

INTER-OFFICE MEMORANDUM

SUBJECT: Seismicity in the Vicinity of Cove Fort, Utah

DATE April 19, 1976

TO: R. A. Barker

cc: W. M. Dolan
H. J. Olson
J. Roth

FROM: A. L. Lange

The presence of microearthquakes in an area of thermal manifestations has been found to be a favorable sign for a geothermal resource. Association of seismicity with established fields has been observed at The Geysers, Imperial Valley and Coso Hot Springs, California; as well as other sites around the world, including, Yellowstone, Iceland, Kenya, New Zealand, Japan, El Salvador, and the West Indies. The Cove Fort area of central Utah is one in which micro-earthquakes are prevalent, on the basis of three surveys made during the past three years, and a major earthquake.


1. A magnitude of 4.6 earthquake was recorded and felt in the area on 23 June 1971. Remote seismic observatories placed the epicenter approximately 11km due west of Cove Fort (see attached map).
2. A microearthquake survey was conducted during the interval 9 through 20 March 1973 by Senturion Sciences for Thermex Corporation. Reliable data were obtained during 9 days of this period. About 60 to 70 events were recorded that appeared to occur in the vicinity; those that could be located are shown on the map by open circles. Because the seismic network operated only in the neighborhood of Cove Fort-Dog Valley, events in the western portion of the map could not be located.
3. During September, 1974, the University of Utah operated a seismic net around the Mineral Range, to the southwest of our map. Several events were observed in the valley between Cove Fort and Black Rock (solid circles); however, their net did not provide coverage north of Cove Fort. Their remarks, cited from their 1975 Progress Report are of interest:

An interesting cluster of earthquakes occurs between Roosevelt Hot Springs and Cove Fort. Epicenters here are not aligned along the northerly trend of the faults. The clustered distribution of these epicenters coincident with a zone of Quaternary basalt flows and in a zone of hot springs suggest the possibility that they could be related to thermal-mechanical stresses related to cooling volcanic flows or to deeper volcanic rocks. They clearly lie along the northern edge of the Pioche-Beaver-Tushar mineral belt to be described subsequently.

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4. AMAX initiated a microearthquake reconnaissance of the Mineral Range in February, 1976, utilizing our dual channel smoked-paper seismograph. The instrument is intended to identify areas of seismicity by the presence of activity, but from its output we cannot accurately locate events. Although we have not as yet operated the instrument in the area of Cove Fort, we do note the occurrence of microearthquakes emanating from the north approximately on the Cove Fort-Black Rock line. Analysis is not yet complete; however, the incidence of these events is on the order of one to three per day, seen from distances as great as 40km.

To my knowledge a high-resolution microearthquake survey has not yet been performed in the Cove Fort area; nevertheless, there seems to be no doubt that the information gained therefrom would contribute valuable information on substructure, thermal manifestations and volcanism. Meanwhile, the seismic evidence accumulated thus far does appear promising for the existence of a geothermal target, and warrants taking a lease position.



Arthur L. Lange

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Attach.