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GEOHERMAL PROSPECTS IN THE GEYSERS-CLEAR LAKE REGION  
BASED ON  
CURIE POINT DEPTH ANALYSIS AND TECTONIC MAPPING

C-8060

October 1979



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## ABSTRACT

Eureka Resource Associates offers a comprehensive geothermal study of a 2800 square mile area surrounding The Geysers steam field in California (Figure 1).

The project includes 1900 line miles of proprietary aeromagnetics processed and interpreted for structural data, location of large serpentinite bodies, Curie point isotherm and apparent temperature gradient mapping.

A geothermal prospect map delineates a number of attractive targets that warrant detailed ground exploration. Other supporting data for this map are a complete Bouguer gravity map (1288 stations), published seismicity, electrical resistivity, water chemistry, mercury prospects and hot springs temperatures.

Participants in the study will receive a 48 page report discussing the criteria used in selecting prospects, as well as the general data and methods used. Each client will receive a Landsat image, scale 1:125,000, and seven transparent plates that fit over the Landsat image. The plates are:

- Tectonic map of The Geysers-Clear Lake region
- Estimated depth to the Curie point temperature
- Residual aeromagnetic anomaly map
- Offset aeromagnetic profiles
- Complete Bouguer gravity map
- Apparent temperature gradient map based upon Curie point depth estimates, with geothermal well locations, hot springs and alterations
- Geothermal prospect evaluation map

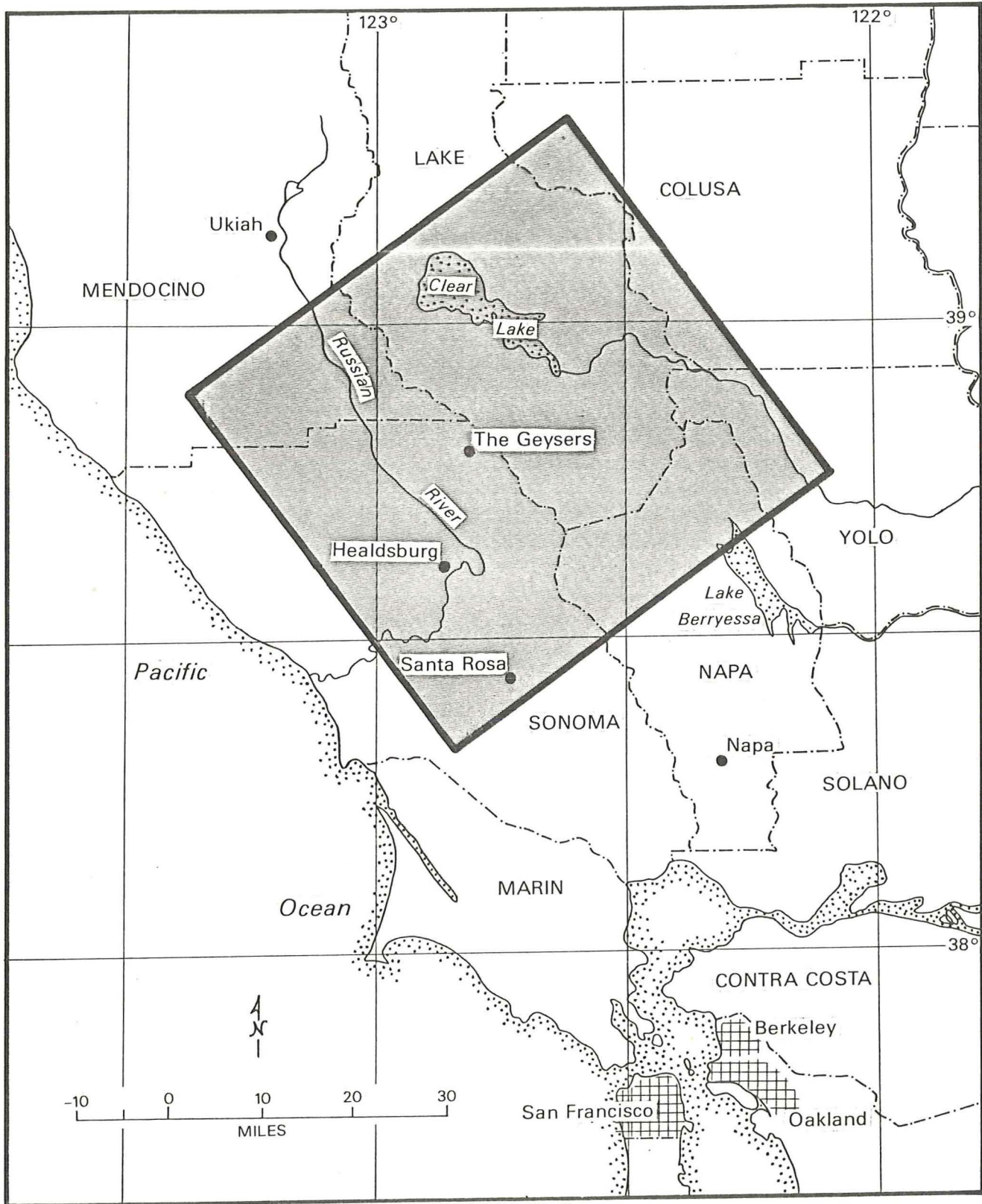


Figure 1  
Geysers-Clear Lake Geothermal Study Area

The project includes a one-day presentation in Berkeley of the report and plates. At that time specific questions and prospects will be discussed.

The price for the entire area is \$39,500. The north or south parts may be purchased separately for \$22,000 each.

In this study, the scientists of Eureka Resource Associates combine more than 17 years experience in The Geysers, covering geophysical surveys, geochemical analyses, geologic mapping, drill hole evaluation and expert testimony.

## INTRODUCTION

Although the rate of geothermal exploration in The Geysers steam field continues to increase, the more than 250 exploration and development wells drilled to date in The Geysers-Clear Lake region have failed to define the geographic limit of economic steam production. Indeed, the interpretation of regional geophysical data (Chapman, 1975; Isherwood, 1976a, b, and c; Iyer and others, 1978) suggests that the region, characterized by anomalously high crustal temperatures at relatively shallow depth, may be three or four times larger than the present production area. Some of the temperatures may be high enough to be economically interesting. Present production comes from a roughly elliptical area about 13 miles long and 6 miles wide (see location map, Figure 2).

The report and accompanying plates present a geological and geophysical basis for judging the relative merits of geothermal prospect areas in The Geysers-Clear Lake region. There is a discussion of the criteria for determining the geographic extent, and the geological, geophysical and hydrological characteristics of the presently producing Geysers steam field. Special note is taken of the evidence for, and causes of, the high heat flow and high crustal temperatures at shallow depth. Significant data for the entire Geysers-Clear Lake region, selected to evaluate the quality of particular geothermal prospects within the region, is presented. Prospect evaluation is based upon a comprehensive compilation of geological and geophysical data from both published and private sources, in the form of transparent overlays on an enhanced Landsat image, as well as a regional thermal gradient map calculated from Curie point depth estimates, and a tectonic analysis of that data.

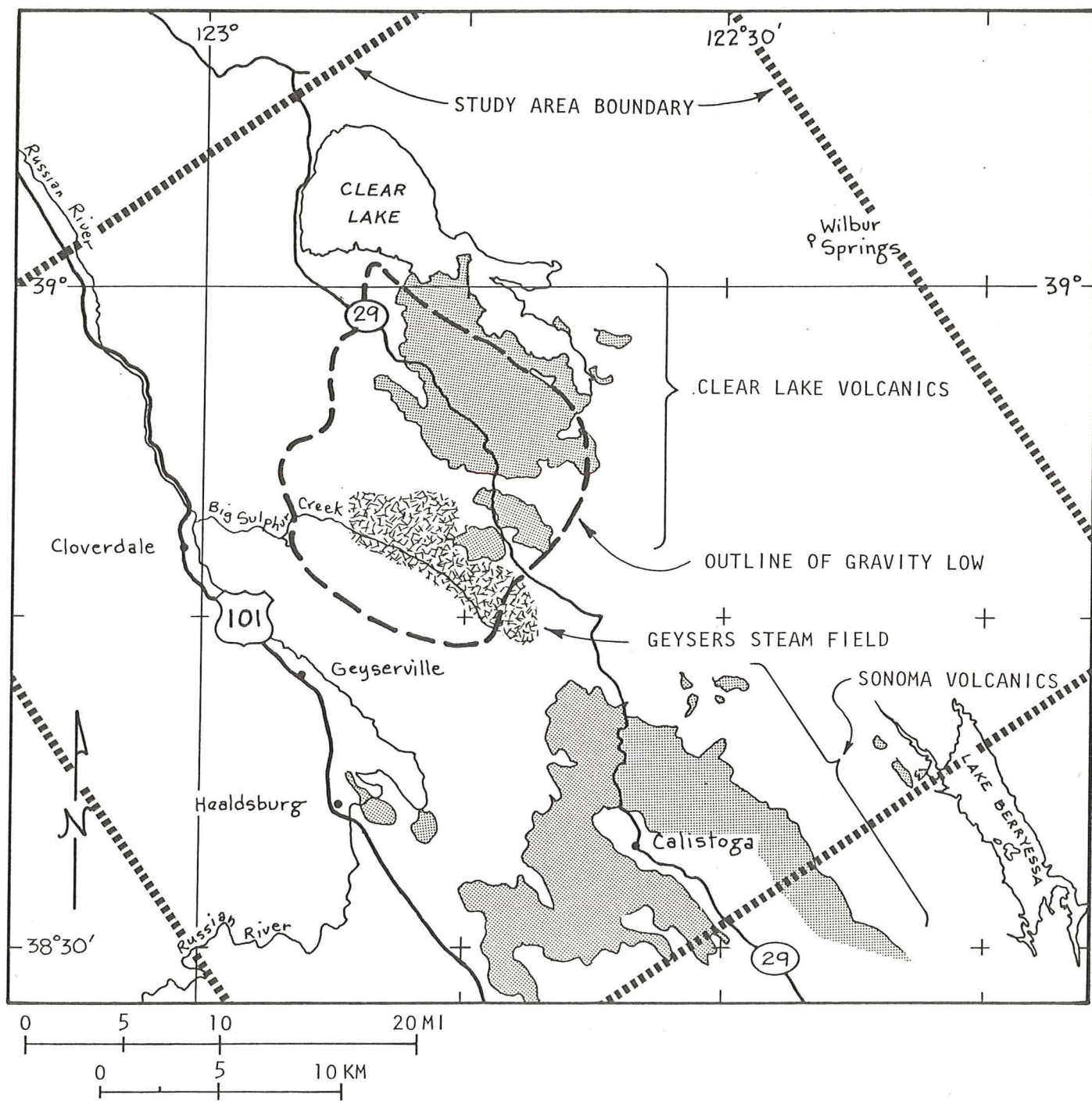


FIGURE 2

LOCATION MAP OF THE GEYSERS-CLEAR LAKE REGION SHOWING THE RELATIONSHIP BETWEEN THE STEAM FIELD, THE GRAVITY LOW, AND THE CLEAR LAKE AND SONOMA VOLCANICS. (Modified from Chapman, 1975.)

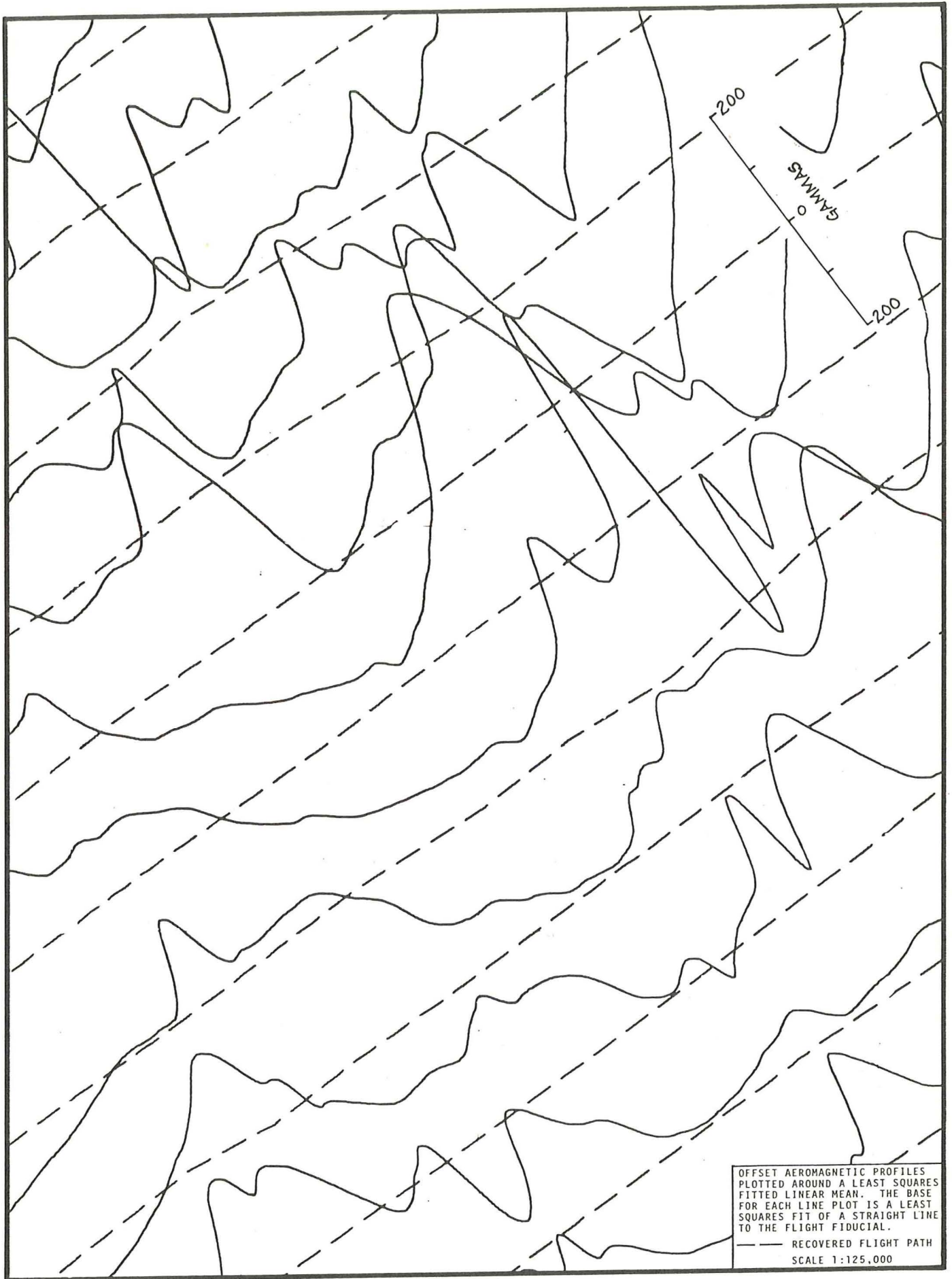
## APPENDIX

The following items are taken from the final report and plates to show prospective clients examples of the deliverables.

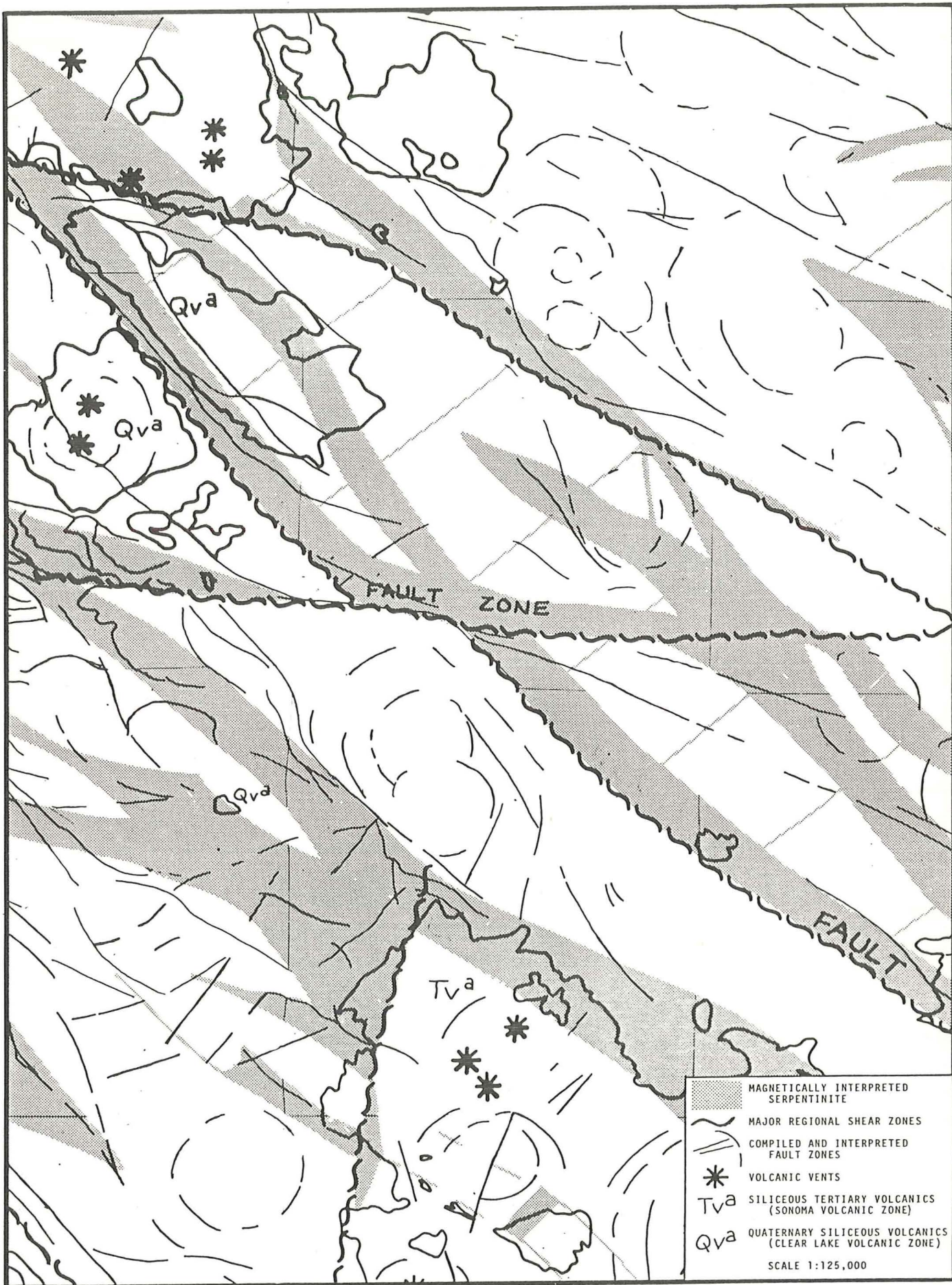


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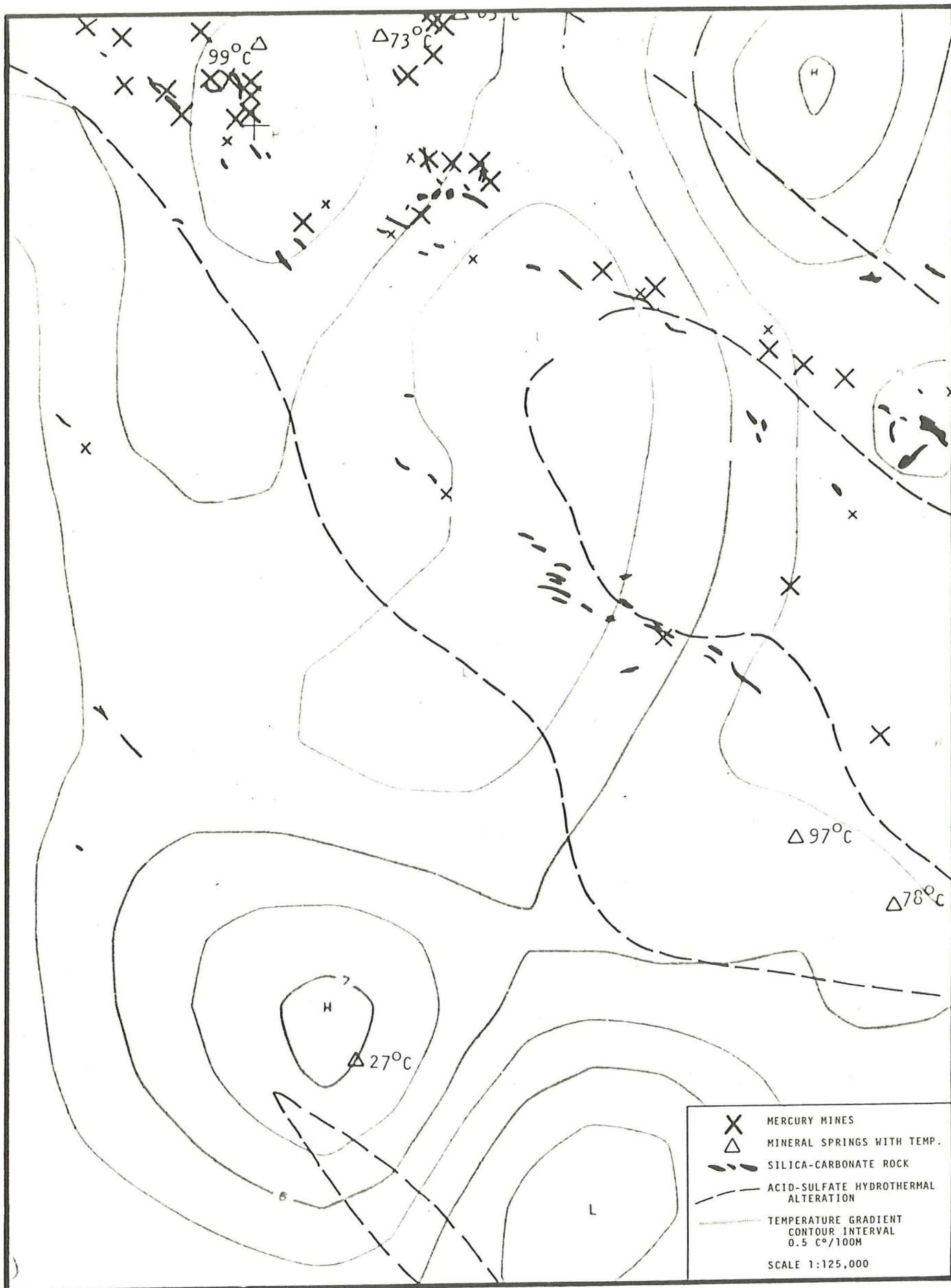


OFFSET AEROMAGNETIC PROFILES  
(Locational information removed)



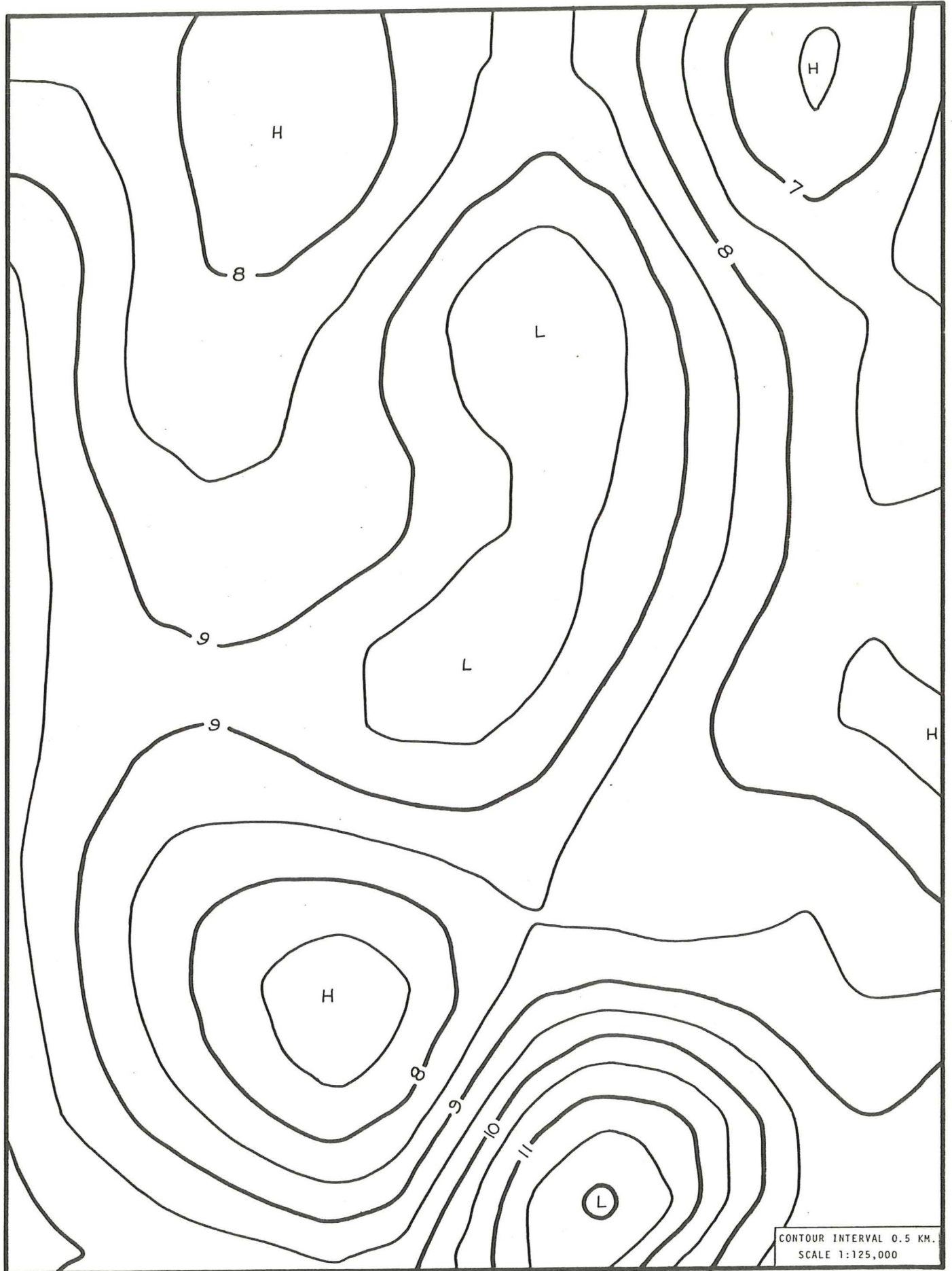
TECTONIC MAP

(Locational information removed)

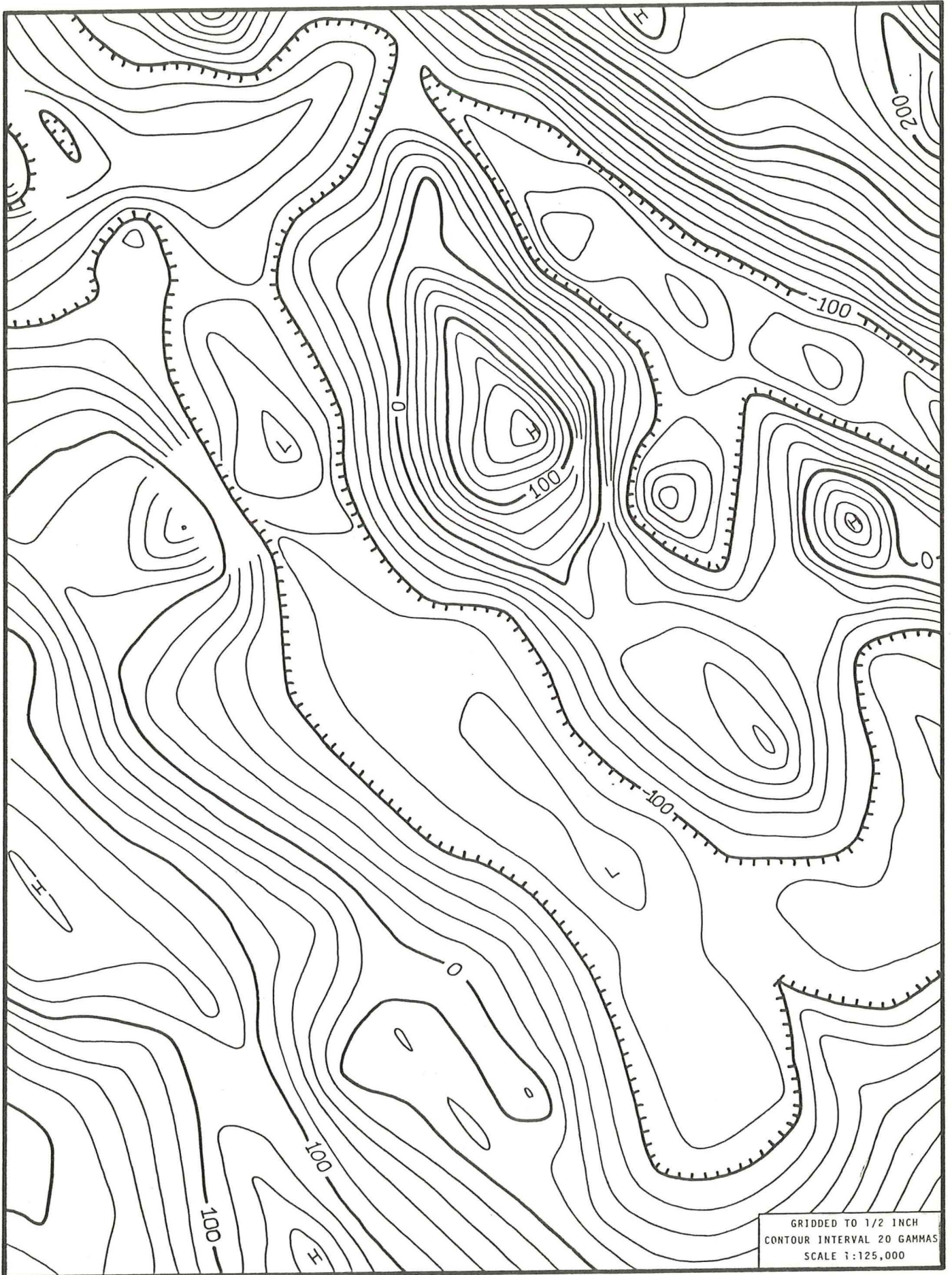


APPARENT TEMPERATURE GRADIENT MAP,  
 BASED UPON CURIE POINT DEPTH ESTIMATES

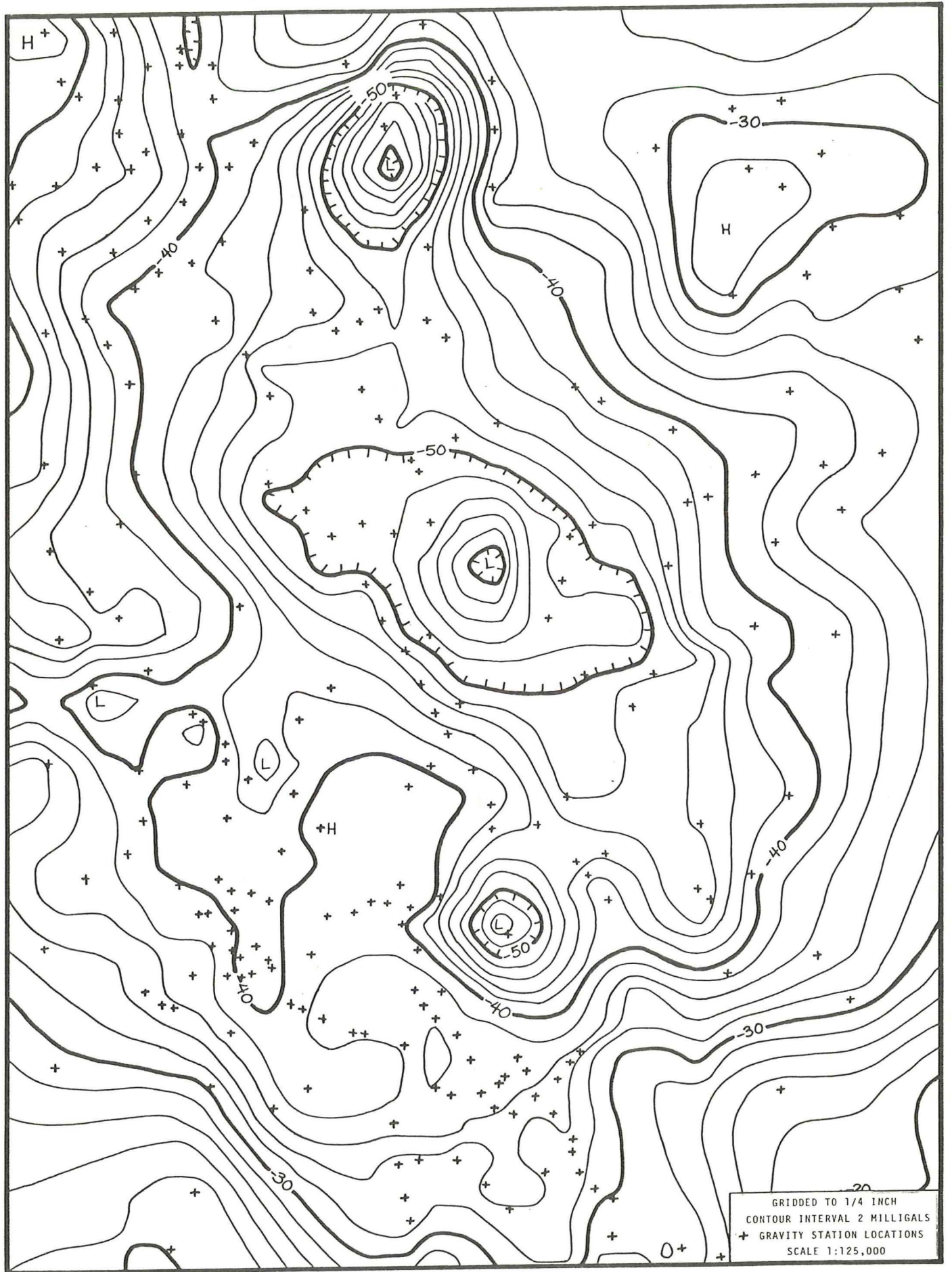
(Locational information and geothermal wells removed)



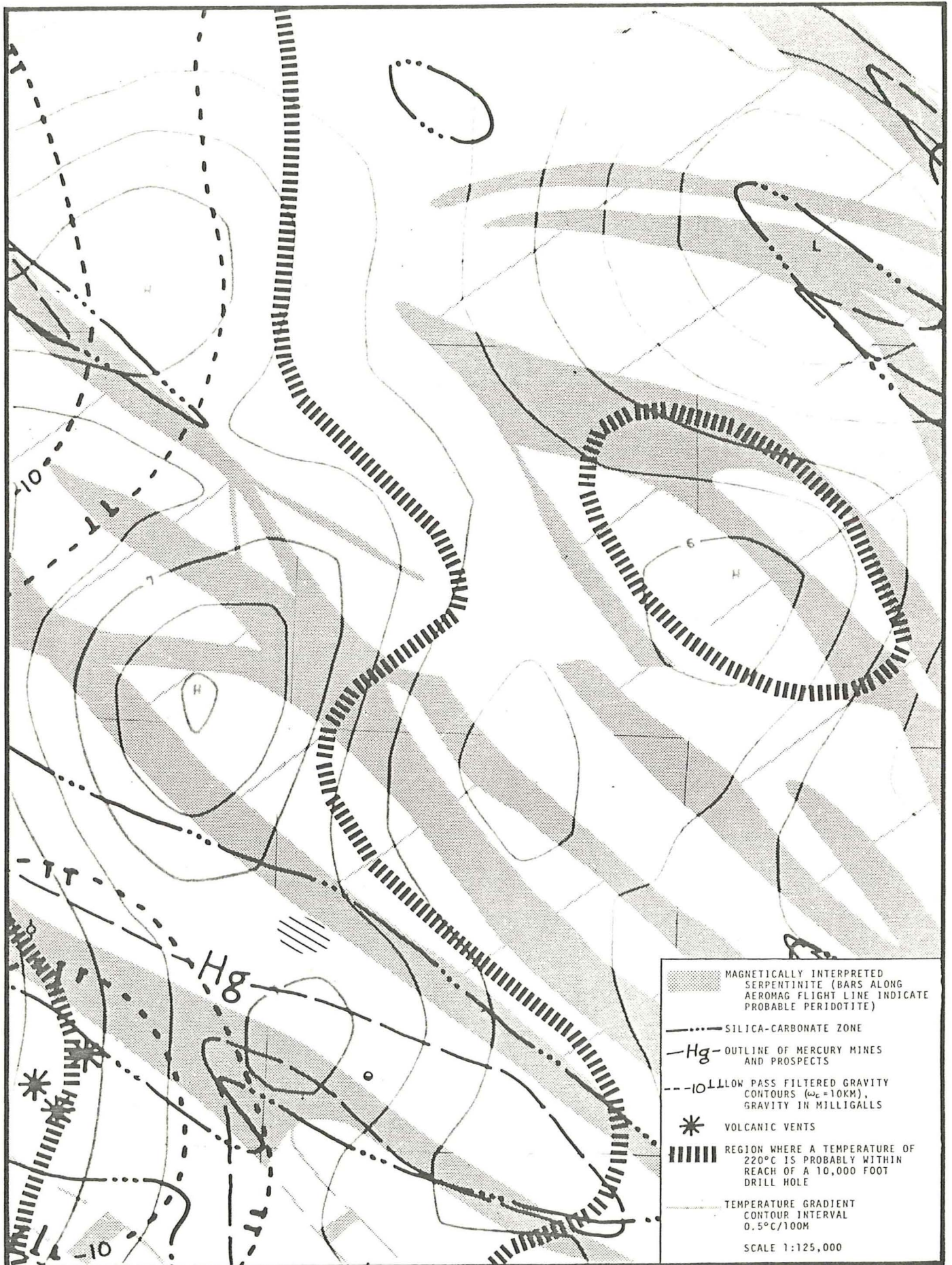
ESTIMATED DEPTH TO THE CURIE POINT TEMPERATURE.  
(Locational information removed)



RESIDUAL AEROMAGNETIC ANOMALY MAP  
(Locational information removed)



COMPLETE BOUGUER GRAVITY MAP  
(Locational information removed)



GEOHERMAL PROSPECT EVALUATION MAP

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