RESISTIVITY SURVEY
TUSCARORA PROJECT
ELKO COUNTY, NEVADA

FOR

AMAX EXPLORATION, INC.

mining geophysical surveys inc

RESISTIVITY SURVEY

TUSCARORA PROJECT

ELKO COUNTY, NEVADA

FOR

AMAX EXPLORATION, INC.

PROJECT 0925

mining
geophysical surveys inc

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DISTRIBUTION:

ORIGINAL & 2 COPIES: Arthur L. Lange, Denver

RESISTIVITY SURVEY
TUSCARORA PROJECT
ELKO COUNTY, NEVADA
FOR
AMAX EXPLORATION, INC.

INTRODUCTION:

During the period of July 3 through August 6, 1979 a resistivity survey was performed at the titled property. The project was under the direction of A. L. Lange, geophysicist for AMAX; the field survey was supervised by Kem Johnson, technician; the report by W. Gordon Wieduwilt, geophysicist for Mining Geophysical Surveys, Inc.

Three resistivity profiles, Lines 5, 9 and 16, were surveyed using 610 meters dipoles in a dipole-dipole electrode configuration reading to dipole separations of 3050 meters ("n" = 5). A minimum effective line coverage of 28.0 km was obtained in 27 days of field surveying.

SUMMARY:

Two areas of low resistivity material have been mapped by the resistivity survey. The most well-defined zone at the northern end of Independence Valley lies between State Highway 11 and Hot Creek over a width of 3 miles. The boundaries suggest a NNW'ly strike to the zone. A second area only partially explored lies west of a NNW'ly striking contact aligning Long Hollow

Creek (Section 26, T42N, R51E), the headwaters of Skull Creek (Section 35, T42N, R51E), and a N'ly trending gully in the NE quarter of Section 11 (T41N, R51E). These two low resistivity zones may connect at depth.

The resistivity contact along the east side of Independence Valley suggests a bounding contact with indurated rock east of that contact. The high resistivity surface layers are believed to express the relatively dry material above the water table. We are not certain that the apparent buried high resistivity ridge in the northern part of Independence Valley is real. There is a suggestion it would be an accumulative effect of the surface resistivities.

INTERPRETATION:

LINE 5

A resistivity contact occurs between electrodes C_3-C_4, spread 3. High resistivity of 500 ohmmeters occurs east of the contact, increasing to >1000 ohmmeters off the east end of the line at depth. A low resistivity surface layer of 200 ohmmeters$\pm$ occurs east of electrode C_6 and to a depth of 80 meters, increasing in thickness to the east. Low resistivities of 4-6 ohmmeters occur west of the contact under a surface layer of relatively high resistivity material of 10 to 20 ohmmeters. This surface layer has an average thickness of 300 meters. Locally from about electrode C_4, spread 1 (more pronounced contact at C_5) to

C_1, spread 2, the surface resistivities are higher on average (about 100 ohmmeters+) with the high resistivity layer increasing in thickness to the east, possibly plunging to depth. The resistivities at depth >600 meters below this high resistivity layer are in the order of 10 ohmmeters.

LINE 9

Two resistivity contacts occur in the area of spread 1. A contact at electrode C_2 indicates 4-6 ohmmeters west of the contact (possible fence effects disturb the data here) and 200 ohmmeters$\pm$ to the east. A second contact near electrode C_6 indicates 1000 ohmmeters$\pm$ east of that contact. The relatively high resistivity surface layer is absent on this line. The resistivity pattern throughout suggests irregular blocks of varying resistivities occurring from surface to depths in excess of 1200 meters. Starting with the contact at C_2, spread 1, a zone of 4-6 ohmmeters material extends west to near C_1, spread 2 (fence effects may distort the data in the area between spreads 1 and 2). 10 ohmmeter material occurs west of here to C_6-C_7, spread 3. An area of high resistivity rock 150 ohmmeters$\pm$ occurs as an irregular layer from a depth of 100 to 600 meters approximately.

Surface resistivities are lower (in the order of 15 ohmmeters to a depth of 90-100 meters) but variable, causing irregularities in the resistivity pattern. Resistivities are indicated to decrease below 600 meters. A low resistivity zone of 4 ohmmeters occurs west of the above high resistivity zone off the west end of the line. A possible high resistivity surface layer of 20 ohmmeters overlies the low resistivity zone west of electrode C_1, spread 3.

LINE 16 (diagonal line)

A low resistivity of 8 ohmmeters to a depth of 610 meters occurs at the northwest end of the line, with increasing resistivity to 40 ohmmeters or greater at depth. A flat SE dipping zone of low resistivity rock of 4 ohmmeters$\pm$ occurs from C_2 to C_6, spread 1. This low resistivity zone extends to the SE under the 70 ohmmeters surface layer. A high resistivity surface layer occurs over the SE half of the lines where 70 ohmmeters material occurs to a depth of 300 meters, thinning to the NW. A resistivity contact (possibly at depth) may occur 610 meters SE of the line; however, the contact characteristics are not clearly defined.

SURVEY PROCEDURE:

The resistivity measurements are made in the time-domain or D. C. mode of operation using an EGC model R20A receiver with a capability of reading the primary voltage from 150 microvolts to 100 volts full scale, and a Geotronics model FT-20 transmitter and power supply with a capability of transmitting a maximum of 20 amps of current to the ground. A 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.

Throughout the survey a conventional inline dipole-dipole array of seven current electrodes (one spread) was used, with the dipole length "a" equal to 610 meters. Measurements were made from dipole separation factors "n" of 1/2 and 1 to 5. 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 employed.

Data was recorded from meter readings during the current "on" part of the cycle. The current in amperes and primary voltage in millivolts were observed for at least two full cycles, with the average value entered in the field notes. Where low signal levels were encountered and "telluric" noise caused variations in the primary voltage, the primary voltage signal was observed for a greater number of cycles. Two reasonably equal (positive and negative) amplitudes were obtained by monitoring the primary voltage for relatively "quiet" periods during the course of reading. These values were marked ≈ in the field notes. The apparent resistivity is calculated in units of ohmmeters and plotted in quasi-section to facilitate presentation of data at all separations. The plotted data presents a reasonably smooth pattern of varying resistivities, suggesting no serious interference from noise. The repeat stations show reciprocity and indicate good quality data.

Respectfully submitted,

W. Gordon Wieduwilt
Geophysicist

Registered Professional Engineer
CERTIFICATE NO.
W. GORDON WIEDUWILT
DATE SIGNED 8/17/79
Arizona U. S. A.

August 17, 1979

Tucson, Arizona

RESISTIVITY SURVEY

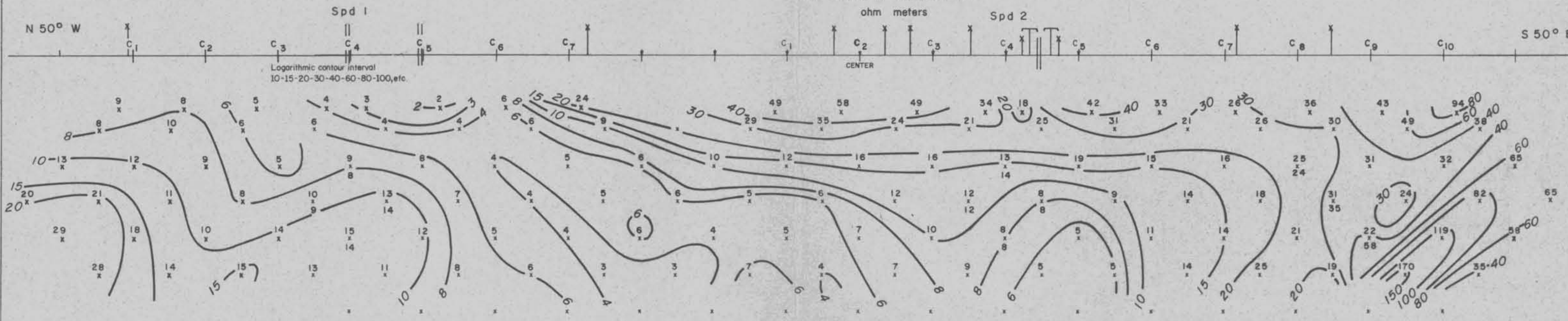
TUSCARORA PROJECT – ELKO COUNTY, NEVADA

FOR

AMAX EXPLORATION INCORPORATED

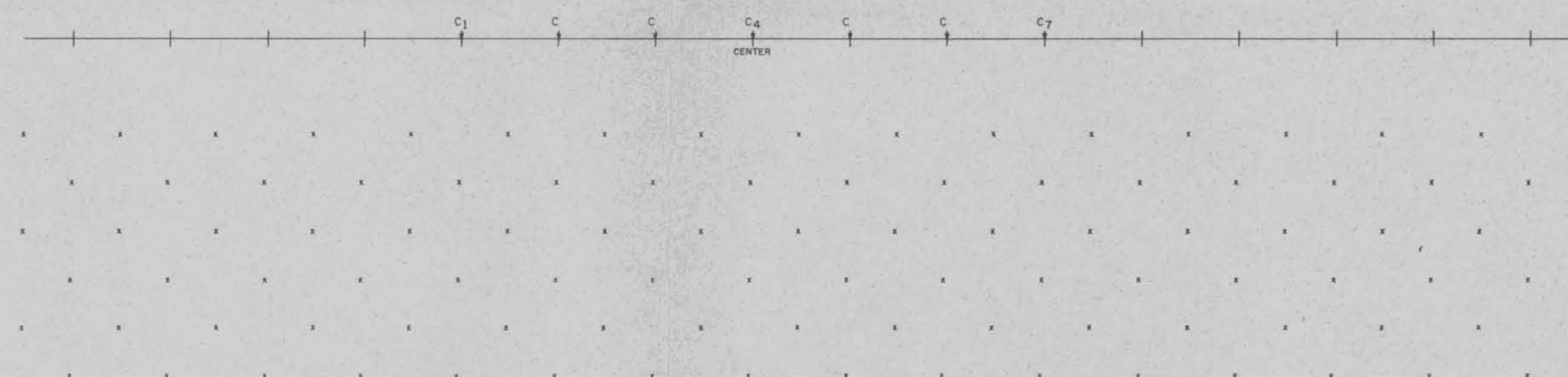
APPARENT RESISTIVITY

ohm meters



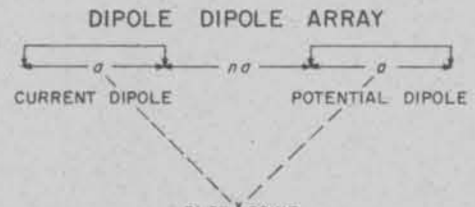
APPARENT POLARIZATION

millivolt seconds/volt



LINE 16

DIPOLE DIPOLE ARRAY



LINE: . . 16 Spd 1 & 2

LOOKING: . . . . . . NE

DIPOLE LENGTH: . . . . 2000' (610 meters)

DATE: August 4/1979

LEGEND

FENCE x

PIPELINE . . . . . . ⌽

POWERLINE . . . . . T

ROAD, RR. ═══ ┼┼┼┼

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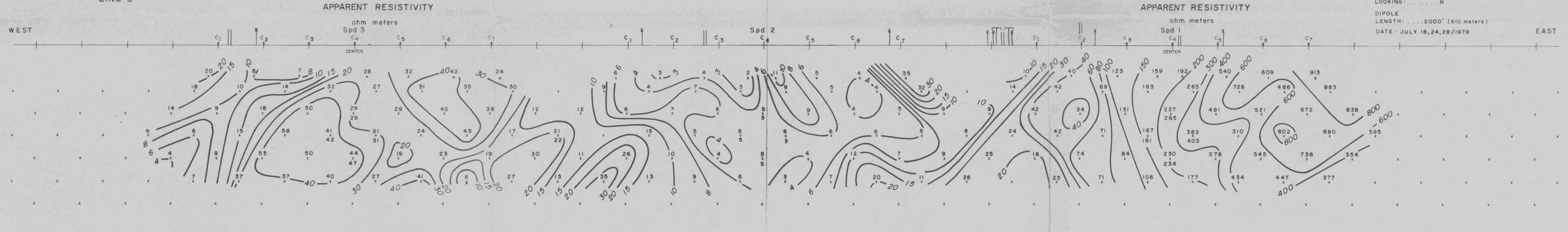
RESISTIVITY SURVEY

TUSCARORA PROJECT-ELKO COUNTY, NEVADA

AMAX EXPLORATION INCORPORATED

LINE 5

LINE: 5 Spds. 1,2,3
LOOKING: ....N
DIPOLE LENGTH: ....2000' (610 meters)
DATE: JULY 18,24,28/1979



LINE 9

DIPOLE DIPOLE ARRAY

CURRENT DIPOLE — POTENTIAL DIPOLE

PLOT POINT

LINE:
LOOKING:
DIPOLE LENGTH:
DATE:

LEGEND

FENCE
PIPELINE
POWERLINE
ROAD, RR

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M.G.S

DIPOLE DIPOLE ARRAY

CURRENT DIPOLE — POTENTIAL DIPOLE

PLOT POINT

LINE 9 Spds. 1,2,3
LOOKING: ....N
DIPOLE LENGTH .....2000' (610 meters)
DATE JULY 7/1979

LEGEND

FENCE
PIPELINE
POWERLINE
ROAD, RR

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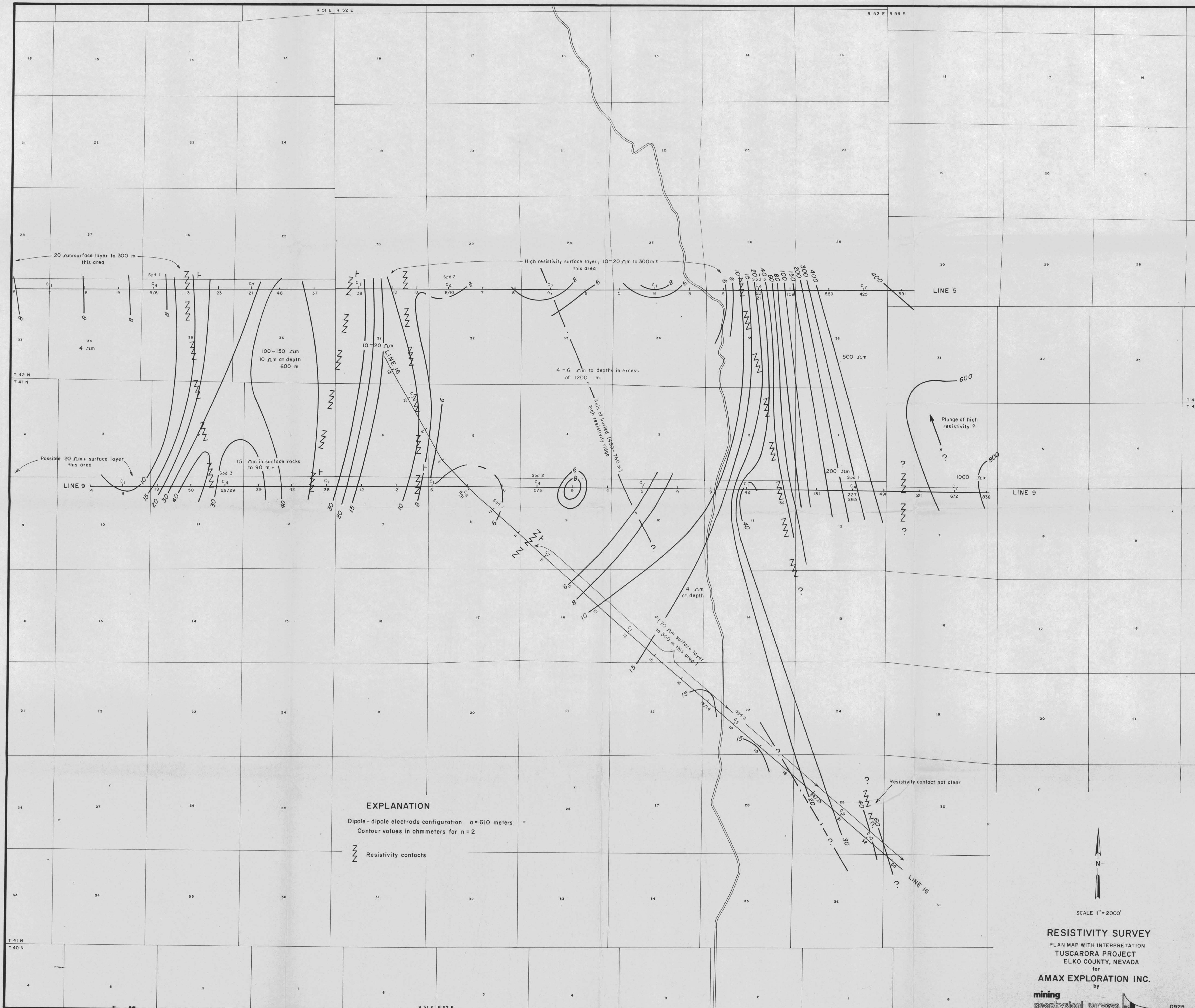
R 51 E R 52 E
R 52 E R 53 E
T 42 N
T 41 N
T 40 N
LINE 5
LINE 9
LINE 16
20 Ωm+surface layer to 300 m. this area
High resistivity surface layer, 10-20 Ωm to 300 m± this area
4 Ωm
100-150 Ωm
10 Ωm at depth 600 m
10-20 Ωm
4-6 Ωm to depths in excess of 1200 m.
Axis of buried (450-760 m) high resistivity ridge
500 Ωm
Plunge of high resistivity ?
Possible 20 Ωm+ surface layer this area
15 Ωm in surface rocks to 90 m.+
200 Ωm
1000 Ωm
4 Ωm at depth
(70 Ωm surface layer to 300 m this area)
Resistivity contact not clear
EXPLANATION
Dipole-dipole electrode configuration a = 610 meters
Contour values in ohmmeters for n = 2
Resistivity contacts
N
SCALE 1" = 2000'
RESISTIVITY SURVEY
PLAN MAP WITH INTERPRETATION
TUSCARORA PROJECT
ELKO COUNTY, NEVADA
for
AMAX EXPLORATION INC.
by
mining geophysical surveys
0925