RESISTIVITY SURVEY
TOPAZ PROJECT
JUAB COUNTY, UTAH

FOR

AMAX EXPLORATION, INC.
GEOTHERMAL BRANCH

mining
geophysical surveys inc

RESISTIVITY SURVEY

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MGS 1158

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ACCOMPANYING THIS REPORT:

1 PLAN MAP

1 SET OF 4 RESISTIVITY PROFILES

DISTRIBUTION:

ORIGINAL & 2 COPIES: Arthur L. Lange, Denver

RESISTIVITY SURVEY
TOPAZ PROJECT
JUAB COUNTY, UTAH

FOR

AMAX EXPLORATION, INC.
GEOTHERMAL BRANCH

Registered Professional Engineer (Geophysical)
CERTIFICATE 8842
W. GORDON WIEDUWILT
12/16/81
DATE SIGNED
Arizona U.S.A.

INTRODUCTION:

During the period of November 10 through December 2, 1981 a resistivity survey was performed on the titled property. The survey was designed as laid out by Arthur L. Lange, geophysicist for AMAX. The field survey was supervised by Eric R. Gardner, technician; the final report by W. Gordon Wieduwilt, geophysicist for Mining Geophysical Surveys, Inc.

Four N-S lines of varying length at one mile intervals (along section lines) constitute the present coverage. Resistivities to "n" = 5 dipole separations were obtained using 2000' dipoles.

SUMMARY:

High resistivity rock occurs throughout the area in outcrop in the NE and extending south and west under varying thickness of alluvial cover. The high resistivity rock (150-500 ohmmeters+) occurs at depths of 2000 to 3000' in the southwest corner of the area. A conducting layer in alluvium above the high resistivity rock has an average resistivity of 15 ohmmeters over a varying thickness of 600 to 1300'. This layer could represent ground

water in gravels above the high resistivity bedrock. A relatively high resistivity surface layer of 50 ohmmeters represents alluvial soils above the water table.

A conducting surface layer of irregular thickness occurs over much of the shallow bedrock and reflects a soil cover or a weathered bedrock surface. Some trends within the surface layer exhibit unusually low resistivities of 5 to 20 ohmmeters. Zones of high resistivity (>200 ohmmeters) occur at surface throughout the outcrop area.

DETAILS OF INTERPRETATION:

East to west, in order of lines as numbered on plan map.

LINE 3

A S'ly dipping resistivity contact occurs north of electrode C_7, spread 1, and separates high resistivity bedrock of 150 ohmmeters and greater to the north from a low resistivity trend of 25 ohmmeters to the south. The low resistivity trend is a surface layer with increasing thickness to the south (2000' thick in vicinity of electrode C_6, spread 1). A broad high resistivity dike trend of 150-200 ohmmeters occurs from C_2 to C_4 of spread 1. High resistivity bedrock of 600 ohmmeters+ lies north of C_2, spread 2, to a depth of 2000'. Resistivities of 150 ohmmeters occur below the high resistivity layer and at surface adjacent to it as well.

LINE 1

A high resistivity dike-like trend occurs in the vicinity of electrodes C_1-C_2, spread 2. The dike trend has a resistivity of 500 ohmmeters, a near vertical to S'ly dip, and lies near or forms a contact between layered low resistivity alluvial(?) material to the south and 250 ohmmeters$\pm$ resistivity rock to the north. The dike width is estimated at 2000' or less. A multi layered media occurs south of the dike contact with upper (surface) layer material of 30-70 ohmmeters to an average depth of 1000'. A middle conducting layer has a resistivity of 15 ohmmeters and an estimated thickness of 1500'. The lower layer has an average high resistivity of 500 ohmmeters+ and may reflect an irregular bedrock surface. The conducting middle layer has a flat S'ly dip and comes close to surface in the vicinity of electrodes C_4-C_5, spread 1. The conducting layer is in the order of 600-700' thick in this area.

LINE 4

A zone of low resistivity material of 5 ohmmeters$\pm$ occurs as a flat lying surface layer in the vicinity of electrodes C_4 to C_6 of spread 2. The conducting layer is about 500' thick and occurs against a resistivity contact at electrode C_6, spread 2, with 200-300 ohmmeters to the north (resistivities decrease north of C_6, spread 3). Gradationally decreasing resistivity of 75 to 50 ohmmeters occur south of the conductor to a contact 2000' north of electrode C_7, spread 1. A flat S'ly dipping multiple layered resistivity characteristic occurs south of this contact. The multi layered characteristics are a high resistivity surface layer of 50 ohmmeters with variable thickness averaging 1300'; a conducting middle layer with a response of 15 ohmmeters average and a thickness of 1300' (the conducting layer varies in thickness and/or resistivity); and a lower layer of high resistivity which lies below an uneven surface varying from 2000' to 3000' north to south and could represent high resistivity bedrock of 500 ohmmeters or greater.

LINE 2

Numerous contacts and/or dike-like trends of high resistivity rock are expressed on this line. The contacts and dikes or tabular dipping zones appear to have a S'ly dip. A conducting surface layer occurs from C_7, spread 1 to C_7, spread 2. The layer has an irregular thickness increasing from 1000 to 2000' north to south, and variable resistivity of 10-30 ohmmeters. Below the conducting layer high resistivity S'ly dipping tabular or dike trends of 500 ohmmeters average are interspaced with 100-200 ohmmeter rock. At the south boundary of the conducting layer a S'ly dipping high resistivity dike of 500 ohmmeters occurs within 500' of surface. The 50 ohmmeter trend at the north end of the line may be part of a low resistivity zone to the north.

SURVEY PROCEDURE:

The resistivity measurements are made in the DC mode using a high input impedance Beckman model 310 digital voltmeter, and a Elliot 45A transmitter and power supply with a capability of transmitting a maximum of 10 amps of current to the ground. The current waveform is a 2.0 second DC squarewave pulse reversing every 4.0 seconds.

Throughout the survey a conventional inline dipole-dipole array of seven current electrodes was used, with the dipole lengths "a" = 2000'. Measurements were made for 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 or additional current-electrodes used.

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 pairs of (+) and (-) primary voltage readings are obtained and entered in the field notes. Usually if three to five consecutive cycles produce repeatable pairs, the absolute average of the pair is considered an acceptable reading. In areas where signal levels are not sufficient to override telluric noise, the readings will have some scatter. When this occurs, additional readings are taken and averaged to obtain a repeatable primary voltage across the potential dipole.

Respectfully submitted,

W. Gordon Wieduwilt
Geophysicist

Registered Professional Engineer (Geophysical) No. 8842 W. GORDON WIEDUWILT DATE SIGNED 12/16/81 Arizona U. S. A.

December 9, 1981

Tucson, Arizona

RESISTIVITY SURVEY

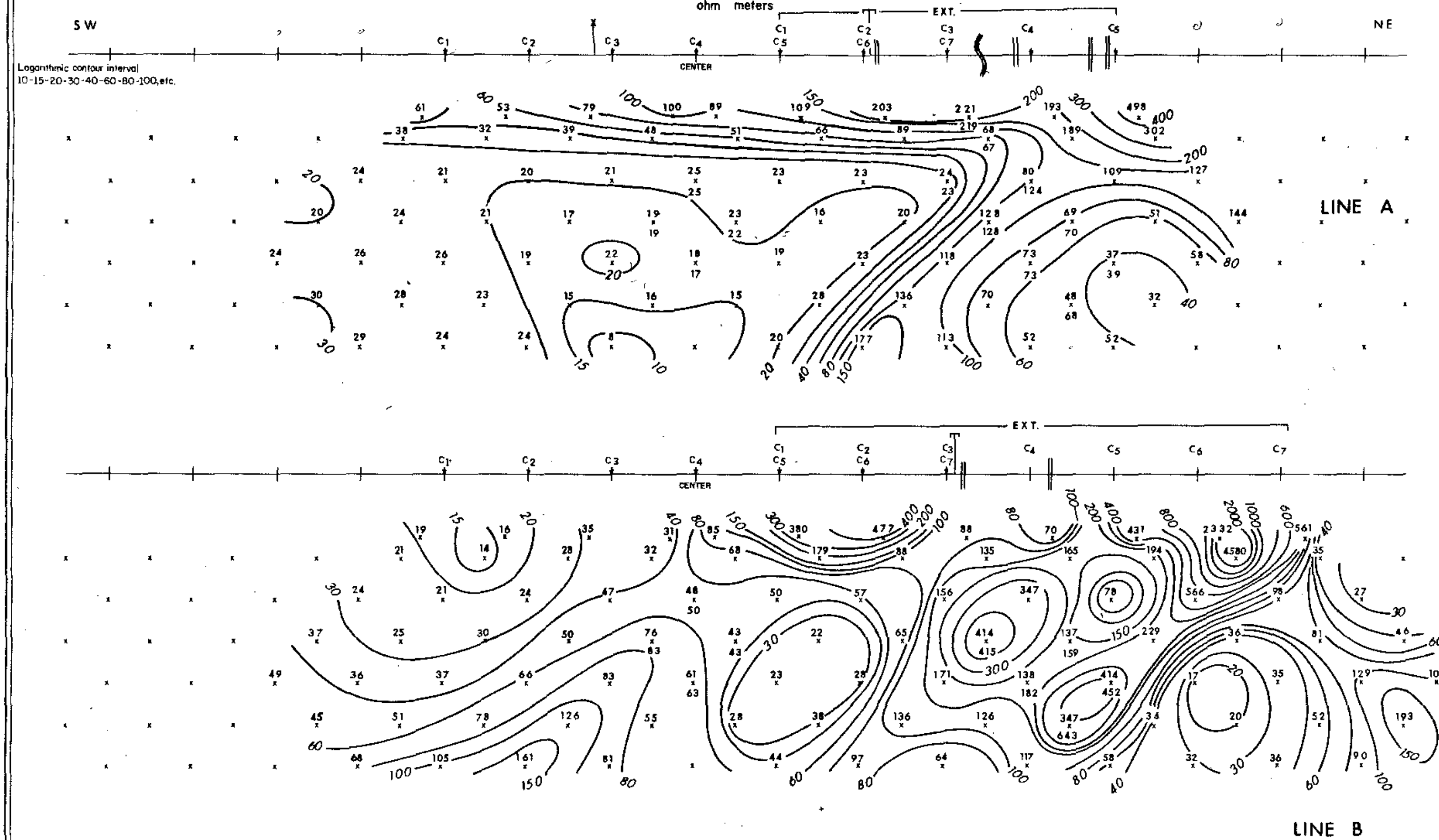
BURNING STONE PROJECT-BEAVER CO. UTAH

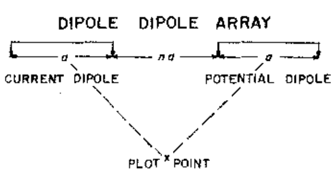
FOR

AMAX EXPLORATION INC., GEOTHERMAL BRANCH

APPARENT RESISTIVITY

ohm meters





LINE: A & B, SPD's 1 & EXTs.

LOOKING: . . . . NW

DIPOLE LENGTH: . . . . 2000'

DATE MAR.7,- MAR.11,1981

LEGEND

FENCE . . . .

PIPELINE . . . . . .

POWERLINE . . . .

ROAD, RR

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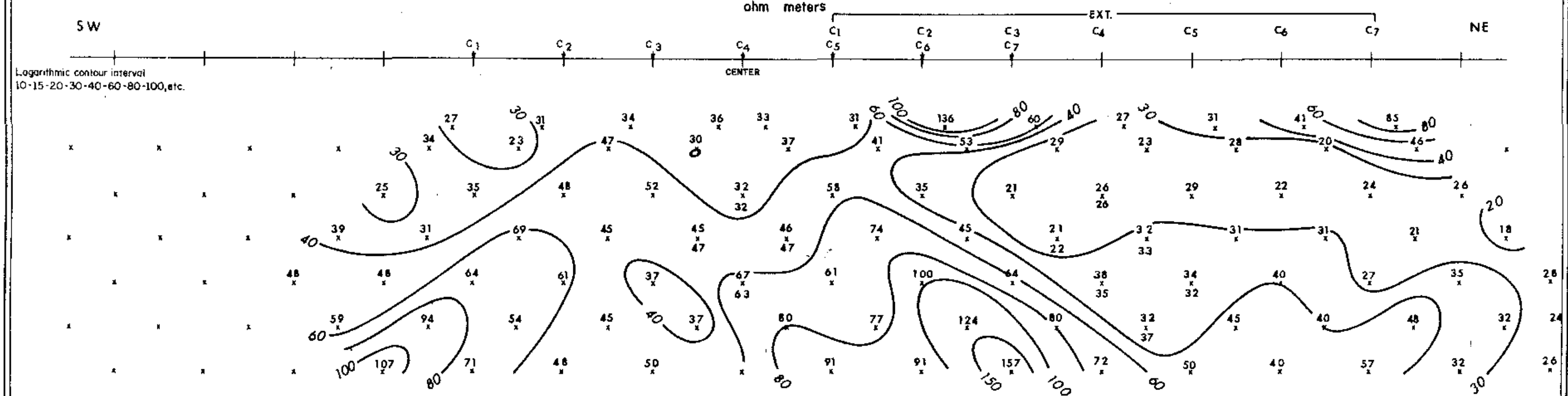
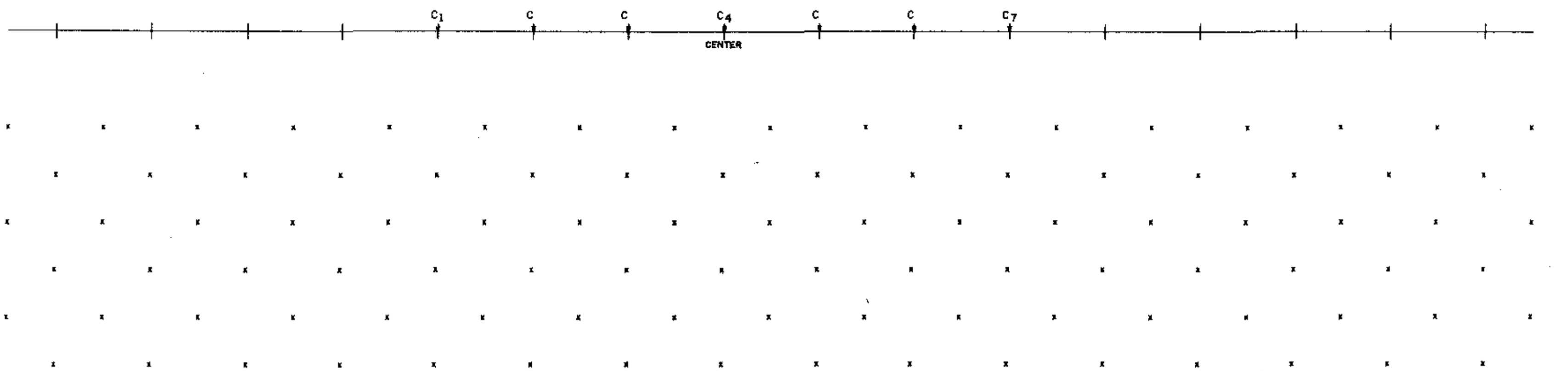
APPARENT RESISTIVITY

ohm meters

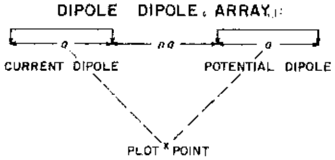


APPARENT POLARIZATION

millivolt seconds/volt



DIPOLE DIPOLE ARRAY



LINE: . . . . C, EPD. 1 & EXT.

LOOKING: . . . . NW

DIPOLE LENGTH. . . . . 2000'

DATE: MARCH. 20 / 1981

LEGEND

FENCE . . . .

PIPELINE . . . . . .

POWERLINE. . . . .

ROAD, RR.

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