GL01079

RESISTIVITY SURVEY

McCOY PROJECT

CHURCHILL & LANDER COUNTIES, NEVADA

FOR

AMAX EXPLORATION INC.

GEOTHERMAL BRANCH

MGS 1106

mining geophysical surveys inc

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ACCOMPANYING THIS REPORT:

3 PROFILES

1 PLAN MAP

DISTRIBUTION:

ORIGINAL & 2 COPIES: Arthur L. Lange, Denver

RESISTIVITY SURVEY
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SUMMARY:

Resistivity lows that may locate conduits of hot saline waters are shown in red on the plan map. An apparent deep conductor is centered at C_6, spread 3, Line B, but the interpretation of this feature is complicated by lateral and apparent resistivity effects. We are not convinced that buried low resistivity rocks occur here and model studies would contribute to the understanding of this feature.

Dike-like resistivity variations are probably caused by basement fault blocks in the central part of the survey area. Layered resistivity changes in Antelope Valley on the east, and on the west ends of Lines B and D are likely caused by thick alluvial and volcanic sequences filling broad downdropped basement blocks.

INTRODUCTION:

A resistivity survey was carried out in the titled area during the period February 2 to March 3, 1981 under the direction of Eric Gardner, technician for Mining Geophysical Surveys, Inc. The report and interpretation are by Robert E. West, geophysicist for MGS, Inc. The survey was conducted along lines specified by AMAX.

The McCoy geothermal prospect is discussed in a report by Arthur L. Lange entitled "The McCoy Geothermal Prospect". A basement arch brings Mesozoic and Paleozoic rocks to surface on Line B and close to surface on Line C. Basin and Range block faulting have distorted the arch and the overlying Tertiary volcanics.

INTERPRETATION:

LINE B

The area from C_2, spread 2 to C_1, spread 1, is characterized by dike-like and near-surface resistivity changes. These resistivity changes coincide with block faults in Mesozoic and Paleozoic marine and continental sedimentary rocks. They probably represent resistivity variations from one fault block to another. A dike-like resistivity low centered at C_6, spread 2, is located at a narrow graben that is filled with Tertiary volcanics. The dip of this feature is difficult to determine because of the resistivity effects of other bodies that lie adjacent to it. The actual dip of a single conductor (see model profile) is opposite to the apparent dip of the pseudo section.

Layered low resistivity rocks extend from C_8, spread 3 (contact location uncertain) to C_3, spread 2, over westward dipping limestones west of the McCoy Mine.

A high resistivity zone is centered at C_6, spread 3. A deep conductor occurs beneath the high resistivity zone on the pseudo section, but this feature may be an apparent low that results for a dike-like high resistivity body. Lateral effects of near-surface low resistivities to the east and west may also contribute to the amplitude of this apparent low.

Layered low resistivities to the west coincide with volcanics in a downdropped basement block.

LINE C

Resistivity changes along Line C are more subdued. Tertiary volcanics cover all of this line and the dike-like resistivity changes over the crest of the basement arch are less distinct.

LINE D

A geologic profile was not available for Line 3 but sharp resistivity boundaries near C_4, spread 1, Extension east suggest that the basement arch may bring pre-Tertiary rocks close to surface again. A narrow buried low resistivity zone is centered at C_5 of spread 1. Lateral effects from the low resistivity zone at C_4 may increase the amplitude of this low. A buried low resistivity zone on the west end of Line D is probably caused by deep volcanics in a downdropped basement block.

Topographic effects have not been considered in the interpretation and they probably have some influence on the data. The rugged terrain of the mountain ranges create the largest topographic effects. The outcropping of Mesozoic and Paleozoic rock and the fault block structures in the ranges also cause significant resistivity changes and it is difficult to separate these effects from those of topography.

SURVEY PROCEDURE:

The resistivity measurements are made using a high input impedance Beckman model 310 digital voltmeter, and a Geotronics model FT20 transmitter and power supply with a capability of transmitting a maximum of 20 amps of current to the ground. The current wave form was a 0.3 Hertz square wave.

Throughout the survey a conventional inline dipole-dipole array of seven current electrodes was used, with the dipole lengths "a" equal to 2000'. Measurements were made for dipole separation factors "n" of 1/2 and 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 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.

Portions of Line B were resurveyed at no cost to AMAX because primary voltage measurements were rounded off at low values causing inaccurate apparent resistivities to be calculated.

Data Acquisition:

A series of consecutive primary voltage 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, more readings are taken and averaged to obtain the primary voltage across the potential dipole.

Respectfully submitted,

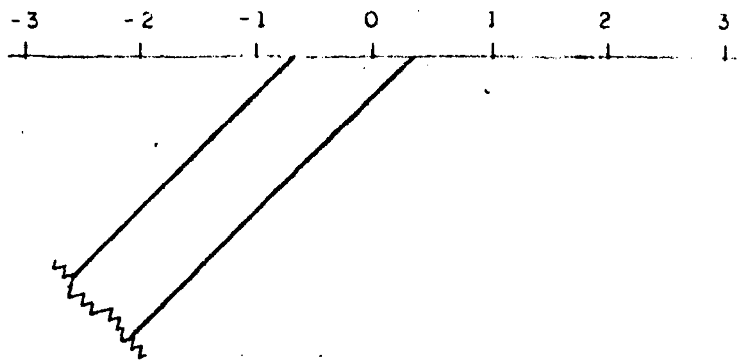
Robert E. West

Robert E. West
Geophysicist

April 2, 1981

Tucson, Arizona

Apparent Resistivity & Induced Polarization Response
Dipole-Dipole Array Inclined Dike Case



$\frac{\rho_2}{\rho_1} = 0.1$

$\frac{W}{a} = 1.0$

$\phi = 45°$

-5	-4	-3	-2	-1	0	1	2	3	4	5
1.0	1.0	1.0	.50	.26	.25	1.1	1.0	1.0	1.0	
1.0	1.0	.97	.35	.34	.46	.26	1.1	1.1	1.0	1.0
1.0	.91	.29	.40	.53	.47	.26	1.2	1.1	1.0	
1.0	.86	.26	.45	.58	.53	.47	.27	1.2	1.2	1.1

$\frac{\rho_a}{\rho_1}$

-5	-4	-3	-2	-1	0	1	2	3	4	5
(.00)	(.01)	(.00)	.18	.78	.80	(.02)	(.01)	(.00)	(.00)	
(.01)	(.01)	.01	.31	.69	.65	.77	(.04)	(.03)	(.01)	[illegible]
(.01)	.03	.39	.62	.58	.63	.75	(.06)	(.05)	(.02)	
(.01)	.04	.46	.56	.53	.57	.61	.73	(.07)	(.06)	(.03)

B_2

Ref: VC-7