

## THE MCCOY, NEVADA GEOTHERMAL PROSPECT

### An Interim Case History (Abstract)

by Arthur L. Lange, AMAX Exploration, Inc., Geothermal Branch

The McCoy prospect is located in Lander and Churchill Counties of central Nevada, approximately 65km NW of Austin. Exploration is being conducted by AMAX Exploration, Inc. partially supported by the Department of Energy's Industry-Coupled Program. The property has been consolidated with O'Brien Resources as a Federal geothermal unit. O'Brien is also participating in the exploration program.

The geothermal area occupies the junction of the Augusta and Clan Alpine Mountains and the New Pass Range, made up of Paleozoic through Tertiary sediments, and igneous rocks. Cenozoic volcanics range in age from 36 to 16 million years. The sequence has been subjected to multiple folding and thrusting, and transected by basin-range faulting since Late Miocene time. Mercury has been sporadically produced from the McCoy Mine near the center of the prospect. One water sample was obtained from a well at the McCoy mine ( $39^{\circ}\text{C}$ , 1065 TDS). The water chemistry forecasts a minimum equilibration temperature of  $186^{\circ}\text{C}$  but with a rather high deduced cold water fraction.

Temperature surveys made in 40 gradient holes and 5 existing holes resulted in a N/S-trending thermal anomaly 20km long and 2 to 3km wide. The heatflow pattern, based on thermal conductivities from cuttings, exhibits three principle centers measuring 15 (over the mine) to 22HFU (near the southern end of the anomaly).

A complete Bouguer gravity map produced from 340 stations reveals two gravity low zones forming an upright V, intersecting at the region of highest heat flow. These zones coincide with two aeromagnetic low trends. Positive magnetic and negative gravity closures appear over the McCoy mine.

A passive seismic survey conducted during 31 days over 22 stations detected 36 microearthquakes. Of those locatable, a cluster of 3 occurred at the McCoy mine, 3 more at the southern end of the property and 3 to the west. A P-wave delay correlates with the highest heatflow, and an advance extending northward along the thermal axis may relate to silicification.

An extensive self-potential survey resulted in a negative anomaly of 50 to 90 millivolts corresponding approximately to the thermal feature. Localized negatives appear over the McCoy mine and the thermal high to the south.

A magnetotelluric survey of 38 stations reveals in one-dimensional inversions a resistive section to 10 or more km depth in the center of the thermal anomaly, and a more conductive plug-like mass under the McCoy mine. The southern region appears conductive above one kilometer, while at depth, an extended one-ohmmeter conductive zone ascends to 7km depth in the vicinity of the highest heat flow, SP negative peak and the P-wave delay zone. The MT soundings are being supplemented in the upper zones by an E.M. survey conducted by Lawrence Berkeley Laboratories.

Two deep gradient holes (to 600 or more meters) are being drilled to test the zones of highest heatflow.

Arthur L. Lange

Chief Geophysicist

AMAX Exploration, Inc.

7100 W. 44th Avenue

Wheat Ridge, Colorado 80033