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**GEOHYDROLOGY OF THE EASTERN SLOPE OF WEST MAUI:  
Progress Report**

**Mel C. Caskey**

*Water Resources Research Center*

University of Hawai'i at Mānoa  
Honolulu, Hawai'i 96822

GEOHYDROLOGY OF THE  
EASTERN SLOPE OF WEST MAUI

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This progress report is intended to summarize the activities of the geohydrologic study of the eastern slope of West Maui initiated in August 1966 by the Water Resources Research Center. This study is supported by joint funding from the State of Hawaii and Wailuku Sugar Company. Phases now completed and in progress include: review of the geological aspects of the area under consideration, installation of hydrologic monitoring systems, and compilation of data needed to establish a permissive sustained yield (safe yield). Also a two-day geophysical exploration project employing Seismic techniques was carried out in the Wailuku area as an important adjunct to the above activities. A report on the Seismic technique will be submitted later through the Water Resources Research Center.

This report is appended by an expenditure report.

Review of Geology

H. T. Stearns and G. A. Macdonald's Bulletin 7 of the Division of Hydrography relating the geology and groundwater resources of the Island of Maui has been reviewed in detail. Considerable time has been spent going through the personal files of Dr. Doak C. Cox, Water Resources Research Center. The files contain vast quantities of hydrogeologic information concerning West Maui. The search of the published and unpublished literature has been coupled with several reconnaissance trips to Maui which have pinpointed areas in need of additional detailed work.

Detailed mapping will be carried out during the spring and summer months of 1967. This work will utilize modern topographic maps at a scale of 1:24,000 which is smaller and thus should provide greater information than those of H. T. Stearns at a scale of 1:62,500.

Investigation and mapping will be accompanied by at least two interested graduate hydrogeology students (Thomas Bandy, B.S. University of Redlands and Pedro Tenario, B.S. University of Hawaii).

#### Installation of Hydrologic Monitoring Systems

The original proposal had planned installation of three water level monitoring systems to record basal water levels underlying the project area. However, through cutting costs on the monitoring systems, while at the same time maintaining the original desired accuracy, equipment for four monitoring systems could be purchased. Water level monitoring systems have been installed on the following wells: Maalaea (a Department of Water and Land Development well), Waiakapu (an abandoned military(?) well), Field 63 (a test hole drilled by Wailuku Sugar Company) and Iao (a United States Geological Survey well-number 102). An attached section of a Maui topographic map shows the approximate location of the wells.

The monitoring network has two float-level recorders (Leupold and Stevens) and two pressure recorders (Foxboro). The two float-level recorders are on the Maalaea and Waikapu wells while the pressure recorders are on the Field 63 and Iao wells. An attached sheet shows these monitoring devices.

After installation of the float-level systems, it was discovered that the mechanisms were not friction free and as a result small fluctuations were not recorded. The systems have since been modified and pending unforeseen difficulties, the records should register precise fluctuations. Good records were further hampered in the Waikapu well due to vandalism but this problem is under consideration by Mr. Donald Cataluna of Wailuku Sugar Company.

The pressure system records have not been up to the quality expected due to mechanical failures. The drive clock in the Field 63 well was the first to give trouble and then the pressure regulator in the Iao well malfunctioned. Also, due to a discontinuous draft on the Wailuku Shaft by Wailuku Sugar Company and a very high infiltration rate coupled with large amounts of precipitation, the full scale reading on the pressure recorders

(0 to 5 feet of water) is unable to record the total range of variation of water levels, and therefore the record was incomplete. This problem is being solved through the installation of another pressure recorder (measuring 0 to 25 feet of water) in parallel with the present recorder. After the second recorder is installed the 0-5 feet recorder will record the small fluctuations and during the periods of little draft and high recharge when the 0-5 feet recorder is "off scale" the 0-25 feet recorder will insure a continuous record.

The records of the float-level recorders (Maalaea) as well as the pressure recorders records (Iao) show diurnal fluctuations attributed to tidal and/or barometric influences. After more complete records have been obtained for longer periods comparisons between the barometric and tidal highs and lows will undoubtedly be better identified.

The installation of the recording systems was aided tremendously by the planning of Mr. Donald Cataluna of Wailuku Sugar Company. Mr. Cataluna is now maintaining the recording stations, including changing and keeping charts of these records.

#### Compilation of Data

In addition to basal water levels, data such as precipitation records, surface runoff records, evapotranspiration rate records, ditch flow records, draft records, are also needed in order to facilitate estimation of permissive sustained yield. The necessary records are being obtained as follows: precipitation records from the United States Weather Bureau and Wailuku Sugar Company, surface runoff records from the United States Geological Survey, evapotranspiration rate records from Wailuku Sugar Company and Water Resources Research Center (Dr. Paul Ekern), ditch flow records from Wailuku Sugar Company and East Maui Irrigation Company (Mr. Robert Bruce) and draft records from Wailuku Sugar Company and the Maui Board of Water Supply.

*L. Stephen Lau*

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L. Stephen Lau  
Acting Director

EASTERN SLOPE OF

WEST MAUI



- A- Iao Well
- B- Field 63 Well
- C- Waikapu Well
- D- Maalaia Well

Scale  
1:62,500

