: Evaluate new idea of alteration zoning as a lead to concealed porphyry copper deposit. Alteration patterns suggest previous drilling has been too far north.

LAND CONSIDERATIONS: Conoco controls all claims in immediate area.

PERMITS REQUIRED? (identify)

REMARKS; ANTICIPATED DRILLING PROBLEMS; OTHER: None

SIGNED G. L. Price DATE 1-25-80 APPROVED JHK/M. R. Phillips DATE 2-25-80

Original + 2 copies to WAP, with 2 copies of location plat.

MINERALS DEPARTMENT - METALLICS EXPLORATION

(35) Item 15

REQUEST FOR DRILLINGEXPLORATION DELINEATION

PROSPECT BUCKSKIN DISTRICT Reno
 BLOCK Buckskin Area #54 CHARGE NO. 8182-7071773
 BUDGETED? YES NO \$ EXPENSE \$ CAPITAL, AFE'D?
 CONOCO WI 100 % PARTNERS %
 REQUESTED SCHEDULING February-March, 1980 PRIORITY High
 SPECIAL CIRCUMSTANCES

DRILLING PROGRAM

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 ESTIMATED PROGRAM COSTS \$ 136,500
 TOTAL

OBJECTIVES: Evaluate new idea of alteration zoning as a lead to concealed porphyry copper deposit. Alteration patterns suggest previous drilling has been too far north.

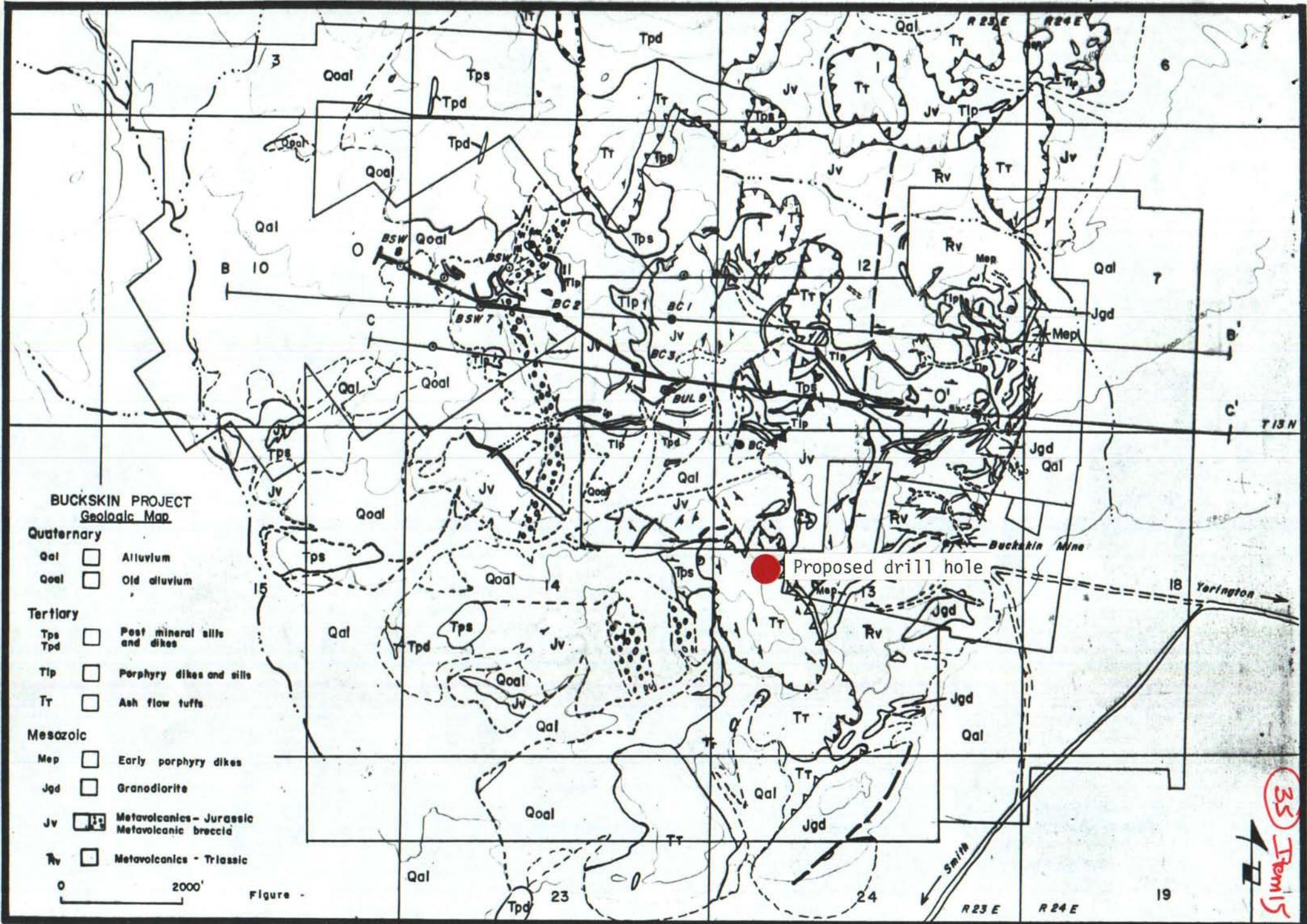
LAND CONSIDERATIONS: Conoco controls all claims in immediate area.

PERMITS REQUIRED? (identify)

REMARKS; ANTICIPATED DRILLING PROBLEMS; OTHER: None

SIGNED G. L. Price DATE 1-25-80 APPROVED DATE

Original + 2 copies to WAP, with 2 copies of location plat.



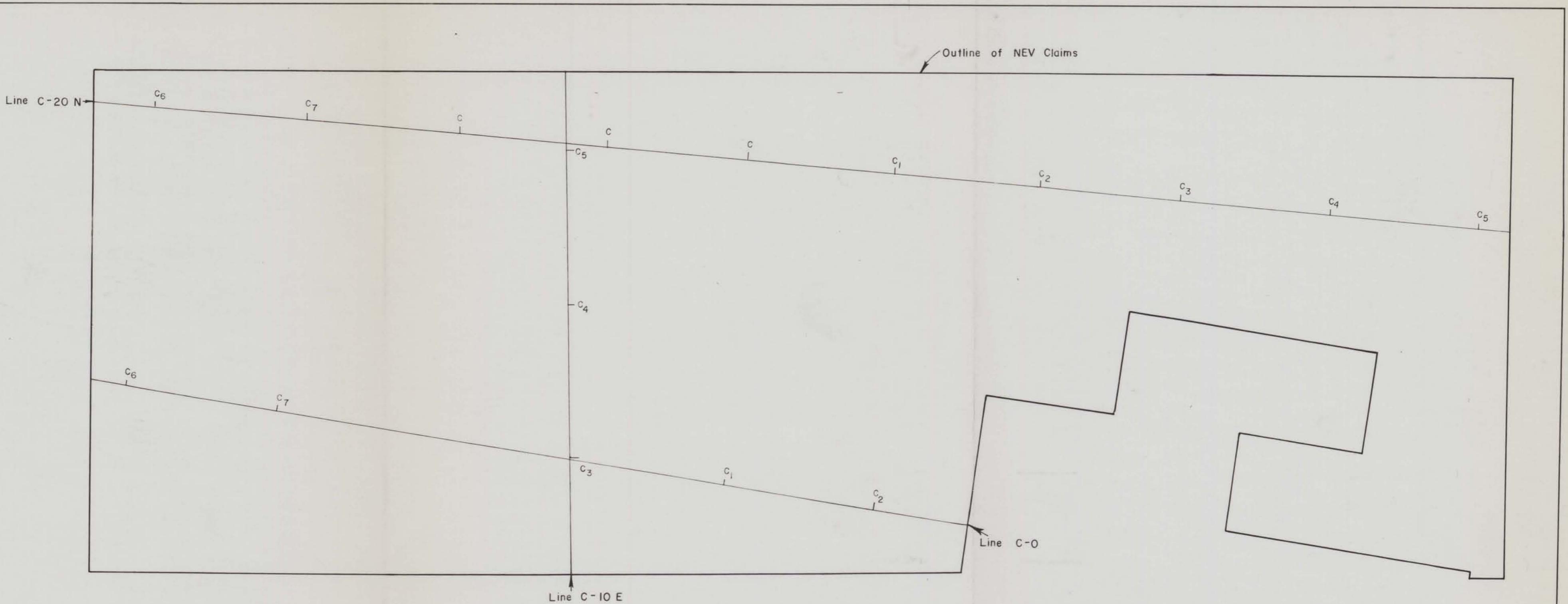
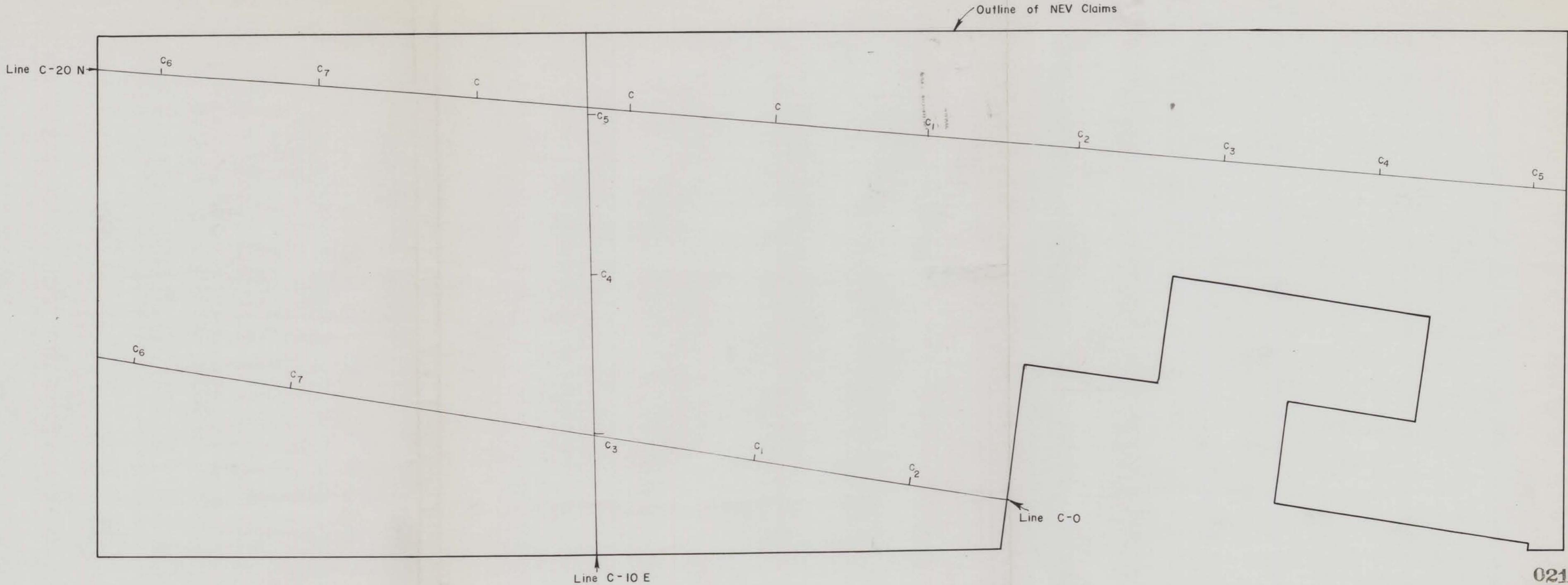


EXHIBIT "D"

Attached to and made a part of
that certain PROOF OF LABOR
dated July 6, 1976 by Continental
Oil Company covering the NEV 1-28,
75-78, and 130-136 unpatented
lode mining claims.

CONTINENTAL OIL COMPANY MINERALS-METALLICS, RENO	
I.P. SURVEY LOCATION MAP	
NEV CLAIMS	
Douglas County, Nevada	
Scale: 1" = 500'	Date: 7/23/76
By:	File: Buckskin drawer



02119

BOOK 776 PAGE 1629

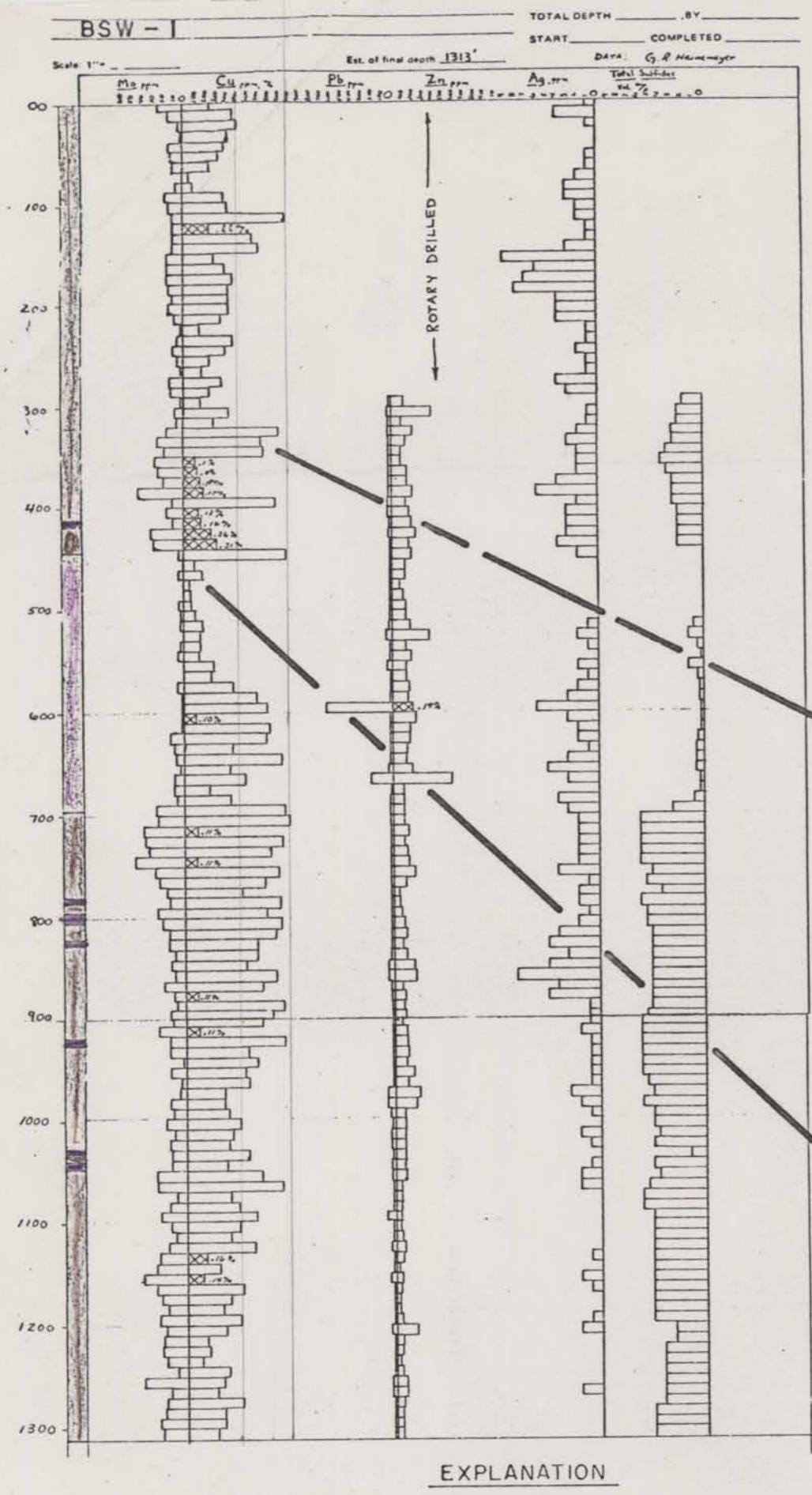
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I.P. SURVEY LOCATION MAP	
NEV CLAIMS	
Douglas County, Nevada	
Scale: 1" = 500'	Date: 7/23/76
By:	File: Buckskin drawer

0770 0015 (35) Item 15

0770 0015



- [Aal] Alluvium
- [Oal] Older Alluvium
- [Ts] Semi-consolidated tuffaceous sedimentary rocks
- [Trt] Rhyolitic ash-flow tuff
- [Tqlp] Biotite, Hornblende, Quartz latite porphyry flows
- [Kdp₁] Hornblende biotite (Kdp₁-syn-mineral)
- [Kdp₂] Dacite porphyry (Kdp₂-post-mineral)
- [QF] Quartz - Feldspar porphyry (Intrusive) (Indeterminate original composition)
- [Kgnd] Hornblende granodiorite
- [IMR] Intermediate Metavolcanic Rocks (Predominantly flow breccias) (Including metaquartzites)

