

INTER-OFFICE MEMORANDUM

SUBJECT: Project 903, Dixie Valley

DATE July 24, 1979

cc: H. J. Olson

TO: H. D. Pilkington

FROM: J. T. Gross

A shallow temperature gradient hole drilling program was conducted in Dixie Valley beginning on the 21st of March and terminating on the 20th of May. Fourteen 50-94 meter holes were supplemented by 25 ten foot holes in an experimental attempt to detect shallow thermal anomalies. It was hoped that a correlation between anomalous temperatures at ten feet and calculated heat flows from the 50-94 m holes could establish a basis for casual use exploration of other geothermal prospects. Unfortunately, low or invalid heat flow calculations have made correlation difficult.

A single station seismic record was maintained by the field geologist for the duration of the project.

Drilling:

Drilling operations were carried out by two contractors, All Terrain Drilling at Sacramento, CA and Maxfield-Harris Drilling Co., Poway CA. Poor progress was made in drilling 6 gradient holes by the former company, and 2 of these 6 holes were subsequently redrilled by the Maxfield-Harris rig. Inadequate equipment and an inexperienced crew combined to produce a mere 5 completed temp. gradient holes and 23 10' holes in 24 days. Approximately 3 days were required for the 10' holes, and 21 days for 5 completed temperature gradient holes. A performance comparison is shown below:

	<u>All Terrain</u>	vs.	<u>Maxfield-Harris</u>
Drilled	378m		915m
time	21 days		13 days
average	18m/day		70m/day

No outstanding drilling problems were encountered that could not be overcome by an experienced driller and the right equipment and materials.

Thermal

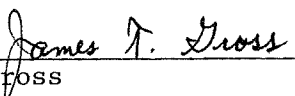
A demonstrable thermal anomaly exists in the vicinity of investigation as evinced by temperatures in holes 2,3,6,7 and 15. Warm water blown back to the surface in an air redrill of hole #2 is probably rising

along a fault southeast of holes 2 & 7 and mixing with cooler meteoric water percolating down the alluvial fan. Descending values for both temperature and heat flow in a northwesterly direction are probably a result of this mixing. There is evidence for this groundwater flow in the depressed temperatures and temperature gradients of holes on the fan draining Deep Canyon.

The more rapid decline in temperatures laterally to the northwest from hole #2 may be due either to a greater discharge of cold water from Grover Canyon or a lesser discharge of geothermal water near hole #7. Or perhaps both. Hole #7 was mud drilled and no groundwater information was obtained.

The low temperature gradients seen in holes 4 and 5 are particularly discouraging, however, since these were air drilled and no water was detected in these holes. It is possible (but purely speculative), that aquifers below the depths of investigation in these two holes are transferring heat laterally.

The very low values for conductive heat flow (where data is reliable) in the vicinity and the extremely local anomaly that is almost certainly convective heat transfer do not suggest a geothermal reservoir of any size beneath this part of Dixie Valley. Lateral and vertical transfer of geothermal fluids from great depths and perhaps miles away could be responsible for the anomaly.



J. T. Gross

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