A CULTURAL RESOURCE EVALUATION (PHASE I AND II) FOR THE TAU-FALEASAO WATERLINE PROJECT LOCATED ON TAU ISLAND, MANUA, AMERICAN SAMOA, SEPTEMBER 1996

Prepared for: Mr. Willredo Carreon
American Samoa Power Authority
P.O. Box PPB
Pago Pago, American Samoa 96799

Prepared by: Archaeological Consultants of the Pacific, Inc.
D. Kyle Latinis, M.A.
James R. Moore, B.S.
Mike T. Carson, M.A.
Joseph Kennedy, M.A.
59-624 Pupukea Road
Haleiwa, Hawaii 96712
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Abstract

At the request of Mr. Wilfredo Carreon of the American Samoa Power Authority, Archaeological Consultants of the Pacific, Inc. conducted Phase I and II cultural resource investigations for the Ta'u-Faleasao Waterline Project located on Ta'u Island, Manu'a, American Samoa. A cursory pedestrian survey was conducted along the entire subject corridor. However, sub-surface testing was only conducted at the Faleasao Village and Ta'u Village sections of the subject corridor. No historic properties were encountered along the ridge area of the subject corridor separating the two villages. Faunal and artifacts remains in the Faleasao Village section of the subject corridor were sparse and inconclusive. However, stratigraphic analyses indicates multiple periods of habitation and land use due to the existence of anthropogenic layers characterized by dark organic layers with charcoal mottling, likely resultant from past land use practices. Subsequently, Faleasao Village was assigned a site number (AS-11-76). Likewise, similar depositional conditions occur in Ta'u, indicating multiple periods of habitation and land use.

Of immediate concern, however, is an in situ human burial (Feature AA of Site AS-11-23) which was encountered in the Ta'u Village section of the subject corridor. Local informant testimony indicates that this was an ancestral burial location, multiple burials may exist, and that the individuals may have been important or powerful people. This is also a location known for ghosts and spirits, further supporting the local testimony above. Furthermore, this may be a feature of Site AS-11-23, the Papatea Sacrifice/Burial Site reported by Kikuchi (1963:127). The burial represents a significant historical property and if the waterline is placed as planned, there will be an adverse effect to the site. Archaeological Consultants of the Pacific, Inc. recommends mitigation for the burial. The burial needs to be attended to in a satisfactory manner which accords with Federal (Section 106 of the National Historic Preservation Act and its implementing regulations promulgated by the Advisory Council on Historic Preservation regulations, 36 CFR 800), Territorial, and local Village recommendations. Furthermore, additional cultural remains and human burials may be located in the immediate area surrounding the subject corridor, thereby warranting that extreme caution be taken and additional monitoring be implemented during the course of construction activities.
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A Cultural Resource Evaluation (Phase I and II) for the Ta'u-Faleasao Waterline Project Located on Ta'u Island, Manu'a, American Samoa

Section 1: Introduction

At the request of Mr. Wilfredo Carreon of the American Samoa Power Authority (ASPA), Archaeological Consultants of the Pacific, Inc. (ACP) conducted investigations for cultural resource evaluations, a Phase I and Phase II cultural resource investigation, for the Ta'u-Faleasao Waterline Project located on Ta'u Island, Manu'a, American Samoa.

Archaeological Consultants of the Pacific, Inc. was contracted to assess the subject area for potential cultural and archaeological resources. This included evaluation of the significance of these resources and evaluation of the effect of the project on cultural and archaeological materials. Finally, recommendations are proposed for mitigation of impacts to archaeological sites along the proposed construction area as needed and required in accordance with Territorial and Federal regulations.

The waterline will be placed on the inland shoulder of the existing road from the northern section of Ta'u Village (directly west of the power plant; see Figures 1-3). The waterline will be placed in an excavated trench approximately five feet wide and six feet deep. The majority of the proposed waterline will be located in the roadway along the steep slopes of the rock outcrop which forms a steep ridge separating Ta'u Village from Faleasao Village.

No sub-surface archaeological remains were expected along the ridge area due to; 1) the nature of geological processes occurring in this area, and 2) the paucity of cultural remains noted from previous pedestrian survey assessments. However, sections of the proposed waterline near Ta'u Village and Faleasao Village were selected for sub-surface testing and further assessment. These areas have significant cultural resource potentials.

Both Ta'u Village and Faleasao Village have been locations for archaeological research and additional archaeological testing for various projects as required by Federal and Territorial regulations (Best 1992a; Clark 1990; Foster 1991a, 1991b; Fentress 1995; Herdrich et al. 1995; Hunt & Kirch 1988, 1987; Kikuchi et al. 1975; Latinis et al. 1996; Weisler 1993). Numerous archaeological sites (both historic and prehistoric) have been identified in both villages. The majority of these are located in the northern section of Ta'u Village. Ta'u Village itself is considered one large archaeological site (AS-11-51; Hunt & Kirch 1988; see also Clark 1990). Of significant interest is the Papatea Sacrifice/Burial Site (AS-11-23) reported by Kikuchi (1963) which is an extensive burial area for sacrificial victims located near the Ta'u extent of the subject property on what was the old school building. Furthermore, the Tui Manu'a Tomb (Site AS-11-27) is located in the northern section of Ta'u Village, not far from the subject property.
Figure 1: Property Location on a Map of Ta'u

source: Kirch and Hunt 1993

source: University Press of Hawaii 1980
Figure 2: Subject Property on a U.S.G.S. Topographic Map
Figure 3: Trench and Test Unit Locations

Test Unit 1: Location of Burial

Test Unit 2

Trench 3

Trench 1

Trench 2

Falasao Waterline

Source: American Samoa Power Authority (Water Division) n.d.
Tat\'u Village has considerable research potential for prehistoric archaeology, historic archaeology, and geo-archaeology (see Hunt \& Kirch 1988). Falesa\'o Village, though not likely having the same occupational time depth as Tat\'u Village, also has significant archaeological potential.

Two test trenches and one test unit were excavated at the northern section of Tat\'u Village. One test trench and one test unit were excavated at the western section of Falesa\'o Village.

Of immediate concern was the discovery of a single burial located at the northern section of Tat\'u Village (presently considered Feature AA of site AS-11-23). This was discovered in the test unit excavations. The burial was located in situ 90-95cmbs (centimeters below surface). The burial was not defined by a marker or a stratigraphically recognizable grave boundary.

The remains indicate that a single adult had likely been buried in an extended position (laying on the back) with the head directed north. The skull and parts of the upper torso were exposed during excavations. Additional remains extend under the existing road. Although the remains noted in the test unit are undisturbed, it is impossible to determine if any additional skeletal remains underneath the road have been disturbed or also remain intact. Only additional test excavation will yield this information.

This area of Tat\'u Village is locally known for its association with ghosts (aitu), spirits and burials. Precise location of ancestral burials is not currently known. However, the property owner, Junior Vesega, confirmed that the area was a burial location of related ancestors. He further indicated that the number of burials was quite high.

Evidence from the remaining excavations indicate episodes of human habitation and land use. Sterile sand layers noted in the stratigraphic analysis may indicate land formation changes during a continuous occupation by humans, or may indicate various episodes of occupation. This can only be determined through additional excavation and geological analyses to determine the nature of land changes in this area. Unique geological processes accelerated by human impact and land use play a significant role in the history and land formation processes located in Tat\'u Village (see Hunt \& Kirch 1988; 1993) and to some extent in Falesa\'o Village. These areas are also subject to periodic natural weather phenomena (e.g., hurricanes and flooding) which have affected land formation, depositional histories, and human populations in Tat\'u and Falesa\'o Villages.

The archaeological findings warrant further considerations. Future investigations will not only contribute to general historic and prehistoric knowledge of the area, but will also help to define the extent of burials located at the northern section of Tat\'u Village. It is likely that these burials are of significant antiquity and are associated with Site AS-11-23, the Papatea Sacrifice/Burial Site. Extreme caution and planning will be required concerning any future activities in this area. The human burial will need to be treated.
according to local Village, ASHPO, and Federal policies and directions, provided waterline construction activities continue as planned.

This investigation along with future investigations will also contribute to the development of knowledge concerning the history and prehistory within this region. Extensive research in this area is still deficient for addressing many research concerns. Information recovered during this investigation and further investigations will contribute to research designs and questions concerned with material culture, chronology, trade, settlement, spatial variation, temporal variation and change.

Based on Phase I and Phase II results, Archaeological Consultant's of the Pacific, Inc. recommends treatment of the human burial (Feature AA of Site AS-11-23) in accordance with ASHPO, Federal and local Village policies providing future alterations to the proposed waterline will continue to impact burial(s) located in this area. In the course of future construction activities, this may include the determination of the boundaries and extent of burials located in the Ta'u Village portion of the subject area and formalized reports of findings and further mitigation concerning historic properties and historic cultural materials in accordance with ASHPO (American Samoa Historic Preservation Office) and ACHP (President's Advisory Council on Historic Preservation) regulations.

Waterline construction activities will likely not have severe impacts on anthropogenic deposits located in the Faleasao section of the subject corridor as few material remains are present. Additional testing within the subject corridor will likely not yield the information necessary for forementioned research concerns due to compliance restrictions. Finally, no historic properties were noted along the higher elevation ridge portion of the subject corridor which separates Faleasao and Ta'u Villages.
Section 2: Physical Setting

Section 2.1: The Samoan Archipelago

The Samoan Archipelago is a politically divided chain of islands in the central South Pacific about 4200km (2600mi) southwest of Hawaii and 1000km (620mi) northeast of Fiji. It is located between Geographic Grid Coordinates 168W to 173W and 13S to 15S. The large islands of Upolu and Savai‘i, along with the small islands of Manono and Apolima, make up the independent nation of Western Samoa. To the east lies American Samoa, a U.S. territory. Tutuila, the largest island in American Samoa, and the small neighboring island of Aunu‘u form a distinct subgroup about 100km (60mi) west of the Manu‘a subgroup of Ofu, Olosega and Ta‘u. Tiny Rose Atoll, about 160km (100mi) further east, represents the easternmost edge of the archipelago. Swains Island, 375km (225mi) to the northwest, though geographically a part of the Tokelau Islands, is the northernmost political possession of American Samoa.

Section 2.2: The Manu‘a Group and Ta‘u Island

Built by volcanic activity along the crest of the easternmost portion of the submarine Samoan Ridge, the Manu‘a subgroup is a typical example of “hot spot” progressive volcanism stretching from northwest to southeast. Ta‘u Island (see Figure 1), having an area of 28.5 square kilometers, represents the largest volcanic center of the subgroup, where a‘a and pahoehoe flows of non-porphyriritic basalt, olivine basalt, picrite basalt, and feldspar-phyric basalts accumulated more than 932m (3056ft) AMSL (above mean sea level) at the summit of La‘a Mountain (Stice & McCoy 1968).

The three Manu‘a islands share a common physiography of a steep sided volcanic shield, narrow (or nonexistent) rockband coastline, fringing coral reef, and a limited area of habitable coastal plain. Potassium-Argon (K-Ar) dates for Ta‘u reported by McDougal (1985), revealing an age of 0.1 million years Before Present (B.P.), are consistent with the steep topography of the island which contrasts the older, more eroded islands to the west.

Ta‘u falls entirely within the Tropical Climate Zone characterized by a maritime climate with abundant rainfall and warm, humid days and nights. Trade winds blow predominantly from the east. Records from the airport on Tutuila (Nakamura 1984) indicate a mean annual rainfall of 3100mm (124”). This average is likely representative of coastal regions on Ta‘u. However, rainfall can vary greatly over small distances, due to topographical differences, with some areas receiving as much as 6200mm (250”) in a year.

Mean daily temperature is reported at 80.0 degrees F (26.7 degrees C)(Nakamura 1984) ranging from a mean daily maximum of 85.4 degrees F to a minimum of 74.6 degrees F. Humidity is generally high during day and night ranging between 80 and 86 percent.
Hurricanes and cyclones strike the islands at irregular intervals, often after prolonged terms of hot weather. The effect of such storms varies depending on the intensity of the storm and the path of the storm in relation to the islands. Evidence of hurricanes in the archaeological records can be found in the form of anomalous layers of gravel, rocks and coral fragments deposited by the high energy storm surge. The effects of such storms on the prehistoric populations of Ta'u were certainly as severe as those which have been historically recorded.

Yuncker (1945) lists 421 plant species for Manu'a, both indigenous and introduced species. The distribution of vegetation areas in Ta'u (with the exception of tropical montane forest and tropical cloud forest) is largely dependent on the amount of human disturbance. This, in turn, is often limited by topography. Additional edaphic, microclimatic, and drainage conditions also have a lesser effect on vegetation distribution.

Along the coastal plains and less steep slopes, human activity has significantly modified the natural vegetation. Shifting gardens of taro (Colocasia esculenta), yam (Dioscorea alata), and other crops form a complex with secondary growth and stands of trees: mainly coconut (Cocos nucifera), breadfruit (Artocarpus communis), papaya (Carica papaya) and banana (Musa sp.). These dominate the lower elevations (Kirch 1993), many having been introduced with the first immigrants to the island.

A large marsh area at the northeast end of Ta'u Village, hypothesized to have been formed by the infilling of a shallow embayment and formation of a broad dune ridge (Hunt & Kirch 1988), is well suited for intensive taro production. A leaf blight struck the taro crop throughout the archipelago in 1993 from which the area is just beginning to recover. As a result, little taro cultivation was observed during the field season in areas normally under intensive cultivation. All of the current survey was conducted in the area deemed 'managed land' (Atlas 1981).

Surrounding the coastal plains, further inland and at a higher elevation, is a zone of 'disturbed forest' (Atlas 1981). Inland of the 'disturbed forest' zone is a vast expanse of the original tropical montane rain forest. At higher elevations, there is tropical cloud forest. The steep slopes and dense vegetation that comprise the majority of the inland area preclude any other than occasional utilization by humans.

Typical of island ecosystems, the fauna of Ta'u is impoverished in terrestrial vertebrates with a somewhat higher diversity of invertebrate species. The highest vertebrate diversity is among the avifauna with several permanent resident species along with seasonal migrants and visiting seabirds. As in other Polynesian islands, the avifauna diversity has been drastically reduced since human occupation began.

There is one indigenous mammal, the fruit bat (Pteropus sambensis). Other mammals, the Polynesian rat (Rattus exulans), dog (Canis familiaris), pig (Sus scrofa), and more recently, the housecat (Felis catus) were all introduced with human colonization. Lizards of the families Gekkonidae and Scincidae are the only other
indigenous terrestrial vertebrates. Marine turtles (*Chelonia mydas* and *Eretmochelys imbricata*) are infrequent visitors today, although they were certainly more common in the past.

Nearly the entire island of Ta'u is surrounded by fringing coral reef 40m to 150m wide. This complex ecosystem supports over 800 species of fish and a wide variety of invertebrates (*Jordan & Seale 1906*) that are heavily exploited by humans. In the open ocean, beyond the coral reef, are a lesser variety of fish, dolphins and, seasonally, whales.

Towards the back, or eastern section, of Ta'u Village is a marsh composed of non-calcareous sediments (see discussion above and below). Towards the back, or southern section, of Faleasao Village, the geology is characterized as non-calcareous sediments composed of alluvium, talus and water born deposits. Further back, the mountains rise steeply and are characterized as the Faleasao Formation: Undifferentiated Tuff Complex of Palagonitized Vitric-Crystal Lapilli Tuff, Breccia, and occasional horizontal lava flows from a cone centered at Faleasao. This is the same formation which forms the steep ridge extending to Utumanua Point which separates Ta'u Village from Faleasao Village (*Atlas 1981*).

The slopes along the Ta'u Village section and the Faleasao Village section of the subject corridor ranges from 0 to 10 degrees (0-20%). The slopes along the ridge section of the subject corridor range from 20 degrees (at only a few locations) and higher. This area mostly includes extremely steep slopes and cliffs.

There are no permanent streams or springs located near the subject corridor. Average annual rainfall is between 4500-5000mm in most locations. The coastal areas may receive slightly less rainfall annually which ranges from 3000-4100mm. The vegetation and soils are characterized as predominantly managed land composed of silty clay loams, sandy clay loams, bouldery loams, and rock outcrops (*Atlas 1981*).

Although fruit trees can be found along the ridge separating the two villages, mixed forest and occasional rock outcrops with no vegetation dominate the area. Village, coastal areas and nearby areas with fairly level surfaces are utilized for fruit trees and garden crops. Coconut and breadfruit trees (*Cocos nucifera* and *Artocarpus communis* respectively), small ornamental gardens, and some grasses are found near many of the households which border the edges of the subject corridor in the village areas. Mixed forest and marsh plants are located in areas to the east of Ta'u Village further away from the coast.

Typical of a geologically young island, the soils of Ta'u are undeveloped and generally shallow in parent materials of vitric-crystal ash, Lapilli tuff, alluvium, talus, and stream deposits.

The subject corridor passes through areas containing and surrounded by four specific soil types (*Atlas 1981*). The soil type which is dominant in the locations close to
the calcareous sand dunes on which Ta’u and Faleasao Villages are located is characterized as Urban land-Ngede bush complex. This soil complex occurs on nearly level coastal plains with slopes from 0-5%. It consists of 40-60% Urban land and 30-50% Ngede bush sand. The percentages vary from area to area. Many of these areas are leveled and filled with coral and coral fragments, sand, cinder, and other soil materials. Ngede bush soil is very deep and excessively drained. It is formed from calcareous sand derived from coral and seashells. Surface layers are composed of brownish gray and brown sand to about 10 cmbs (centimeters below surface) with underlying pale brown and light yellowish brown sand layers which reach a depth of approximately 155 cmbs. Ngede bush soils are highly permeable and available water is low. Effective rooting depth is 155 cmbs or more. Runoff is slow and there is slight hazard of water erosion. In some places this soil is subject to occasional brief periods of flooding during prolonged, heavy rainfall or during high surf.

Within Ta’u Village, in the marsh area located to the east of the subject corridor, the soil is classified as Insak Variant clay loam (Atlas 1981). Elevation ranges from 0-6 m AMSL. This is a deep and very poorly drained soil. It is formed in fine-textured alluvium deposits over coral sand. The surface layer is a dark grayish brown clay loam which extends to about 13 cmbs. In some areas it is a loam or silty clay loam. Below the surface structure is a dark grayish brown silty clay loam which extends to about 80 cmbs. Reddish brown mottles and black concretions and stains are common. The stratum is a light gray coral sand to about 155 cmbs. The soil is further characterized as having a moderately rapid permeability with a moderate available water capacity. The area is subject to brief periods of flooding. These soils are often used for wetland taro, but are dominated by unutilized marshland.

Faleasao Village and some sections of the ridge separating the two villages contain Ofu Variant silty loams. Elevation ranges from 0-150 m AMSL. Slope is generally between 20 and 40%. This is a deep, well drained soil generally found on upland areas. The soils were formed in volcanic ash and, in places, from pyroclastic material. Surface layers are dark brown silty clays which reach a depth of approximately 20 cmbs. Lower layers extend to about 36 cmbs and are composed of dark yellowish brown clay loams. The substrata reach a depth of 155 cmbs or more and consist of highly weathered tuff that crushes easily to sandy loam. The soils have a rapid permeability with a moderate to high available water capacity. These soils mostly support woodland vegetation, although a few areas support subsistence tree crop and taro cultivation.

Along the ridgeline and the mountainous area immediately behind Faleasao Village, Ofu Variant-Rock outcrop complex emerges (Atlas 1981). This occurs on very steep mountainsides and consists of about 65% Ofu Variant silty clay and 25% Rock outcrop. This soil is well drained. It is formed from volcanic ash and, in some places, from pyroclastic material. The surface layer is generally dark brown silty clay which extends to about 20 cmbs. The lower 15 cm is generally a dark yellowish brown clay loam. The substratum extends to 155 cmbs and deeper. This is composed of highly weathered tuff that crushes easily to sandy loam. The permeability is moderate to rapid and the available
water capacity is moderate. The Rock outcrop component is exposed tuff bedrock with little or no vegetation in many places. In most places the vegetation is woodland or mixed forest.

**Geo-morphodynamic Model of Ta’u:**

The geology of the subject property located along the Ta’u Village section of the corridor is characterized as modern beaches composed of unconsolidated fragments of dead and decaying remnants of marine organisms; beach rock being frequently present. This extends north to south at the western side of Ta’u Village along the coast. Directly behind the northern section of Ta’u Village in the marsh area to the east, the geology is characterized as “marsh” which sometimes occur in areas behind constructional benches. Immediately north of Ta’u Village is an undifferentiated tuff complex of palagonitized vitric-crystal Lapilli tuff, breccia, and occasional horizontal lava flows from at least three main cones centered at Paleasaa, To’a and Fa’asemene Cones. Behind Ta’u to the east and bordering both the dune area and the swamp are alluvium, talus and water born deposits. The area is further bordered to the east by volcanic deposits of red vitric-crystal ash, Lapilli tuff, olivine basalt lavas; and to the south by post-caldera volcanics consisting of olivine basalt, picrite-basalt, basalt and hawaiite.

Kirch (1993) has developed a morphodynamic model of coastal terrace formation in relation to human occupation on Ofu that he believes is likely reflected on Ta’u due to their close proximity and similar geological age (see also Hunt & Kirch 1988; Kirch et al. 1990). The model, based on Holocene sea level change, subsidence due to point loading on the oceanic crust, and increased sedimentary budgets in relation to the formation of the coastal terrace would predict that the earliest formation and stabilization of the currently habitable coastal zone at To’aga, Ofu Island occurred about 5000 to 3000 years B.P., with rapid progradation after about 2000 years B.P. (Kirch 1993; Hunt & Kirch 1988; Kirch et al. 1990). It is suggested that the area of coastal terrace available for initial establishment of human habitation (about 3400 to 3200 years B.P.) would have been restricted to a relatively narrow beach zone at the base of steep cliffs (Kirch:1993:40). Similarly, the earliest habitation on Ta’u, which being geologically younger than Ofu and likely to still be in a period of subsidence due to point loading on the earth’s crust, would be situated in a similar geo-morphological location.

Hunt and Kirch (1988) suggest that coastal terrace progradation on Ta’u was accelerated by an increased sedimentary budget due to deforestation and clearings by human occupants. They believe this was especially important for the in-filling of a hypothesized shallow embayment and the formation of the marsh now located behind Ta’u Village and historically used for intensive taro production. Kirch’s morphodynamic model implies that the earliest archaeological deposits will be found at considerable depths, more likely in the former coastal terrace area and adjacent marshlands inland from Ta’u Village. This also has implications concerning early settlement and land use changes throughout time.
The model is supported by Hunt and Kirch's research (1988) and Hunt's excavations as reported by Clark (1990). Clark notes that the test units excavated by Hunt on the highest point of the beach ridge and in an area adjacent to the marsh did not produce significant amounts of cultural remains. No pottery was recovered from these two test units (see also Hunt & Kirch 1988).

Hunt and Kirch excavated three test units in Ta'u Village along a seaward-inland transect in the S'ufaga sector. A pottery-bearing deposit (uncorrected C14 marine shell date 2,330 +/- 50 B.P.) along with preliminary depositional sequencing suggests that recent deposits are located on the seaward portion of the current beach ridge while older deposits are located on the inner slope of the beach ridge (Hunt & Kirch 1988). This accords with their morphodynamic model.

Section 2.3: Location of the Subject Property

The subject corridor is located on Ta'u Island, Manu'a, American Samoa. This includes sections in both Faleasao and Ta'u Counties.

The subject corridor begins from the northern end of Ta'u Village (see Figures 1 and 2) just west of the McConnell-Dowell housing building where the Ta'u Secondary Road and the main road converge. Geographical coordinates at this location are 14°13'45"S by 169°30'59"W (UTM coordinates 8426400mN by 660250mE). The main road winds along the ridgeline separating Faleasao Village from Ta'u Village until it enters the southwestern section of Faleasao Village. This is the location of the Faleasao extent of the subject corridor. Geographical coordinates at this location are 14°13'38"S by 169°30'46"W (UTM coordinates 8426750mN by 660450mE). The waterline will be excavated along the inside (mountainside) of the road. The subject corridor follows the centerline of the proposed waterline from these coordinates and maintains an approximate width of 5-6m. Although the total corridor length is approximately 1,300m, only about a combined 400m length was intensively surveyed and tested. These areas are located at the Ta'u Village and Faleasao Village ends of the subject corridor; further located at the geographical grid coordinates listed above.

Elevation ranges from 3-4m AMSL to approximately 80m AMSL. The areas tested for sub-surface remains were approximately 4-10m AMSL. The tested areas were approximately 100-150m from the coastline.
Section 3: Literature Review

Section 3.1: The Samoan Archipelago

Writings concerning sites of an archaeological nature in the Samoan Archipelago can be traced back to the early missionaries and secular writers of the 19th century. These authors in the course of describing Samoan life at the time, or their experiences in Samoa, on occasion gave general locations for large sites such as abandoned villages and individual sites types such as mounds, raised walk-ways and religious structures (fale aitu) (Pritchard 1866; Turner 1884; Stair 1894, 1895, 1897; Churchward 1887; Churchill 1902; Williams 1984). In addition, some authors explicitly described archaeological sites as such (Sterndale 1890; Stair 1894). Thompson (1927) provides a description of earthmounds in Western Samoa. Kramer’s (1962-3) ethnography of Samoa and Buck’s (1930) volume on Samoan material culture provide ethno-historic information of interest to the archaeologist. In the 1940’s, Freeman (1943, 1944a-c) described a number of archaeological sites. Using ethno-historic material, Watters (1956, 1958), a geographer, constructed a model of early Samoan settlement patterns.

Modern archaeology in Samoa began in the late 1950’s and early 1960’s with Golson’s (1957) preliminary survey and excavations followed by Green and Davidson’s (1969, 1974) extensive surveys and excavations in Western Samoa. Another large survey and excavation project was carried out in Western Samoa in the 1970’s (Jennings et al. 1976; Jennings & Holmer 1980). These surveys provided detailed information on settlement patterns, site types, artifact classes, and a chronology that placed initial occupation of the islands at c. 3000 B.P. In addition, the discovery of Lapita pottery on Upolu in Western Samoa was important information linking the origin of Samoan peoples to migrations from as far away as the Bismarck Islands located north of Papua New Guinea (Jennings 1974, Kirch 1988).

Meanwhile, by comparison, very little archaeological work was carried out in American Samoa. Kikuchi (1963, 1964) conducted a preliminary survey and description of surface sites primarily based on informant testimony and site checking. He and Sinoto conducted some very limited test excavations on Tutuila and Ta’u (Emory & Sinoto 1965). Several contract cultural resource management surveys were conducted by Federal agencies (Ladd & Morris MS 1970, Kikuchi, Silva & Palama MS 1975, McCoy MS 1977). In 1972, Frost (1976, 1978) carried out the next research directed survey. Clark (1980) compiled a site inventory based on a review of previous work, field checking of sites and very limited survey. Little of this research was intensive or systematic and, where it was, it was limited to small project areas tied to compliance.

1993; Best, Leach & Witter 1989; Clark 1989; Herdrich 1991; Herdrich & Clark 1993; Kirch & Hunt 1993). These surveys and excavations created a much needed baseline understanding of site distribution, provided detailed excavations of the first early pottery sites known for the Territory, and contributed to the understanding of geo-morphological processes that are important for locating early sites and understanding site formation processes. It has also stimulated academic interest in the Territory thereby encouraging scholars to seek funding and carry out work independently of the Historic Preservation Office (Sheppard et al. 1989; Best et al. 1992; Best 1994; Clark & Nunn 1994; Clark & Michlovic in press; Clark, Wright & Herdrich in review).

In addition, beginning in 1989 enforcement of the National Historic Preservation Act of 1966 lead to an increase in the number of archaeological compliance projects conducted in the Territory (Kennedy 1989; Clark 1990; Foster 1991a-b; Best 1992a-b, Moore & Kennedy 1995; Herdrich et al. 1995; Latinis et al. 1996; Shapiro & Cleghorn 1994).

Section 3.2: The Manu'a Group and Ta'u

Kramer (1902) visited the Manu'a Islands in 1898 providing some limited information on abandoned villages. He noted a song that mentioned the existence of pigeon catching mounds (tia seu linpe) on Ta'u. Buck (1930:322-24) also provides some information about Ta'u; primarily about a raised road in Fitiuta. The first modern archaeological survey work on Ta'u was conducted by Kikuchi and Sinoto (Emory & Sinoto 1965) who excavated three test units, one in Mata'ana Cave (Site AS-11-34) near Faleasao Village and the other two at "cooking-house sites", also in Faleasao. In 1975, Kikuchi et al. (1975) conducted a compliance survey for the U.S. Army Corps of Engineers at the proposed Ta'u Harbor between Fusi and Fagamota. They located several structure and recommended mitigation be carried out. Their recommendations were not acted on (Clark 1980:10). Clark (1980) visited the Manu'a group in 1980 and recorded eight sites on Ofu, eight sites on Olosega, and 50 sites on Ta'u.

In 1986, Hunt and Kirch (1988)(see also Kirch et al. 1990) carried out test excavations on all three islands as well as additional survey. Their excavations on Ta'u included four test units in Ta'u Village and coring in the marsh behind the Luma section of Ta'u Village. Their excavations provided information on the geo-morphological history of the village (discussed above) and, with the discovery of pottery dating to 2,330±50 B.P., provided initial data that the village had significant antiquity (Hunt & Kirch 1988:168-171).

In 1987 and 1989 Hunt and Kirch focused their efforts on the To'aga site on Ofu by conducting extensive test excavations (Kirch & Hunt 1993, Kirch et al. 1990). Since Hunt and Kirch's 1986 work, Ta'u has been the subject of a series of compliance surveys, monitoring and limited excavations related to the Fitiuta Airport (Hunt 1987), the Ta'u Road (Clark 1990; Best 1992a; Herdrich et al. 1995) and the Faleasao Harbor (Foster 1991a-b). Herdrich et al. evaluated the significance of three known sites (AS-11-59, 60,
and 61) and further identified three additional sites (AS-11-70, 71, and 72). In addition, Herdrich and Clark conducted a brief hypothesis guided survey for star mounds in 1990 (Herdrich & Clark 1993). Furthermore, limited testing and assessment has been conducted for a portion of the Ta'ū Secondary Road reconstruction project (Latinis et al. 1996). This investigation has identified cultural remains, faunal remains, and cultural deposits consisting of dark organic layers with charcoal mottling separated by alternating layers of storm surge deposits and sand along the wave-cut embankment on the seaward side of the Ta'ū Secondary Road.
Section 4: Methods

Section 4.1: Research Design

Section 4.1.1: Previously Recorded Sites

There are several recorded archaeological sites near the corridor of the project area; Ta'u Village (Site AS-11-51) (Hunt & Kirch 1988, Clark 1990) being the largest. Sites recorded in the vicinity of the Ta'u section of the subject corridor include: 1) Ma'a Fe'e Rock (AS-11-16), a 'petrified' squid or legendary throwing contest between two chiefs, 2) The Wall of Vaovasa (AS-11-20), a 5m long and 3.5m high stone wall, 3) the Papatea Sacrifice/Burial site (AS-11-23), 4) the Siaga O Mo'ava site (AS-11-25), a large elliptical stone (unprovenienced) thought to be a fire making stone belonging to the legendary cannibal Mo'ava, 5) Ta'u Bait Cups #2 (AS-11-18), now destroyed, 6) the Tu'i Manu'a House (AS-11-26), retreat of the Tu'i Manu'a Elisara, 7) the Tu'i Manu'a Tomb (AS-11-27), 8) the Tu'i Manu'a Bathing Pool (AS-11-36), 9) Matamuli Pool (AS-11-37), 10) Matafeli Pool (AS-11-38), 11) Ta'u Marsh (AS-11-45), characterized by a terraced swamp, terraces and walls made of coral and rock, ditches, canals, faced terraces, house platforms, ovens, trash pits, and a platform (fale afolau), 12) Terrace #1 (AS-11-44), 13) Terrace #2 (AS-11-47), 14) stone walls (AS-11-48), 15) an enigmatic pit (AS-11-46), and 16) the Ma'alafitu Tupua Site (AS-11-15) which is two rocks thought to represent petrified bodies located along the road between Ta'u and Faleasao Villages. Several additional sites are located within and surrounding Ta'u Village which will not be detailed further as they are well outside of the subject corridor.

Three recorded pools are located in the ridgeline area separating Ta'u and Faleasao Villages (AS-11-40, Tapana Pool; AS-11-41, Utumanu'a Pool; and AS-11-42, Utusegisegi Pool). Sites have been recorded in and near Faleasao Village but tend to cluster towards the northeast section near Tufu and Siulagi Points. However, AS-11-34, Matana Cave, located behind Faleasao Village, has been tested for sub-surface cultural remains (Emory & Sinoto 1965). No indications of occupation were discovered. A few refuge areas have been recorded but not investigated (AS-11-3, Aualuma Village; AS-11-4 Anapo Village, AS-11-5, Faleapa; and AS-11-6). These are thought to be located behind Ta'u and Faleasao Villages.

Three small coral scatters have been identified by Clark (1990), located further east behind Ta'u Village and up the slope of the hill/mountain bordering the back of the Ta'u Village area located along the Ta'u Road (Sites AS-11-59, 60 & 61).

Test excavations and survey at Ta'u (AS-11-51) conducted by Hunt and Kirch (1988) lead to the recovery of 115 sherds of Polynesian Plain Ware, shell fishhooks (one of considerable antiquity but presumed to postdate pottery), basalt tools, and a waterworn tabular-shaped coral pebble with parallel grooves (possible early form of net weight). A polished, drilled bone bead was also recovered in the erosional deposits of the Arnoali (AS-11-52) stream bed. This bead was associated with a plano-convex adze form which
may indicate an early first millennium A.D. age (Hunt & Kirch 1988:175). The bead, of which similar forms are referred to elsewhere from eastern Polynesia as "reel" ornaments (Leach et al. 1979; Kirch & Yen 1982), was the first documented from Samoa at the time of Hunt and Kirch's report (1988). A similar polished bone artifact has recently been recovered from cultural deposits along the Ta'u Secondary Road (Latims et al. 1996). Although "reel" artifacts may indicate an early first millennium A.D. temporal context (as well as certain adze forms), this assumption needs further verification. Chronological information concerning prehistory in Manu'a is still deficient.

Recently reported sites within a kilometer of the research area include three star mounds above Ta'u and Falesafo Villages (Hardrich & Clark 1993) and sites identified by Herdrich et al. (1995).

Section 4.1.2: Archaeological Research Topics in Samoa

Archaeological work conducted in the Samoan archipelago relates to a large variety of research topics. The results of the current work have relevance or potential relevance for four specific research topics discussed below.

The first area of research interest has to do with prehistoric ceramics. Green (1974a-b) has argued that Samoa has a continuous sequence of pottery which begins with the manufacture and use of Lapita pottery, a decorated and statistically thin pottery found in Upolu of Western Samoa. Pottery deriving from Lapita continues through time changing to an undecorated and statistically thicker pottery. Until recently it has been believed that pottery production stopped around 200-300 A.D in Ofu (Kirch et al. 1990). However, Hunt and Kirch (1993) have found pottery at To'aga on Ofu that dates to 400-500 A.D. Hunt and Kirch (1993) argue that their dates simply show a minor variation and is of no consequence for Green's general description of the Samoan pottery sequence. Clark (1993), however, has excavated pottery in Aoa on Tutuila with C14 dates as late as 1400 A.D.

Clark's dates are at least 1000 years later than Green's. This evidence raises a number of possibilities with regards to Green's sequence. First, it may be that there is regional variation within the archipelago and that Green's sequence is generally correct, but certain communities such as Aoa maintained their tradition longer (Clark 1993, 1994). Secondly, Green (1974a-b) did have late dates from his pottery sites, but interpreted pottery in late stratigraphic contexts as having been pulled up by the prehistoric excavation of posts and features. Clark, in a review of radiocarbon dates and contexts for Samoa, argues that Green's interpretation exaggerated the extent of this uplifting process (Clark 1994).

The Ta'u Village section of the subject corridor has a potential for early prehistoric occupation. These archaeological deposits may yield early ceramics. This has implications concerning the establishment of temporal sequences related to pottery use and styles in this area of Manu'a.
The second research topic has to do with the extent of inter-island trade of material for stone tools. Recently, a number of authors have conducted element analyses on stone tools found throughout the Pacific and on the source rock from known quarries on Tutuila. Best et al. (1992) have shown that some stone tools found in Tonga, Fiji, the Solomon Islands, the Tokelau Islands, and the Cook Islands have originated from Tutuila quarries. They argue, in particular, that these originated from the quarry known as Tataga-matau near Leone.

In addition, Weisler (in Kirch & Hunt 1993) has conducted analysis on stone tools in Manu'a and compared them to rock found at Tataga-matau. He concluded that 50% of the tools analyzed from Ta'u were from Tataga-matau. Most recently Clark, Wright and Herdrich (in press) have conducted analyses of basalt from all the major quarries on Tutuila as well as a detailed literature review. One of the findings from that analysis is that there is an overlap between the elemental percentages found in stone at different quarries. It may not be possible to pin-point exactly which quarry any given tool came from, only that it came from a particular island. However, ACP has suggested that analysis of the trace element composition may differentiate between quarries on some islands (e.g., quarries located on Tutuila Island (Moore & Kennedy 1995)).

Furthermore, based on recovered lithic implements from Hunt and Kirch's research in Manu'a (1988), there may be a distinct lithic technology or tool kit represented in Manu'a which differs from other Samoan lithic tool kits (Hunt & Kirch 1988). This difference may be reflected in distributions of tool forms. Findings may confirm or contradict this suggestion.

The third research focus concerns the distribution of star mounds (*i'a 'ave) in Manu'a. Hunt and Kirch (1988:165–166) in their survey (which was primarily coastal) found no star mounds on the Manu'a Islands and made the strong claim that there were no star mounds anywhere on Ta'u or in Manu'a in general. Yet, Herdrich and Clark (1993) demonstrated that this was incorrect when they identified three star mounds above Ta'u Village and Faleasao. Based on this information, Herdrich and Clark (1993) claimed that the distribution pattern of star mounds, on either high ridge tops or in uninhabited lowland rainforest areas, found throughout Samoa, could also be expected to be reflected on Ta'u. A star mound (Site AS-11-71) that was identified during the 1995 investigation (Herdrich et al. 1995) lends support to this hypothesis.

The final topic of concern is the pattern of settlement distribution and land-use. Previous research in Samoa has shown a settlement pattern that started with coastal settlement. Following this, settlement systems were developed with the population moving inland. Another shift occurred in the late prehistoric/early historic period, from inland settlements back to the coast (Davidson 1969, 1974). These sorts of shifts may have corresponded with changes in subsistence strategies, targeting either coastal or inland resource zones. If this pattern holds for Manu'a, there is the potential for the presence of multiple coastal settlements throughout time with a possible hiatus of limited coastal settlement in between these periods. Furthermore, based on morpho-dynamic models
discussed above, settlement shifts are expected to have occurred due to landform changes and infilling of the previous coastal areas which have formed the current marsh area behind Tatu Village.

Section 4.1.3: Current Investigations and Research Goals

The primary purpose of the current investigations was to assess the effect of construction activities through the identification and evaluation of historic and prehistoric archaeological sites within the subject corridor as required by Section 106 of the National Register of Historic Places as amended, particularly Part 800 concerning the protection of historic and cultural properties. This research is important with regards to both Territorial and regional research goals.

Territorial Goals:

Territorial goals include the following:
1) Development of an inventory of historic and prehistoric archaeological sites.
2) Evaluation of historic and prehistoric sites relative to the criteria for the National Register of Historic Places.
3) Nomination of eligible properties to the National Register of Historic Places.
4) Protection of significant historic and prehistoric archaeological properties from potentially negative impacts.

The research contained in this report contributes to these territorial goals in the following ways: 1) By conducting a systematic survey of the subject corridor, any historic or prehistoric sites within the corridor will be identified; 2) By conducting a systematic evaluation of sites identified in the current survey area, a determination of their significance relative to the National Register of Historic Places criteria will be able to be made; 3) The evaluation of known sites is the first step in the process of nominating sites to the National Register of Historic Places; 4) An assessment of the impact of the waterline on sites identified as significant will be made and, where necessary, recommendations will be made for their protection. In addition, providing the location of significant archaeological sites will contribute to the protection of these sites in the event of future developments.

Regional Goals:

Regional goals include the following:
1) Gaining an understanding of trade relationships between various island groups (Best et al. 1990; Weisler 1993; Clark, Wright & Herdrich in review).
2) Polynesian Origins: Constructing a sequence of migration and colonization of island groups (Kirch & Green 1987).
3) Documenting settlement patterns as evidence of the evolutionary trajectory of island societies in order to gain an understanding of evolutionary mechanisms.
effecting the development of societies throughout the Pacific (Goldman 1970, Kirch 1984; Graves & Green 1993).

The research contained in this report contributes to these regional goals in the following ways: 1) Any collected pottery and lithic material can be made available for analysis to determine whether they were of local origin or are made of exotic materials thereby indicating the existence and extent of inter-island trade networks with these materials, 2) Future analysis of pottery sites may provide important evidence for understanding the sequence of migration and colonization in the Pacific, and 3) The identification and analyses of sites are important contributions in understanding the evolution of Samoan settlement patterns. A clearer understanding of Samoan settlement patterns will eventually lead to a better understanding of regional evolutionary mechanisms and trajectories.

Section 4.2: Archaeological Methods

Due to the fact that this investigation is compliance oriented the investigators were not guided by an explicit theoretical orientation other than a very general scientific and evolutionary perspective. Also, given that this is a compliance investigation it was not guided by explicit hypothesis testing. However, some of the current findings may contribute to and have implications for hypotheses that are currently being discussed in the literature. The information collected during this survey has potential implications for the recent work discussed above concerning pottery, basalt tools, additional cultural materials and artifacts, features and sites, settlement and chronology.

The current investigations were conducted under the supervision of the Principal Investigator, Joseph Kennedy, M.A. Fieldwork was carried out by the Field Supervisors, James R. Moore, B.S. and D. Kyle Latinis, M.A. during December 1995. Special thanks is given to the people of Ta'u for their aid and cooperation.

The limitations of the investigation include the following:

1) First and foremost this investigation was a compliance oriented project. Therefore, research was limited to the narrow corridor along the road. Had the investigations been guided only by research goals, the survey area would have had a wider scope and different survey techniques would have been used. In addition, Ta'u Village (Site AS-11-51) and Falensao Village would have been tested with larger numbers of test units along a systematic series of transects.

2) This compliance project was defined by the scope of work as Phase I (survey) and Phase II (evaluation) which limited the investigations to only conducting limited excavations for evaluation purposes. Once enough data was collected to evaluate a site it was not possible to collect additional data which would have contributed to answering purely research oriented questions.
Methodological Strategies:

The methods employed were: 1) pedestrian and visual survey, 2) test excavations (trenches) at three locations using a backhoe, including screening of deposits with 1/4 inch screen to recover cultural and faunal remains, and 3) test excavations in the form of two 1m by 2m pits, including screening of deposits with 1/4 inch screen to recover cultural and faunal remains. The test excavations were conducted in order to identify and recover cultural materials, identify and assess the stratigraphy of the deposits, and recover soil samples from all stratigraphic layers.

The surface survey was expected to locate and identify any potential archaeological surface sites. Test excavations were expected to yield cultural and faunal remains and stratigraphic profiles. Analyses are useful for reconstructing land use and settlement changes, the nature of specialized activity areas, the depositional history of land formation processes, and the further contribution of knowledge to the issues discussed above concerning archaeological goals and research.

Surface survey was conducted by a pedestrian assessment of the subject corridor. Test excavations were conducted using a backhoe in three locations. Two of these were located in Ta'u Village, while the other was located in Faleasao Village. Excavated deposits were screened with 1/4 inch screen. All recovered materials were sent to ACP laboratory facilities for further analysis. Stratigraphic profiles were drawn in the field. Soil samples were taken from each stratigraphic layer and sent to ACP laboratory facilities for further analyses.

Two additional test units were manually excavated using shovels and trowels. One of these units was located in Ta'u Village, while the other unit was located in Faleasao Village. All excavated deposits were screened with 1/4 inch screen. All recovered materials were sent to ACP laboratory facilities for further analyses with the exception of the human burial remains which were left in situ and covered immediately following their discovery. Stratigraphic profiles were drawn in the field for each unit. Soil samples were taken from each stratigraphic layer and sent to ACP laboratory facilities for further analyses.

ACP and the Territorial Archaeologist concurred that sub-surface testing along the ridgeline between Ta'u Village and Faleasao Village was unnecessary. Construction of the existing road has already impacted the area. The waterline will be excavated in sections which have already been disturbed along this portion of the subject property. Furthermore, there is little possibility of the existence of significant sub-surface cultural deposits given the geology, depositional history, and steep slope of this area.
Faunal remains were sent to Dr. Alan Ziegler for further identification and analysis.

All materials are curated at ACP facilities, 59-624 Pupukea Road, Haleiwa, Hawaii 96712.
Section 5: Archaeological Findings

Section 5.1: Survey

Pedestrian survey along the entire subject corridor identified no historic surface sites or features. The lower elevation flat areas in Ta’u Village and Faleasao Village had depositional and soil qualities which warranted further assessment. These were the locations of sub-surface testing. If sub-surface cultural remains were present along the subject corridor, it was expected that these would be the most likely locations.

The subject corridor along the ridge area separating the two villages had already been disturbed due to previous road construction activities. Furthermore, the steep slope and rockiness of the terrain prevents substantial accumulation of deposits with the exception of some weathered rock and dead organic material. Deep deposits were virtually non-existent. Human occupation or residence on such a steep slope is not likely. The area was fairly densely foliated with some managed fruit trees, but predominantly mixed forest.

The areas outside of the subject corridor, further inland and up the slopes of the cliffs level out to some degree. These areas are likely to yield cultural remains and deposits if they exist along the ridgeline. However, this area is well outside the impact zone of the subject corridor.

Section 5.2: Test Excavations

The excavation of Test Unit One (TU1) in Ta’u Village revealed an in situ human burial. The remaining test trenches and test unit yielded little artifactual material, a small amount of faunal material, and stratigraphic profiles indicative of human occupation and land use. These will be detailed below.

Trench 1: Trench 1 (T1) was located along the curve of the main road in Ta’u Village which leads to Faleasao Village. T1 was 31m, 65 degrees MN (magnetic north), from the southeast corner of the McConnell-Dowell (McDow) housing facility (see Figure 3). Total trench length was 8.8m at 355-175 degrees MN. T1 was excavated to a maximum depth of 290cmbs (centimeters below surface). A dense banana tree garden was located at the northeastern border of the subject corridor. The surface was covered with garbage and recent historic debris. Five stratigraphic layers were encountered (see Figure 4).

Layer I extended from the surface to approximately 25-55cmbs. Layer I was composed of a brown (10YR 5/3) sand.

Layer II extended from the base of Layer I to approximately 75-80cmbs. Layer II was composed of a dark brown (7.5YR 3/3) sandy clay loam. Layer II contained some charcoal. This layer was probably an anthropogenic deposit.
Figure 4: Trench 1, East Face

Layer I: 10YR 5/3, brown sand.
Layer II: 7.5YR 3/3, dark brown sandy clay loam.
Layer IV: 10YR 2/2, very dark brown sandy clay.
Layer V: 10YR 7/4, very pale brown sand.

Total Length 8.8m
Maximum Depth 290cmbs
Layer III extended from the base of Layer II to approximately 80-95cmbs. Layer III was composed of a dark yellowish brown (10YR 3/4) sandy clay loam.

Layer IV extended from the base of Layer III to approximately 150-160cmbs. Layer IV was composed of a very dark brown (10YR 2/2) sandy clay. Layer IV became sandier at the base, much like a diffuse layer distinction.

Layer V extended from the base of Layer IV to approximately 230cmbs. This was the base of the excavated deposits. However, Layer V likely extended further. Layer V was composed of a very pale brown (10YR 7/4) sand. This appeared to be a sterile, basal layer.

Faunal remains recovered from T1 (refer to Table 1) included bones from indeterminate large mammals and pig (Sus scrofa). This included a jaw fragment and one tooth. Recovered historic materials included six fragments of glass, one fragment of recent ceramic and one piece of oxidized iron (refer to Table 2).

**Trench 2:** Trench 2 (T2) was located 10.4m south (145 degrees MN) from the southern end of T1. T2 had a maximum length of 8.4m and was oriented 140-320 degrees MN. T2 was excavated to a maximum depth of 230cmbs. The surface was covered with garbage and recent debris. Five stratigraphic layers were encountered (see Figure 5).

Layer I extended from the surface to approximately 45-50cmbs. Layer I was composed of a yellowish brown (10YR 5/4) sand.

Layer II extended from the base of Layer I to approximately 75-80cmbs. Layer II was composed of a dark brown (7.5YR 3/3) loamy sand.

Layer III extended from the base of Layer II to approximately 80-95cmbs. Layer III was composed of a black (7.5YN 2/0) loamy sand.

Layer IV extended from the base of Layer III to approximately 150-160cmbs. Layer IV was composed of a black (7.5YN 2/0) sandy clay loam.

Layer V extended from the base of Layer IV to approximately 230cmbs. This was the extent of the excavation. Layer V appeared to be a sterile, basal sand layer similar to Layer V from T1. Layer V likely extended further. Layer V was composed of a very pale brown (10YR 7/3) sand.
Figure 5: Trench 2, Southwest Face

SE (2m) NW (5m)

0 100 200 300cm

surface

Layer I
Layer II
Layer III
Layer IV
Layer V
unexcavated

Total Length 8.4m
Maximum Depth 230cm

Layer I: 10YR 5/4, yellowish brown sand.
Layer II: 7.5YR 3/3, dark brown loamy sand.
Layer III: 7.5YN 2/0, black loamy sand.
Layer IV: 7.5YN 2/0, black sandy clay loam.
Layer V: 10YR 7/3, very pale brown sand.
Layers III and IV from T2 had significantly different qualities from the same layers encountered in T1. Both Layers II and III contained charcoal flecking, indicative of anthropogenic deposits. This warranted further, more careful assessment. Therefore, it was decided that this would be the location of Test Unit 1. The upper layers and basal layers, however, appeared to be relatively similar in both cases.

Recovered material from T2 included plastic, aluminum, scrap metal, and tar covered roofing shingles (refer to Table 2). No faunal remains or additional cultural remains were recovered.

**Trench 3**: Trench 3 (T3) was located in Paleasao Village, 14.5m up the road (west) from the mountain side of the last house along the ROW (Right-of-Way). T3 was placed along the mountain side of the existing road. The total trench length was 8m at an angle of 30-210 degrees MN. T3 was excavated to a maximum depth of 230cmbs. Four layers were encountered (see Figure 6).

Layer I extended from the surface to approximately 50cmbs. Layer I was composed of a dark yellowish brown (10YR 3/4) loamy sand. This appeared to be fill from the road.

Layer II extended from the base of Layer I to approximately 85cmbs. Layer II was composed of a white (10YR 8/2) sand. This layer also appeared to be composed of some road fill.

Layer III extended from the base of Layer II to approximately 120cmbs. Layer III was composed of a very dark brown (10YR 2/2) sandy clay.

Layer IV extended from the base of Layer III to approximately 230cmbs. Excavation was halted at this level. Layer IV appeared to continue further. Layer IV was composed of a very dark grayish brown (7.5YR 3/2) sandy clay and appeared to be barren of any cultural materials.

Although no cultural materials were recovered from Layers III and IV, these layers contained considerable amounts of charcoal flecking, suggesting human activity. Recovered historic debris from other layers included aluminum cans, rubber, plastic and metal foil (refer to Table 2). Additional remains included a large piece of coral and a basalt flake.
Figure 6: Trench 3, East Face

Layer I: 10YR 5/4, yellowish brown sand.
Layer II: 7.5YR 3/3, dark brown loamy sand.
Layer III: 7.5YN 2/0, black loamy sand.
Layer IV: 7.5YN 2/0, black sandy clay loam.
Test Unit I: Test Unit I (TU1) was located 8.4m from the southeast end of T2 (310 degrees MN) and 44.4m (96 degrees MN) from the southeast corner of the McDow housing facility. T2 measured 100 X 200cm and was excavated to a maximum depth of 95cmbs. Three layers were encountered (see Figure 7 and Appendix A). The lower half of Layer I appeared to be inter-mixed with Layer II. However, the boundary between Layer II and Layer III was quite distinct.

Approximately 15cm into Layer III a human burial was encountered (see Figure 8) (Feature AA of Site AS-11-23). This was clearly below the darker deposit which composed Layer II. It appears that the remains were buried prior to the formation of Layer II. There was no evidence that Layer II had been disturbed or intruded to bury the remains. Excavation was halted after the discovery of the human burial. All skeletal material was covered and the test unit was filled shortly after a brief assessment.

Layer Ia extended from the surface to 40cmbs. Layer Ia was composed of a dark brown (7.5YR 3/2) sandy loam. This layer appeared to be fill from the existing road construction.

Layer Ib extended from the base of Layer Ia to approximately 60cmbs. This appeared to be partially inter-mixed with Layer II. Layer Ib was composed of a black (2.5YR 2.5/0) sandy clay loam. This layer also appeared to be part of the existing road fill.

Layer II extended from the base of Layer Ib to approximately 80cmbs. Layer II was composed of a black (7.5YR 2/0) sandy loam. Layer II contained some charcoal and pig bone (Sus scrofa). The charcoal in this layer suggests human activity.

Layer III extended from the base of Layer II to approximately 95cmbs. Layer III was composed of a dark brown (7.5YR 3/3) sand. Significant amounts of coral and rock were mixed with this deposit as well. At the base of this layer a human burial was encountered. The remains were discovered at the southwest corner of the test unit. The skull was positioned facing up and was directed north. It appears that the individual was buried in an extended position, laying on the back. The remaining skeletal material appears to extend underneath the road. More detailed information is discussed below concerning the burial.

Other materials noted include animal bone, echinoderm spines, coral, shell opercula and one piece of glass which likely fell into the deposits from the surface debris (refer to Table 2). However, this has implications concerning the date of the burial. If the glass is indeed included in the burial deposit, this may indicate an historic burial.
Figure 7: Profile of Test Unit I

Layer Ia: 7.5YR 3/2, dark brown sandy loam.
Layer Ib: 2.5YR 2.5/0, black sandy clay loam.
Layer II: 7.5YR 2/0, black sandy loam.
Layer III: 7.5YR 3/3, dark brown sand.
Test Unit 2: Test Unit 2 (TU2) was located in Faleasao Village, 54.8m (29 degrees MN) from the northeast end of T3. This location was on the east shoulder of the main road and only a few meters past a secondary road leading west behind the village. The dimensions of TU2 were 100 X 200cm. TU2 was excavated to a maximum depth of 220cmbs. Seven layers were encountered (see Figure 9 and Appendix A).

Layer I extended from the surface to approximately 35cmbs. Layer I was composed of a dark brown (7.5YR 4/4) sand.

Layer II extended from the base of Layer I to approximately 55cmbs. Layer II was composed of a black (7.5YN 2/0) sandy loam.

Layer III extended from the base of Layer II to approximately 85cmbs. Layer III was composed of a dark brown (10YR 3/3) loamy sand. Coral fragments and some rock were present in the matrix.

Layer IV extended from the base of Layer III to approximately 95cmbs. Layer IV was composed of a brown (10YR 5/3) sand. This layer appeared to be a finer grained sterile layer.

Layer V extended from the base of Layer IV to approximately 107cmbs. Layer V was composed of a very dark grayish brown (10YR 3/2) sand. Coral fragments and some rock were present in the matrix. This layer appeared to be similar to Layer III.

Layer VI extended from the base of Layer V to approximately 125cmbs. Layer VI was composed of a distinctly dark (almost black) very dark brown (10YR 2/2) sandy loam.

Layer VII extended from the base of Layer VI to approximately 220cmbs. Layer VII was composed of a pale brown (10YR 6/3) sand. The base of Layer VII was not encountered.

Recovered faunal materials include fish bone from Layers I, II, and VI (refer to Table 1). Other recovered materials include echinoderm spine(s), coral fragments and plastic from Layers I and II (refer to Table 2). Layer VI produced two basalt fragments (refer to Table 2). Layers II and VI contained charcoal flecking characteristic of anthropogenic deposits.
Figure 8: Top Plan of Burial Feature AA of Site AS-11-23

Skeletal Remains Encountered 95 cmbs in Layer III
Figure 9: Profile of Test Unit 2

North Face

W
0 50 100 150 200 cm

Surface

Layer I

Layer II

Layer III

Layer IV

Layer V

Layer VI

Layer VII

unexcavated

250 cm

Anthropogenic Layers
Characterized by Charcoal Mottling

250 cm

Layer I: 7.5YR 4/4, dark brown sand.

Layer II: 7.5YN 2/0, black sandy loam.

Layer III: 10YR 3/3, dark brown loamy sand.

Layer IV: 10YR 5/3, brown sand.

Layer V: 10YR 3/2, very dark grayish brown sand.

Layer VI: 10YR 2/2, very dark brown sandy loam.

Layer VII: 10YR 6/3, pale brown sand.
Table 1: Faunal Remains

<table>
<thead>
<tr>
<th>Unit</th>
<th>Layer</th>
<th>Class</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>TU1</td>
<td>Layer II</td>
<td><em>Sus scrofa</em></td>
<td>1.9g</td>
</tr>
<tr>
<td>TU2</td>
<td>Layers I/II*</td>
<td>Diodontid</td>
<td>0.8g</td>
</tr>
<tr>
<td></td>
<td>Layer VI</td>
<td>Fish</td>
<td>0.5g</td>
</tr>
<tr>
<td>Trench 1</td>
<td>Sift</td>
<td><em>Sus scrofa</em></td>
<td>8.1g</td>
</tr>
<tr>
<td></td>
<td>Sift</td>
<td>Large mammal</td>
<td>10.0g</td>
</tr>
</tbody>
</table>

*This material was recovered at the base of Layer I and the beginning of Layer II.
<table>
<thead>
<tr>
<th>Unit/Trench</th>
<th>Layer</th>
<th>Material</th>
<th>Additional Description</th>
<th>Count</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trench 1</td>
<td></td>
<td>Glass Fragments</td>
<td>Brown</td>
<td>5</td>
<td>35.5g</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Blue</td>
<td>1</td>
<td>8.5g</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ceramic</td>
<td>Recent</td>
<td>1</td>
<td>27.5g</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Iron</td>
<td></td>
<td>1</td>
<td>2.0g</td>
</tr>
<tr>
<td>Trench 2</td>
<td></td>
<td>Plastic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Aluminum</td>
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<td></td>
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<td>Metal</td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td>Shingles</td>
<td>Tar</td>
<td></td>
<td>24.0g</td>
</tr>
<tr>
<td>Trench 3</td>
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<td>Coral</td>
<td></td>
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<td>129.0g</td>
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<tr>
<td></td>
<td></td>
<td>Lithic Flakes</td>
<td></td>
<td></td>
<td>2.0g</td>
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<tr>
<td></td>
<td></td>
<td>Aluminum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rubber</td>
<td></td>
<td></td>
<td>27.5g</td>
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<td></td>
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<td>Plastic</td>
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<td></td>
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<td></td>
<td></td>
<td>Metal Foil</td>
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</tr>
<tr>
<td>TU1</td>
<td>Layer III</td>
<td><em>Turbo sp.</em> Opercula</td>
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<td>4.0g</td>
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<tr>
<td></td>
<td></td>
<td>Coral</td>
<td></td>
<td>1</td>
<td>7.5g</td>
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<tr>
<td></td>
<td></td>
<td>Echinoderm Spines</td>
<td></td>
<td>3</td>
<td>7.0g</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Glass Fragment</td>
<td>Brown (intrusive?)</td>
<td>1</td>
<td>7.3g</td>
</tr>
<tr>
<td>TU2</td>
<td>Layers II/III*</td>
<td>Echinoderm spine</td>
<td></td>
<td>1</td>
<td>5.5g</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Coral</td>
<td></td>
<td>1</td>
<td>6.5g</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Plastic</td>
<td></td>
<td>1</td>
<td>3.5g</td>
</tr>
<tr>
<td></td>
<td>Layer VI</td>
<td>Lithic Flakes</td>
<td></td>
<td>2</td>
<td>41.5g</td>
</tr>
</tbody>
</table>

* This material was recovered at the base of Layer II and the beginning of Layer III.
Section 5.3: Further Assessment of the Burial

The skeletal remains were discovered on the property of Mr. Junior Vasega. Mr. Vasega confirmed that the area was a burial location of related ancestors, though exact locations were unknown. He further suggested that the number of burials was quite high. Furthermore, this area of Ta'u Village is locally know for its association with ghosts (catu), spirits and possible burials. Many powerful people are thought to be buried in the vicinity.

The remains discovered in TUI indicate a single burial (currently ascribed Feature AA of Site AS-11-23). Skull fragments, the mandible, the left clavical and the left scapula were encountered during excavations. The remains were moderately well preserved, but appeared to be significantly fragile. No further excavation was attempted after the discovery. It was also decided not to further brush deposits from the recognized bones.

The remains included occipital skull fragments near the orbits, parietal skull fragments, maxillary skull fragments with teeth included, a complete mandible with all teeth included (including fully erupted third molars), a clavicle and a fragmented scapula. No boundaries of a burial pit were evident. It appears that the individual was buried prior to the deposition of Layer II.

The skull, clavicle and scapula were positioned such that the individual was facing up; further indicating that the individual had likely been buried in an extended position, lying on the back. There is a possibility that the burial may have been flexed. However, the lack of hand and upper body long bones in the chest area below the skull, and the position of the scapula and clavical in relation to the skull indicate that the burial was more likely extended. The head was directed north (see Figure 8). The rest of the skeletal remains appear to extend underneath the road. Although the upper skeletal remains are in an undisturbed deposit, it is impossible to determine if any additional skeletal remains underneath the road have been disturbed or remain intact.

All third molars were erupted and fairly well worn, indicating a mature adult age. The incisors and canines were well worn. All mandibular teeth were occluded. The left molars were more heavily worn (almost flat). The right molars were worn on the medial edges somewhat unevenly. The buccinator grooves were large, deep and robust. The Mylohyoid groove was deep and robust as well with a large mandibular foramen. Mental foramina were difficult to assess due to the accumulation of soil. However, the mental eminence protruded significantly giving a robust appearance to the mandible. Overall, the mandible appeared thick and robust, but not exceptionally deep along the corpus. Both left and right ascending Rami were present. However, both mandibular condyles were missing. Shoveling was noted on the maxillary incisors. No shovelling was noted on the mandibular incisors.
Section 5.4: Faunal Analysis

Faunal Analyses were conducted by Alan C. Ziegler, Ph.D., Zoological consultant (see Appendix B). The faunal material recovered was rather limited. Large mammal bones, including pig (*Sus scrofa*) were recovered from T1. One of these fragments had evidence of being 'metal sawed'. This indicated deposition in the post-Contact period. A partial dentary of a 3-4 month old pig (*Sus scrofa*) was also recovered from T1. TU2 yielded Diodontid bone from Layers I and II and also fish bone from Layer IV. TU1 also yielded pig (*Sus scrofa*) bone from Layer II (note: in the Ziegler report included in Appendix B, the layers from TP1 are mis-represented and have been corrected as appears in Table 1). Few conclusions can be drawn from the available faunal evidence.

Section 5.5: Artifact Analysis

Few conclusions can be drawn from the available artifacts recovered from the trenches and test units. The total material was rather limited (refer to Table 2). The glass fragments, metal, aluminum, and plastic clearly have a recent historical origin. This suggests that some of the upper layers may have been recently deposited. The glass fragment in Layer III of TU1 is likely intrusive; falling into the excavation unit from the surface debris. The lithic material recovered from Layer VI in TU2 appears to have some evidence of human introduction into the location. These pieces appear to be unutilized flake fragments typically found in chipping stations or lithic workshops. However, the deposit was barren of extensive flake debris which suggests that this was not a work floor. The pieces also do not have any indications of use damage or additional treatment such as grinding or polishing.
Section 6: Discussion

Archaeological investigations along the proposed corridor for the Ta'ū-Faleasao waterline project has indicated that significant sub-surface cultural remains are present. This warrants further investigation.

The most immediate concern is the identification of an in situ human burial in the Ta'ū Village section of the proposed corridor. This was located in Test Unit 1. The burial is positioned such that the individual was laying on the back with the head oriented north. The individual was of a mature adult age. Cursory assessment of the dental remains indicate full eruption of the third molars and significant tooth wear. This indicates a relatively old age at death. The remaining skeleton extends beneath the existing road. It is unknown if the additional remains have been previously disturbed by road construction.

The burial is further positioned beneath a dark layer underneath a layer of existing road fill. This layer has no indication of being intruded. The remains were likely buried prior to the deposition of the above layers. There were no indications of a burial marker or pit.

Local testimony suggests that additional burials are located in the vicinity. Furthermore, local testimony indicates that these burials are the remains of significant individuals. This area is thought to be an ancestral burial location. Furthermore, it is a well known location for ghosts and spirits according to local sources. It must also be stressed that this is the location of the Papatea Sacrifice/Burial Site (AS-11-23) and also that the tomb of the Tui Manu'a (AS-11-27) is located not far from the subject corridor in Ta'ū Village.

That test trenches 1 and 2 did not yield any skeletal remains is likely due to mere chance. If the waterline continues through this area, then this area needs further considerations and acceptable treatment of the burial(s) in this location. The remains recovered in Test Unit 1 were less than one meter below the surface. Construction activities will impact deposits well below this level.

Faunal and artifactual analyses revealed little information other than suggesting that many of the sub-surface deposits had evidence of human occupation from both pre- and post-Contact temporal contexts. However, lithic and faunal remains in the lower deposits indicate human occupation associated with some of the deeper deposits. A larger sample will be needed to make more specific conclusions.

Stratigraphic analyses of the deposits in both Faleasao and Ta'ū Villages indicate multiple periods of human occupation and land use. These are separated by sterile layers. These sterile layers are generally beach sand, coral fragments and occasional rock fragments. These may have been deposited as storm surge deposits. However, this may indicate periods of abandonment or settlement shifts. Further investigation is warranted to understand the stratigraphic profiles of these deposits in relation to human occupation.
settlement and land use in these areas. However, further archaeological testing along the current subject corridor will likely not yield the information necessary to address these research concerns. Areas well outside the subject corridor would need to be tested. This is not possible due to the compliance nature of this project which restricts archaeological investigations to the spatial limitations of the subject corridor. The three test trenches and two test units do not cover an area wide enough, nor do they compose a sample large enough to make more specific conclusions. Furthermore, Waterline construction activities will likely have little adverse effect, with the exception of the human burial (Feature AA of Site AS-11-23), in light of the paucity of cultural materials located within the subject corridor.

The ridge area separating the two villages did not yield any notable surface remains. Sub-surface testing was not conducted at these locations as deposits are not significantly deep and significant cultural remains have not been previously identified. Furthermore, the subject corridor at this location has been thoroughly impacted already from previous road construction activities. Finally, the slope and condition of this area likely prevented the development of habitation sites or specialized activity areas.
Conclusion

Archaeological Consultants of the Pacific, Inc. (ACP) has conducted a Phase I and Phase II cultural resource investigation for the Ta'u-Faleasao Waterline Project located on Ta'u Island, Manu'a, American Samoa. This was conducted at the request of Mr. Wilfredo Carreon of the American Samoa Power Authority (ASPA).

The areas located at lower elevations in the northern section of Ta'u Village and the western section of Faleasao Village were tested for sub-surface cultural remains. The testing in Ta'u Village revealed an *in situ* adult human burial approximately 95cm below the surface. Evidence and local testimony suggests additional burials are located in this area. Further considerations of the burial and the site (AS-i 11-23) are necessary, including treatment in accordance with local Village, Territorial (ASHPO), and Federal regulations will be necessary. Monitoring is recommended during the course of construction activities in this location. Site AS-11-23 meets criteria A (site reflects major trends in history) and D (site likely to yield important scientific data) for site significance evaluations (see Table 3) based on criteria defined in the National Historic Preservation Act (section 106) and Advisory Council Regulations (36 CFR Part 800).

All sub-surface testing and stratigraphic analyses in both Faleasao and Ta'u Villages indicate multiple periods of human habitation and land use. However, faunal and artifactual remains were relatively sparse. Therefore, the results are relatively inconclusive for determining specific information. This is likely due to limited sample size rather than reflecting limited previous human impact and land use.

The subject corridor at higher elevations along the ridge separating Faleasao and Ta'u Villages revealed no surface archaeological remains. Furthermore, there is little chance of the existence of significant sub-surface cultural remains due to the topography and nature of the subject corridor in this area.

Archaeological Consultants of the Pacific recommends mitigation for the burial located in the Ta'u Village portion of the subject corridor providing that future construction activities will disturb the remains. The present plans will have an adverse effect. The human burial (Feature AA of Site AS-11-23) located in the Ta'u Village section of the subject property will need to be attended to in a satisfactory manner in accordance with Federal (Section 106 of the NHPA; ACHP 36 CFR Part 800), Territorial, and local Village recommendations. Although anthropogenic deposits were noted in the Faleasao Village section of the subject corridor, construction activities will likely have no adverse effect. Additional testing, however, would provide important information for research concerns directed towards settlement shifts, land use and human occupation. Subsequently, Faleasao Village was assigned a site number (AS-11-76). AS-11-76 meets criteria D (see Table 3). However, testing to recover the necessary data to answer the questions listed above would require testing along transects well outside of the subject property. Testing along the subject corridor will not likely yield the information necessary for these research concerns. Finally, ACP has made a 'no historic properties'
determination (see Advisory Council Regulations 36 CFR Part 800.4 (a-d)) for construction activities in the subject corridor only along the higher elevation areas which follow the road along the ridge separating Fa'asaa and Ta'u Villages.

### Table 3: Summary of Site Significance Evaluations

<table>
<thead>
<tr>
<th>Site &amp; Feature</th>
<th>Description</th>
<th>Function</th>
<th>SignificancePrior to IS</th>
<th>SignificanceAfter IS</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS-11-23</td>
<td>Papatea Sacrifice/</td>
<td>Ceremonial/</td>
<td>A &amp; D</td>
<td>A &amp; D</td>
</tr>
<tr>
<td></td>
<td>Burial Human Burials</td>
<td>Ritual Cemetery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AS-11-76</td>
<td>Fa'asaa Village: Anthropogenic Deposits</td>
<td>Habitation/ Agricultural Land Use</td>
<td>D</td>
<td>D</td>
</tr>
</tbody>
</table>

**Code For Significance Evaluation Criteria**

- **NS** Not Significant
- **NLS** No Longer Significant
- **A** Site Reflects Major Trends in History
- **B** Site is Associated with the Life of a Significant Person
- **C** Site is an Excellent Example of a Site Type
- **D** Site Likely to Yield Important Scientific Data

*note: IS = Inventory Survey*
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Stice, G.D. and F.W. McCoy


Thompson, Andrew


Turner, G.


Watters, Raymond F.


Weisler, M.


Williams, J.


Yuncker, T.G.

Appendix A: Photographs
Plate 1: From McConnell Dowell housing facility looking west to Ofu - Olosega; ridge to right separates Ta'u and Faleasao.

Plate 2: Approximate location of Trench 1 and Trench 2; view from McConnell Dowell housing facility facing Ta'u road.
Plate 3: Trench 2 Stratigraphy (profile) Ta'u.

Plate 4: Test Unit 2 Profile.
Plate 5: Test Unit 2 — Stratigraphy.

Layer I
Layer II
Layer III
Layer IV
Layer V
Layer VI
Layer VII

Plate 6: Test Unit 2.
Appendix B: Faunal Analysis
DATE: 9 January 1996

TO: Archaeological Consultants of the Pacific, Inc.,
(ATTN.: Patrick Sarvak, Laboratory Assistant)

FROM: Alan C. Ziegler, Zoological Consultant

SUBJECT: Identification of faunal material from Ta'ū and Paleasao villages,
Manu'a, American Samoa, received 6 January 1996

I have identified this lot of faunal material to the lowest taxonomic level
possible for me, and am returning it all to you along with this MEMO in one box by
prepaid Certified Priority Mail. Return Receipt Requested. An INVOICE covering
the total of 3 hours spent on this work (itemized separately as 2 hours for the
Ta'ū material and 1 for the Paleasao material) is also included here.

Additionally, I have enclosed a 3½" computer diskette containing all of this same
current hard-copy MEMO information, as well as that of a 9 January 1996 revision
of my Faunal Category List. The format used is that of WordPerfect 5.1/MS-DOS
5.0, which I hope will be compatible with whatever word-processing program you are
using. The file names are: KENNEDY.RTF and KENNEDY.FAU. (The primary reason that
I include the new Faunal Category List to replace the old one you may have on file
is that it is slightly reworded so that each category definition is as self-
explanatory as possible—that is, in most cases it should not now be necessary to
refer to additional categories to understand any given one.)

Each of the labeled plastic bags I received contained the (primarily) vertebrate
faunal remains from a discrete excavation unit (i.e., from a particular site, test
unit, trench, layer and/or level, or other sampled area). For each of these
excavation units I have identified and separated the material into various faunal
categories, and placed the remains of each category in an individual stapled
plastic bag along with a yellow-paper slip giving the name of the particular
category represented and sometimes a pertinent comment on the material (but,
note, to keep the identification time to a minimum, not the provenience, which
appears only on the original labeled plastic container bag now holding the
identified material).

All of these lots of stapled bags from each excavation unit have then been put
back in your appropriate original labeled container bag. These various stapled
bags with yellow-paper identification slips are arranged within each container bag
in the same order as the category names appear on the Faunal Category List
described below.

To allow possible future weighing of the material from each faunal category
without the time and trouble of removing the material from each of my faunal-
category bags, I might note that each of these stapled bags is of (approximately)
the same weight as all of the others. bears one staple, and contains a single
paper-slip label of uniform weight; thus you should be able to deduct an identical
tare weight throughout any in-bag weighing procedure.

Any remains identified as "Artifact" have similarly been placed in individual
stapled bags, with an identification of the animal or nonfaunal substance
apparently represented by the original raw material. Additionally, I segregated
and saved in individual stapled plastic bags the invertebrate and nonfaunal items
encountered, although you may well not need some of them.

To explain the faunal categories used for the present material, I have included
with this MEMO a 9 January 1995 revision of the same general Faunal Category List
used in earlier work for you, which still contains all previously identified
categories (whether or not they appeared in the present lot of material) but which
did not need updating because no new faunal categories appeared in the present lot
of faunal remains.

It should be noted in this list that when I mention the common or scientific name
of genera or species in explanations of the more-generalized faunal categories--
as for example, in "Medium Bird" or "Small-to-Medium Mammal"--unless it is
obviously indicated otherwise, I intend these names to convey only an idea of the
general size of the animal represented rather than to definitely indicate that any
specific taxon mentioned is necessarily present in the material.

For some identifications on the yellow-paper slips, I have prefixed the name of a
family, genus, or species with "cf."
. This means that the material seems
extremely close osteologically to the taxon named and quite likely belongs to it,
but I cannot entirely rule out the possibility that an extinct, accidental, or
extremely rare, morphologically similar form--although, usually of the same order,
family, or genus--is represented instead. For most later compilation purposes,
however, I would advise simply omitting the "cf." whenever you see it in my
identifications :--I guess the main reason I use it at all is to let any possible
future identifiers examining the bones know that I did realize that in some cases
there was an alternative, although unlikely, identification possible.

In regard to minimum number of individuals, if it was obvious that more than one
individual was represented by the material in the stapled bag, I have noted on the
yellow-paper identification slip the number indicated (written as "MNI = ... ").

In the case of fish other than sharks, rays, and eels, whenever vertebrae were
present, I have given approximate total lengths of the particular individuals
involved (written as "Len's. =."), based on comparison of vertebra size with
that of prepared skeletal specimens of known length. These estimates could well
be off by perhaps 20-30% (depending, for example, on species represented and
position of the vertebrae in the spinal column) but they will serve to give you at
least a general idea of the size of many of the fish present.

I have not attempted to chronologically age any bird individuals whose bones are
present in the faunal material, except to note on the yellow-paper slips any
obviously immature bones (usually meaning nestlings in species other than chicken
and other precocial ground-living birds), lack of any such notation meaning that
the bird bones are apparently of adult individuals.
For mammals other than rodents, whenever possible I have endeavored to give a general idea of age at death (in the case of appropriate material often estimating the probable minimum and/or maximum chronological age at death by reference to published tables—when available—of dental replacement sequence or stage of long-bone epiphyseal union).

You may already routinely present the following in each of your archaeological excavation reports but, in case you do not, I hope you will consider including a minimal faunal-data table in each such final paper. That is, a simple table (similar to the sample included as an ATTACHMENT to this MEMO) for each trench, site, or other excavation unit, giving at least the actual numbers and/or weights of the bones/fragments per level assigned to each faunal category that occurs in the excavation unit. This is so possible future investigators will always have available these raw faunal data, along with other information such as midden volumes contained in your report, for use in faunal analysis calculations that, for one reason or another, you may not have carried out.

As I mentioned to others at your company previously, I usually do not write up a formal faunal analysis report per se (—having found that, in terms of the amount that would have to be paid for my time, this is much more expeditiously done by personnel who either actually participated in the field work or, at least, have more ready access to the complete original excavation data than I do—) but, instead, I provide a series of general and specific, largely subjective, comments (as I have done below) regarding the identified faunal material. (I would assume these comments would be more meaningful to you when considered jointly with any tabulation you may make of the material.) These comments can then be quoted or paraphrased, or the information contained in them otherwise utilized in the manner most suitable to the style of the final overall project report.

**COMMENTS ON TA’U VILLAGE 2ND ROAD PROJECT, AMERICAN SAMOA, FAUNAL MATERIAL**

The quite limited amount of vertebrate faunal material suggests a rather typical—but not at all heavily used—human habitation area. It is not determinable, however, from the present material whether this occupation occurred in the pre- or post-Contact period (or both).

T.U. 1 yielded two common families of inshore fishes, as well as possibly "Sea Turtle". To judge from the preservation of the single "Medium Bird" bone, it may well represent a natural death rather than a human food item. A Polynesian Rat dentary is also present, along with a bone or two of a pig-sized and/or slightly larger mammal.

T.U. 2 had only a bone or two of medium-sized "Fish" and an apparent "Shark and/or Ray" vertebra.

**COMMENTS ON FALEASAO VILLAGE PROJECT, AMERICAN SAMOA, FAUNAL MATERIAL**

The even-more-limited vertebrate faunal material from this project indicates a (presumably terrestrial) "Large Mammal", thus indicating deposition in the post-Contact Period for at least Trench 1; one of the bone fragments from a mammal of
this size is also metal-saved. The partial dentary of a 3-4-month-old pig accompanied this larger mammal material of the trench.

T.P. 1 had only the unworn(?) adult upper first incisor of a pig of about 9-11 months of age.

T.P. 2 contained only an apparent dermal spine of "Diodonid" along with a very little material of "Fish" of small-to-medium body size.

I hope these few identifications and brief comments may be of some interest and use to you. Many thanks for the chance to see this material. Please be sure to let me know if there are any questions on any of my procedures, identifications or comments. Continued best in everything!!

...
Table 00. Sample "minimal faunal-data" table for a collection of nonartifactual vertebrate faunal remains from one excavation unit of a hypothetical Hawaiian site. Figures for faunal remains indicate raw numbers (—or weights could be used instead--) of identified bones and bone fragments.

<table>
<thead>
<tr>
<th>Site Hi-La-136</th>
<th>Depth (cm below datum)</th>
<th>Total per Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pit 5-4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0-10</td>
<td>10-20</td>
</tr>
<tr>
<td></td>
<td>20-30</td>
<td>40-50</td>
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<td>70-80</td>
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<tr>
<td></td>
<td>90-93</td>
<td></td>
</tr>
<tr>
<td>OSTEICHTHYES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Murasenid</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Diodontid</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>Amphibia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bufo marinus</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>REPTILIA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sea Turtle</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Small Lizard</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>AYES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pterodroma phaeopygia</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>Medium Prococerialis</td>
<td>11</td>
<td>22</td>
</tr>
<tr>
<td>Gallus gallus</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Small Passeriform</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Medium Bird</td>
<td>22</td>
<td>24</td>
</tr>
<tr>
<td>MAMMALIA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rattus exulans</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>Canis familiaris</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Sus scrofa</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Medium Mammal</td>
<td>-</td>
<td>2</td>
</tr>
</tbody>
</table>

Total per Level: 60 124 45 25 4 23 47 57 101 78 554
CATEGORIES USED FOR ARCH. CONSULS. OF THE PACIFIC FAUNAL IDENTIFICATIONS

Alan C. Ziegler
Revised 9 January 1996

MISCELLANEOUS

Artifact..........................................................any historically manufactured item as well as any geological, vegetal, osteological, or other material obviously or possibly intentionally "worked", including bones showing apparent butchering marks.

NON-VERTEBRATE

Basalt..........................................................all non-disintegrated volcanically derived material, including pumice, and volcanic glass fragments not included under "Artifact".

Inorganic..........................................................usually, geological material not included under either of the 2 foregoing categories.

Coal

Charcoal

Vegetable..........................................................all uncharred or otherwise unmodified vegetal material.

Coral Reef Rubble.............................................including fragments of mollusk, echinoderm, etc., that seem obviously to have weathered out of the reef or to be quite beach-worn, and thus probably not human food midden.

Coral............................................................non-fossil material that seems to have entered the deposit in a relatively fresh condition, although sometimes beach-worn.

Echinoderm....................................................usually, exoskeleton remains of sea urchin, quite possibly being human food midden.

Mollusk..........................................................non-fossil material of marine, freshwater, and/or terrestrial forms that seems to have entered the deposit in a relatively fresh condition, most of the non-terrestrial material probably being human food midden.

Crustacean......................................................usually, exoskeleton remains of crab or lobster, with an occasional barnacle plate, much--but not all--probably being human food midden.

Invertebrate....................................................remains of invertebrate groups either not more specifically identifiable, or other than those listed above; for example, bryozoan exoskeletons, calcareous polychaete worm tubes, insects, etc.

VERTEBRATE

CLASS CHONDRICHTHYES (Sharks and Rays) AND/OR CLASS OSTEICHTHYES (Bone Fishes)


Shark..........................................................not identified to any lower taxonomic level; in Hawai‘i there are 9 families comprising about 22 species.

Ray.............................................................not identified to any lower taxonomic level; in Hawai‘i there are 3 families comprising about 5 species.

Albulid...........................................................member(s) of the family Albulidae (Bonefishes), of which there is a single species reported for Hawai‘i; usually found near shore in open sand-bottomed areas, and reaching about 90 cm in length.

Syndontid........................................................member(s) of the family Syndontidae (Lizardfishes), of which there are 9 species in Hawai‘i; primarily inshore bottom-dwellers of reefs and mud or sand substrates, and reaching 30 cm in length.
Muraenid. ............................................................. member(s) of the family Muraenidae (Moray Eels), of which there are over 35 species in Hawai'i; some reaching a length of 150 cm.

Congrid. ............................................................. member(s) of the family Congridae (Conger Eels), of which there are at least 7 species in Hawai'i; some reaching a length of 150 cm.

Marine Eel. .......................................................... member(s) of 1 (or more) of the 10 eel families recorded for Hawaiian waters, of which the Muraenidae (Moray Eels), Congridae (Conger Eels), and Ophichthidae (Snake Eels) are by far the most speciose and frequently encountered groups.

Belonid. ............................................................. member(s) of the family Belonidae (Needlefishes), of which there are 3 species in Hawai'i; usually found somewhat offshore near the ocean surface, and reaching 100 cm in length.

Holocentrid. .......................................................... member(s) of the family Holocentridae (Squirrelfishes), of which there are about 15 species in Hawai'i; many of them found in deeper reef areas, with most of them fairly small and only 1 or 2 approaching 45 cm in length.

Bothid. ............................................................. member(s) of the family Bothidae (Left-eyed Flounders), of which there are 12 species in Hawai'i; 2 of the species are found on sandy bottoms in nearshore waters while the others occur primarily on the ocean floor in deeper offshore areas, with the largest individuals reaching about 48 cm in length.

Sphyraenid. .......................................................... member(s) of the family Sphyraenidae (Baracoudas), of which there are 2 species in Hawai'i; most often pelagic but sometimes found either singly or in small schools near shore, usually about 50-80 cm in length although an occasional individual may reach almost 200 cm.

Mugilid. ............................................................. member(s) of the family Mugilidae (Gray Mullets), of which there are only 2 species in Hawai'i; both relatively common inshore forms, reaching a maximum length of about 45 cm.

Polynemid. .......................................................... member(s) of the family Polynemidae (Threadfins), of which Polydactylus sexfilis (Mci) of inshore sand-bottomed areas is apparently the only species thus far reported for Hawai'i, reaching perhaps 45 or 50 cm in length.

Serranid. ............................................................. member(s) of the family Serranidae (Groupers), of which there are about 15 species in Hawai'i; most of them being deeper-water, and fairly small (2-20 cm) forms, although 1 species reaches 40-45 cm and 2 others are occasionally between 1 and almost 3 m long.

Priacanthid. .......................................................... member(s) of the family Priacanthidae ('Awoweos or Bigeyes), of which 4 species are usually encountered in Hawai'i; either near-shore or deeper-river forms, with maximum lengths of about 35 cm.

Apo gonid. .......................................................... member(s) of the family Apogonidae (Cardinalfishes), of which there are 11 species in Hawai'i; all relatively common inshore forms but active mostly only at night, with the largest species reaching no more than about 18 cm in length.

Carangid. .......................................................... member(s) of the family Carangidae (Jacks), of which there are over 30 species in Hawai'i; most of them deeper-water and fairly large forms; the species Caranx ignobilis (Ula--or Pāpio for the smaller young) sometimes ranging in close to shore, and reaching 100 cm or more in length.

Lutjanid. .......................................................... members(s) of the family Lutjanidae (Snappers), of which there are 10 or 11 native species in Hawai'i; most of them offshore deep-water--although not pelagic--forms, reaching maximum lengths of 30 to almost 100 cm.
Mullid. .......................................................... member(s) of the family Mullidae (Gastrodentes), of which there are 10 species in Hawai‘i; many of them living on the reef or frequently visiting it, usually about 20-25 cm long but a few reaching 40-60 cm.

Kyphosid. .......................................................... member(s) of the family Kyphosidae (Rudderdishes), the most often encountered of the 4 species reported from Hawai‘i being 2 members of the inshore genus Kyphosus (Menue), which may reach 60 cm in length.

Chaetodontid. .................................................. members of the family Chaetodontidae (Butterflyfishes), of which there are between 25 and 30 species in Hawai‘i (including 8 species separated as the family Pomacanthidae [Angelfishes] by some authors), most often inshore reef forms, reaching no more than about 35 cm in length.

Cirrhitid. .......................................................... member(s) of the family Cirrhitidae (Hawkfishes), of which there are 5 or 6 species in Hawai‘i; all inshore forms, only 1 of which reaches as much as 30 cm in length.

Pomacentrid. ..................................................... member(s) of the family Pomacentridae (Demselfishes), of which there are about 14 species in Hawai‘i, all except 2 characteristic of inshore waters (most in abundance), and reaching maximum lengths of near 25 cm.

Labrid. ............................................................. member(s) of the family Labridae (Wrasse), which is the largest family of fishes in Hawai‘i with over 40 species; predominately inshore forms, most of them fairly small but with a few larger forms reaching about 50 cm in length.

Scarid. ............................................................. member(s) of the family Scaridae (Parrotfishes), of which the genera Calotomus (27 species) and Scarus (4-5 species) are essentially the only 2 expected to occur in Hawai‘i; both being typically inshore groups, and including 1 or 2 species that may reach 70 cm in length.

Acanthurid. ..................................................... member(s) of the family Acanthuridae (Surgeonfishes), of which there are over 20 species in Hawai‘i; most of them inshore forms, with the genus Naso (Unicornfish or [mostly] Kala) comprising the 5 generally largest of these, reaching 40 to 75 cm in length.

Scombrid. .......................................................... member(s) of the family Scombridae (Tunas and Mackereisa), of which there are perhaps a dozen species in Hawaiian waters; almost all open-ocean (pelagic) forms, many reaching a m or more in length.

Scorpaenid. ..................................................... members of the family Scorpaenidae (Scorpionfishes), of which there are perhaps as many as 25 species in Hawai‘i; a majority of them inshore, and fairly small (8-15 cm), forms, although several species may reach between 25 and 50 cm in length.

Balistid. .......................................................... member(s) of the family Balistidae (Triggerfishes), of which there are about 10 species in Hawai‘i; mostly inshore forms, with the largest reaching about 35 cm in length.

Monacanthid. .................................................. member(s) of the family Monacanthidae (Filefishes), of which the small Pteragogus spilogramma (Pantail Filefish), reaching only about 15 cm in length and sometimes washing up on beaches dead in great numbers, is by far the most abundant of the 8 species to be expected in near-shore Hawaiian waters; the genus Aultra contains the largest species, reaching about 60 cm in length.

Tetraodontid. .................................................. member(s) of the family Tetraodontidae (Smooth Puffers), of which there are about 5 species, ranging up to 50 cm in length, in Hawai‘i (or perhaps close to a dozen if the several, generally small, species of the genus Canthigaster [considered to constitute the family Canthigasteridae (Sharp-backed Puffers) by some authors] are included); a few forms of both types of these puffers may found in shallower inshore areas, and all of the species may possess an intrinsic poison although the flesh is apparently sometimes eaten without ill effects.
Diadontid..........................................................member(s) of the family Diadontidae (Spiny Puffers), of which 2 species of the genus Diadon, ranging from 35 to 70 cm in maximum length, are by far the most abundant in Hawaiian inshore waters. The single remaining species reported for Haiti (genus Chlorarcharstes, 50 cm in length) apparently being quite rare here; all of these species are suspected of possessing an intrinsic poison although the flesh is apparently sometimes eaten without ill effects.

Fish..........................................................material of indeterminate class and family.

CLASS AMPHIBIA

Order Anura
Family Bufonidae: (True Toads)

Bufo marinus (Giant Neotropical Toad) ..........introduced to the Hawaiian Islands in 1932.

CLASS REPTILIA

Order Testudinata (Order Chelonia of some authors)
Family Cheloniidae: (Typical Sea Turtles) and/or Dermochelyidae: (Leatherback Sea Turtles)

Sea Turtle......................................................comprises fragmentary remains that could not be assigned to a particular one of the half-dozen species of marine turtle found in the Pacific; among the several cheloniids, Chelonia mydas (Green Sea Turtle) is possibly the most abundant and, apparently, the one most often taken for food; Dermochelys imbricata (Hawksbill Sea Turtle) is usually found much less frequently and is apparently not eaten although the horny plates of the carapace and plastron "elephantine shell" are used artistically; while the sole dermochelyid, Dermochelys coriacea (Leatherback Sea Turtle—which lacks the large flat bony plates of the carapace found in all other sea turtles) is an important egg-producer for human food purposes in Indonesia, Malaysia, and probably other areas of the Southwest Pacific, although it does not lay eggs in Haiti.

Family Indeterminate

Freshwater or Land Turtle................................turtle(s), terrapin(s), and/or tortoise(s) of a non-marine family; any one of about 6 such groups could conceivably be represented, none of which is native to the Hawaiian Islands. Trionyx sinensis (Chinese Softshell Turtle), family Trionychidae) was once propagated here in fish ponds as a historic food item (and now maintains wild populations in various local bodies of fresh water). Members of other families have also been imported alive and were probably likewise occasionally eaten although none seems to have been raised here for this purpose; a number of individuals have apparently been released or escaped to possibly establish wild populations.

Order Squamata
Family Indeterminate

Small Lizard................................................lizard(s) with a head-and-body length of less than about 10 or 15 cm; usually not identified to any lower taxonomic level although in Hawai'i most or all of the material probably represents the Polynesian-introduced (?) families Gekkonidae (geckos) and/or Scincidae (skinks) rather than any of the smaller members of historically introduced families.
Order Procellariiformes
  Family Diomedeidae: (Albatrosses)

Diomedea sp. (Albatross)

Family Procellariidae: (Shearwaters, Petrels, and Fulmars)

Puffinus pacificus (Wedge-tailed Shearwater)

Puffinus sp. (Shearwater) .................. member(s) of this genus that in Hawai‘i most likely include the relatively small species Puffinus nativitatis (Christmas Shearwater) and, possibly, Puffinus lherminieri (Audubon’s Shearwater; see Olson and James 1982:33), as well as the medium-sized species Puffinus pacificus (Wedge-tailed Shearwater) and Puffinus newelli (Newell’s Shearwater).

Bulweria bulwerii (Bulwer’s Petrel)

Pterodroma phaeopygia (Hawaiian Petrel)

Pterodroma sp. (Petrel) .................. member(s) of this genus that in Hawai‘i most likely include the relatively small species Pterodroma hypoleuca (Bonin Petrel) and the prehistorically extinct Pterodroma jugabulis (Gracie Petrel) of Olson and James 1991:17-22, as well as the medium-sized species Pterodroma phaeopygia (Hawaiian Petrel).

Small Procellariid ...................... smaller member(s) of the family Procellariidae, in the general size range of Puffinus nativitatis (Christmas Shearwater), Bulweria bulwerii (Bulwer’s Petrel), Pterodroma phaeopygia (Bonin Petrel), as well as, possibly, Puffinus lherminieri (Audubon’s Shearwater; see Olson and James 1982:33) and the prehistorically extinct Pterodroma jugabulis (Gracie Petrel) of Olson and James 1991:17-22.

Medium Procellariid .................. medium-sized member(s) of the family Procellariidae, in the general size range of Puffinus pacificus (Wedge-tailed Shearwater), Puffinus newelli (Newell’s Shearwater), and Pterodroma phaeopygia (Hawaiian Petrel).

Family Hydrobatidae (Family Oceanitidae of Olson and James 1982:33): (Storm-Petrels)

Oceanodroma castro (Banded-rumped Storm-Petrel) .... material of a very small member of this family, presumably this species but I have not been able to obtain comparative skeletal material of it either locally or from the Smithsonian Institution, although I have satisfactory material of the larger Oceanodroma tristrami (Tristram’s Storm-Petrel).

Order Pelicaniformes
  Family Phaethontidae: (Tropicbirds)

Phaethon lepturus (White-tailed Tropicbird) .... the smallest of the 3 tropicbird species occurring in the Pacific.

Order Ciconiiformes
  Family Ardeidae: (Heron, Egrets, and Bitterns)

Nyctibius nysticorax (Black-crowned Night-Heron)
Order Anseriformes

*Family Anatidae: (Swans, Geese, and Ducks)*

*Branta* sp. (Goose) .................................................. presumably, either the historically known *Branta sandvicensis* (Hawaiian Goose) or one of the prehistorically extinct, apparently semiflightless—or possibly even flightless—medium-sized forms morphologically similar to, but evidently specifically distinct from, *Branta sandvicensis*; (see Olson and James 1991:42-47).

*Thambetochen ranian* (O‘ahu Lowland Moa-nalo)

*Thambetochen* sp. (Moa-nalo, in part) .................................. prehistorically extinct, large, "toothed-jawed", flightless, goose-like member(s) of the family Anatidae; (see Olson and James 1991:28-32, 35-38).

*Moa-nalo* (Large Flightless Anatid) .................................. prehistorically extinct, large, obviously flightless, goose-like member(s) of the family Anatidae; (see Olson and James 1991:29-32 for the various genera and species potentially represented on the different Hawaiian Islands).

*Small Anatid* .............................................................. duck(s) in the size range of *Anas wyvilliana* (Hawaiian Duck), *Anas laysoniana* (Layson Duck), and some migrant or accidental continental teal; smaller than most other migrant ducks that often reach the Hawaiian Islands, which are often in the general "medium" size range of continental *Anas platyrhynchos* (Mallard).

*Medium Anatid* ............................................................ member(s) of the family Anatidae in the general size range of smaller geese and larger ducks, such as *Branta sandvicensis* (Hawaiian Goose) and continental races of *Anas platyrhynchos* (Mallard).

Order Galliformes

*Family Phasianidae: (Turkeys, Peafowl, Guineafowl, Chickens, Pheasants, Quail, etc.)*

*Gallus gallus* (Red Junglefowl (=Chicken)) ...................... (in almost all cases, fragmentary material representing pre-Contact Polynesian junglefowl would not be distinguishable from that of historically introduced chicken breeds of this same species. Also, I am not sure that all such material of other phasianids such as various species of larger pheasants (*Phasianus, Lophura*, etc.), as well as guineafowl (*Numida*),—all historically introduced—could usually be distinguished.)

*Small-to-Medium Galliform* .......................................... member(s) of an indeterminate family (--although, in Hawai‘i, most likely family Phasianidae--) in the general size range of historically introduced *Alectoris chukar* (Chukar) and various *Francolinus* (francolins), all also historically introduced.

*Medium Galliform* ..................................................... member(s) of an indeterminate family (--although, in Hawai‘i, most likely family Phasianidae--) in the general size range of *Gallus gallus* (Red Junglefowl (=Chicken)) and various larger species of pheasants (*Phasianus, Lophura*, etc.) as well as guineafowl (*Numida*), the latter two types all being historically introduced forms.

*Large Galliform* ....................................................... member(s) of an indeterminate family (--although, in Hawai‘i, most likely all historically introduced members of the family Phasianidae--) in the general size range of *Pavo cristatus* (Common Peafowl) introduced to the Hawaiian Islands in 1850) and *Meleagris gallopavo* (Wild and Domestic) Turkey; introduced in 1788).

Order Gruiformes

*Family Rallidae: (Rails, Moorhens or Gallinules, Coots, etc.)*

*Porzana* sp. (Hawaiian Flightless Rail) ......................... (formerly "Small Flightless Rallid"); sparrow-to-plover-sized flightless member(s) of the family Rallidae; (see Olson and James 1991:43-45 for the various species potentially represented on the different Hawaiian Islands).
Gallinula chloropus (Common Moorhen)

Medium Railid........................................ member(s) of the family Railidae in the general size range of Gallinula chloropus (Common Moorhen) and Pufica cf. alii (Hawaiian Coot); most of the material probably consists of certain bones of 1 or both of these 2 species that I cannot satisfactorily distinguish, especially in the case of fragmentary material.

Order Charadriiformes
   Family Charadriidae: (Plovers and Dotterels)

Pluvialis fulva (Pacific Golden-Plover)....... (formerly "Pluvialis dominica [Lesser Golden-Plover]"); this relatively common migratory species is most abundant--and thus most readily available for capture--in the Hawaiian Islands from August through April, although a few individuals may occasionally be found here all year.

Family Scolopacidae: (Curlews, Turnstones, Tattlers, Sandpipers, etc.)

Numenius tahitiensis (Bristle-thighed Curlew)

Medium Scolopacid................................ member(s) of the family Scolopacidae, smaller than curlew, in the general size range of Arenaria interpres (Ruddy Turnstone), Heteroscelus incanus (Wandering Tattler), or a slightly larger species.

Family Laridae: (Gulls, Terns, and Jaegers)

Medium Jaeger...................................... member(s) of the family Laridae in the general size range of jaegers and medium-sized gulls, none of which breed in the Hawaiian Islands although several species are relatively frequent vagrants or winter visitants here.

Order Columbiformes
   Family Columbidae: (Pigeons and Doves)

Columba livia (Rock Dove)........................ introduced to the Hawaiian Islands in 1798. (There are no native Hawaiian columbiforms, and of the 20 or so species of the order [all family Columbidae except for 1 sandgrouse of the family Pteroclididae historically introduced to the State only 4 managed to establish widespread, long-surviving populations: Columba livia (Rock Dove or "Domestic Pigeon"), Streptopelia chinensis (Spotted Dove), Geopelia striata (Zebra Dove), and Zenaidura macroura (Mourning Dove--apparently only in the Pu'ula'wa'a area in the North Kona District of Hawaii'i Island). Thus, I presume most or all bones of columbids found will represent only these 4 forms although in a few cases osteologically similar species--introduced but now extirpated--could conceivably be represented.)

Streptopelia chinensis (Spotted Dove)........... introduced to the Hawaiian Islands sometime in the 1800's. (There are no native Hawaiian columbiforms, and of the 20 or so species of the order [all family Columbidae except for 1 sandgrouse of the family Pteroclididae historically introduced to the State only 4 managed to establish widespread, long-surviving, populations: Columba livia (Rock Dove or "Domestic Pigeon"), Streptopelia chinensis (Spotted Dove), Geopelia striata (Zebra Dove), and Zenaidura macroura (Mourning Dove--apparently only in the Pu'ula'wa'a area in the North Kona District of Hawaii'i Island). Thus, I presume most or all bones of columbids found will represent only these 4 forms although in a few cases osteologically similar species--introduced but now extirpated--could conceivably be represented.)

Geopelia striata (Zebra Dove)..................... introduced to the Hawaiian Islands in 1922. (There are no native Hawaiian columbiforms, and of the 20 or so species of the order [all family Columbidae except for 1 sandgrouse of the family Pteroclididae historically introduced to the State only 4 managed to establish widespread, long-surviving, populations: Columba livia (Rock Dove or "Domestic Pigeon"), Streptopelia chinensis (Spotted Dove), Geopelia striata (Zebra Dove), and Zenaidura macroura (Mourning Dove--apparently only in the Pu'ula'wa'a area in the North Kona District of Hawaii'i Island). Thus, I presume most or all bones of columbids found will represent only these 4 forms...
although in a few cases osteologically similar species—introduced but now extirpated—could conceivably be represented.)

Order Strigiformes
   Family Strigidae: (Typical Owls)

Asio flammeus (Short-eared Owl)

Medium Strigid............................................comprises owl material that does not appear to be the sole Hawaiian representative of the family Tytonidae Tyto alba (Common Barn-Owl, introduced to the Hawaiian Islands in 1959), but very likely represents either or both the native Asio flammeus (Short-eared Owl) and the prehistorically extinct owl genus Gralliglastrix (Stri-OWLS) of Olson and James 1991:67-81 (both family Strigidae), many of whose bones I cannot yet satisfactorily distinguish, especially when fragmentary.

Order Passeriformes
   Family Corvidae: (Ravens, Crows, Magpies, and Jays)

Corvus hawaiiensis (Hawaiian Crow)

Corvus (large species) (Crow)..........................member(s) of the genus in the general size range of continental Corvus corax (Common Raven); presumably either or both the prehistorically extinct Hawaiian Corvus impluvius and C. viridus of James and Olson 1991:11-22 could be included.

Corvus sp. (Crow).............................................comprises material presumably representing this genus but that could not be certainly assigned to any of the 3 Hawaiian species: the extant Corvus hawaiiensis (Hawaiian Crow) or the prehistorically extinct Corvus impluvius (Arch-billed Crow) and C. viridus (Long-billed Crow) of James and Olson 1991:11-22.

Family Meliphagidae: (Honeyeaters)

Chaetoptila sp. (Kioea)....................................(historically extinct on Hawai‘i Island, and known only fossil elsewhere in the State.)

Family Indeterminate

Small Passeriforme.........................................member(s) of 1 or more families of this order ("Perching Birds" or "Songbirds"), up to the general size of cardinals or smaller thrushes; most of the extinct and extant endemic Hawaiian passeriform species—as well as a number of the historically introduced ones—would be of this size.

Medium Passeriforme......................................member(s) of this order in the general size range of myna and robin to larger jays; among endemic Hawaiian passeriform species, apparently only the extinct Chaetoptila sp. (family Meliphagidae) and, possibly, a very few of the larger prehistorically extinct species of Hawaiian Honeycreepers and Finches (subfamily Drepanidinae of the family Fringillidae; see James and Olson 1991)—as well as a few of the historically introduced species of various families—would be of this size.

Order and Family Indeterminate

Small Bird.................................................member(s) of indeterminate order and family up through the general size of storm-petrel, quail, plover, sparrow, myna, and thrush; probably a large amount of the material represents passeriforms but smaller native or historically introduced species of 3 or 4 other orders could well be included, also.

Medium Bird..............................................member(s) of indeterminate order and family in the general size range of shearwater and petrel, tropicbird, night-heron, duck, hawk, junglefowl (chicken), Moorhen and coot, curlew, gull, owl, crow, and so on; in Hawai‘i, probably no passeriforms other than Hawaiian species of the genus Corvus would be included, but a number of native or historically introduced species of up to a half-dozen other orders could potentially be.
Large Bird........................................... member(s) of indeterminate order and family in the general size range of ibis, cranes, booby, frigatebird, goose, eagle, turkey, raven, and so on; in Hawai‘i, a number of native or historically introduced species of up to a half-dozen orders could potentially be included.

CLASS MAMMALIA (Insofar as possible, arrangement and nomenclature follow Tomich, P. Q., 1980, Mammals in Hawai‘i, Second Edition, Bishop Museum Press, Honolulu; except that the more generally accepted name Mus musculus is used here instead of Mus domesticus.)

Order Chiroptera
Family Vespertilionidae: (Common Bats)
Lasiurus cinereus (Hoary Bat)

Order Primata
Family Hominidae: (Humans)
Homo sapiens (Modern Human)

Order Lagomorpha
Family Leporidae: (Hares and Rabbits)
Oryctolagus cuniculus (European Rabbit).............. introduced to the Hawaiian Islands sometime after 1778; known to have become established by 1825.

Order Rodentia
Family Muridae: (Old World Rats and Mice)
Rattus exulans (Polynesian Rat)...................... comprises all material of this Polynesian-introduced species that, because of its relatively small size, could be distinguished with some degree of certainty from corresponding material of the larger Rattus norvegicus (Norway Rat) and R. rattus (Roof Rat), both historically introduced to the Hawaiian Islands.

Rattus norvegicus and/or Rattus rattus (Norway and/or Roof Rat)...... comprises all material that, because of its relatively large size, could be distinguished with some degree of certainty from that of the smaller Rattus exulans; although, except for essentially intact crania, I doubt that isolated skeletal elements of these 2 larger, post-Contact, species can safely be distinguished from each other.

Rattus sp.............................................. comprises material presumably all representing this genus but that could not be assigned to either the Polynesian-introduced Rattus exulans (Polynesian Rat) or the historically introduced R. norvegicus (Norway Rat) and R. rattus (Roof Rat), usually because of either its fragmentary nature or its relative immaturity.

Mus musculus (House Mouse)......................... introduced to the Hawaiian Islands sometime after 1778.

Order Mysticeti
Family Balaenopteridae: (Fin-back Whales) and/or Balaenidae: (Right Whales)
Mysticete................... member(s) of the order Mysticeti (Whalebone Whales); of which perhaps 5 species might be expected to occur in the Central Pacific, with adult lengths ranging from about 8 to 30 m.

Order Odontoceti
Family Delphinidae: (Porpoises, Dolphins, etc.), Physeteridae: 'Sperm Whales', and/or Ziphiidae: 'Beaked Whales'
Physeter macrocephalus (Sperm Whale)................ a physeterid, with largest individuals (males) reaching a length of 19 m.

Small Odontocete................................ member(s) of the order Odontoceti (Toothed Whales) up to about 3 m or so in length, thus including in the Pacific a half-dozen or
more porpoise- and dolphin-like species of the family Delphinidae, as well as the 2 unusual tiny physeterids of the genus Megaptera (Pygmy and Dwarf Sperm Whales).

Medium Odontocete.................................member(s) of the order Odontoceti (Toothed Whales) from about 3 to 9 m in length, thus including here only the 4 largest species of Pacific Delphinidae, as well as both Pacific members of the family Ziphidae.

Order Carnivora
Family Canidae: (Wolves, Dogs, Foxes, etc.)
Canis familiaris (Domestic Dog)......................(I doubt that it is possible to distinguish remains of pre-Contact Polynesian dogs from morphologically similar forms of historically introduced ones, although individuals of very large or otherwise osteologically distinct introduced modern breeds of this same species might be successfully identified as such.)

Family Viverridae: (Mongeese, Civets, etc.)
Herpestes surcunctatus (Small Indian Mongoose)...introduced to the Hawaiian Islands in 1882.

Family Felidae: (Lions, Tigers, Cats, etc.)
Felis catus (House Cat)................................introduced to the Hawaiian Islands sometime after 1778.

Order Perissodactyla
Family Equidae: (Horses, Donkeys, Zebras, etc.)
Equus caballus (Domestic Horse)......................member(s) of the family Equidae in the horse size range; although I have referred all such material to this species (introduced to the Hawaiian Islands in 1603), in reality, the similar-sized Equus asinus × Equus caballus (Hule; introduced or produced locally by at least 1851)—and perhaps even the smaller Equus asinus (Donkey; introduced by at least 1825)—could not always be distinguished from it on the basis of most fragmentary material. (In addition, there are apparently no comparative skeletons of Hule, and only a few miscellaneous bones of Donkey, available in Hawaii.)

Order Artiodactyla
Family Bovidae: (Pigs, Batirusa, Warthogs, etc.)
Sus scrofa (Pig)...........................................(just as in the case of the Domestic Dog, I doubt that it is possible to distinguish remains of pre-Contact Polynesian pigs from morphologically similar breeds of historically introduced ones, although individuals of extremely large or otherwise osteologically distinct introduced modern breeds of this same species might be successfully identified as such.)

Family Cervidae: (Muntjac, Deer, Elk, Pudu, Moose, Caribou, etc.)
Medium Cervid..............................................member(s) of the family Cervidae in the size range of Axis axis (Axis Deer) and Odocoileus hemionus (Hule Deer), both of which have been introduced to various Hawaiian Islands, the former in 1867 and the latter, definitely, in 1981, if not as early as about 1816 (see pp. 133-134 in the Tomich 1986 reference cited on page 8 of this List).

Family Bovidae: (Cattle, Buffalo, Goats, Sheep, etc.)
Bos taurus (Domestic Cattle)..........................member(s) of the family Bovidae in the cattle size range; although I have referred all such material to this species (introduced to the Hawaiian Islands in 1793), in reality, other such large bovids as Bubalis bubalis (Water Buffalo; introduced about 1891) and Bison bison (North American Bison; introduced in 1968) could not be distinguished from it on the basis of most fragmentary material.

Capra hircus/Ovis sp. (Domestic Goat/Sheep)......comprises fragmentary material from 1 or more smaller historically introduced members of, presumably, the family Bovidae, with the osteologically very similar Capra hircus (Domestic Goat) introduced to the Hawaiian...
Islands in 1778) and Ovis aries (Domestic Sheep; introduced in 1791) being the species most likely represented, although Ovis musimon (Mouflon; introduced in 1954) is an additional possibility on some Hawaiian Islands. (Except for portions of the cranium, I doubt that isolated, often fragmentary, bone material of these 2 genera can safely be distinguished, considering both their general skeletal similarity and the osteological variation occasioned by possible interbreeding with and among the different breeds of domestic stock.)

**Family Indeterminate**

Medium Artiodactyl.................................................. Member(s) of indeterminate family, other than Cervidae (Deer); although on most isolated Pacific islands the possibilities (all historically introduced) are probably limited to Cervidae (various deer) and smaller Bovidae (Capra aegagrus (Domestic Goat) and Ovis aries (Domestic Sheep)); however, in Hawai‘i, Antilocapra americana (Pronghorn) of the family Antilocapridae, as well as the bovid Ovis musimon (Mouflon)—introduced here in 1959 and 1954, respectively—must additionally be considered.

**Order and Family Indeterminate**

Small Mammal.......................................................... Member(s) of indeterminate order and family up through the general size of Rattus sp. and mongoose; in Hawai‘i, Polynesian- or historically introduced species of at least 3 orders could potentially be included.

Small-to-Medium Mammal.............................................. Member(s) of indeterminate order and family in the general size range of wallaby, rabbit, dog, and cat; in Hawai‘i, Polynesian- or historically introduced species of at least 3 orders could potentially be included.

Medium Mammal........................................................ Member(s) of indeterminate order and family in the general size range of man, porpoise, seal, pig, deer, and goat/sheep; in Hawai‘i, native or introduced species of at least 4 orders could potentially be included.

Large Mammal.......................................................... Member(s) of indeterminate order and family in the size range of medium and large whales, horse, mule, donkey, and cattle; native or historically introduced species of up to 4 orders could potentially be included.

**CLASS INDETERMINATE**

**Order and Family Indeterminate**

Small Vertebrate.................................................... Comprises highly fragmented bone material representing member(s) of indeterminate class, order, and family, but with an estimated head-and-body length less than about 0.3 m.

Medium Vertebrate.................................................. Comprises highly fragmented bone material representing member(s) of indeterminate class, order, and family but with an estimated head-and-body length of from about 0.3 m to, roughly, 2.0 m.

Large Vertebrate.................................................... Comprises highly fragmented bone material representing member(s) of indeterminate class, order, and family, but with an estimated head-and-body length of more than about 2.0 m.
Appendix C: Correspondence
March 4, 1996

Mr. David J. Herdrich, Territorial Archaeologist
American Samoa Historic Preservation Office
Department of Parks and Recreation
American Samoa Government
Pago Pago, American Samoa 96799

Dear Mr. Herdrich,

Please find enclosed a copy of our draft report, "A Cultural Resource Evaluation (Phase I and II) for the Taʻu-Faleasao Waterline Project Located on Taʻu Island, Manuʻa, American Samoa," which we submit for your review.

We would like to thank you in advance for your consideration of this document and look forward to your comments. If you have any questions, please feel free to phone or fax.

Sincerely,

[Signature]

D. Kyle Latinis
Project Supervisor
ACP, Inc.

cc: Mr. Wilfredo Carreon
DEPARTMENT OF PARKS AND RECREATION
American Samoa Historic Preservation Office

28 March 1996

Mr. D. Kyle Latini, Project Supervisor
Archaeological Consultants of the Pacific, Inc.
59-624 Pupukea Road
Haleiwa, Hawai‘i 96712

Dear Mr. Latini,

Thank you for the opportunity to review the report A Cultural Resource Evaluation (Phase I and II) for the Ta‘u-Faleasao Waterline Project Located on Ta‘u Island, Manu‘a, American Samoa March 1996. The report has been reviewed using the American Samoa Historic Preservation Cultural Resource Investigations - Report Guidelines and the Section 106 implementing regulations "Protecting Historic Properties" (36 CFR Part 800). In general the report is of a high quality, but we do have a number of comments, primarily with regard to grammar. These follow:

- p. 1 "...Federal and Territorial regulations Best..." should read "...regulations (Best..."

- p. 7 "...4200 km (2600 mi)" should be 260 mi

- p. 15 "...(Emory & Sinoto 1965) who excavated three tests units..." should read "test units"

- p. 18 "The results...has..." should be "have"

- p. 23 "Analyses are useful for...further contribute..." should read something like "...the further contribution of knowledge...

- p. 30 The Munsell color determinations for Layers Ib and II are listed as "YN" - presumably this should be "YR"

- With regard to the Research Design section, the research goals should reflect the unique remains within this project area. The project provides an opportunity to investigate land use patterns in the Faleasao area and to examine pre-modern burial practices. This information can be compared with comparable information in other parts of Samoa to examine how similar or different such practices (burial and land use) were across the archipelago, as well as with other parts of Polynesia.

- On a matter of form, the specific faces of excavation units that are represented in photos should be noted in the caption. As they stand it is very difficult to compare them with the profile drawings in the text. The profiles do not appear as regular in the photos as they do in the profile drawings, but this is difficult to assess as the photo captions do not note which face is presented (e.g., photos of TU2 (Plates 4, 5 and 6) compared with Fig. 9; the
photo of T2 (Plate 3) appears to indicate a shallow scooped out feature possibly containing charcoal, which is not represented in Fig. 5).

- On a related topic, no mention is made of the results of soil analysis on the soils that were collected and sent back to ACP. Particularly in the case of the Faleasao deposits, this analysis could indicate what activities took place in this area. The presence of very dark, presumably organically rich deposit indicates human activity; the paucity of artifacts does not mean that humans did not impact the area and that important information cannot be gained from the deposits. There is no mention anywhere in the text as to whether or not charcoal flecks were present in the deposits, or indeed if any charcoal was present. This would be particularly pertinent in TU2 Layers V and VI, and T2 Layers III and IV. In addition, the presence of apparently non-cultural layers above these dark deposits indicates that the area was subsequently abandoned, and given the presence of plastic only returned to after European contact. This information could contribute significantly to the history of land use in the area and aid in forming future hypotheses about changes in land use patterns on Ta'u. Inclusion of such information as the results of soils analysis and the presence or absence of charcoal flecks (or larger quantities of charcoal) would aid in the determination of effect and the potential contribution of information recovered from sites to the body of knowledge about the history and prehistory of the village, the island, and the region. The report cites work by Kirch regarding anthropogenic landscapes but does not appear to have incorporated methods used by Kirch and others to evaluate such landscapes archaeologically. Even in such a restricted area as this project area important information can be gathered about land use activities both there and inland from the area, e.g.,

"That humans played a key role in initiating this increased rate of erosion and deposition of colluvium after about 2 kyr B.P. is suggested by the presence of charcoal in most of these colluvial sediments...the presence of charcoal flecking in these sediments is almost certainly a signal of human burning...This burning most likely was associated with forest clearance for agriculture, specifically shifting cultivation of root and tuber crops on the steep hillsides inland of the site (Kirch & Hunt 1993: 235; see also Kirch & Yen 1992 for another example of the study of anthropogenic soils)."

Soils analysis should be able to reveal the origin of the deposits encountered, and charcoal content would provide some information about human land use activities both at the site and further inland. We would like to see this analysis done; I will contact ACP regarding this issue soon.

Thank you for your time and attention. If you have any questions please do not hesitate to call at (684) 699-9513 or fax (684) 699-4427.

Sincerely,

Julie M. Endicott
Archaeologist

Enc1.
References cited:


JOSEPH KENNEDY  
Senior Archaeologist

Mr. Eric Rekdahl  
FEMA Region 9  
Building 105  
Box 29998  
Presidio of San Francisco  
San Francisco, California 94129  

September 25, 1996

Dear Mr. Rekdahl:

Pursuant to our telephone conversation earlier today I am providing you with a copy of our report entitled A CULTURAL RESOURCE EVALUATION (PHASE I AND II) FOR THE TA’U - FALASASAO WATERLINE PROJECT LOCATED ON TA’U ISLAND, MANU’A, AMERICAN SAMOA MARCH 1996.

This report was transmitted to David Herdrich of the American Samoa Historic Preservation Office on March 4, 1996. Mr. Wilfredo Carrion was sent a copy of the report on the same day.

For a brief summation of CRM recommendations, I would direct your attention to the last sentence of the Abstract, as well as the last paragraph on page 40 and the only paragraph on page 41.

As I mentioned on the phone, please feel free to contact me directly if there are any questions regarding this report or the project in general.

Sincerely,

Joseph Kennedy  
Senior Archaeologist
September 30, 1996

Mr. David Herdrich
American Samoa Government
Department of Parks and Recreation
American Samoa Historic Preservation Office

Dear Mr. Herdrich,

Please find enclosed the revised version of "A Cultural Resource Evaluation (Phase I and II) for the Ta'u-Faleasao Waterline Project Located on Ta'u Island, Manu'a, American Samoa." This report has been revised according to suggestions requested by your office.

If there is any additional information you require, please inform our office and we will respond as soon as possible. We wish to thank you for the time and troubles you have taken concerning reviewing our report.

Sincerely,

D. Kyle Latinis
Project Supervisor

59-624 Pupukea Road • Haleiwa, Hawaii 96712
Telephone/Fax: (808) 638-7442
Samoa Office: P.O. Box 3735 • Pago Pago, American Samoa 96799
DBA: Archaeological Consultants of Hawaii • Archaeological Consultants of Samoa
Archaeological Consultants of Micronesia • Archaeological Consultants of the Pacific Rim