PRELIMINARY SURVEY OF A PORTION OF PARKER RANCH

W. M. Adams, F. Peterson, C. Lao

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The work reported here was performed on 2 and 3 March 1968. Since the area of interest is closed to the general public, the key to the gates along the lower course of the area of interest had to be obtained from Mr. Jim McIntyre. Hapuna Beach Park was the starting point for the reconnaissance which proceeded along Lalamilo Coast towards Pauoa Bay (see Fig. 1).

AREA NORTH OF LAND OF INTEREST (LOI)

The first gate was encountered at the end of the paved road as shown on (Fig. 1) and a rental car was left parked behind the buildings there. A water sample (#1 in Fig. 1) was taken from the rock-lined pit behind this building, said to belong to Mrs. Ruttle (?); specific conductance of the sample was 5700 micromhos. Further down the road at Pauoa Bay, a second gate was encountered. Back of Pauoa Bay for a distance up to 200 yards, the land was level and cleared of vegetation. It was evident that only relatively few changes had been made by construction equipment, or small Keanapou Fishpond would have been filled too since it was so shallow, overgrown, and appeared to contain very little water surface. Therefore this flat seems to be the result of beach deposits accumulating over an older lava surface. The temperature of the pond water was 26.5°C on the north side of the pond in about 6 inches of water. The fact that the temperature nearly coincided with a fairly large spring (the largest found on this trip) suggests an appreciable velocity of ground water through this area. Additional evidence for this belief was the occurrence of numerous, although not particularly large, lava tubes with southern exposures along the coast at Keanapukalua. The spring, discovered by C. Lao who noted the backwash of waves exceeded the onwash, is located at the shore just northwest of the Keanapou Fishpond. The discharge face at the beach is 12 feet wide and approximately 4 inches above the low point of the outwash. A water sample (#2) showed a conductance of 7700 micromhos and a temperature of 26.5°C. Another spring about 4 feet wide occurs approxi-

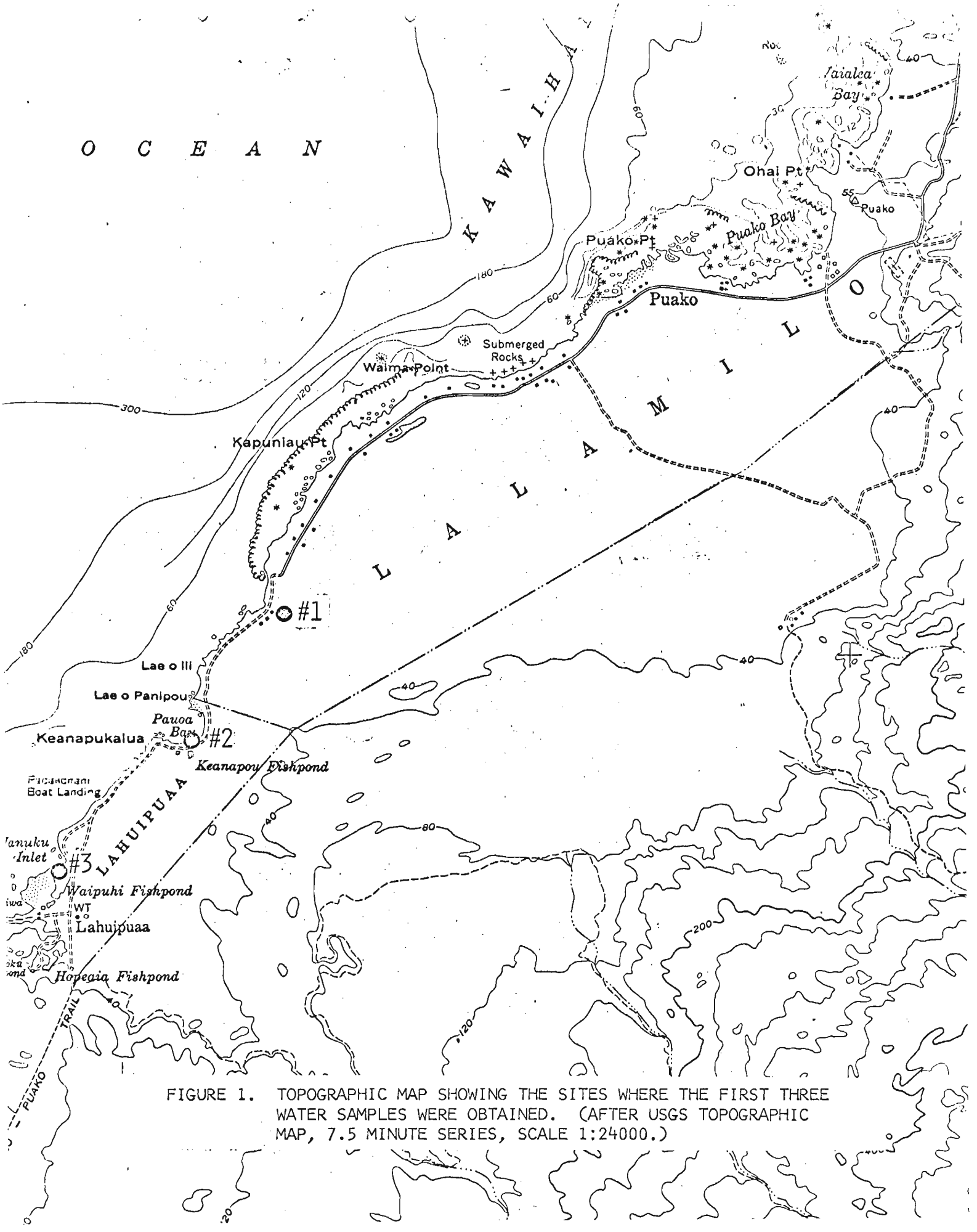

FIGURE 1. TOPOGRAPHIC MAP SHOWING THE SITES WHERE THE FIRST THREE WATER SAMPLES WERE OBTAINED. (AFTER USGS TOPOGRAPHIC MAP, 7.5 MINUTE SERIES, SCALE 1:24000.)

mately 30 feet to the south and has a discharge area 4 feet wi
The water from this spring was brackish but no sample was taken.
Further down the coast along Keanapukalua, refraction effects from infusion of fresher water into the ocean were observed in tidal pools. A water sample, taken from Waipuhi Fishpond (#3), gave a value of 9000 micromhos at a temperature of 27.0°C. The pond was open to the ocean through a concrete weir with wire screen barriers. Water was observed flowing both in and out of the pond, Water, presumably fresh, was also noted upwelling on the ocean side of the concrete fishpond wall. Ulua, normally a salt water species of fish, were observed in this pond. Manini, also a salt water species, and tilapia were observed in the pit near the Ruttles' place. Apparently these species were introduced and managed to adapt to a less saline environment.

The road was followed around the water tank above the capital "L" in Lahuipuaa (Fig. 1). It quickly led up to the aa flow where the LOI property line begins. (Possibly, this is designated on the map by the dashed line running just below the 40' contour.) The road became rugged and the vehicle was shifted to four-wheel drive at this point. The road runs across the top of the aa flow parallel to and makai of the Kiholo-Puako Trail (see Fig. 2). The road followed down along the trail, averaged about 60' elevation, although it appeared to be considerably higher. The turn-off towards the beach which was taken led down to Honokaope Bay. A view of the beach at this bay is given in Figure 3. Behind the beach a pond is located in the clinkers. The sample (#4) taken from this pond measured 5000 micromhos. A view of the pond is given in Figure 4. It seems from the strand mark that the water level at this pond has fluctuated in height. This is approximately where the LOI begins along the coast. The dashed line shown running along the coast designated as a road is probably a fishing trail, but is being improved by Francis Ii Brown on the Waawaa Point. Returning to the main trail adjacent to the Kiholo-Puako Trail, we continued on the road to Anaehoomalu Bay towards the petroglyphs which were seen between the new road and old Hawaiian trail. At this point, the road became impassable. Presumably at one time it ran along the beach, but has been washed out. A sample from Kuualii Fishpond (#5) was analyzed for salinity and found to have a conductance of 13,000

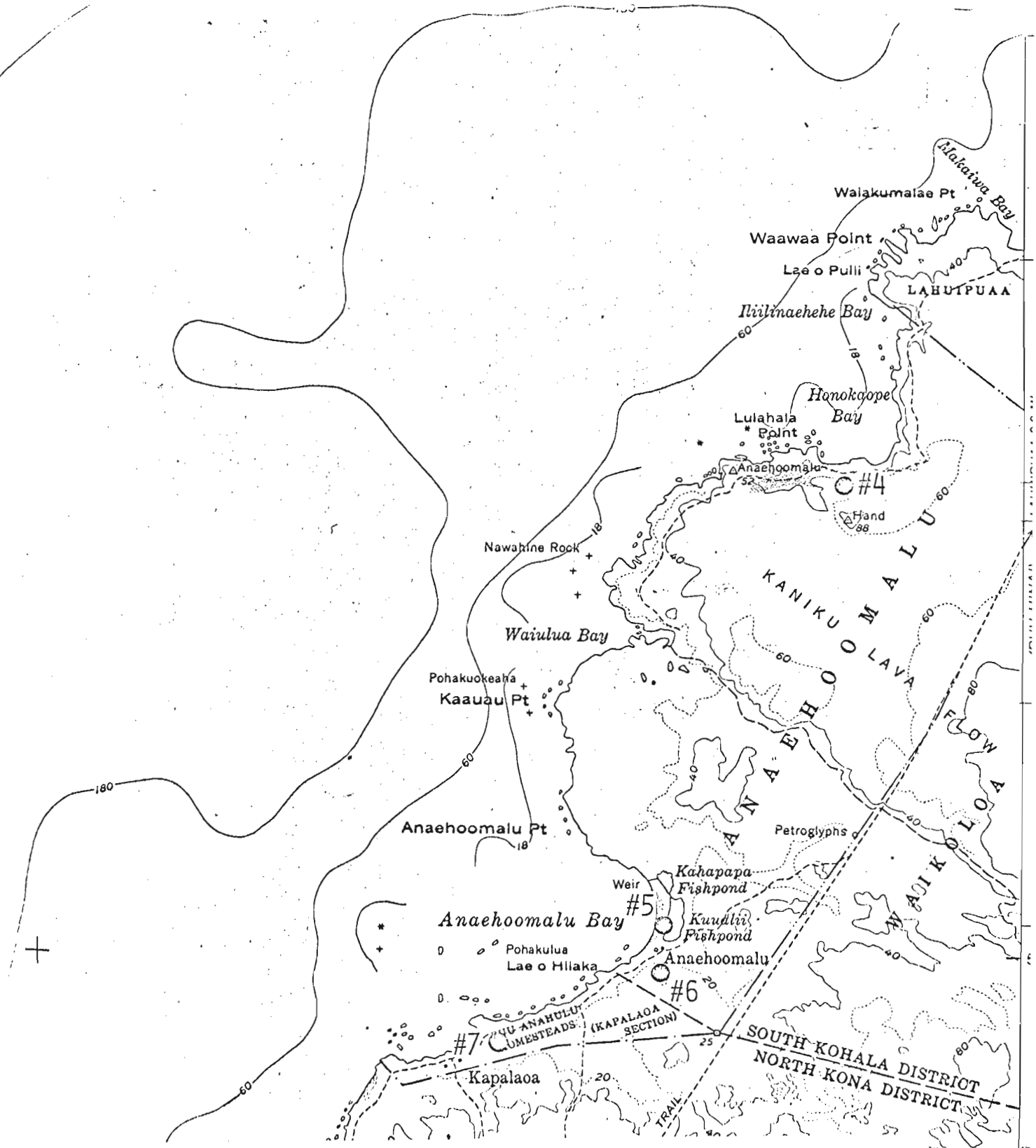

FIGURE 2. TOPOGRAPHIC MAP SHOWING WATER SAMPLE SITES #4 TO #7. (AFTER USGS TOPOGRAPHIC MAP, 7.5 MINUTE SERIES, SCALE 1:24000.)

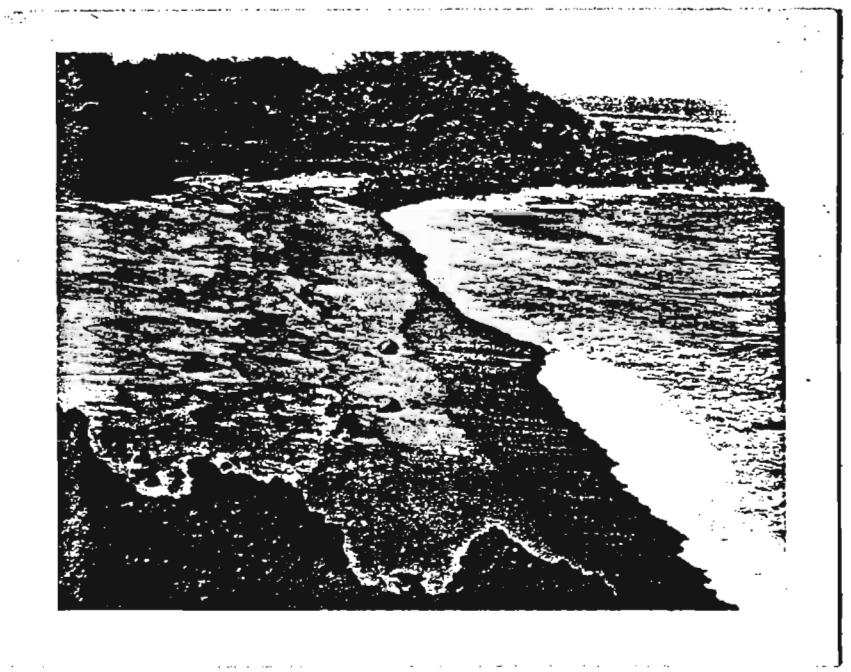

FIGURE 3. BEACH, NEAR "HAND" (LOI). 2 MARCH 1968.

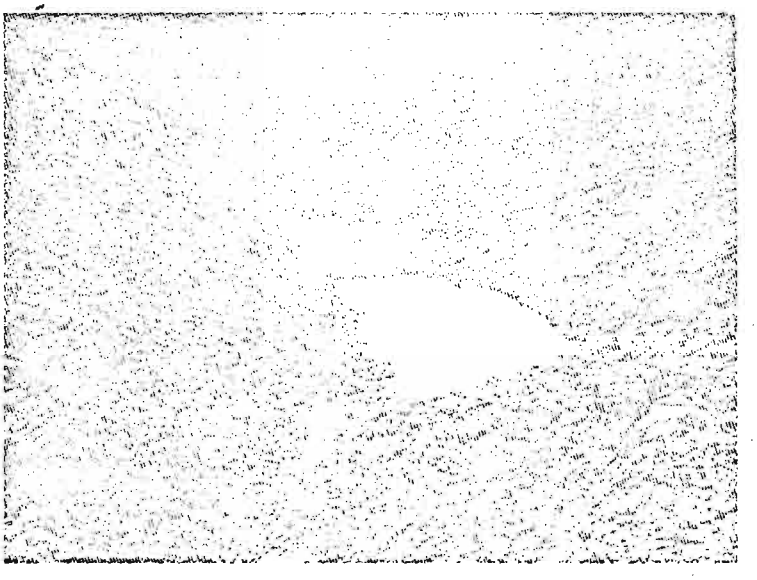

FIGURE 4. POND NEAR "HAND" (LOI). 2 MARCH 1968.

micromhos. This pond is in the [illegible] pahoehoe flow not covered by the aa flow. A sample from the small pond near the work Anaehoomalu (#6) showed a conductance of 4600 micromhos, the lowest of all samples. A pond halfway between the northernmost house and the "P" in Puu gave 14,000 micromhos (#7).

No one is presently living at the Kapalaoa settlement although there was evidence of recent weekend usage. The buildings have corrugated iron roofs with the rain gutters arranged to feed into a cistern. Each home has its own cistern. Where the gutters were still up, the cisterns were full. Although the road coming down into the Kapalaoa settlement from the mauka side (coming up from the south on the map) appeared to be in good condition, it is not apparent how it is used. There is no other apparent way to gain access to that road from the north because a thorough search was made for a road continuing along the Hawaiian Trail and none was found. (Aerial photos do show a road to the south.) Hawaiian chessboards were found beside the wall back of the homes. On the return passage along the road by the trail, the condition of the trail was noted. This is shown in Figure 5. The breach in the wall on the makai side of the trail on the left-hand side mauka of the wall is undamaged. From this evidence, it is concluded that no extensive flash-flooding has occurred in the area. It is conceivable, although it does not seem probable, that the wall might have been damaged by flooding and repaired.

The conductivities were run using the procedure shown in Figure 6. The inverter was connected to the battery of the three-wheel drive vehicle, an International Harvester extended cab pick-up, with the bridge plugged into the inverter, and the sensor dipped into the water bottle sample. This was an extremely inconvenient field procedure. If future field trips are to be conducted, a portable system should be procured. In particular, a measurement system which does not use a nulling procedure is recommended. Nulling is a simple way of achieving high precision. For a reconnaissance effort, such precision is unnecessary. A non-nulling system, possibly with an optional portable recording attachment, would be especially suitable for reconnaissance along coastlines using small craft.

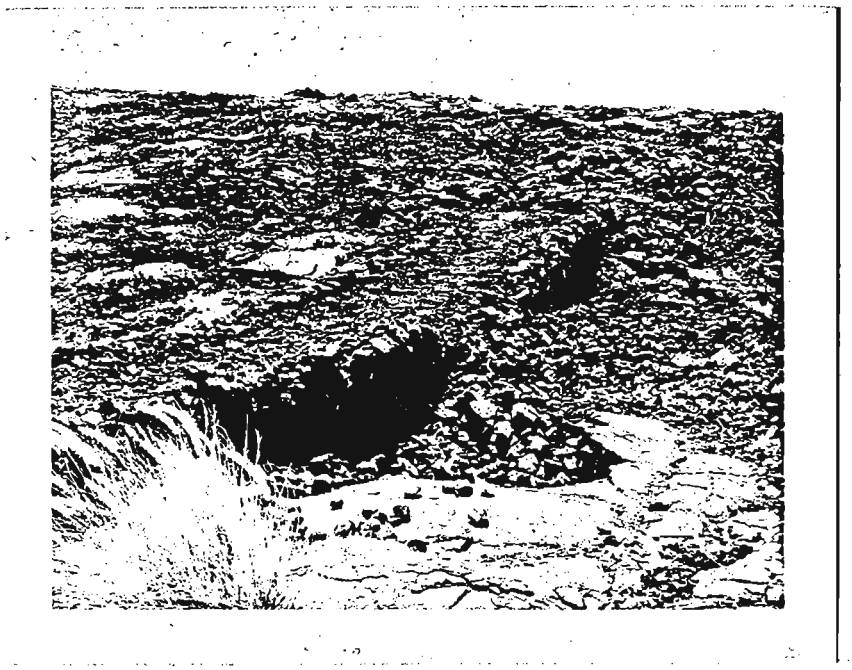

FIGURE 5. HAWAIIAN TRAIL NEAR PETROGLYPHS. 2 MARCH 1968.

FIGURE 6. TESTING WATER SAMPLES FOR CONDUCTIVITY.
NEAR PAVILLION AT HAPUNA BEACH PARK.
2 MARCH 1968.
F. PETERSON & W. ADAMS.

Swimming in Pauoa Bay was selected because this bay seems have the least disturbance and the clearest waters. It was possible to see bottom out to a depth of at least 20 feet. Swimming to greater depths was not attempted. Occasionally mixing was evidenced by refraction effects and consequent blurring of the vision. This warmer fresh water appeared to stream out from shore for at least 100 feet and was at least 2 feet thick near the beach and thinned out to sea. It was not, however,comparable to the refraction that one finds, for example, at Punaluu or near South Point. There was not sufficient fresh water to prevent the presence of salt-water fish everywhere in the bay, although there seemed to be less fish in the mixing zone next to shore.

On the following day, the 3rd of March, we drove into the area of interest from the Circum Island Road and down past Puu Hinai (see Fig. 7). This road has been improved by bulldozing. A view of the end of the road looking towards the coast is shown in Figure 8 with the bulldozer beside the road. The coast was visually evident but is not visible on the picture due to a misty overcast.

The drill site selected for the first well is shown in Figure 9. Dr. Frank Peterson is standing next to the truck. (The hood of the truck is lifted to cool the engine, not because of engine trouble.)

As a result of this field effort, and extensive discussions with Mr. Jim McIntyre, the following recommendations seem appropriate:

1. No evidence was encountered in the area of interest (LOI) to indicate any discharge of water on the order of 1,000,000 gallons/day. There is no reason to believe that any obvious flow at the shoreline visited was completely missed.
2. As verification for the conclusions indicated by the present findings, two possible actions occur:
   a. Subsurface Flow: Resistivity profiles could be run along the Hawaiian Trail, possibly during the spring vacation. Available equipment should note any large subterranean flow of fresh water not apparent due to surficial conditions.
   b. Submarine Flow: To monitor for this, a boat could travel down the coastline trailing an electrode hooked to a conductivity meter. As the coastline is rather steep,

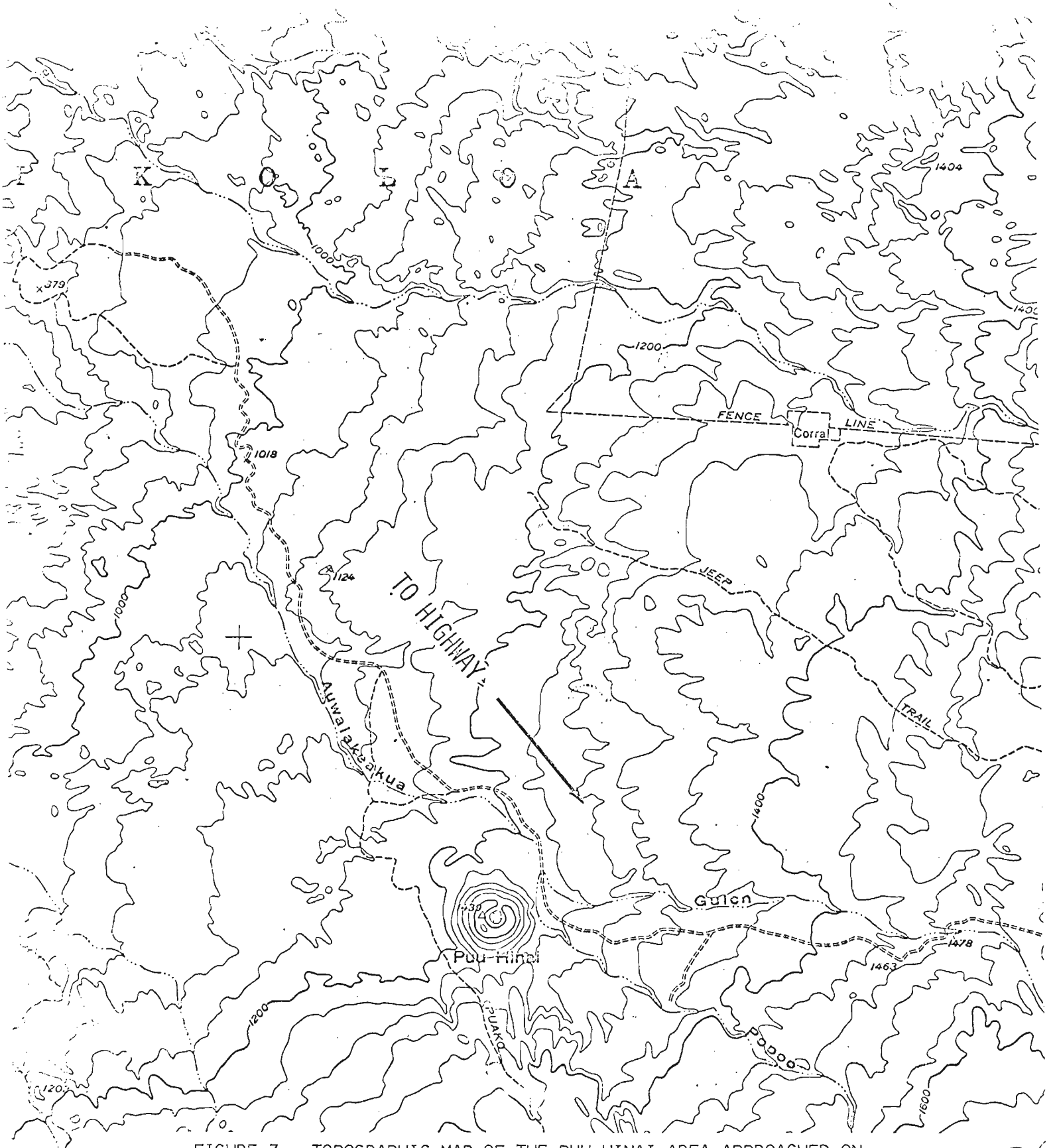

FIGURE 7. TOPOGRAPHIC MAP OF THE PUU HINAI AREA APPROACHED ON THE CIRCUM ISLAND ROAD. (AFTER USGS TOPOGRAPHIC MAP, 7.5 MINUTE SERIES, SCALE 1:24000.)

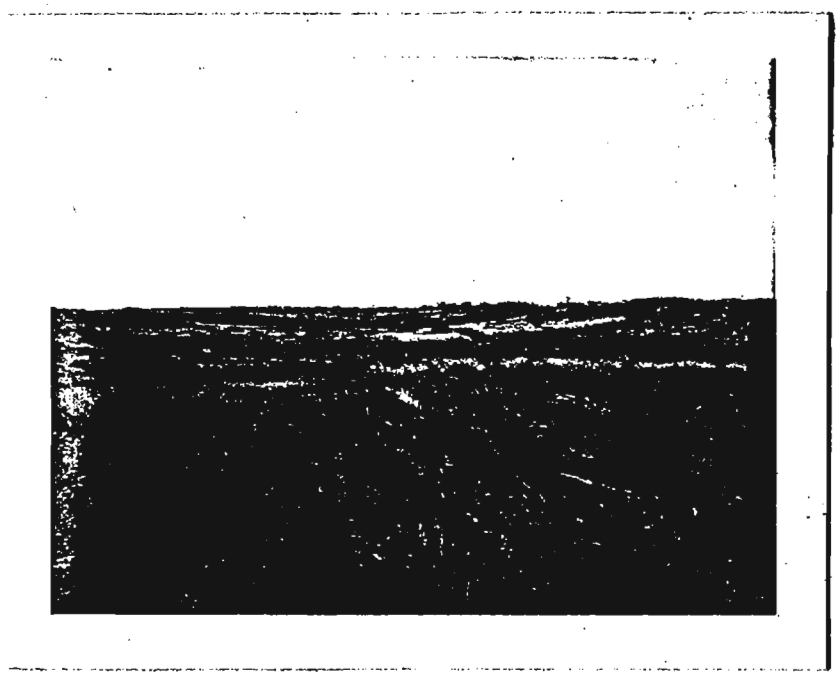

FIGURE 8. END OF UPPER ROAD - (LOI).
CAT TO LEFT. 3 MARCH 1968.

FIGURE 9. DRILL SITE - (LOI).
FRANK PETERSON
3 MARCH 1968.

except at the bays, this would be from a power boat. Such a boat used for tsunami work is available at Hilo. It would be launched at Kawaihae and piloted down the coast into the area. It would not, however, be able to enter the shallow waters adjacent and inside the several bays. For these areas, a shallower draft boat such as a kayak or rubber life raft would be desirable. Such bays are few in number and might be monitored by individually approaching them from the shore. Considerable interest was shown by Mr. McIntyre on the possibility of discerning the amount of soil cover in the upper reaches of the area of interest. At present, the high rainfall has prompted a greater than normal vegetative cover. It has been proposed by Teledyne to fly infrared pictures of the area of interest for the purpose of describing the thickness of soil cover. It is highly dubious whether this technique is feasible, especially under the current conditions of extensive vegetation. It is probable that a resistivity profile on a mauka to makai line, such as along the road, would give an indication of the average thickness of the soil cover. At present, no personnel is available to do this work, although the equipment exists.