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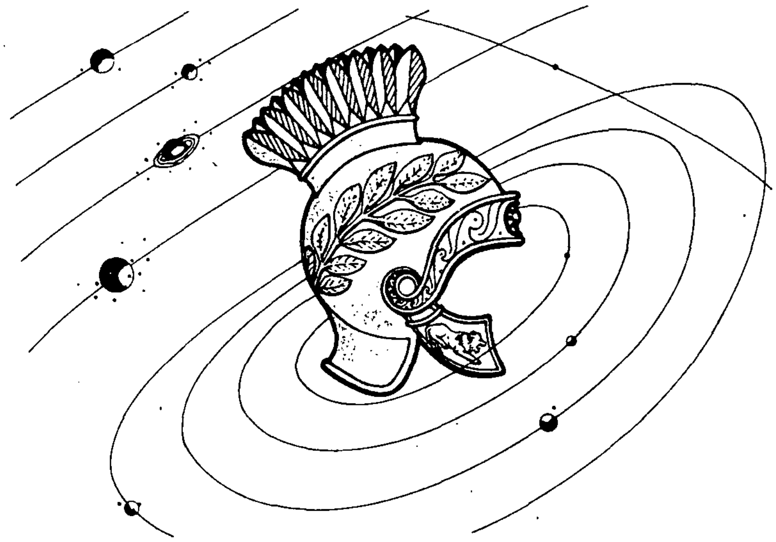

SEISMIC GROUNDNOISE SURVEY IN THE SAN EMIDIO DESERT

for:

STANDARD OIL COMPANY OF CALIFORNIA

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I. INTRODUCTION

Location: San Emidio Desert, Washoe County, Nevada. T28,29 30N; R22,23E.

Dates: May 4-9, 1974.

Seismic groundnoise is due to a combination of cultural, atmospheric, and geological disturbances. The resultant microseisms propagate primarily as surface waves with a log normal type of distribution in their power versus frequency plot (Figure A).

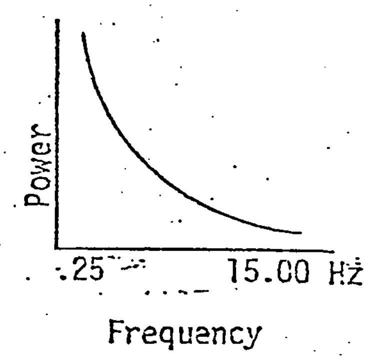

FIGURE A

Microseism power may vary from region to region, but for a given locale it can be considered as originating at a distant source. If the impedance sequence, coupling, and response of seismometers in an array are the same, then the measured power spectrum of the groundnoise would be identical from seismometer station to seismometer station. Since instrument response is identical and ground coupling is good, measured variation of power and frequency may be associated with varying impedance sequences beneath each station.

A local noise generator may also be responsible for power and frequency anomalies. Such an energy source is caused by a circulating steam/water system; deep volcanic activity, fluid flow in a fault system, pressure fluctuations, and other associated expressions of tectonic activity.

The recorded time series (24 hrs.) at each groundnoise station is searched for a "quiet" interval (3 hrs. or more); and this is spectrally analyzed for the true ground beat at that station.

The data from all stations is statistically evaluated for each specified parameter (Integrated Power, Mean Frequency, etc.) and the parameter(s) tabulated and contoured. Based on the statistical analysis, parameters exhibiting more than 1 standard deviation above the mean can be considered anomalous. In groundnoise surveys an anomaly is defined as an area in which two or more parameters exhibit values greater than 1 standard deviation, Figure 3, Anomalous Areas Map.

II. OVERVIEW

The purpose of the survey was to investigate the possibilities of areas of geothermal interest. A complementary objective included delineation of structural features due to faulting.

III. RESULTS

The San Emidio survey consists of 36 stations on a 1+ mile grid. It is contained in an area of approximately 5 mi (E-W) by 16 mi (N-S).

Statistical data is contained in Table 1.

Parameter	Average	Standard Deviation	% Std. Dev.
Integrated Power (db)	31.87	9.37	29.41
Mean Frequency (Hz)	6.34	0.86	13.62
36 Stations			

Table 1.

A major groundnoise anomaly occurs at the intersection of Sec. 17, 18, 19, 20 of T29NR23E, Figure 3, Anomalous Areas. The fault pattern lends itself to two possible interpretations. If the existence of a strike-slip NNW trending fault is feasible, the horst structure of faults T-U and T'-U' indicates this displacement. T and U are expressed to the west by Rodeo Creek and Rattlesnake Canyon. There is also an indication of this possibility through the structural displacement of the northern portion of Lake Range separated by the Three Mile Canyon showing NW/SE slip. This interpretation is indicated on the Anomalous Areas Map, Figure 3.

The alternate possibility is faulting normal to the NNE structural trend with Fault T-T' and U-U' striking WNW-ESE. Fault X is then expressed out of Stage Canyon trending NE through the southern portion of the survey. This interpretation establishes the groundnoise anomaly in a downthrown fault block. Fault V on cross sections A-A' and C-C' is topographically indicated by the Three Mile Canyon to the south.

IV. COMMENTS - RECOMMENDATIONS

Interpretation of faulting was aided by correlation of topography and power/frequency cross-sections. The major anomaly is also expressed via SP measurements made by Senturion Sciences. See Self Potential Survey, San Emidio, Nevada, dated June 1, 1974. Further work is in progress utilizing stations 1.1 through 6.1 as control stations for microearthquake investigations. Heat flow test holes are recommended to provide complementary information on this prospective area.

The computer generated grids for contouring were developed on ½ mi grid intervals. Data is stored for additional processing if required.

V. LIST OF FIGURES AND APPENDIX