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INDUCED POLARIZATION AND

RESISTIVITY SURVEY

CRESCENT PEAK PROJECT

CLARK COUNTY, NEVADA

FOR

PARNASSE DELAWARE COMPANY, INC.

PROJECT 0021

mining
geophysical surveys

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ACCOMPANYING THIS REPORT:

1 CONTOUR PLAN MAP

6 PROFILES

1 EXPANDER

INDUCED POLARIZATION AND
RESISTIVITY SURVEY
CRESCENT PEAK PROJECT
CLARK COUNTY, NEVADA

FOR

PARNASSE DELAWARE COMPANY, INC.

INTRODUCTION:

During the period July 14 through July 30, 1970, an induced polarization and resistivity survey was performed on the titled property. The field survey was under the direction of Mr. James B. Parker, technician for Mining Geophysical Surveys. Mr. L. H. Loidolt, geologist, as well as Mr. Maurice Auriol, geophysicist, represented Parnasse Delaware Company, Inc. during the course of the field survey.

The geophysical grid was presented by Parnasse Delaware Company, Inc. and consisted of a total of 10 north-south profiles spaced 1000' apart. Dipole spacings of 1000' were used. Line 3, the initial survey line, indicated strong anomalous IP response occurred in the north half of the line. The survey was then extended to partially outline a major IP response zone. Unfortunately, complete coverage was not obtained by the present effort.

The anomaly expresses a zone of IP response in the form of an irregular-shaped stock-like body which lies east of Crescent Peak and extends from the Peak down the southeast slope of the mountain. The response is a relatively near-surface feature

occurring approximately within 500' of surface and extending to depths greater than 1500'. The true size of the stock is not known as the northeast boundary of the stock has not been established. Although the IP response within the stock is variable, a minimum true IP response of 70 ms is calculated and could represent 3% to 4% sulfides by volume under ideal conditions. This correlation between % sulfides and calculated IP response must be determined from core analysis before a reliable relationship can be established.

A broad shoulder-like zone of moderate response lies south of and in contact with the stock. A narrow dike-like appendage occurs NW'ly from the main body and appears to be controlled by a NNW'ly striking structural feature.

SURVEY PROCEDURE:

The induced polarization and resistivity measurements are made in the time-domain mode of operation. 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 was used, with dipole lengths (a) of 1000'. Measurements were made for dipole separation factors (n) of 1 to 6. The potential dipoles normally occupy positions on both sides of the current electrode spread, thereby obtaining a total line coverage approximately nine times the dipole length for our standard line of seven electrodes. Actual line coverage varies in this survey, as shown on the profile plots.

A dipole-dipole expander with dipole lengths (a) of 100' and separation factors (n) of 1/2 to 8 was surveyed east of Line 2 in an effort to obtain details of the actual depth to the response zone. More depth tests would have been obtained within the main block had time permitted.

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.

DISCUSSION OF RESULTS:

A detailed review of each line from east to west:

LINE 11 - North half only - incomplete data to the north and south.

The moderately strong response over an apparently broad width is believed to be a lateral effect of the main anomalous zone which lies west of this line. A resistivity contact occurs near electrode C_3. Data coverage is incomplete and a comprehensive interpretation of conditions on this line is difficult to make. We do see a relationship between an increase in IP response and an increase in resistivity, with the anomalous response material coincident to rock resistivities of 350 ohmmeters or greater.

LINE 3 - Anomaly open to the north.

Strong anomalous IP response of 65 ms occurs in a broad zone greater than 2500' across. The apparent northerly dip could be the effect of anomalous response to the north and west of this line. A high resistivity rock of >500 ohmmeters is associated with the anomalous IP zone. Locally within the response zone, surface resistivities of less than 200 ohmmeters occur. A resistivity contact between C_3 and C_4 occurs southerly adjacent to the major IP anomaly, with resistivities >500 ohmmeters north of the contact and resistivities <400 ohmmeters south of the contact.

South of the main anomaly an apparent surface response of 24 to 27 ms extends for about 3000' south of the major response zone. This layer is about 500' thick and has a calculated response of 30 ms. Below this layer and south of the resistivity contact, background response of 10 to 15 ms is observed. Surface resistivities are variable, as indicated by the complex profile pattern.

LINE 7 - Anomaly open to the north.

Strong IP response of 90 ms occurs in a zone over 4000' wide. A possible north boundary is inferred. Apparent surface response is relatively weak locally and indicates a narrow zone of non-responsive rock striking approximately N-S and of unknown depth extent. The near-surface non-responsive feature does not appear extensive enough to separate the main anomaly into two parts, however. Again, high resistivity rock is related to the strong IP response with a resistivity contact occurring between electrodes C_3 and C_4.

A broad zone of moderate IP response of 25 ms occurs south of the major anomaly. The response extends to depth relative to the surface response noted to the east on Line 3. We interpret this as inferring a steep W'ly dipping contact for the east boundary of the moderate response zone. This response zone is related to relatively low resistivity rock of 250 to 350 ohmmeters.

Background response of less than 20 ms appears south of electrode C_7 and is related to high resistivity rocks of >500 ohmmeters. We likely are beginning to see a rock-type change at the extreme south end of the area, with high resistivity rocks containing low or background response. This line was extended far enough to obtain background characteristics.

LINE 2 - Moderate response zone open to the south - major anomaly incompletely covered to the north.

The north contact of the major response zone lies between C_6 and C_7 (north half) but has not been accurately located. A response of 80 ms is associated with moderately high resistivities of 400 to 600 ohmmeters, with the highest resistivities lying northerly adjacent to a resistivity contact at C_5 (south half).

This line exhibits the best example of the broad moderate response zone of 25 to 30 ms that lies immediately south of the major anomaly. This anomaly is related to relatively low resistivity rock of 200 - 250 ohmmeters, with a high resistivity rock (550 ohmmeters) at depth.

A background response of less than 10 ms is obtained on the northerly extension of this line. The background IP values are associated with variable but relatively high resistivity material of 300 to 700 ohmmeters.

LINE 6 - North half only - coverage incomplete to the north and south.

A major response of 70 ms occurs in a zone of apparent narrow width on this line. Boundary locations are questionable as coverage is not complete to the north. The sharp drop in response to the south is an indication that the moderate response zone of 20 - 25 ms S'ly adjacent to the major anomaly is absent or at least does not occur directly south of the contact, as on the previous two lines.

LINE 1 - North half only - coverage incomplete to the south.

The major response on this line is a narrow dike-like feature with apparent S'ly dip. The anomaly could be related to the narrow (structural) feature that crosses the profile in a NNW'ly strike. The response is likely greater than 50 ms and lies northerly adjacent to a local (surface) high resistivity feature.

EXPANDER # 1

A 100' dipole-dipole expander was surveyed east of Line 2 from electrode C_4 (south).

Data indicates a surface response of 12 ms to about 100' and 35 ms response below that depth. There is evidence of a gradational increase in response at greater depth. Resistivities vary 300 to 600 ohmmeters.

Expanders such as this would be useful in determining the thickness of non-responsive material overlying the stock-like body.

SUMMARY:

A major anomalous IP zone has been partially outlined by the survey and indicates a large, irregular-shaped, near-vertical, stock-like body extending to depths of >1500'. The response is variable at surface, likely reflecting a variable thickness of non-responsive material overlying the stock. The calculated IP response varies line to line from 65 to 90 ms and represents a minimum 3% sulfides by volume. The response is believed due to sulfides since extensive sulfide mineralization is known to occur in the area of Crescent Peak. Three drill sites are suggested; however, one hole should be sufficient to determine the cause of the anomalous IP response.

An E-W resistivity contact separates the stock-like anomaly from a large zone of moderate response of 25 - 30 ms which lies southerly adjacent to the stock. The response is indicative of a minimum 1% sulfides by volume. A change in rock type or variation in alteration of the rock compared to the major stock is inferred by the contrast in IP and resistivity values. Although a smaller percentage sulfides are indicated, we suggest the cause of this moderate response be determined by a drill hole in the zone.

Possible structural features are inferred by the E-W striking resistivity contact and by the sharp contrast in IP and resistivity values along a NNW'ly striking trend forming the west

boundary of the IP anomaly. The NNW'ly structural feature appears to control a narrow dike-like appendage of IP response that occurs at the northwest edge of the major stock.

The stock-like body has a relatively high resistivity of 350 to 600 ohmmeters. The shoulder of moderate response to the south has a relatively lower resistivity of 250 ohmmeters (average). Resistivity values associated with the non-responsive rocks of less than 10 ms are relatively high and vary from 500 to greater than 700 ohmmeters.

RECOMMENDATIONS:

Four drill sites are recommended--three in the main stock-like zone, one in the moderate response zone south of the stock. Drilling should be to 1000' minimum and one hole in the stock should go to 2000'. It is recognized that as drilling results accumulate, the next course of action will be determined; hence, we do not imply that all four holes are necessary to test the anomalous characteristics.

Should continued interest in the property be warranted, it would seem prudent to complete the IP coverage.

Respectfully submitted,

James B Parker

James B. Parker
Technician

W Gordon Wieduwilt

W. Gordon Wieduwilt
Geophysicist

Tucson, Arizona
August 24, 1970

mining
geophysical surveys

TIME DOMAIN INDUCED POLARIZATION AND RESISTIVITY SURVEY

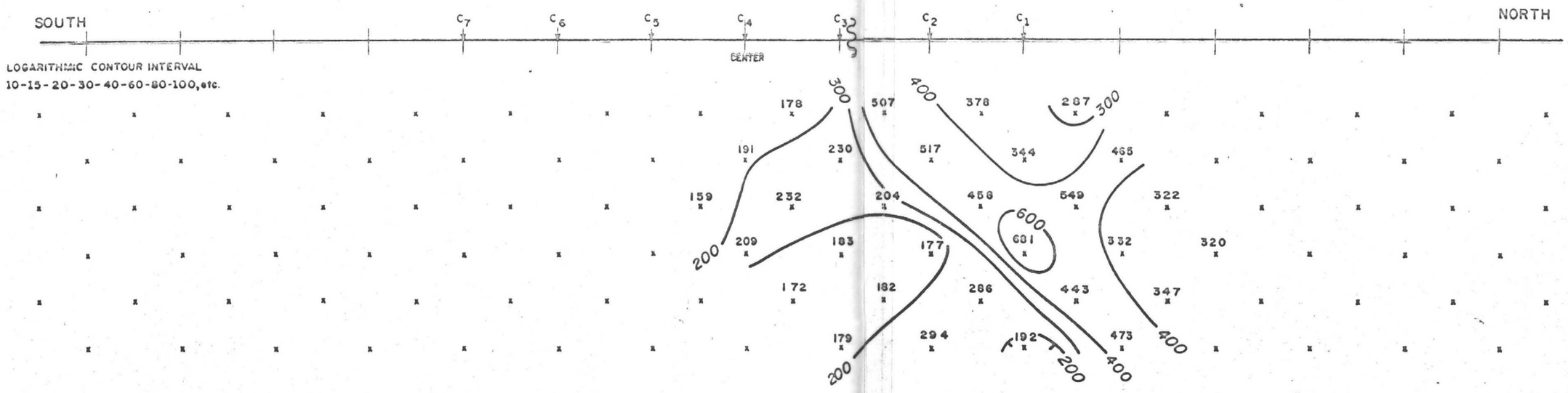
CRESCENT PEAK PROJECT – CLARK COUNTY, NEVADA

FOR

PARNASSE DELEWARE COMPANY INC.

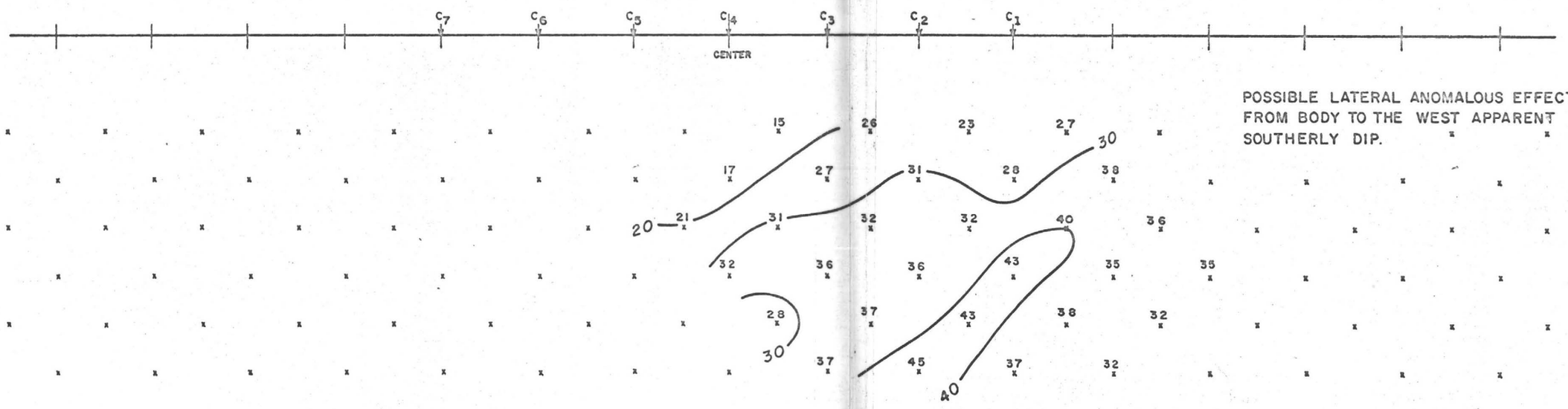
APPARENT RESISTIVITY

ohm meters



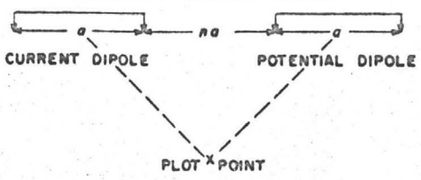
APPARENT POLARIZATION

millivolt seconds/volt



POSSIBLE LATERAL ANOMALOUS EFFECT FROM BODY TO THE WEST APPARENT SOUTHERLY DIP.

DIPOLE DIPOLE ARRAY



LINE: 11

LOOKING: . . . WEST

DIPOLE LENGTH: . . . . 1 000'

DATE: JUL. 24/1970

LEGEND

FENCE. . . . . .

PIPELINE . . . . . .

POWERLINE. . . . .

ROAD, R.R.

mining geophysical surveys

0021

TIME DOMAIN INDUCED POLARIZATION AND RESISTIVITY SURVEY

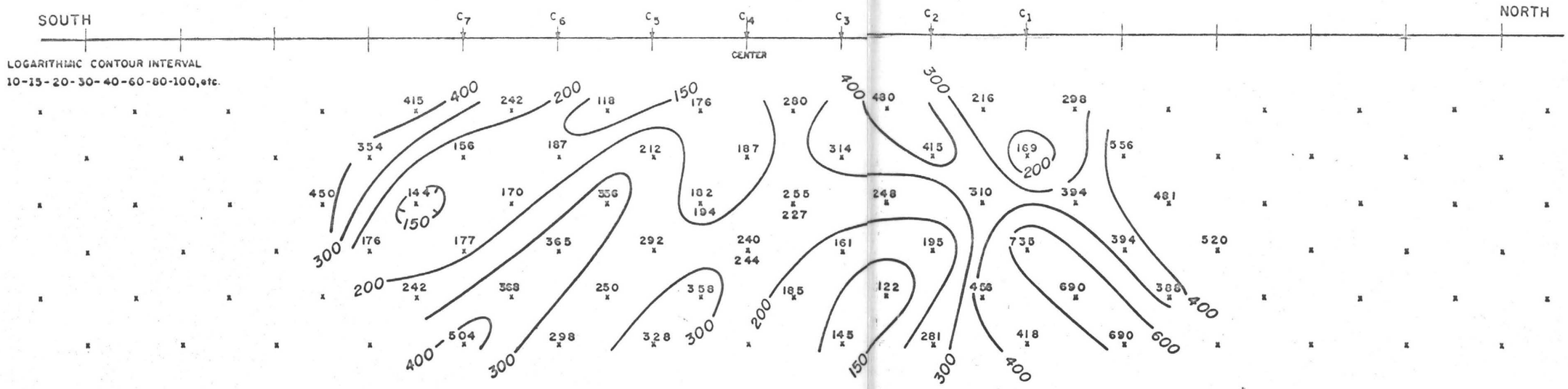
CRESCENT PEAK PROJECT – CLARK COUNTY, NEVADA

FOR

PARNASSE DELEWARE COMPANY INC.

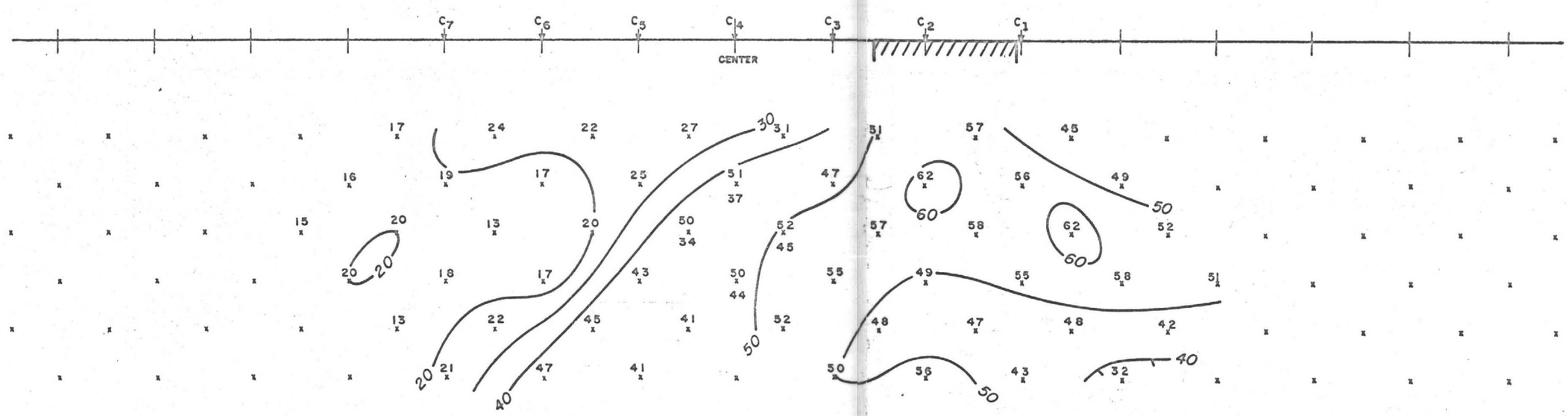
APPARENT RESISTIVITY

ohm meters

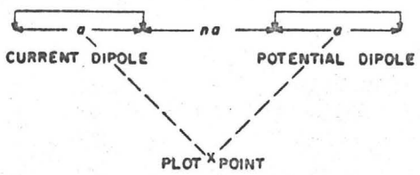


APPARENT POLARIZATION

millivolt seconds/volt



DIPOLE DIPOLE ARRAY



LINE: 3

LOOKING: . . .WEST

DIPOLE LENGTH: . . . 1000'

DATE: JUL. 16/1970

LEGEND

FENCE. . . . . .

PIPELINE . . . . . .

POWERLINE. . . . .

ROAD, RR.

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TIME DOMAIN INDUCED POLARIZATION AND RESISTIVITY SURVEY

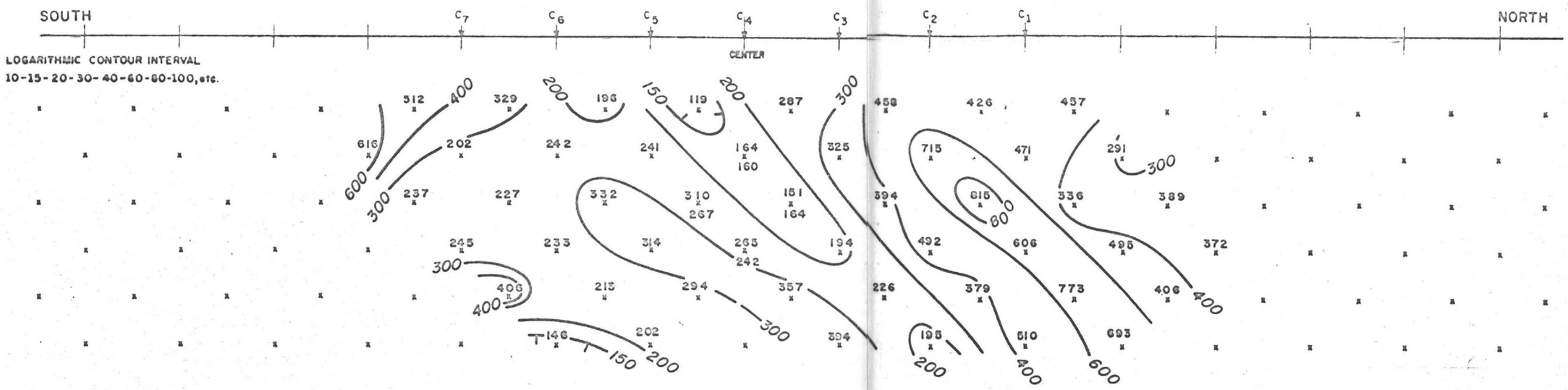
CRESCENT PEAK PROJECT — CLARK COUNTY, NEVADA

FOR

PARNASSE DELEWARE COMPANY INC.

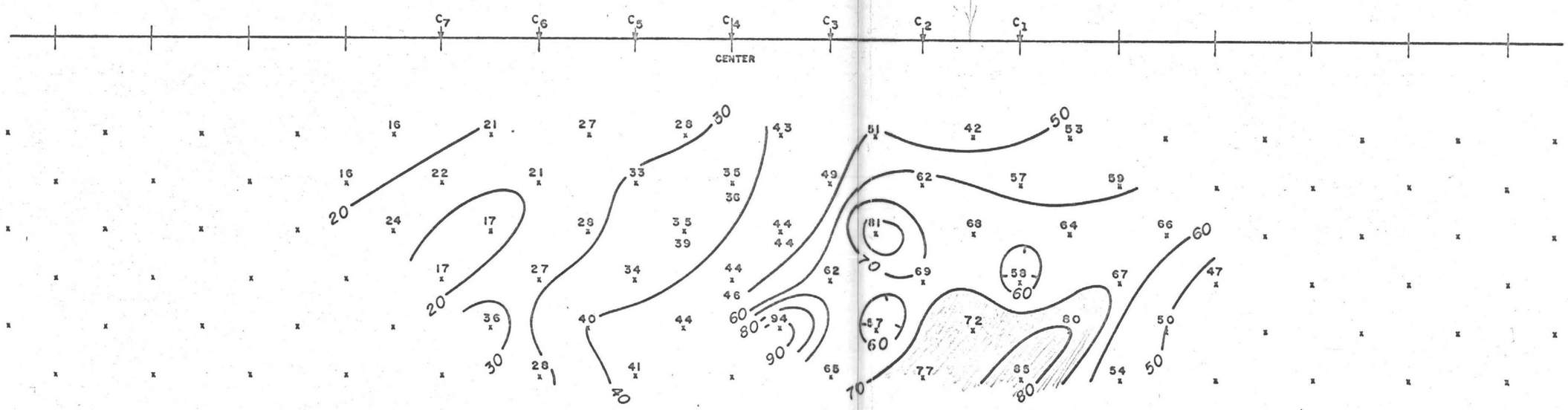
APPARENT RESISTIVITY

ohm meters

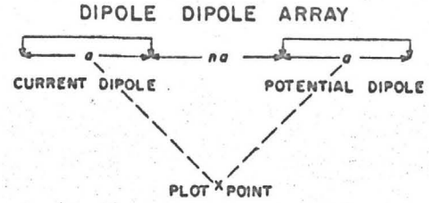


APPARENT POLARIZATION

millivolt seconds/volt



DIPOLE DIPOLE ARRAY



LINE: 7

LOOKING: . . . WEST

DIPOLE LENGTH: . . . . 1000'

DATE: JUL. 23/1970

LEGEND

FENCE . . . . . .

PIPELINE . . . . . .

POWERLINE . . . . .

ROAD, RR.

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TIME DOMAIN INDUCED POLARIZATION AND RESISTIVITY SURVEY

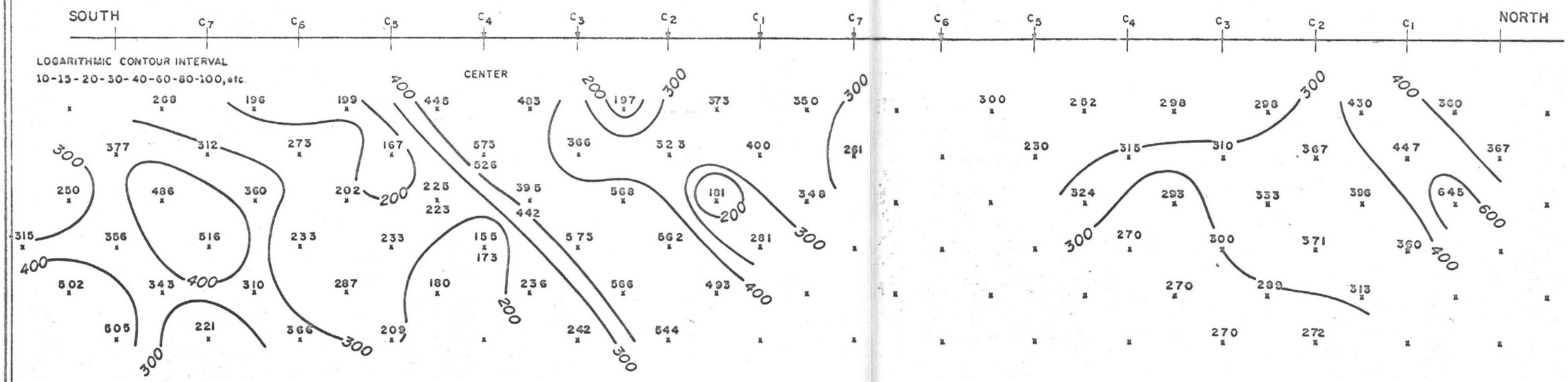
CRESCENT PEAK PROJECT — CLARK COUNTY, NEVADA

FOR

PARNASSE DELEWARE COMPANY INC.

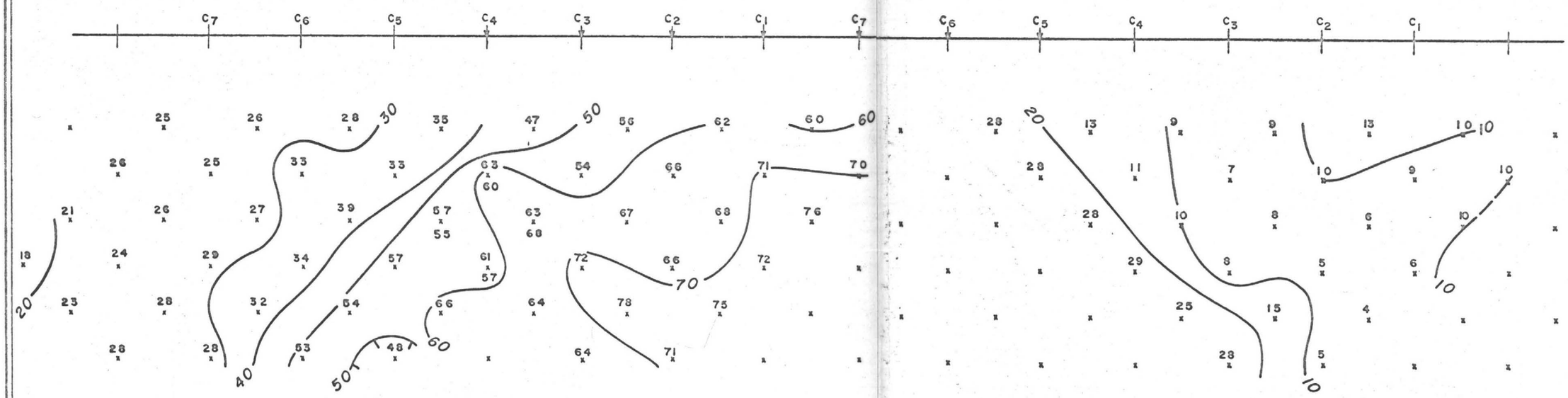
APPARENT RESISTIVITY

ohm meters

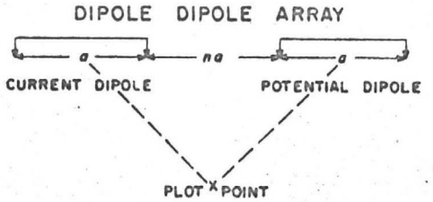


APPARENT POLARIZATION

millivolt seconds/volt



DIPOLE DIPOLE ARRAY



LINE: 2

LOOKING: . . . .WEST

DIPOLE LENGTH: . . . .1000'

DATE: JUL. 21, 29, 1970

LEGEND

FENCE. . . . . .

PIPELINE . . . . . .

POWERLINE. . . . .

ROAD, RR.

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TIME DOMAIN INDUCED POLARIZATION AND RESISTIVITY SURVEY

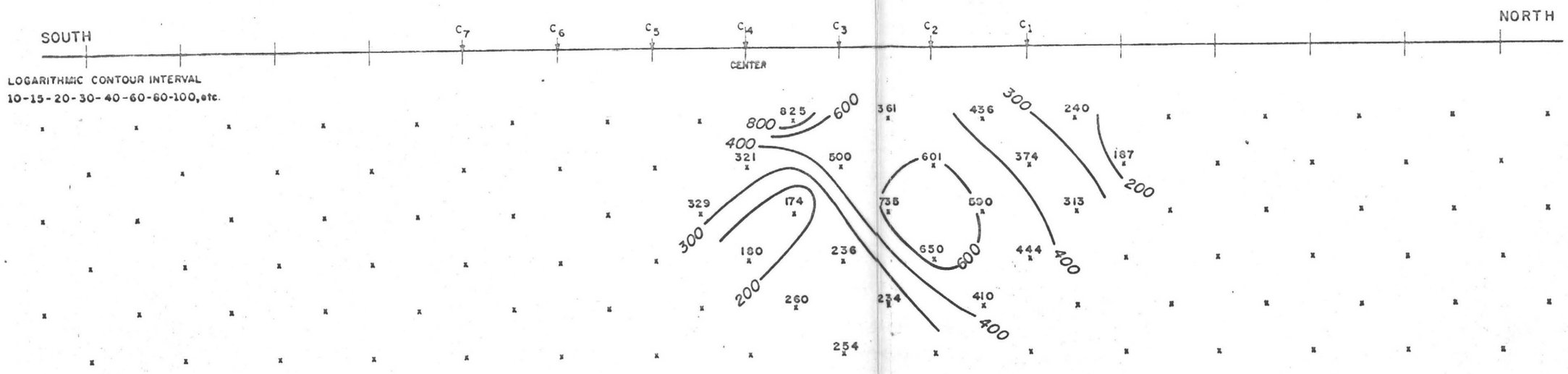
CRESCENT PEAK PROJECT - CLARK COUNTY, NEVADA

FOR

PARNASSE DELEWARE COMPANY INC.

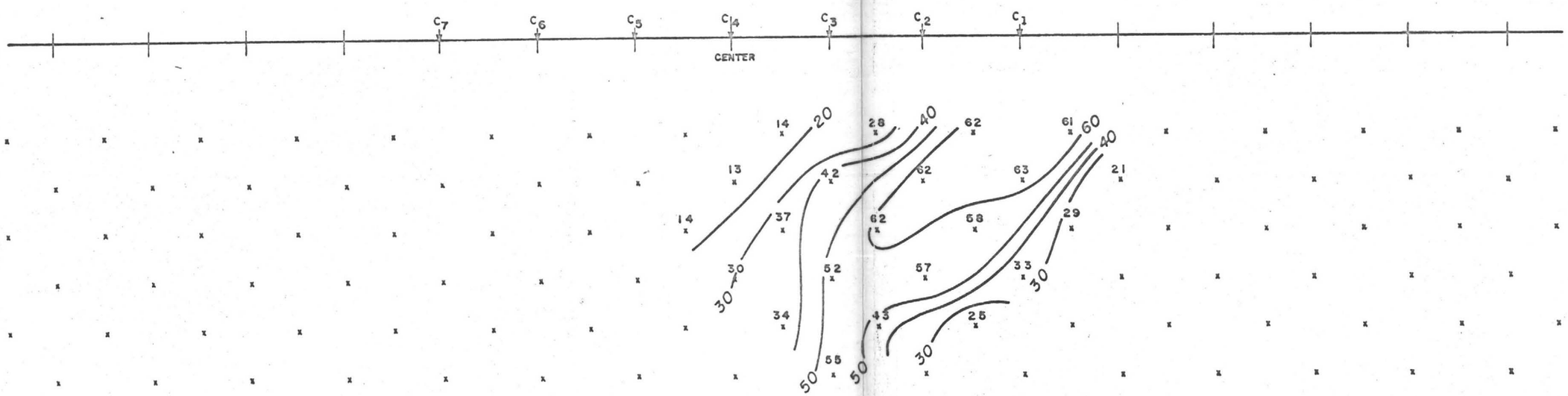
APPARENT RESISTIVITY

ohm meters

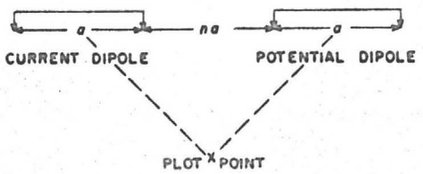


APPARENT POLARIZATION

millivolt seconds/volt



DIPOLE DIPOLE ARRAY



LINE: 6

LOOKING: . . .WEST

DIPOLE LENGTH: . . . .1000'

DATE: JUL. 26, /1970

LEGEND

FENCE. . . . . .

PIPELINE . . . . . .

POWERLINE. . . . .

ROAD, RR.

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TIME DOMAIN INDUCED POLARIZATION AND RESISTIVITY SURVEY

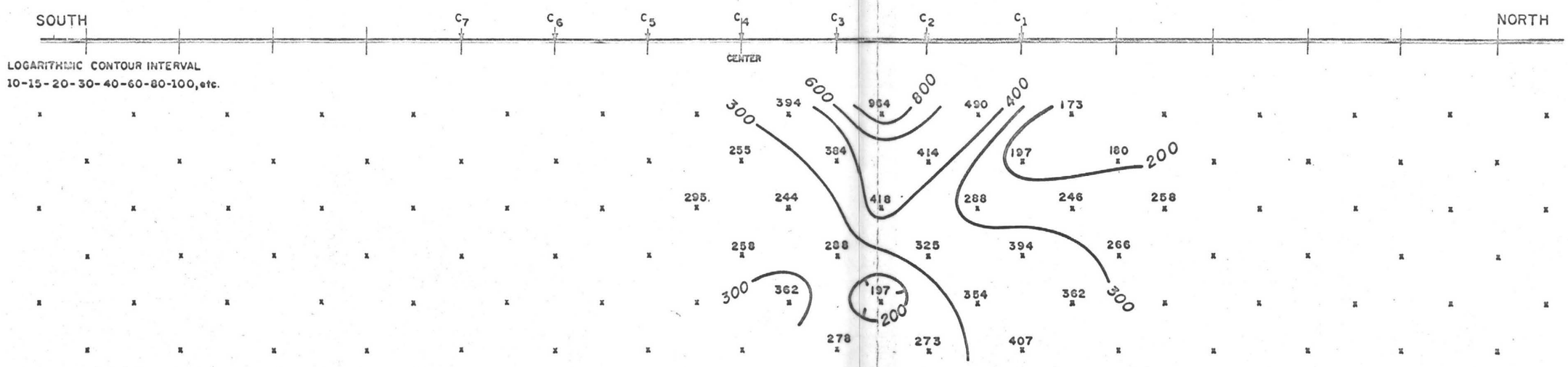
CRESCENT PEAK PROJECT – CLARK COUNTY, NEVADA

FOR

PARNASSE DELEWARE COMPANY INC.

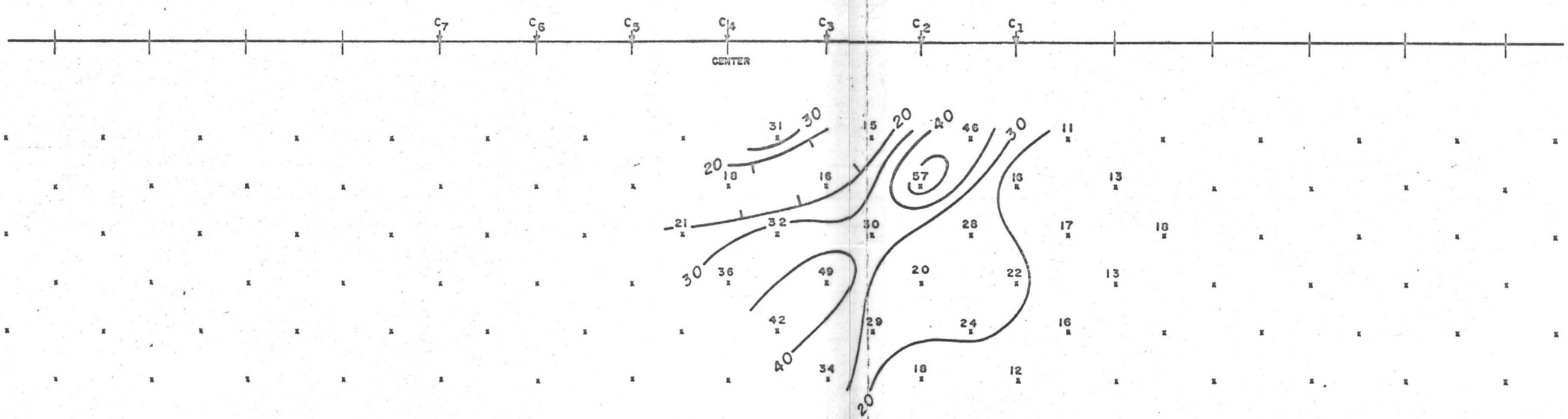
APPARENT RESISTIVITY

ohm meters

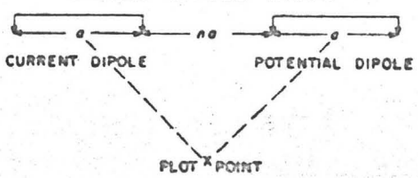


APPARENT POLARIZATION

millivolt seconds/volt



DIPOLE DIPOLE ARRAY



LINE: 1

LOOKING: . . . WEST

DIPOLE LENGTH: . . . 1000'

DATE: JUL. 28/70

LEGEND

FENCE. . . . . .

PIPELINE . . . . . .

POWERLINE. . . . .

ROAD, RR.

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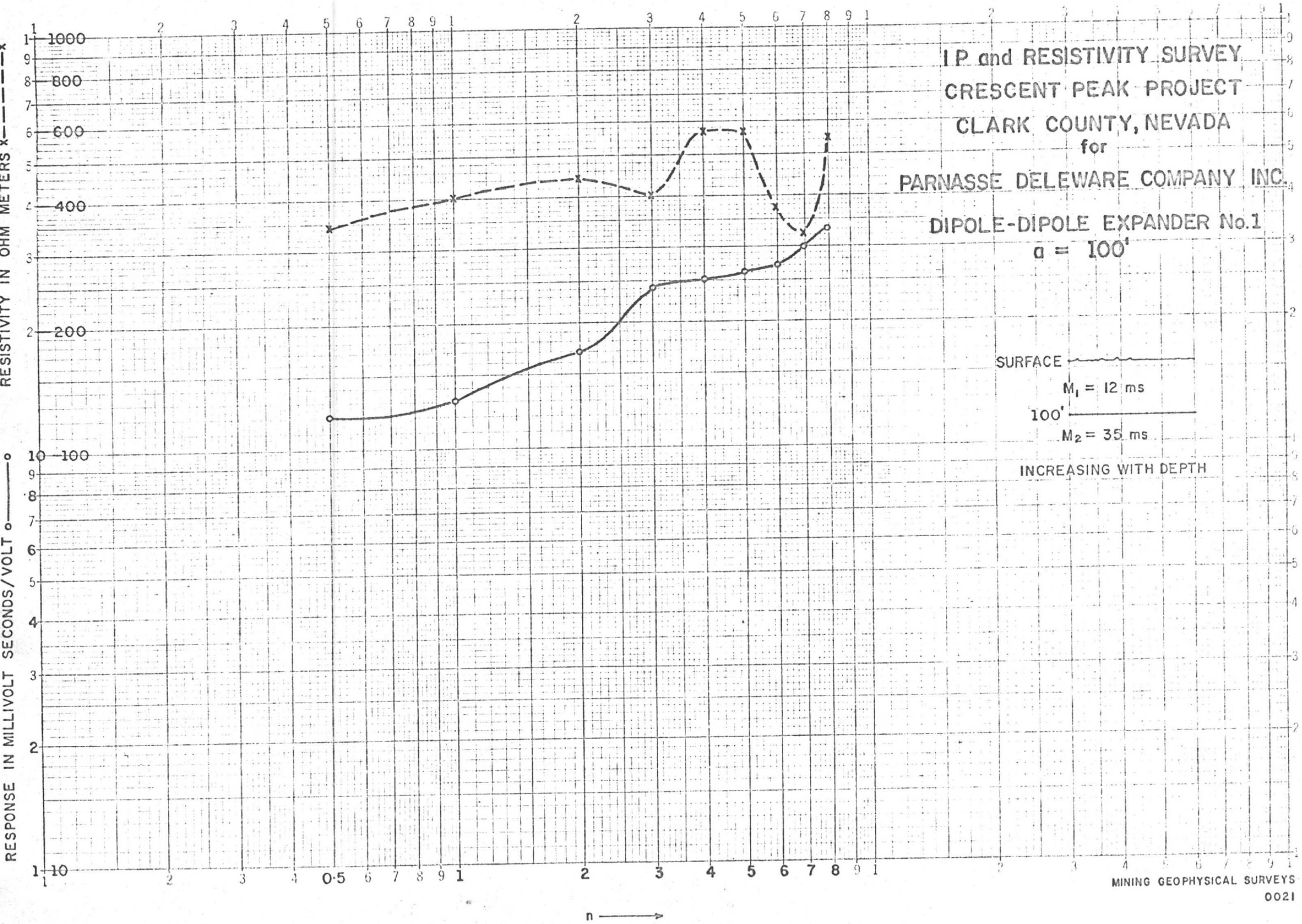
K+E LOGARITHMIC 2 X 3 CYCLES 46 7320 MADE IN U.S.A. KEUFFEL & ESSER CO.

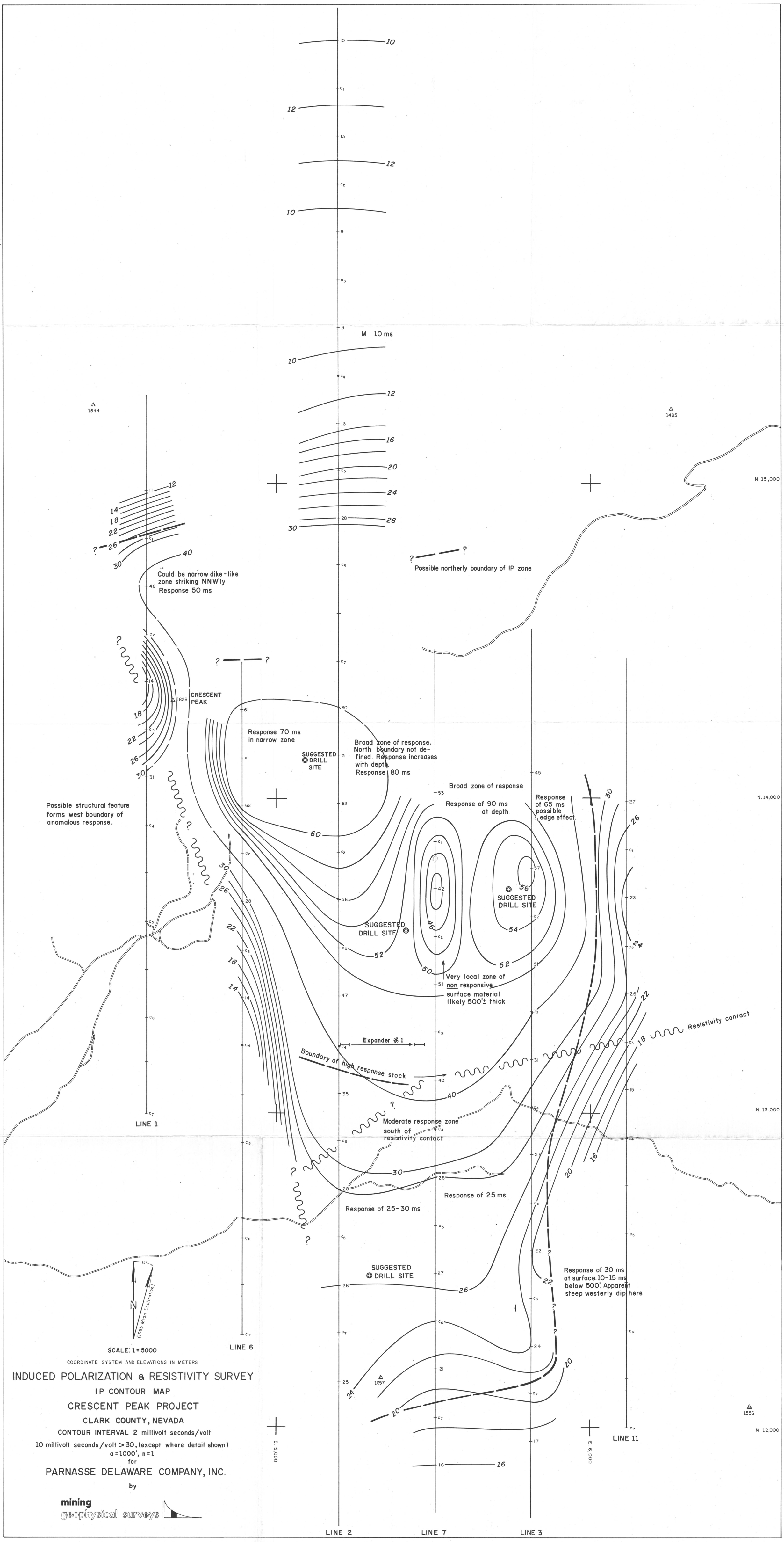


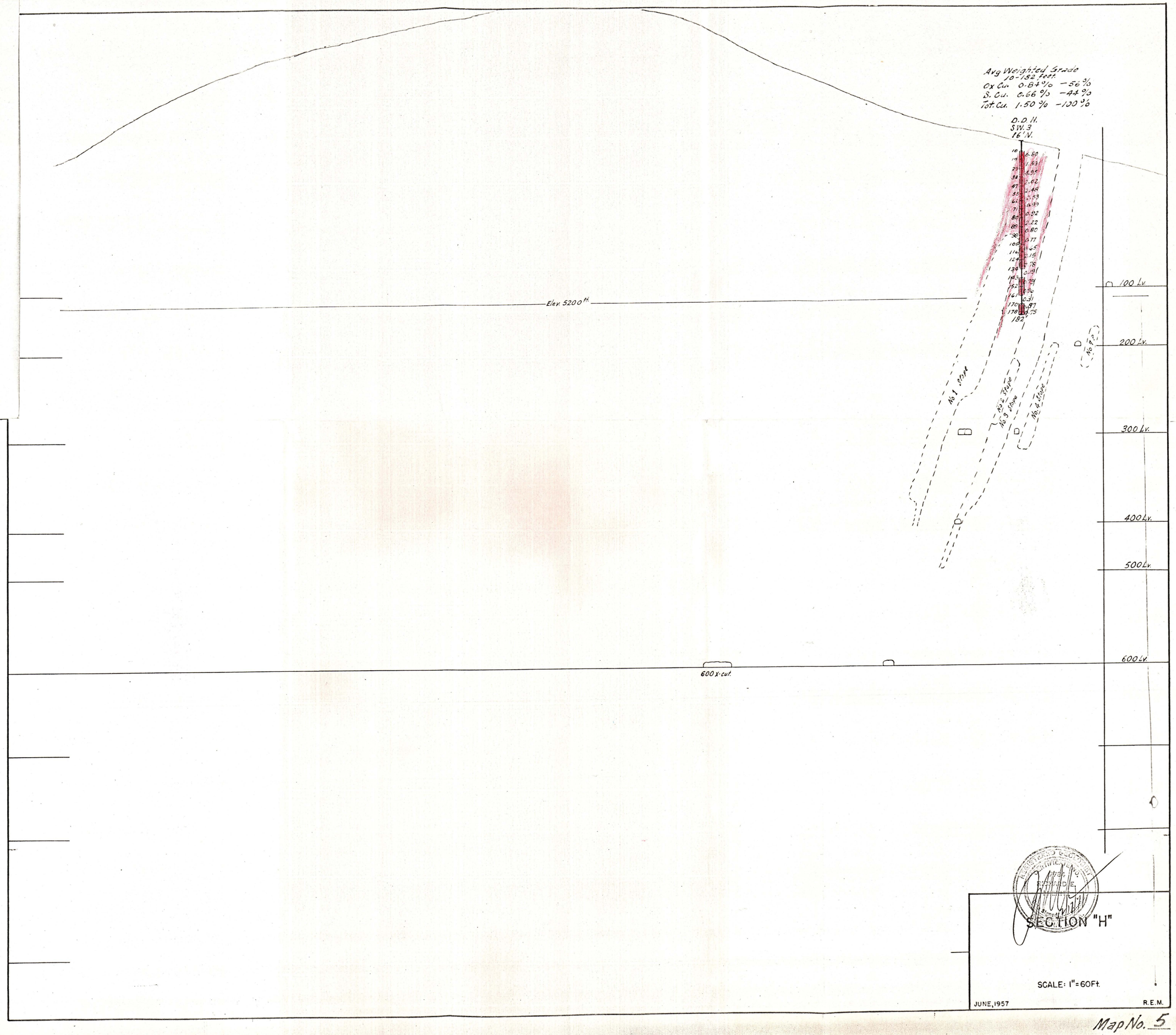
PAUL

Loidolt is having drill logs and other data copied & will send later. Parnassee - Delaware has spent $340,000 & wants a partner to match that expenditure for a 50% interest. I first saw this property about 12 years ago. Has been tested by Bear Creek & Homestake. Surface exposures are quite interesting, probably more representative of a molybdenum porphyry than for copper potential.

Despite previous work still has some merit, but definitely not worth $340,000. I did not turn it down - want to see and copy additional information.

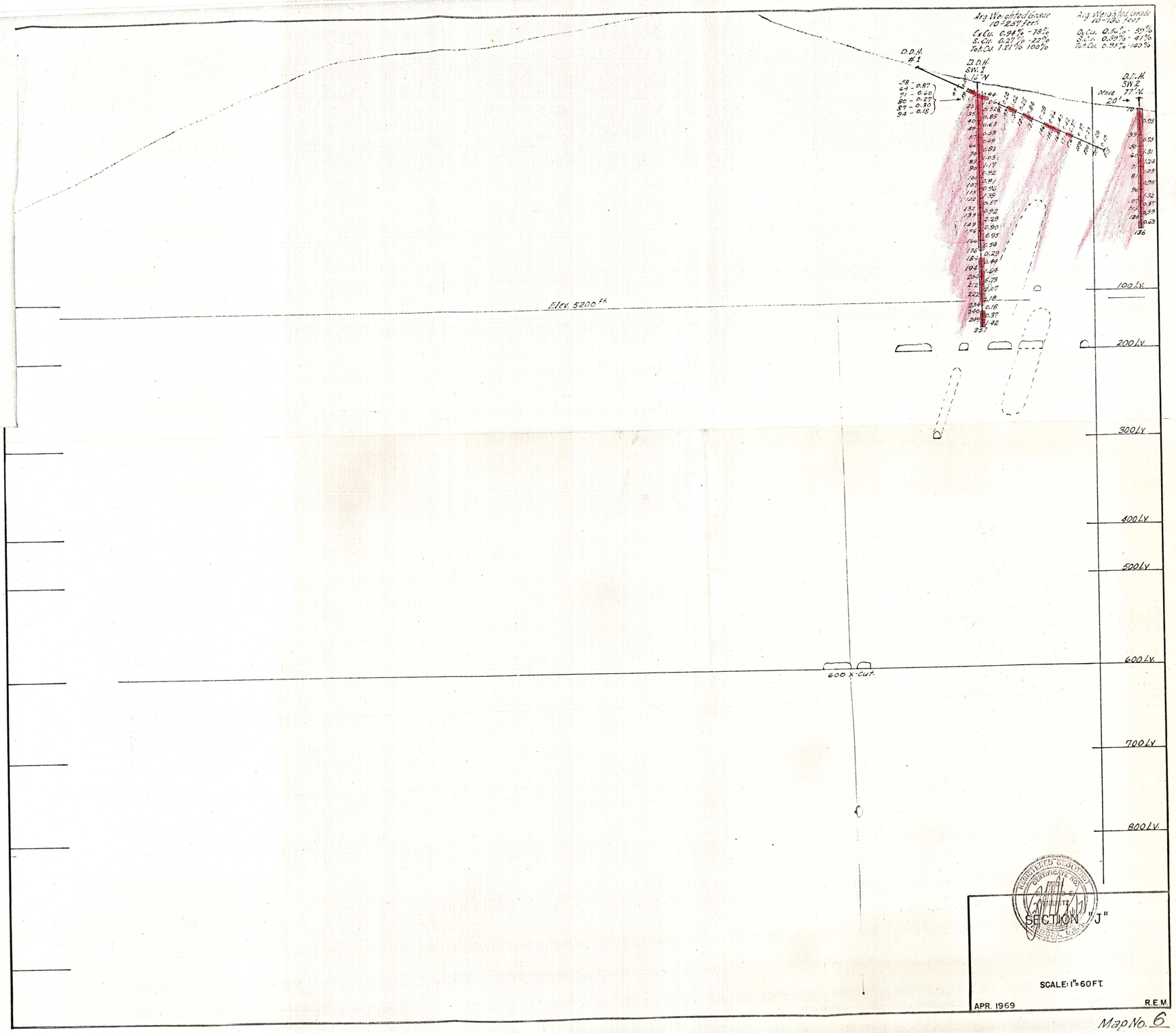
KEN 12-31-71


M 10 ms
Could be narrow dike-like zone striking NNW'ly Response 50 ms
Possible northerly boundary of IP zone
CRESCENT PEAK
Response 70 ms in narrow zone
SUGGESTED DRILL SITE
Broad zone of response. North boundary not defined. Response increases with depth. Response 80 ms
Broad zone of response
Response of 90 ms at depth
Response of 65 ms possible edge effect.
Possible structural feature forms west boundary of anomalous response.
Very local zone of non responsive surface material likely 500'± thick
Expander #1
Boundary of high response stock
Resistivity contact
Moderate response zone south of resistivity contact
Response of 25 ms
Response of 25-30 ms
Response of 30 ms at surface. 10-15 ms below 500'. Apparent steep westerly dip here
LINE 1
LINE 6
LINE 2
LINE 7
LINE 3
LINE 11
N. 15,000
N. 14,000
N. 13,000
N. 12,000
E. 5,000
E. 6,000
1544
1495
1828
1657
1556
N
(1965 Mean Declination)
SCALE: 1 = 5000
COORDINATE SYSTEM AND ELEVATIONS IN METERS
INDUCED POLARIZATION & RESISTIVITY SURVEY
IP CONTOUR MAP
CRESCENT PEAK PROJECT
CLARK COUNTY, NEVADA
CONTOUR INTERVAL 2 millivolt seconds/volt
10 millivolt seconds/volt > 30, (except where detail shown)
a = 1000', n = 1
for
PARNASSE DELAWARE COMPANY, INC.
by
mining geophysical surveys

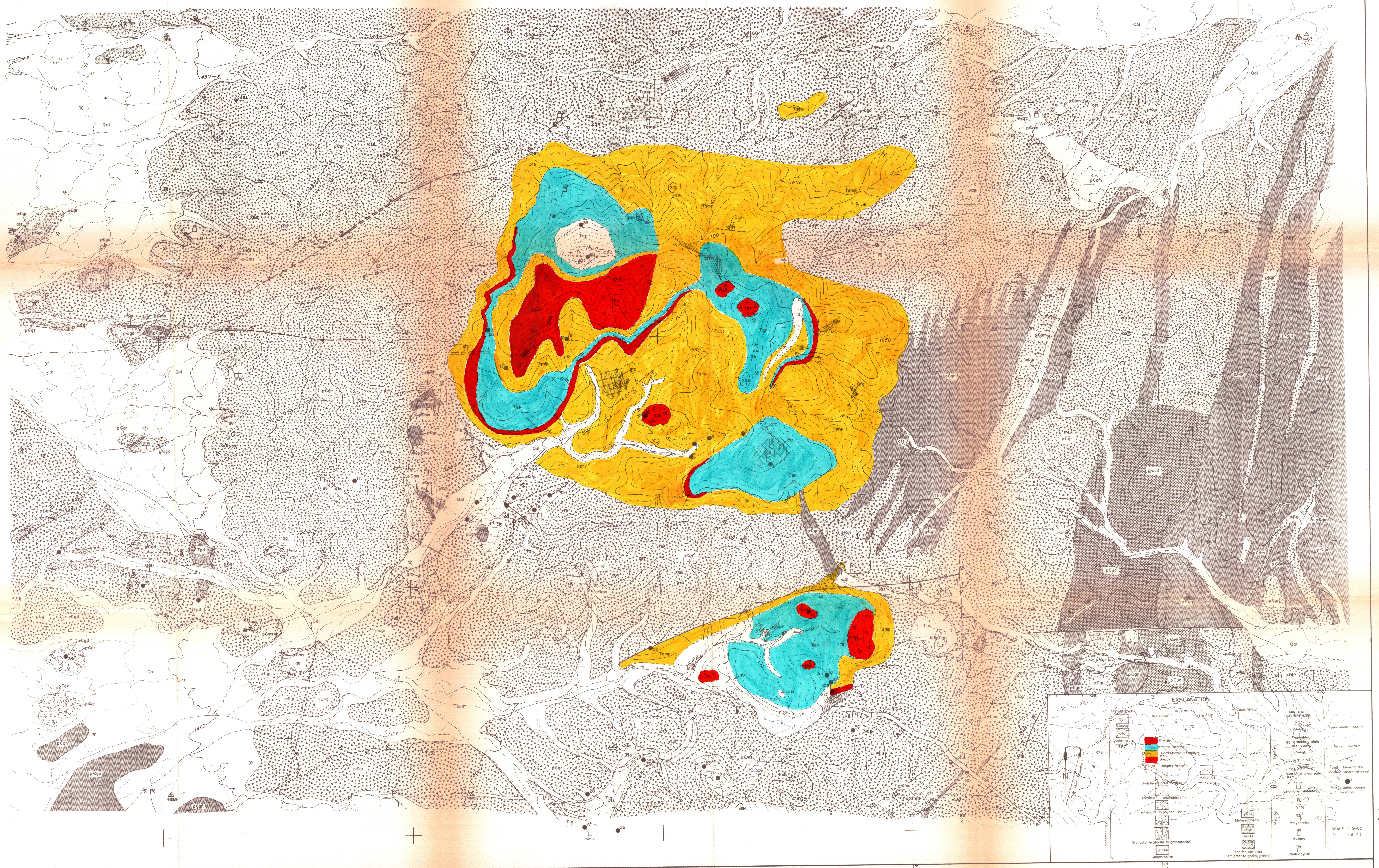

Avg Weighted Grade
10-182 Feet
Ox Cu. 0.84 % -56 %
S. Cu. 0.66 % -44 %
Tot. Cu. 1.50 % -100 %
D.D.H.
SW.3
16' N.
10 6.60
19 1.63
29 1.97
38 2.02
47 2.48
55 0.53
62 0.10
71 0.10
80 0.92
88 2.22
98 0.80
108 0.77
116 1.65
124 2.15
138 0.76
143 0.19
152 0.29
161 0.36
170 0.31
178 0.87
182 0.75
Elev. 5200 ft
No. 1 Stope
No. 2 Stope
No. 3 Stope
No. 4 Stope
No. 1-2
100 Lv.
200 Lv.
300 Lv.
400 Lv.
500 Lv.
600 Lv.
600 X-cut.
SECTION "H"
SCALE: 1" = 60 Ft.
JUNE, 1957
R.E.M.

Map No. 5

E-14


Avg Weighted Grade
10-257 feet
Cu Cu. 0.94% - 78%
S. Cu. 0.27% - 22%
Tot. Cu 1.21% 100%
Avg Weighted Grade
10-130 feet
Cu Cu. 0.50% - 59%
S. Cu. 0.35% - 41%
Tot. Cu 0.85% - 100%
D.D.H. #1
D.D.H. SW 1
16' N
D.D.H. SW 2
77' N.
Move 20'
58 - 0.87
64 - 0.60
71 - 0.27
80 - 0.30
87 - 0.30
94 - 0.16
Elev. 5200 ft.
100 Lv.
200 Lv.
300 Lv.
400 Lv.
500 Lv.
600 Lv.
700 Lv.
800 Lv.
600 X-cut.
REGISTERED GEOLOGIST
CERTIFICATE NO.
SECTION "J"
SCALE: 1" = 60 FT.
APR. 1969
R.E.M.

Map No. 6



CRESCENT PEAK PROJECT - GEOLOGIC MAP

CONSULTANT

CRESCENT PEAK MINING CLAIMS PARNASSE DELAWARE CO. INC.

TOPOGRAPHIC MAP
Scale: 1:5000
Contour Interval 10m
Photography Flown 1/28/70

LOCATION
Sections: 25, 26, 27, 34, 35, & 36
T. 28 S., R. 61 E.
Clark Co., Nevada

PHOTOGRAMMETRY BY
Kenney Aerial Mapping Inc.
Phoenix # 691209 Arizona

SURVEY
Horizontal and Vertical Control Established by:
Leavitt & Holler Surveyors Limited
536 East Sahara Ave. Las Vegas, Nevada
Vertical Datum - Vertical Angle - Crescent & Peak Bench Mark

Date Drawn 3/3/70
Date Revision

N

LEGEND
Horizontal & Vertical
Vertical
Claim Corner
Mine