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Submittal Sheet for Historic Preservation Review Filing Fees  
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Agency/Firm (Requesting Review): SCIENTIFIC CONSULTANT SERVICES  
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Title of Report/Plan: ALS FOR THE HO'OHANA SOLAR FARM  
Project IN KUNIA

Island:	<u>O'ahu</u>	District:	<u>EWA</u>	Ahupua'a:	<u>Wai Kele</u>
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TMK [(1) 1-1-001:001]: TMK: (1) 9-4-002:052

Acreage inventoried (hectares):	<u>161</u>	Number of new sites inventoried:	<u>2</u>
Please characterize survey level: Reconnaissance or intensive			

Submitted Plan/Report Fee & Type: (All reports or plans submitted to the SHPD for review shall be accompanied by the appropriate fee in accordance with HAR §13-275-4 and §284-4).

- Check if Report is a Re-Submittal (no fee charged)
- \$50 Archaeological Assessment
- \$150 Archaeological Inventory Survey Plan
- \$450 Archaeological, Architectural or Ethnographic Survey Report
- \$150 Preservation Plan
- \$25 Monitoring Plan
- \$150 Archaeological Data Recovery Plan
- \$250 Burial Treatment Plan
- \$100 Archaeological Monitoring Report, if resources reported
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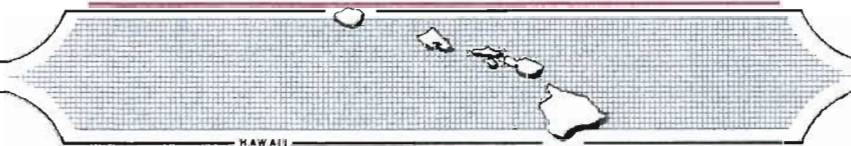
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**AN ARCHAEOLOGICAL INVENTORY SURVEY REPORT  
FOR THE HO'OHANA SOLAR FARM PROJECT IN KUNIA,  
WAIKELE AHUPUA'A, 'EWA DISTRICT,  
ISLAND OF O'AHU, HAWAI'I  
[TMK: (1) 9-4-002:052]**

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June 2014  
**DRAFT**

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## ABSTRACT

At the request of Ms. Tracy Furuya of Group 70 International, Inc., Scientific Consultant Services (SCS), Inc. conducted an Archaeological Inventory Survey of approximately 161-acres of land in preparation for the placement of a solar panel farm located in Kunia, Waikele Ahupua'a, 'Ewa District, Island of O'ahu, Hawai'i [TMK: (1) 9-4-002:052].

Fieldwork was conducted over a period of eight days by SCS archaeologists Guerin Tome, B.A., and Elizabeth Pestana, B.A., under the direction of the Principal Investigator Robert L. Spear, Ph.D. Archaeological work was performed in order to investigate the presence or absence of archaeological features and artifacts. A total of two sites comprised of four features were identified during the current survey. The surface survey and limited subsurface testing conducted produced archaeological cultural materials. All materials collected were subject to analysis. With the exception of three pre-Contact artifacts (a basalt adze perform and two basalt flakes with polished facets) collected during the surface survey, the materials from the subsurface testing are comprised of both Historic and Modern cultural materials.

The Archaeological Inventory Survey has been completed. No further archaeological work is recommended for the current undertaking.

## TABLE OF CONTENTS

ABSTRACT.....	ii
TABLE OF CONTENTS.....	iii
FIGURE LIST.....	iii
INTRODUCTION.....	1
GEOGRAPHIC SETTING.....	5
SOILS.....	5
CLIMATE.....	6
VEGETATION.....	6
PRE- AND POST-CONTACT BACKGROUND.....	6
PRE-CONTACT PERIOD.....	7
THE MĀHELE.....	9
THE POST-CONTACT PERIOD AND PRESENT LAND USE.....	9
SELECTED PREVIOUS ARCHAEOLOGICAL WORK.....	10
PREVIOUS ARCHAEOLOGICAL WORK IN THE PROJECT AREA.....	15
EXPECTED FINDINGS WITHIN THE PROJECT AREA.....	15
FIELD METHODS.....	15
FIELD METHODOLOGY.....	15
LABORATORY METHODOLOGY.....	16
CURRENT ARCHAEOLOGICAL INVENTORY SURVEY RESULTS.....	16
SCS TS-1 ARTIFACT SCATTER.....	17
STATE SITE 50-80-08-7671 (SCS TS-2) ALIGNMENT/WALL/PAVED SEGMENTS.....	20
SHOVEL PROBE 1 (E 600633/ N 2368398).....	30
SHOVEL PROBE 2 (E 600754/ N 2368348).....	38
SHOVEL PROBE 3 (E 600653/ N 2368398).....	38
SHOVEL PROBE 4 (E 600755/ N 2368323).....	43
SHOVEL PROBE 5 (E 600301/ N 2368953).....	44
SHOVEL PROBE 6 (E 600293/ N 2368963).....	49
ARTIFACT ANALYSIS.....	49
DISCUSSION AND CONCLUSION.....	52
SIGNIFICANCE ASSESSMENTS AND RECOMMENDATIONS.....	52
REFERENCES.....	54
APPENDIX A.....	A

## FIGURE LIST

Figure 1: USGS 1998 Schofield Barracks Quadrangle Showing Project Area Location. ....	2
Figure 2: Tax Map Key 9-4-002: 052 Showing Project Area Location. ....	3
Figure 3: Google Map Showing Project Area Location. ....	4
Figure 4: 1925 Map of Oahu Sugar Company Sugarcane Fields Showing Project Location (Conde and Best 1973).....	11
Figure 5: Map of Previous Archaeology Showing Project Area Location. ....	12
Figure 6: 1927 USGS Map of Waipahu Showing Site TS-1 Artifact Scatter in Relation to Four Structures. ....	18
Figure 7: USGA 1998 Schofield Barracks Quadrangle Showing Project Area Location with Archaeological Sites and Artifacts.....	19
Figure 8: Plan View of SCS Site TS-1.....	21
Figure 9: View of West Half of TS-1, Artifact Scatter. View to Northeast. ....	22
Figure 10: Plan View of State Site 50-80-09-7671 (TS-2). ....	23
Figure 11: Site TS-2 Feature 1, Concrete and Basalt Rock Alignment. View to Northwest.....	24
Figure 12: Site TS-2 Feature 1, Concrete and Basalt Rock Alignment. View to Northeast.....	25
Figure 13: Site TS-2, Feature 2, Angular Basalt Cobbles and Small Boulders, Concrete Pipe, and Basalt Block and Mortar Wall. View to Southwest. ....	26
Figure 14: Site TS-2, Feature 2, Angular Basalt Cobbles and Small Boulders. View to Southwest. .....	27
Figure 15: Site TS-2, Feature 2, Concrete Pipe. View to Southwest. ....	28
Figure 16: Site TS-2, Feature 2, Concrete Pipe and Basalt Block and Mortar Wall. View to Northwest. ....	29
Figure 17: 1927 USGS Map of Waipahu Showing a Plantation Road and Railway Passing Through the Current Project Area (Marked as Feature 3). ....	31
Figure 18: Crushed Coral embedded in Dirt Road Surface neat the Eastern End of TS-2 Feature 3, View to Northwest. ....	32
Figure 19: Remnant Pavement of Coral and Dredged Reef Detritus on the Northern Shoulder of TS-2 Feature 3, View to Southeast. ....	33
Figure 20: Mixture of Coral and Modern Crushed Basalt Gravel in Roadbed at the Northernmost Portion of Feature 3, View to West. ....	34
Figure 21: Ferrous Metal Spikes Recovered From the Surface of TS-2 Feature 3.....	35
Figure 22: SP-1 East Wall Profile.....	36
Figure 23: SP-1 Post Excavation Plan View. View to West.....	37
Figure 24: SP-2 North Wall Profile. ....	39
Figure 25: SP-2 Post Excavation Plan View. View to Northeast. ....	40
Figure 26: SP-3 Northeast Wall Profile. ....	41
Figure 27: SP-3 Post Excavation Plan View. View to North. ....	42
Figure 28: SP-4 West Wall Profile. ....	45
Figure 29: SP-4 Post Excavation Plan View. View to West.....	46
Figure 30: SP-5 West Wall Profile. ....	47
Figure 31: SP-5 Post Excavation Plan View. View to Northwest. ....	48
Figure 32: SP-6 East Wall Profile.....	50
Figure 33: SP-6 Post Excavation Plan View. View to Northeast. ....	51

## INTRODUCTION

At the request of Ms. Tracy Furuya of Group 70 International, Inc., Scientific Consultant Services (SCS), Inc. conducted an Archaeological Inventory Survey (AIS) of approximately 161-acres of land in preparation for the placement of a solar panel farm located in Kunia, Ahupua'a of Waikele, 'Ewa District, Island of O'ahu, Hawai'i [TMK: (1) 9-4-002:052] (Figures 1, 2 and 3).

According to the City and County of Honolulu's Real Property Tax Assessment website ([www.honolulupropertytax.com](http://www.honolulupropertytax.com)) accessed on June 6, 2014, the current project area identified as TMK: (1) 9-4-002:052, 161.023-acres, is privately owned by Robinson Kunia Land LLC.

Fieldwork for this project was conducted over a period of ten days in April, May, and July (April 23, 24, 25, 28, and 30, May 1, 2, and 5, and July 17-18, 2014) by SCS archaeologists Guerin Tome, B.A., and Elizabeth Pestana, B.A., under the direction of the Principal Investigator Robert L. Spear, Ph.D. The Archaeological Inventory Survey was performed in order to identify and document archaeological sites. Documentation of the archaeological sites included evaluating the significance of the sites and gathering sufficient information on the sites to be incorporated into the report.

The current project area was previously part of a larger archaeological investigation. In the 1988 Archaeological Walk-Through Survey by Archaeological Consultants of Hawaii (Kennedy 1988), no archaeological sites were identified. However, based on the current AIS fieldwork, a total of two SCS temporary sites (TS-1 and TS-2) were identified; the State Historic Preservation Division (SHPD) later determined that TS-1 lacked sufficient integrity to be assigned a State Site number but TS-2 (a historic plantation road complex consisting of three features) was assigned state site number Sites 50-80-08-7671. Limited subsurface testing was also conducted in the form of six Shovel Probes (SP-1 through -6) (ranging from 0.3 m by 0.3 m to 0.4 m by 0.5 m) placed in different locations within the property in order to examine the stratigraphy of the area as well as search for archaeological cultural material. The pedestrian survey found three pieces of pre-Contact cultural material while Historic and Modern material were found in the majority of the Shovel Probes. The results of the Archaeological Inventory Survey and recommended action are discussed below.

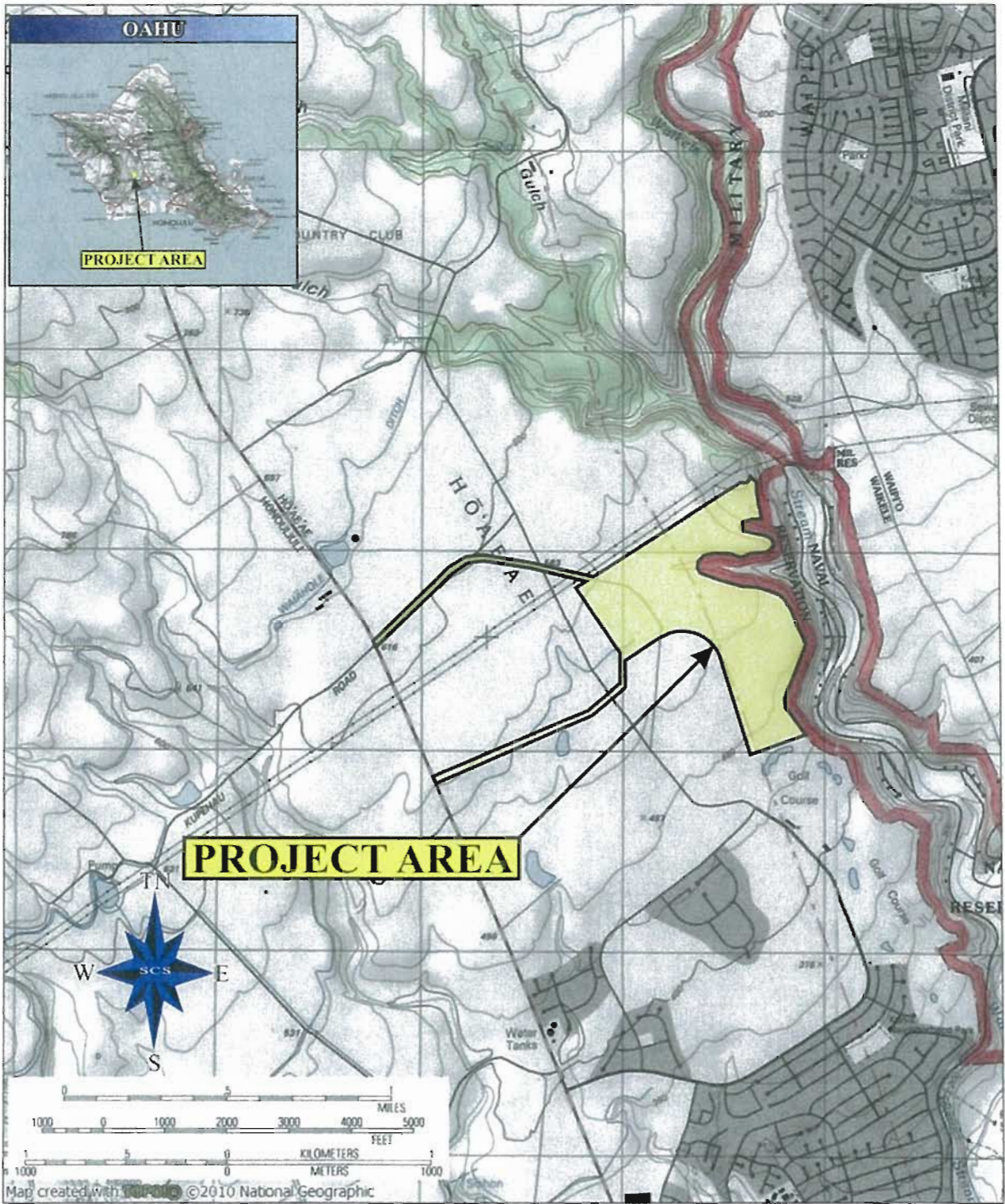


Figure 1: USGS 1998 Schofield Barracks Quadrangle Showing Project Area Location.



Figure 2: Tax Map Key 9-4-002: 052 Showing Project Area Location.





## GEOGRAPHIC SETTING

The current project area is comprised of one property [TMK: (1) 9-4-002:052] situated within Kunia, Waikele *ahupua'a*, 'Ewa District, Island of O'ahu, Hawai'i. The project area falls within the Ahupua'a of Waikele which extends from the Schofield Plateau into the West Loch of Pearl Harbor. Waikele is characterized by several different landforms which compose the topography of the area: coastal plains in the *makai* (towards the sea) portion by Pearl Harbor and slopes and gulches in the *mauka* (towards the mountains) portion towards Schofield Plateau. Waikele *ahupua'a* consists of developed and non-developed land, and extends from c. 3 feet to 1,000 feet above mean sea level (amsl).

The project area is located in the middle portion of the *ahupua'a*. The entire east portion of the project parcel is bounded by Waikakalaua Gulch. The rest of the project parcel is currently bounded by agricultural property: TMK (1) 9-4-003:001 to the north, TMK (1) 9-4-002:080 and TMK (1) 9-4-002:071 to the west, and TMK (1) 9-4-002:046 to the south. The project area is roughly L-shaped and fairly level with an elevation ranging from 460 to 560 feet above mean sea level (amsl).

### SOILS

According to Foote *et al.* (1972:78, 79, 96, 116; Map Sheet Number 42, 43) a total of five soil types are present within the current project area – Lahaina Series LaA, LaB, LaC, and LaC3, and Molokai silty clay loam (MuB). The Lahaina soils series consists of well-drained soils on uplands where the soils developed in material weathered from basic igneous rock. They are nearly level to steep with elevations from 10 to 1,500 feet. These soils are used for sugarcane, pineapple, truck crops, pasture, home sites, and wildlife habitat. Lahaina silty clay (LaA) with 0 to 3 percent slopes has slow runoff and slight erosion hazard. Lahaina silty clay (LaB) with 3 to 7 percent slopes has moderate permeability, slow runoff, and slight erosion hazard. Lahaina silty clay (LaC) with 7 to 15 percent slopes has medium runoff and moderate erosion hazard. Lahaina silty clay (LaC3) with 7 to 15 percent slopes is typically severely eroded. The soil profile I similar to LaC except that most of the surface layer and, in places, part of the subsoil have been removed by erosion. Runoff is medium and erosion hazard is severe.

Molokai silty clay loam (MuB) with 3 to 7 percent slopes has slow to medium runoff and slight to moderate erosion hazard. On Oahu, there are small areas of dark reddish-brown silty clay loams that overlie fine-textured, gravelly alluvium and small areas of dark reddish-brown

silty clay soils that have a mottled subsoil. This soil is used for sugarcane, pineapple, pasture, wildlife habitat, and homesites.

## **CLIMATE**

The area in which the project area lies is the semi-arid central region of Oahu. Waikele typically receives between 30 to 40 inches of rainfall a year most of which occurs in fall and winter (Price 1983:56). The project area is unlikely to receive much upland runoff given the lack of streams directly emptying onto the project area. The closest water feature to the project area was identified as the perennial Waikakalaua Stream (also known as Waikele Stream) located to the east and a reservoir to the southwest

## **VEGETATION**

At present, the project area vegetation consists of both introduced and indigenous vegetation including *koa haole* (*Leucaena glauca*), broomweed (*Sida rhombifolia*), golden crown beard (*Verbesina encelioides*), *ilima* (*Sida fallax*), *uhaloa* (*Waltheria americana*), *ko'oko'olau* (*Bidens sp.*), lilikoi (*Passiflora edulis*), Flora's paintbrush (*Emilia fosbergii*), spiny amaranth (*Amaranthus spinosus*), Popping Amaranth (*Amaranthus sp.*), garden spurge (*Euphorbia sp.*), cactus (*Opuntia sp.*), pigweed (*Portulaca oleracea*), castor bean (*Ricinus communis*), cheeseweed (*Malva parviflora*), black wattle (*Acacia mearnsii*), tobacco plant (*Nicotiana sp.*), African tulip (*Spathodea campanulata*), albizza (*Albiza sp.*), cherry tomato (*Solanum lycopersicum*), hogweed (*Boerhavia sp.*), and camphorweed (*Pluchea sp.*)

## **PRE- AND POST-CONTACT BACKGROUND**

Recent re-evaluation of radiocarbon dates suggests that the Hawaiian Islands were first settled between A.D. 850 and 1100 by Polynesians sailing most likely from central East Polynesia (Kirch 2011:24). Archaeological settlement pattern data indicates that the initial colonization and occupation of the Hawaiian Islands first occurred on the windward shoreline areas of the main islands. Greater population expansion to inland areas and agricultural development on the leeward side of O'ahu was likely to have begun early in what is known as the Expansion Period (A.D.1200-1400) (Kirch 1985). Coastal settlement was still dominant, but populations began exploiting and living in the upland (*kula*) zones.

In general, several terms, such as *moku*, *ahupua'a*, *'ili* or *'ili'āina* were devised to describe various traditional land sections and divisions. A district (*moku*) contained smaller land

divisions (*ahupua'a*), which customarily continued inland from the ocean and upland into the mountains. Extended household groups living within the *ahupua'a* were, therefore, able to harvest from both the land and the sea. Since the Polynesian economy was based on agricultural production and marine exploitation, animal husbandry, and utilizing forest resources, this situation ideally allowed each *ahupua'a* to be self-sufficient by supplying needed resources from different environmental zones (Lyons 1875:111). The *'ili 'āina*, or *'ili*, were smaller land divisions next in importance to the *ahupua'a* and were administered by the chief who controlled the *ahupua'a* in which the *'ili* were located (*ibid*:33; Lucas 1995:40). The *mo'o 'āina* were narrow strips of land within an *'ili*. The land holding of a tenant, or *hoa 'āina*, residing in an *ahupua'a* was called a *kuleana* (Lucas 1995:61).

The island of O'ahu ranks third in size of the eight main islands in the Hawaiian Archipelago. Oral history notes that the division of O'ahu's lands into districts (*moku*) and sub-districts (*'ili*) was performed by a ruling chief, the *ali'i nui* Mā'ili-kūkahi, during the early part of the 16<sup>th</sup> century (Kamakau 1991:53-56; Cordy 2002:23). It was Mā'ilikukahi who had the Island of O'ahu thoroughly surveyed, and permanently defined the boundaries between the different divisions and lands (Fornander 1969:89). Mā'ilikukahi created six districts and six district chiefs (*ali'i 'ai moku*). Land was considered the property of the king or *ali'i 'ai moku* (chief who rules a *moku*) (Pukui and Elbert 1986: 20), which he held in trust for the gods. The title of *ali'i 'ai moku* ensured rights and responsibilities to the land, but did not confer absolute ownership. The king kept the parcels he wanted, his higher chiefs received large parcels from him and, in turn, distributed smaller parcels to lesser chiefs. The *maka 'āinana* (commoners) worked the individual plots of land. It is said that Mā'ilikukahi gave land to *maka 'āinana* all over the island of O'ahu (*ibid*). The six districts of O'ahu were Wai'anae, 'Ewa, Waialua, Ko'olauloa, Ko'olaupoko, and Kona at the time of contact.

The settlement pattern, and timing of land utilization, may be divided into several general periods: the pre-Contact period, the Māhele, the post-Contact/Historic period, and the present land use. Together, these periods create a synthesis of land use in and near the project area as well as provide a basis on which archaeological researchers explored succinct research questions during reconnaissance and sampling work. These time periods are summarized below.

### **PRE-CONTACT PERIOD**

The commonly accepted paradigm of Hawaiian settlement is that the earliest settlements were located in the wet, windward regions. As population pressure increased or politics changed, populations began to branch out into leeward, less hospitable regions of Hawai'i, adapting their

cultivation strategies as they moved into dryer climates (Cordy 2002:8). As mentioned above, the pre-Contact Hawaiian economy was based on agricultural production and marine resource exploitation, as well as raising livestock (*i.e.*, dogs, pigs, chickens), and collecting wild plants and birds. During the pre-Contact Period (pre-1778), there were primarily two types of agriculture, wetland and dry land, both of which were dependent upon geography and physiography. River valleys provided ideal conditions for wetland *kalo* (taro, *Colocasia esculenta*) agriculture that incorporated pond fields and irrigation canals. Other cultigens, such as *kō* (sugar cane, *Saccharum officinarum*) and *mai 'a* (banana, *Musa sp.*), were also grown and, where appropriate, such crops as *'uala* (sweet potato, *Ipomoea batatas*) were cultivated. This was the typical agricultural pattern seen during pre-Contact times on all the Hawaiian Islands (Kirch and Sahlins 1992, Vol. 1:5, 119; Kirch 1985).

The current project is located in Waikele Ahupua'a, 'Ewa District. Waikele means "muddy water" while 'Ewa translates to "crooked" (Pukui *et al.* 1974: 28, 223). 'Ewa District is a major leeward district and played an important role in Hawaiian history. Traditionally, the bays of 'Ewa District provided the most conducive location and ideal conditions in all of the Islands for the building of fishponds and fish traps (Handy and Handy 1972: 469-470). This in turn provided an abundant variety of marine resources and helped make 'Ewa an *ali'i* stronghold. The runoff from the upland streams provided ample water for irrigation during the dry season making it an ideal locale for the cultivation of taro. 'Ewa District was renowned for its "rare and delicious taro" (*ibid.*). This particular type of taro, called *kai*, was native to 'Ewa District and surpassed the other taro varieties in terms of productivity and longevity. This *kalo* was said to be known throughout the Island as the *kalo* that visitors gnaw on and want to live until they die in 'Ewa (Sterling and Summers 1978:8). In addition, the upland valleys supported populations of avifauna which were prized for their feathers which were utilized in the making of leis and feathered capes and helmets (*ibid.*: 470).

Sterling and Summers (1978) relate numerous accounts of legends involving Waikele in the 'Ewa District. Many of the legends involve gods and goddesses, *ali'i*, and accounts of life and the bountiful resources within the area ('Ī 1959:32; Kamakau 1992:71, 75, 136, 137; Sterling and Summers 1978:24-31). Additional legendary figures such as Hi'iaka and Kahalaopuna are said to have passed through during part of their epic journeys. It should be noted that much of the literature and references to Waikele tends to favor the *makai* portion of the *ahupua'a*.

## THE MĀHELE

In the 1840s, traditional land tenure shifted drastically with the introduction of private land ownership based on western law. While it is a complex issue, many scholars believe that in order to protect Hawaiian sovereignty from foreign powers, Kamehameha III was forced to establish laws changing the traditional Hawaiian economy to that of a market economy (Daws 1968:111; Kame‘eleihiwa 1992:169-70, 176; Kelly 1998:4, 1983:45; Kuykendall 1938, Vol. I:145 footnote 47, 152, 165-6, 170).

Once Article IV of the Board of Commissioners to Quiet Land Titles was passed in December 1845, the legal process of private land ownership began. The Māhele of 1848 divided Hawaiian lands between the king, the chiefs, the *konohiki* (land/resource managers), and the government. The subsequently awarded parcels were called Land Commission Awards (LCAs). After this initial division and the establishment of private ownership, lands were made available for the *maka‘āinana* (commoners) under the Kuleana Act of 1850 (so named because the land holding of a tenant residing in an *ahupua‘a* was called a *kuleana* [Lucas 1995:61]). If the *maka‘āinana* had been made aware of the procedures, were able to claim the plots on which they had been cultivating and living. These claims did not include any previously cultivated but presently fallow land, *‘okipu‘u* (forest clearing), stream fisheries, or many other resources necessary for traditional survival (Kelly 1983; Kame‘eleihiwa 1992:295; Kirch and Sahlins 1992). If occupation could be established through the testimony of two witnesses, the petitioners were awarded the claimed LCA and issued a Royal Patent after which they could take possession of the property (Chinen 1961:16).

LCAs and Land Grants (lands that were made available for purchase) abound in ‘Ewa District. At the time of the Māhele (1848), 124 land Court Awards were issued in Waikele. *ahupua‘a*. A search of the Waihona ‘Aina Database (2014) and archival research indicated that the subject property was associated with a LCA. The project property was part of LCA 4:1 (*Āpana* No. 1 of Mahele Award No. 4), Royal Patent 4486, 2, 829-acres, Waikele *ahupua‘a*, Pouhala ‘ili that was granted to Luluhiwalani (Indices of Awards 1929:168). The LCA was designated *kula* land which means that it was primarily used for open vegetation and cultivation in the form of dry land agricultural plots.

## THE POST-CONTACT PERIOD AND PRESENT LAND USE

The post-Contact Period use of lands in Waikele differed between the *makai* and *mauka* portions. Much of the population of Waikele was concentrated around the *makai* portion of the *ahupua‘a* due to the natural resources available. Some parts of the *mauka* portion of Waikele

were also inhabited but the majority of the land was used for agricultural pursuits. Once land became available through the Māhele, large grants of land in Districts throughout the island were leased or sold to foreigners for commercial ventures such as ranching and agriculture. Ranching became an early commercial success once a 1794 *kapu* (prohibition) by Kamehameha I was lifted and cattle could be legally hunted for their skins, tallow, and meat. Providing these and other cultivated western resources to an ever-increasing foreigner population meant a great profit for those who took the opportunity.

During the middle to late 19<sup>th</sup> century and into the 20<sup>th</sup> century, sugarcane and pineapple became dominant cash crops in Hawai‘i. The beginning of the sugar industry in the Hawaiian Islands came in 1835, when Peter Allan Brinsmade, William Ladd, and William Hooper—all New Englanders with missionary connections who had come to Honolulu in 1833 to establish a mercantile trading house—decided that the greatest commercial opportunities in the islands lay in agriculture (Hussey 1962). The establishment of the Oahu Railway and Land (OR & L) Company in 1889 and subsequent construction of railroads allowed the agricultural areas to connect to processing facilities and market places, enabling the easier transportation of agricultural products. ‘Ewa District and Waikele. Ahupua‘a played an active role in the sugar industry as part of the Oahu Sugar Company. A 1925 Oahu Sugar Company map indicates that the project area (fields 23 and 49) and surrounding lands were turned into sugarcane fields (Figure 4). In general, the Plantation Era on O‘ahu extended from ca. 1835 through the early to mid 1900s.

In the early to mid-1900s, with the advent of World War II, ‘Ewa District saw a portion of its lands turned into military facilities. In Waikele *ahupua‘a*, large portions of the West Loch of Pearl Harbor, Waikakalaua Gulch, and Schofield Plateau were turned into military facilities.

### **SELECTED PREVIOUS ARCHAEOLOGICAL WORK**

Several archaeological surveys have been conducted within the vicinity of the project area as well as within the project area. These surveys are summarized below (see Figure 5).

In 1933 McAllister reported on the locations of Mokoula Heiau (State Site No. 50-80-09-127) and Hapupu Heiau (State Site No. 50-80-09-129) in the Waipahu area and relayed that both *heiau* had been destroyed (McAllister in Sterling and Summers (1978:25) and McAllister

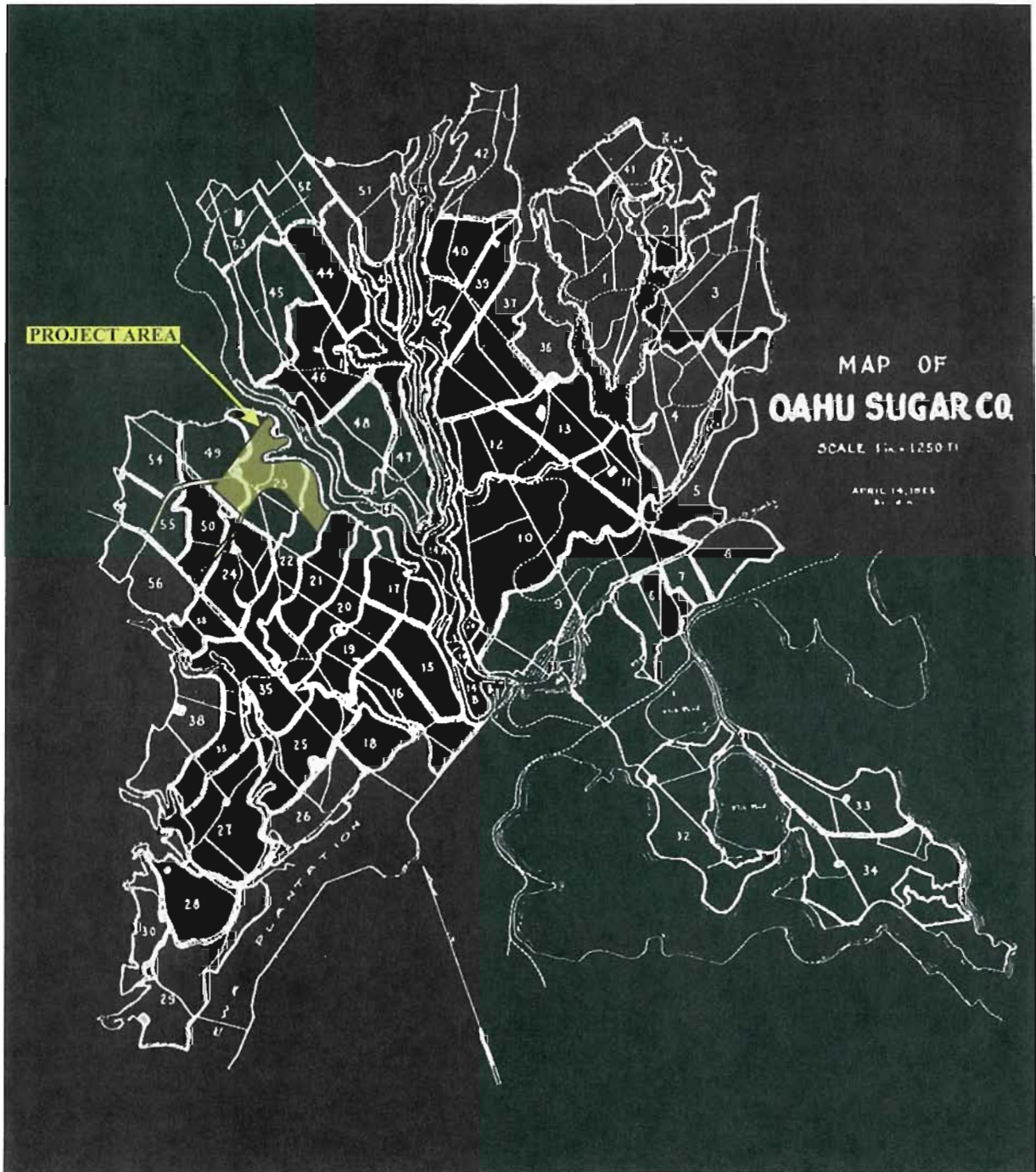


Figure 4: 1925 Map of Oahu Sugar Company Sugarcane Fields Showing Project Location (Conde and Best 1973)



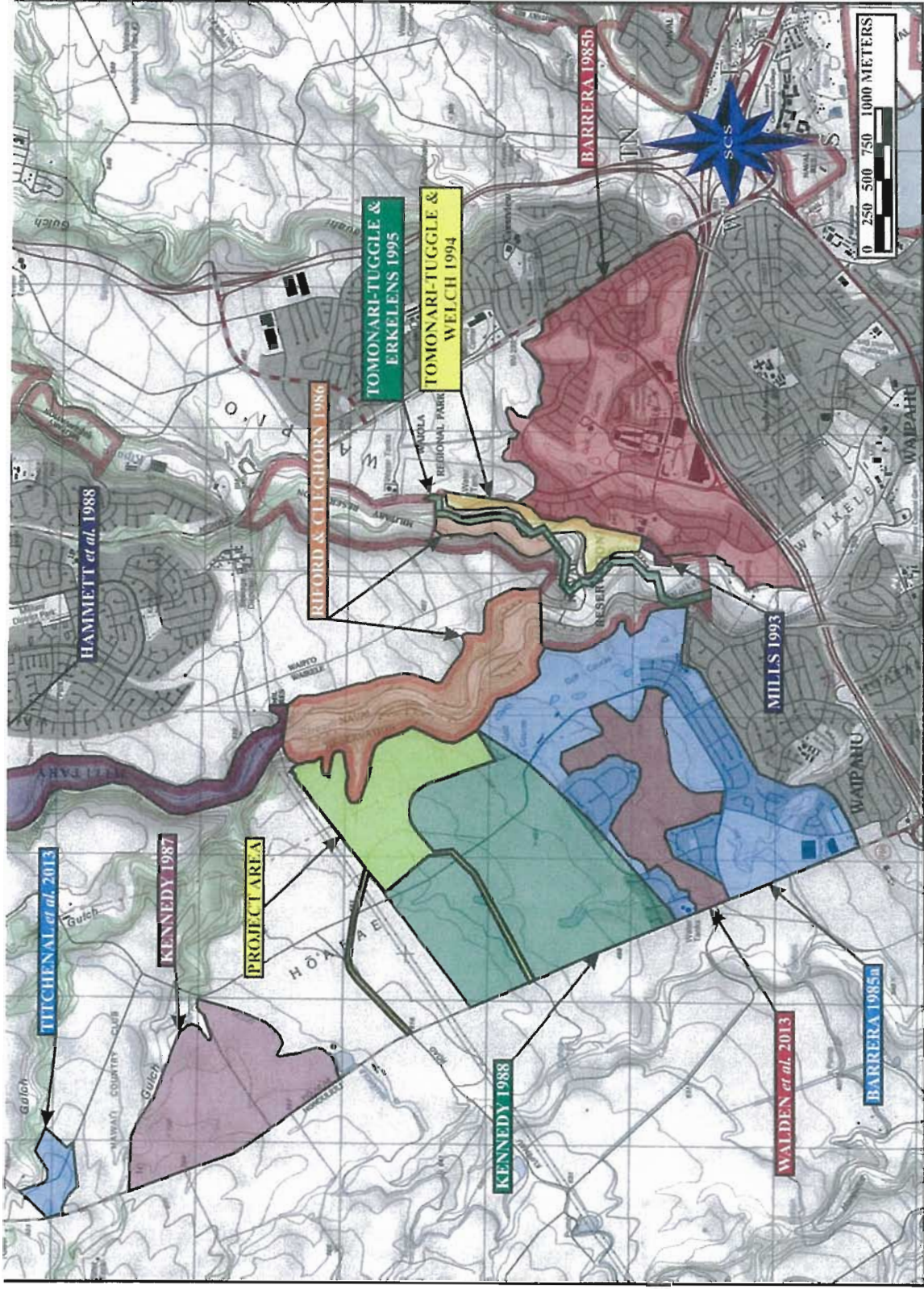


Figure 5: Map of Previous Archaeology Showing Project Area Location.

1933:106). Also in the vicinity, the Bishop Museum identified a Traditional Hawaiian petroglyph site displaying human figures and dogs; this particular site was designated as Bishop Museum Site No. OA-B5-12 (Sterling and Summers 1978:25; Cox and Stasack 1988:96-97).

In July of 1985, Barrera conducted an archaeological reconnaissance survey located at TMK: (1) 9-4-002: portion of parcel 001, Village Park, Waipahu. The survey was conducted on approximately 692-acres of land under sugarcane cultivation. The project area was adjacent to Waikele Gulch on the east, Kunia Road on the west, the existing Village Park subdivision on the south, and sugarcane field to the north. The two-day surface survey yielded negative findings (Barrera 1985a)

In August 1985, Barrera conducted an archaeological reconnaissance of a property located at TMK: (1) 9-4-002:012 and 013 in Waikele. The project area consisted of approximately 586-acres of land under sugarcane cultivation that is bounded on the west by Waikele Gulch, on the south by the H-1 Freeway, on the northeast by Kamehameha Highway, and on the north by pineapple fields. The two-day surface survey yielded negative findings (Barrera 1985b).

In 1986, Riford and Cleghorn conducted an archaeological survey of portions of the Waikele Branch of the Lualualei Naval Magazine. The survey consisted of 264-acres of land within Waikakalaua Gulch and Kipapa Gulch. Five sites were identified along Waikakalaua Gulch – State Sites 50-80-09-2919 through -2923. State Site 50-80-09-2919 consisted of a pre-Contact rockshelter with cultural materials scattered on the interior surface of the site. State Site 50-80-09-2920, three caves, was described as a pre-Contact temporary habitation site. Likewise, State Site 50-80-09-2921 consisted of a cave and crawl space with surface cultural material. State Site 50-80-09-2922 is a probably historic basalt rock quarry located in and on the edge of a 3.5 m deep ravine of an intermittent tributary of Waikakalaua Stream. The site contained basalt flakes with some boulders displaying negative flake scars (Riford and Cleghorn 1986: 38, 48). State Site 50-80-09-2923 is a stone wall located at the top of Waikakalaua Gulch. The wall is constructed of stacked, angular, basalt boulders with angular, cobble-sized, flake core fill. The wall probably functioned as a road facing and vehicle retaining wall (*ibid*: 48). The survey also noted that Historic features were observed on both sides of Waikakalaua Stream and at the top of the Gulch. Of these sites, State Sites -2922 and -2923, both Historic sites, are just beyond the east boundaries of the project area.

In 1987, Archaeological Consultants of Hawaii (Kennedy 1987) conducted a walk-through reconnaissance of a 203.171-acre parcel located at TMK 9-4-04. The property was used for sugarcane cultivation and had an existing ditch, Waiahole Ditch, and two reservoirs. These facilities were associated with the late Historic period and associated with plantation activities. The survey concluded with negative findings for above ground archaeological sites.

In 1988, Cultural Surveys Hawaii (Hammatt *et al.* 1988) conducted an archaeological survey of approximately 422-acres along Waikakalaua Stream in Waikakalaua Gulch (also known as Waikele Gulch). The survey was conducted for the Waikakalaua Storage Tunnels. One site was identified during the survey and consists of two historic sugarcane terraces. No other archaeological sites or artifacts were identified.

In 1993, Mills conducted an archaeological inventory survey of two transmission line realignments totaling approximately 2,000 linear feet on the edge of Waikele Gulch. The study had negative findings for archaeological sites and artifacts.

In 1994, International Archaeological Research Institute (IARII), Inc reported on an Archaeological Inventory Survey conducted in preparation for the Navy Family Housing at the Waikele Branch of Naval Magazine Lualualei. This survey yielded negative results (Tomonari-Tuggle and Welch 1994). Two historic properties were identified: State Site 50-80-09-4935 (pre-contact rock shelter and adjacent cave containing indigenous Hawaiian artifacts) and State Site 50-80-09-4936 (20<sup>th</sup> century railroad bed).

In 1995, IARII conducted an archaeological survey of a 46kV Sub-Transmission Line through NAVMAG-Waikele (Tomonari-Tuggle and Erkelens 1995). Two sites were located. State Site 50-80-09-4936, a rockshelter and adjacent cave containing cultural materials, was located just north of the intersection of Coleman Road and Upper Charlie Road. State Site 50-80-09-4936, a 50 m long, narrow terrace, was found on the north bank of Kipapa Stream below Prime Road.

In 2013, Pacific Consulting Services (PCSI), Inc. (Titchenal *et al.* 2013) conducted an archaeological assessment on 37-acres of land situated on a plateau east of Kunia Road and bordered by Huliwai Gulch on the north and 'Ekahanui Gulch on the south, and Waihole Ditch on the east. . Besides Modern debris and agricultural features such as water irrigation components, no archaeological sites or cultural materials were found during this archaeological investigation.

In 2013, PCSI (Walden *et al.* 2013) conducted an archaeological assessment of approximately 152-acres located within the Royal Kunia subdivision area. This area was first surveyed in 1985 by Barerra which is discussed above. The study found several modern features within the property but concluded that no historical or traditional cultural features or artifacts were identified.

#### **PREVIOUS ARCHAEOLOGICAL WORK IN THE PROJECT AREA**

Archival research indicated that the subject property was included in an Archaeological Walk-Through Survey conducted in November 1988 by Archaeological Consultants of Hawaii. This survey covered 670-acres of TMK: (1) 9-4-002: portion of 001 and 091 (Kennedy 1988). Due to the intensive sugarcane cultivation at the time of survey, Kennedy suggested that the prospect of identifying archaeological sites remaining above ground were remote. This investigation yielded negative findings and Kennedy suggested that the subject property offers little opportunity for subsurface recovery. The 670-acres from this survey overlaps the current project area.

#### **EXPECTED FINDINGS WITHIN THE PROJECT AREA**

Based on the available physiographic and archaeological research, the subject property has undergone extensive disturbance from commercial sugarcane cultivation, and possible railroad and military activity, making it unlikely that any evidence of use predating the Plantation-Era is intact on the ground surface. However, it is possible that cultural deposits, features, or artifacts associated with pre- and/or post-Contact activities may be present in deposits below the existing grade, as well as Plantation-Era activities given the proximity of the Oahu Sugar Mill, and the State Sites located within the Waikele Gulch.

#### **FIELD METHODS**

##### **FIELD METHODOLOGY**

Multiple field tasks were completed during the current Archaeological Inventory Survey. First, pedestrian survey was conducted in order to identify archaeological sites and assess the proposed project area geographical/physiographical features. Transect spacing of ten to fifteen meters (32.8 to 49.2 feet) intervals was employed as ground visibility was good to fair. Once archaeological sites were located, they were marked with two types of biodegradable flagging tape: white with blue and red and white stripes. During the pedestrian survey, results were compiled on standard graphing paper as well as with digital photography. Each site was given a SCS temporary site designation (*e.g.*, TS-1) and plotted on a United States Geological Survey

(USGS) map with a handheld Garmin GPS Map 60CSx global positioning system (GPS) unit. The datum and coordinate system used for the GPS unit was NAD83 and UTM (Universal Transverse Mercator). Magnetic north compass orientation was also employed. All measurements were recorded in metric. Individual sites were also documented in plan view. Site boundaries were primarily determined by feature architecture boundaries or artifact scatter concentration.

Limited excavation was conducted during the current Archaeological Inventory Survey in the form of six Shovel Probes that were placed in different parts of the project area property. Pre-Contact artifacts were found during surface survey while Historic and Modern cultural materials were found during the surface survey and within the Shovel Probe test units.

### **LABORATORY METHODOLOGY**

All field notes and digital photographs were curated at the SCS laboratory in Honolulu. Representative plan view sketches showing location and morphology of identified sites/features/deposits were illustrated. Pre-Contact, Historic and Modern cultural materials were collected during surface survey and excavation. Analysis was conducted for this project at the SCS O'ahu office. All data are clearly recorded on standard laboratory forms that included numbers and weights (as appropriate) of each constituent category. All materials gathered during this project (including documentation) are ultimately the property of the client, who may request their transfer subsequent to the acceptance of the final AIS report.

### **CURRENT ARCHAEOLOGICAL INVENTORY SURVEY RESULTS**

The current Archaeological Inventory Survey was conducted on approximately 161-acres of and in Kunia, Waikele Ahupua'a, 'Ewa District, Island of O'ahu, Hawai'i [TMK: (1) 9-4-002:052] (see Figures 1 and 2). As stated elsewhere in this report, the current project area was previously subjected to an Archaeological Walk-Through Survey by Archaeological Consultants of Hawaii (Kennedy 1988) which found no remaining, above ground archaeological features. However, within the current survey perimeter, a total of two newly identified archaeological sites were documented. One of the two sites (the artifact scatter, SCS TS-1) was later determined by SHPD to lack sufficient site integrity to be assigned a State Site number. The second site (historic road complex TS-2) has been designated as State Site 50-80-08-7671 (Feature 1: alignment/ Feature 2: wall/ Feature 3: paved segments of road and railroad alignment).

Much of the project area has been mechanically impacted and subjected to modern modifications due to agricultural activity. This is evidenced through the mechanical scarring on basalt cobbles and basalt boulders in a large push pile, pieces of mortared ditch sections, agricultural irrigation systems, and active, wooden telephone posts along the north/northwest side of the project area. An earthen berm above 2 m high and approximately 3.6 m wide located in the southern half of the project area. Additionally Historic and Modern debris such as black plastic agricultural irrigation lines, thin black plastic agricultural covering for moisture retention, white PVC pipe fragments and associated black plastic pipe fittings, basalt gravel, ferrous metal railroad spikes, mortar with angular basalt gravel, and shaped basalt blocks were scattered on the project area surface.

To supplement the surface pedestrian survey, a total of six Shovel Probes were manually excavated within the project area. SP-1 and SP-2 were placed close to an earthen berm. Three pre-Contact artifacts were found on the surface in the vicinity of SP-1 and SP-2. These surface artifacts influenced the placement of SP-3 and SP-4 but no other pre-Contact artifacts were located. SP-5 and SP-6 were placed at the end of a dirt road leading from four structures visible on a 1927 USGS Waipahu map in relation to TS-1 to the southeast of the structures (Figure 6). This area was thought to be a Historic dump. The results from SP-5 and SP-6 suggest that the area is mixed fill. The shovel probes did not reveal the presence of subsurface architecture or subsurface features. The cultural materials collected from the shovel probes were analyzed at the SCS O'ahu office by Guerin Tome, B.A. The following paragraphs detail the total inventory of sites recorded during the current Archaeological Inventory Survey, the results of the shovel probes, and a summary of the artifact analysis. This includes a map detailing the location of sites identified in the 1986 Riford and Cleghorn survey in relation to the project area, the two newly identified sites TS-1 and TS-2, the six shovel probe locations, and the locations of the three pre-Contact artifacts (Figure 7).

#### **SCS TS-1 ARTIFACT SCATTER**

GPS Coordinates: East 600416/ North 2368792

Number of Features: 1

Feature Type: Artifact Scatter

Feature Function: Habitation

Feature Structural Integrity: N/A

Feature Age Association: Historic

Candidate for Preservation: No

Archaeological Recommendations: No further work

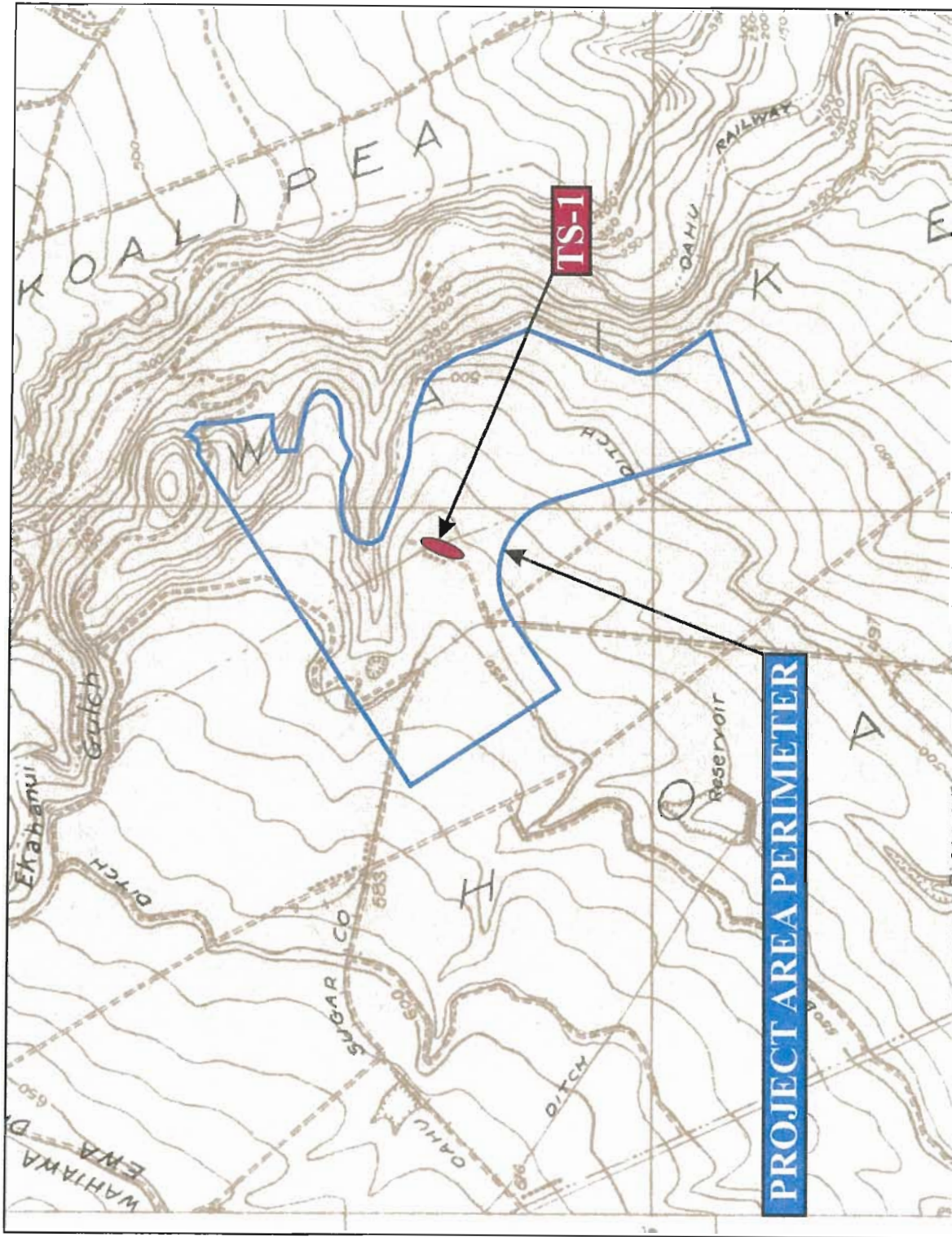


Figure 6: 1927 USGS Map of Waipahu Showing Site TS-1 Artifact Scatter in Relation to Four Structures.

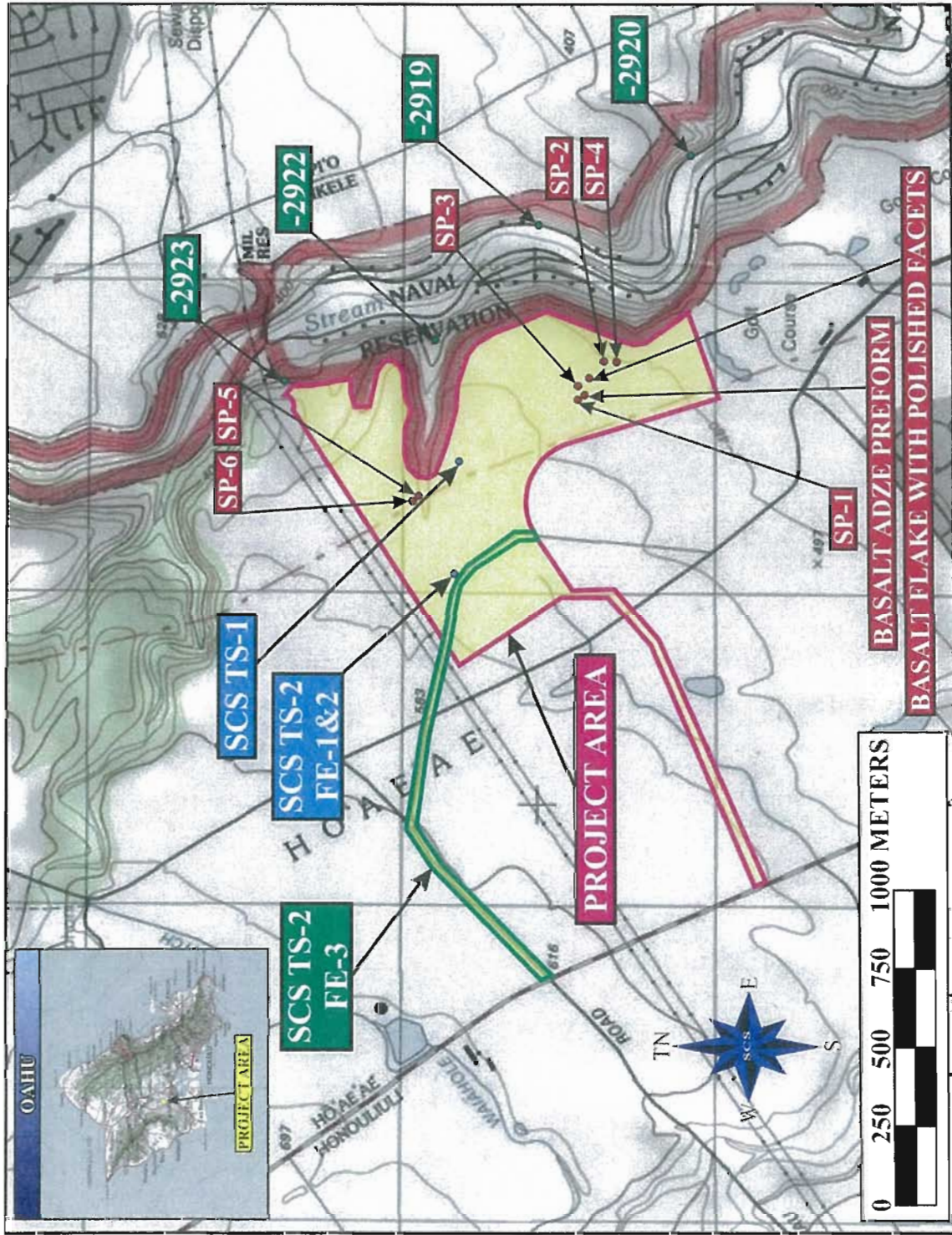


Figure 7: USGA 1998 Schofield Barracks Quadrangle Showing Project Area Location with Archaeological Sites and Artifacts.



SCS site TS-1, located approximately in the center of Tax Map Key 9-4-002:052, consisted of an artifact scatter (Figures 8 and 9). TS-1 was found on relatively flat terrain amongst vegetation. This area is a portion of the road between the agricultural fields at the highest elevation (in the agricultural field portion of the project area). The ground is a level, flat silty red clay soil with some quarried gravel and cobble. The feature is composed of fragmented materials scattered on a segment of the existing graded dirt road surface approximately 126 m long by 18 m wide with varying above ground surface heights. The site's end to end axis was orientated northeast-southwest (45°/ 225° magnetic).

Materials that comprise the feature included historic era fragments of various man-made objects such as porcelain insulators, ceramic dish sherds, colored bottle and vessel glass, and a metal buckle. The historic era materials were identified by manufacture markings as well as the quality and form of the object fragments. In addition to the historic materials the scatter included modern materials such as quarried basalt, sparse limestone gravel, chunks of broken concrete, thin black plastic erosion protection sheeting, irrigation tubing, and PVC fragments.

#### **STATE SITE 50-80-08-7671 (SCS TS-2) ALIGNMENT/WALL/PAVED SEGMENTS**

GPS Coordinates: Feature 1: East 600100 North 2368768;

Feature 2: East 600073 North 2368799

Number of Features: 3

Feature Type: Feature 1: Alignment

Feature 2: Wall

Feature 3: Paved Segments

Feature Function: Road

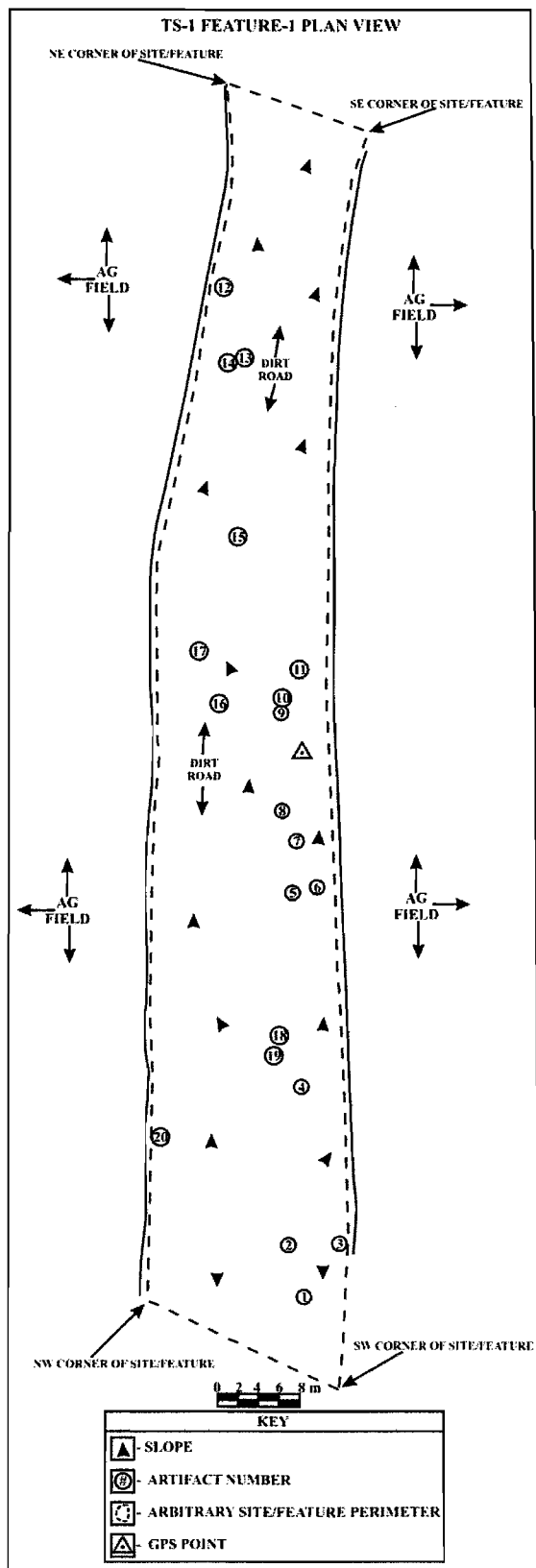
Feature Structural Integrity: Fair

Feature Age Association: Historic

Candidate for Preservation: No

Archaeological Recommendations: No further work

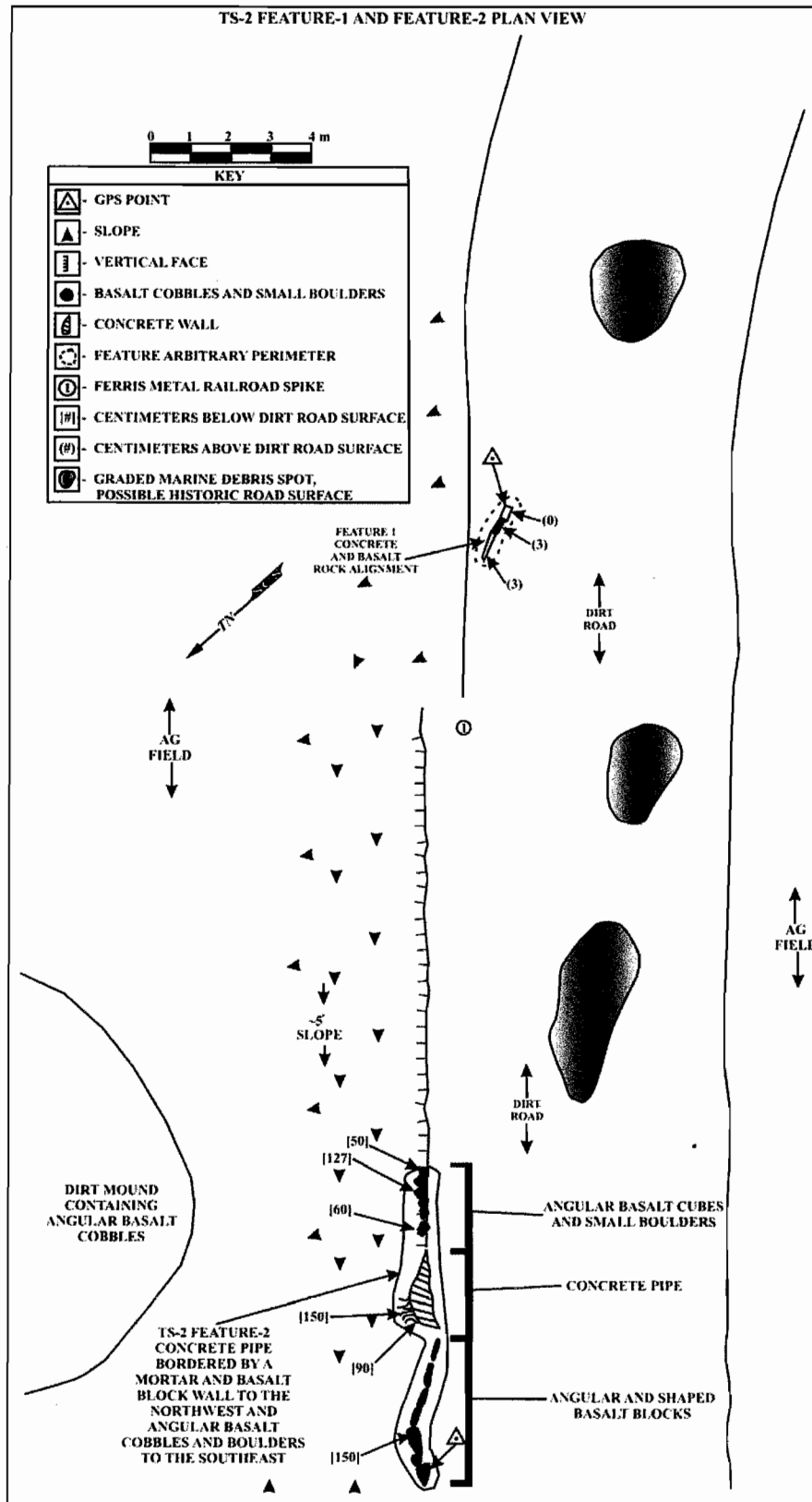
State Site 50-80-08-7671 is a Historic road complex comprised of three features located in the western portion of Tax Map Key 9-4-002:052 (Figures 10 through 16). Features 1 and 2 are located on a slight (about 2-3 degree) southwest to northeast downslope on the east shoulder of a dirt road (Feature 3). Feature 1 appears to be a partial feature which has either been destroyed or buried by mechanical means. As such, a proper tier or course count could not be properly assessed. The feature's end to end axis was orientated northwest- southeast (147°/ 327° magnetic). Modern cultural material, such as thin, black plastic for agriculture, was observed on and around the ground surface of the site. Some marine detritus was also observed.



**Figure 8: Plan View of SCS Site TS-1.**



**Figure 9: View of West Half of TS-1, Artifact Scatter. View to Northeast.**



**Figure 10: Plan View of State Site 50-80-09-7671 (TS-2).**

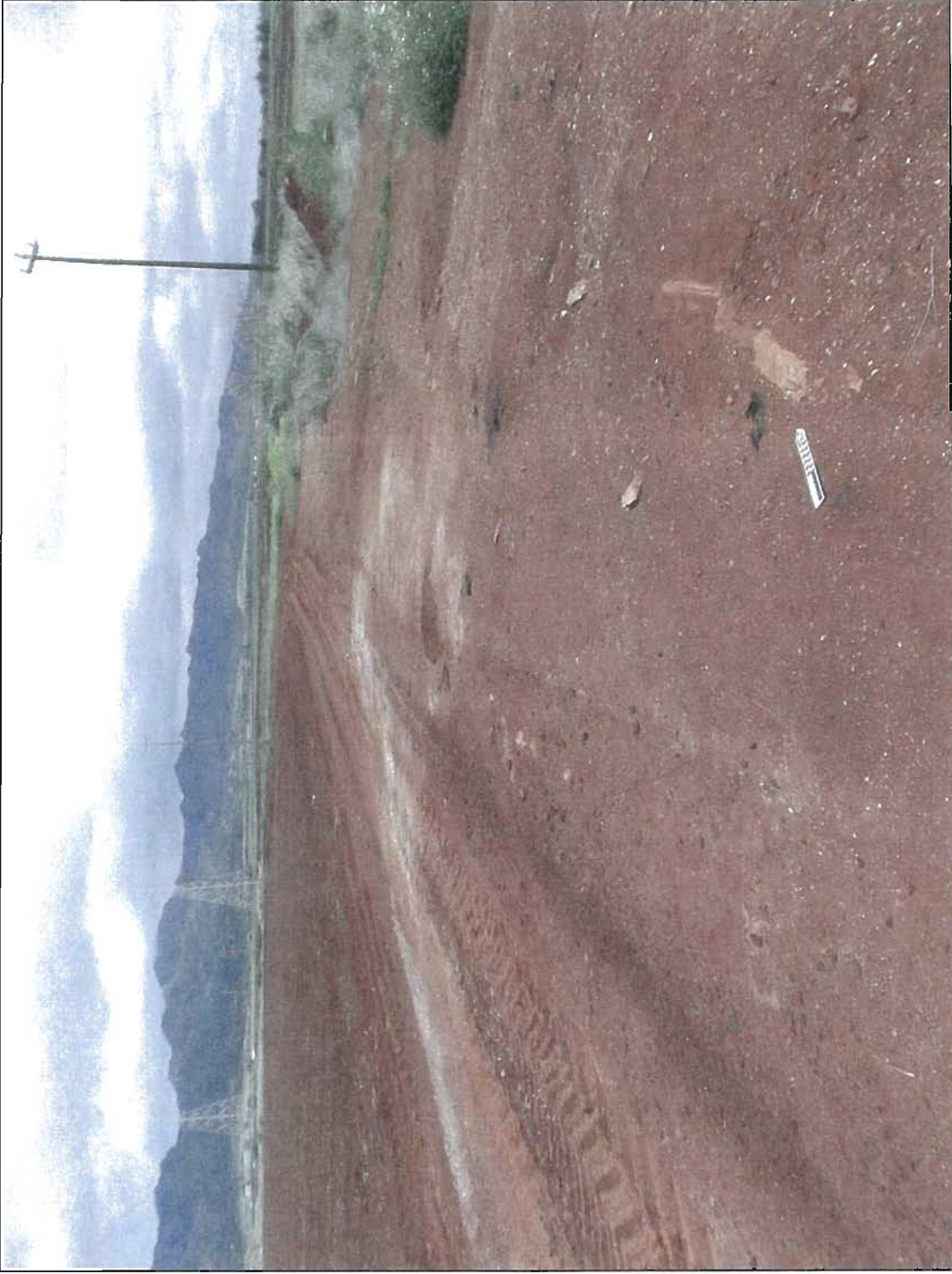


Figure 11: Site TS-2 Feature 1, Concrete and Basalt Rock Alignment. View to Northwest.

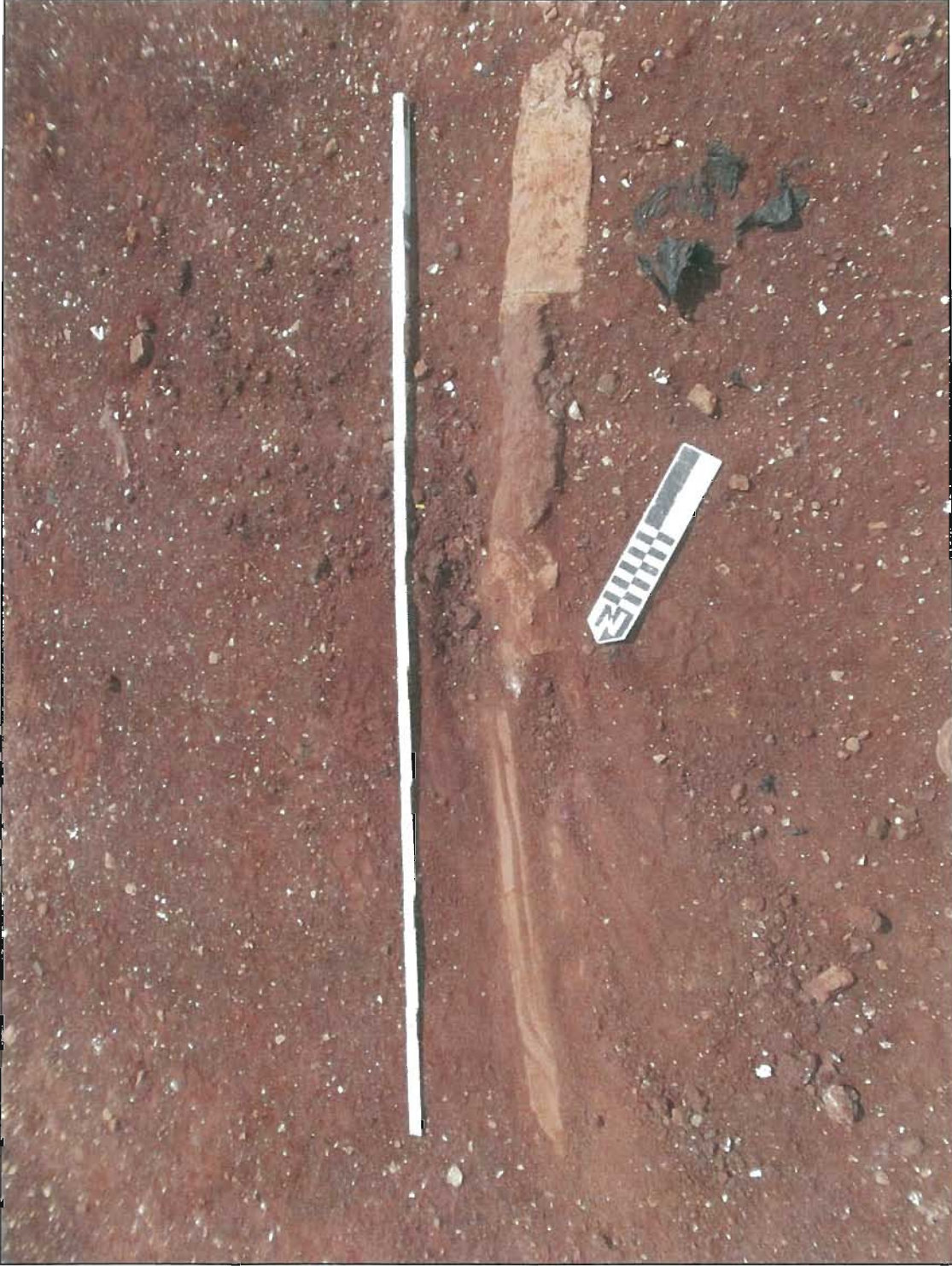


Figure 12: Site TS-2 Feature 1, Concrete and Basalt Rock Alignment. View to Northeast.



**Figure 13: Site TS-2, Feature 2, Angular Basalt Cobbles and Small Boulders, Concrete Pipe, and Basalt Block and Mortar Wall. View to Southwest.**

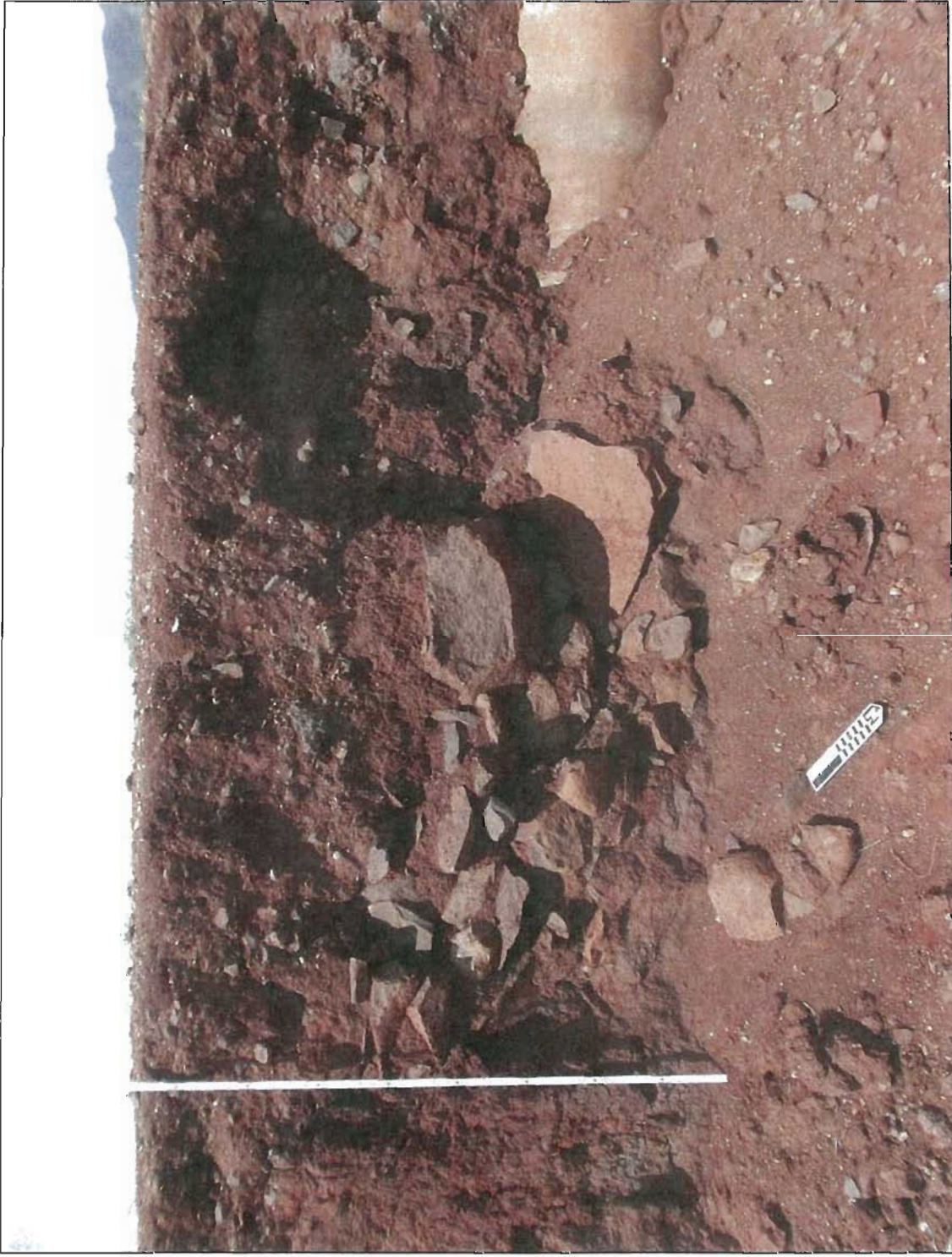


Figure 14: Site TS-2, Feature 2, Angular Basalt Cobbles and Small Boulders. View to Southwest.





Figure 15: Site TS-2, Feature 2, Concrete Pipe. View to Southwest.



**Figure 16: Site TS-2, Feature 2, Concrete Pipe and Basalt Block and Mortar Wall. View to Northwest.**

Feature 2 is a linear feature that consists of three components: a mortar and basalt block wall located subsurface but exposed in profile, a concrete pipe, and angular basalt cobbles and boulders. The wall has at least five courses of basalt blocks some of which do not have mortar. Angular basalt cobbles have been employed in the wall as chinking. The northwest portion of the two upper courses of basalt block does not have mortar and employs the chinking more than the rest of the wall. Closer toward the southeast end of the mortar and basalt block wall is a near 90 degree bend which the wall used to go over the concrete pipe. The concrete pipe is constructed of concrete reinforced with 4 mm diameter ferrous metal wire. The interior diameter of the concrete pipe is 60 cm with a wall thickness of 4 cm. The last component of the feature is a congregation of angular basalt cobbles and small boulders located on the east side of the concrete pipe. This portion of the feature is not mortared but piled. All three components of Feature 2 are located below the surface of the existing dirt road. The entire feature is approximately 8 m long. The feature's end to end axis was orientated northwest- southeast (122°/ 302° magnetic). Portions of Feature 2 have been destroyed and displaced to create an earthen depression for water drainage. Feature 2 is located roughly 15 m northwest of Feature 1. Some modern cultural material in the form of thin, black agricultural plastic was observed along with historic marine detritus.

Feature 3 consists of portions of a Historic plantation road and former railway route, much of which has been mechanically impacted and subjected to modern modifications (this corridor is still actively used as an access road into and across the project area). This former transportation corridor is clearly visible in the 1927 USGS map of the area (Figure 17). Based on the results of the survey the road and rail alignment were paved with a tamped layer of crushed coral and dredged marine and reef detritus, visible today either as segments of coral pavement or as coral pebble remnants embedded in the current dirt roadbed (Figures 18-20). Heavily corroded iron railroad spikes were also recovered from the surface of the corridor (Figure 21). This feature is in poor condition and lacks integrity.

#### **SHOVEL PROBE 1 (E 600633/ N 2368398)**

The purpose of Shovel Probe 1 (SP-1) was to locate archaeological cultural material, archaeological subsurface features, or buried cultural deposits. Shovel Probe 1 was located on the north side of the earthen berm of the east-west dirt road. Measuring approximately 0.3 m long and 0.3 m wide, SP-1 was excavated to a maximum depth of 0.50 m below the soil surface. No archaeological cultural material was found during the excavation of SP-1. The excavation of SP-1 revealed the presence of two soil strata (Figures 17 and 18).

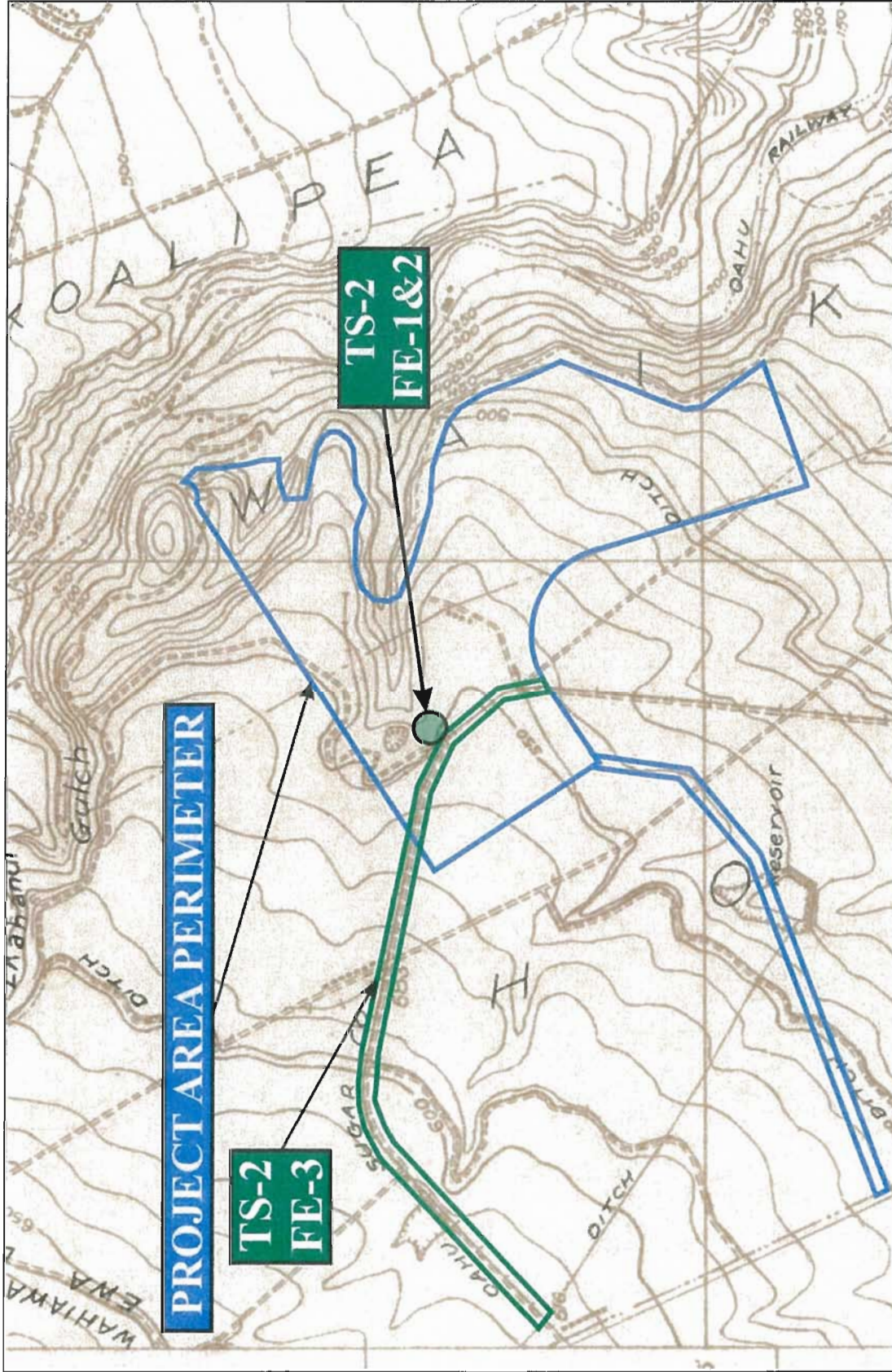


Figure 17: 1927 USGS Map of Waipahu Showing a Plantation Road and Railway Passing Through the Current Project Area (Marked as Feature 3).

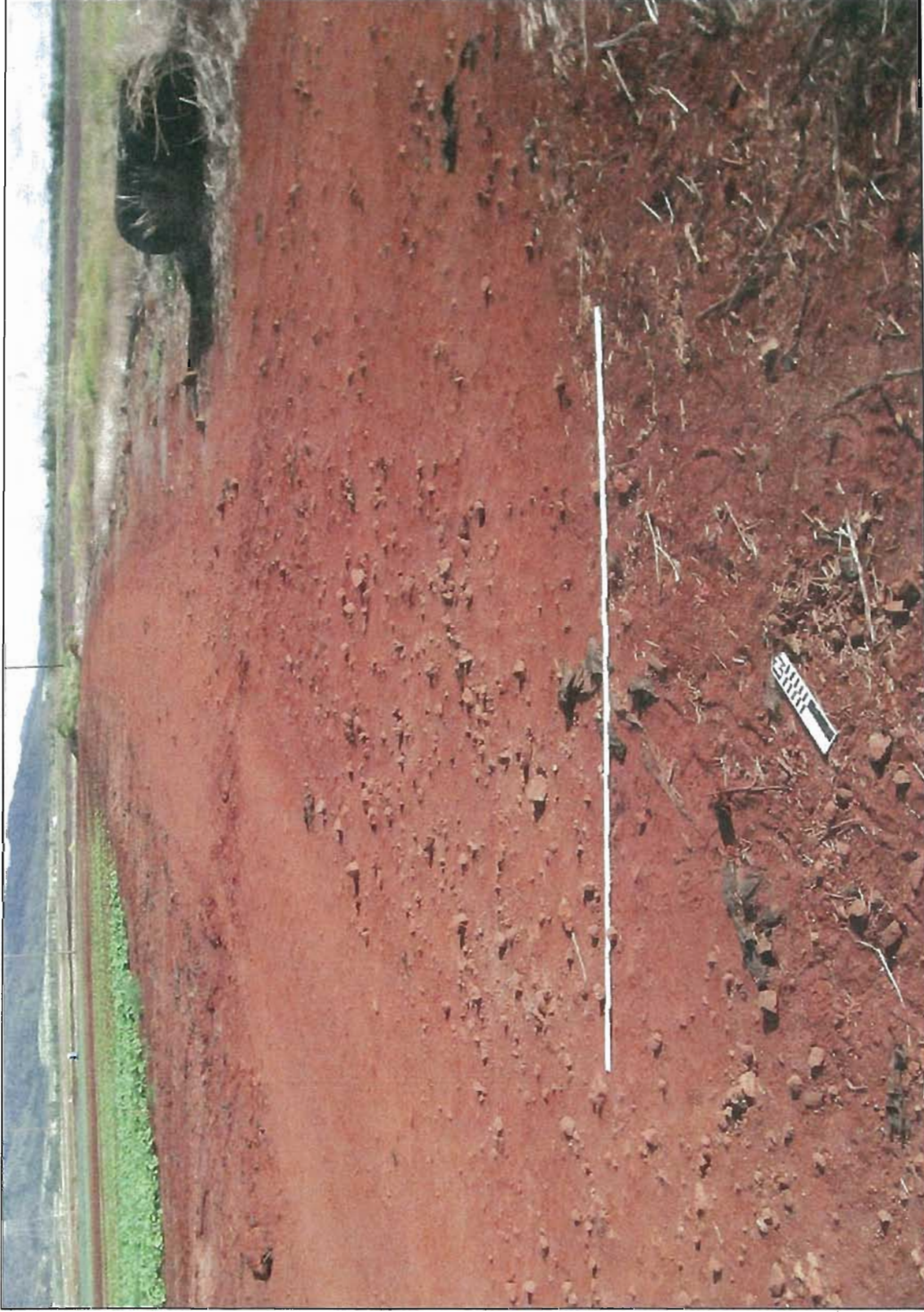


Figure 18: Crushed Coral embedded in Dirt Road Surface near the Eastern End of TS-2 Feature 3, View to Northwest.

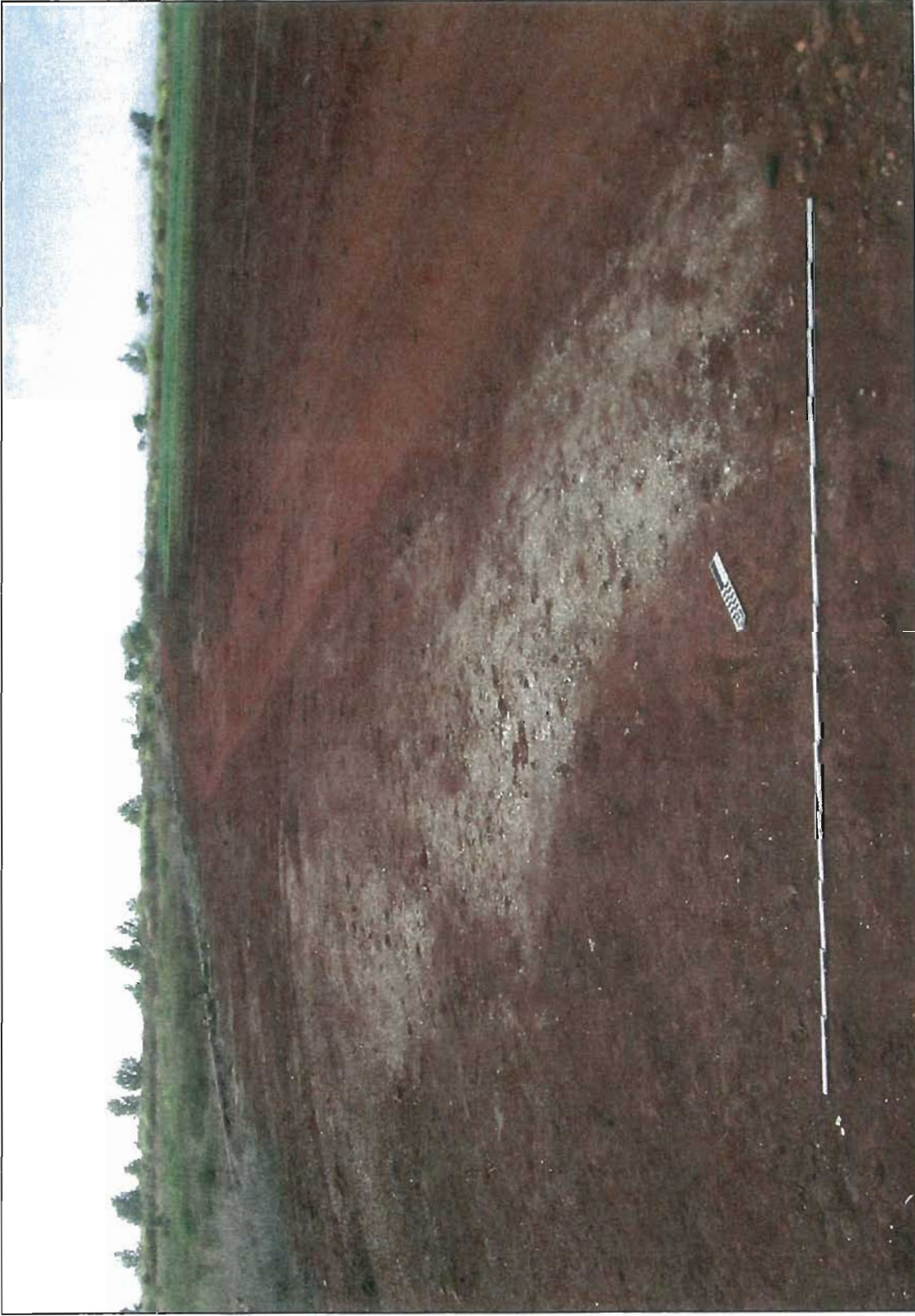
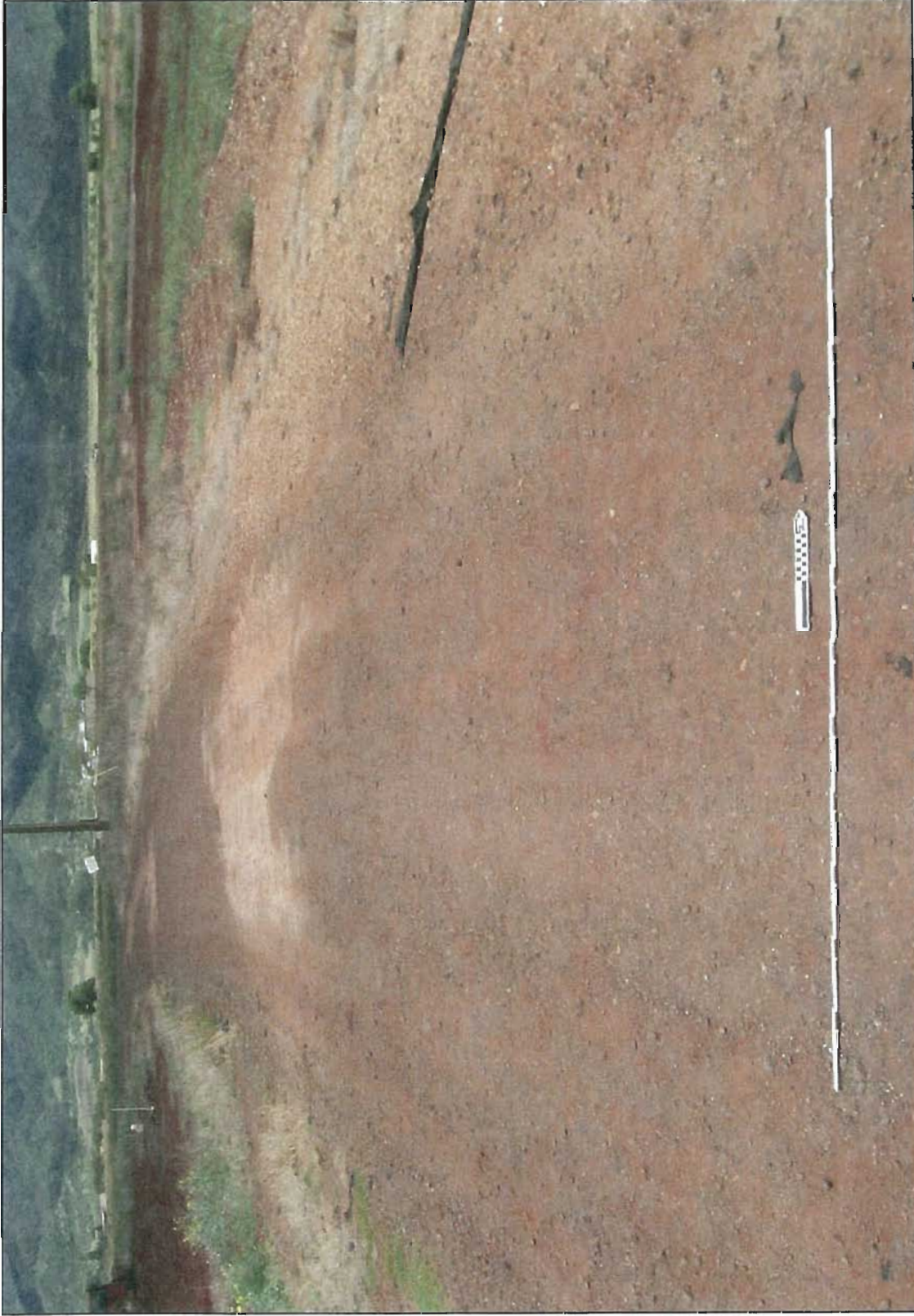


Figure 19: Remnant Pavement of Coral and Dredged Reef Detritus on the Northern Shoulder of TS-2 Feature 3, View to Southeast.



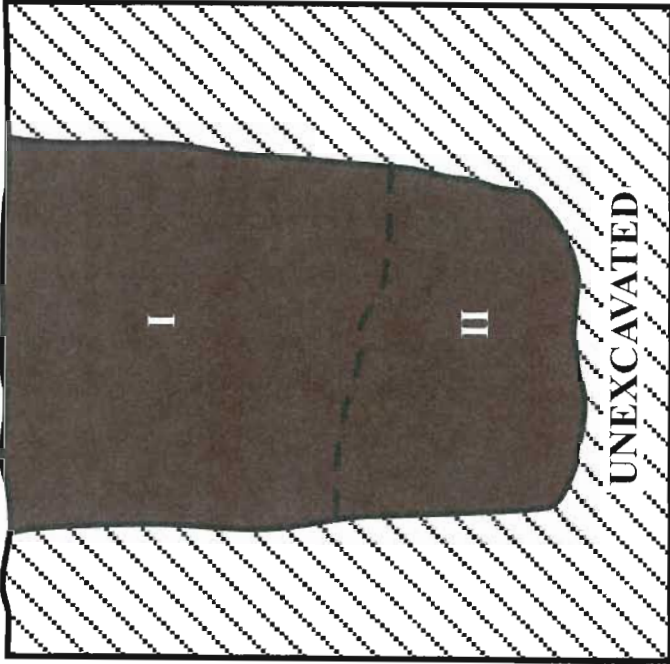
**Figure 20: Mixture of Coral and Modern Crushed Basalt Gravel in Roadbed at the Northernmost Portion of Feature 3, View to West.**



Figure 21: Ferrous Metal Spikes Recovered From the Surface of TS-2 Feature 3.



**SP-1 EAST WALL PROFILE**



**KEY**

**I - LAYER I: DARK RED (2.5YR 3/6) CLAY SILT**

**II - LAYER II: DARK RED (2.5YR 3/6) FINE VERY COMPACT CLAY**

Figure 22: SP-1 East Wall Profile.



Figure 23: SP-1 Post Excavation Plan View. View to West.

- Layer I (0-29/33 cmbs) was a very compact dark red (2.5YR 3/6) clay silt with medium coarse crumb texture (40%). The lower boundary was indistinct and only differed in texture. Thin, black agricultural covering was found. Due to the presence of the modern plastic, LI is interpreted as an agriculturally disturbed natural stratum.
- Layer II (29/33-50 cmbs) was a very compact, dark red (2.5YR 3/2) fine clay. No cultural materials were observed

Excavation of Shovel Probe 1 revealed that this portion of the project area has not been strongly impacted by mechanical or human activities below the surface. Although Layer I has been disturbed by agricultural activities, both Layer I and Layer II displayed the natural stratigraphy of the landscape.

#### **SHOVEL PROBE 2 (E 600754/ N 2368348)**

The archaeological purpose of Shovel Probe 2 (SP-2) was to locate archaeological cultural material, archaeological subsurface features, or buried cultural deposits. Shovel Probe 2 was placed on the shoulder of a dirt road located approximately 18 m southwest of a recently plowed agricultural field. Measuring approximately 0.3 m long and 0.3 m wide, SP-2 was excavated to a maximum depth of 0.63 m below the soil surface. The north wall of SP-2 was oriented east-west (105°/285° magnetic). Although no cultural material was found during the excavation of SP-2, the stratigraphic sequence was exposed (see below). The excavation of SP2 revealed the presence of two soil strata (Figures 19 and 20).

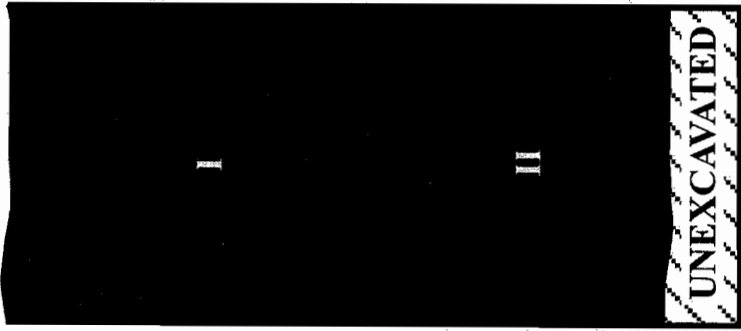
- Layer I (0-36 cmbs) was a compact, dark reddish brown (2.5YR 3/4, dry) clayey silt. Lower boundary is diffused. No cultural materials were found. Due to diffuse lower boundary, LI is interpreted as a natural stratum.
- Layer II (36-63 cmbs) was a compact, dark reddish brown (2.5YR 2.5/4, dry) clayey silt. No cultural materials observed. Since LI is interpreted as a natural stratum, LII is also interpreted as a natural stratum.

Excavation of Shovel Probe 2 revealed that the subsurface of this portion of the project area has not been strongly impacted by mechanical or human activities. Both Layer I and Layer II displayed the natural stratigraphy of the landscape.

#### **SHOVEL PROBE 3 (E 600653/ N 2368398)**

The archaeological purpose of Shovel Probe 3 (SP-3) was to locate archaeological cultural material, archaeological subsurface features, or buried cultural deposits. Shovel Probe 3 was placed on the south side of the earthen berm, 20 m east of SP-1. The ground is slightly sloped (about 4 degrees east-west) and moderately covered in tall grass and *koa haole*. Measuring approximately 0.3 m long and 0.3 m wide, SP-3 was excavated to a maximum depth of 0.52

**SP-2 NORTH WALL PROFILE**



**KEY**

**I** - LAYER I: DARK REDDISH BROWN (2.5YR 3/4, DRY) CLAYEY SILT

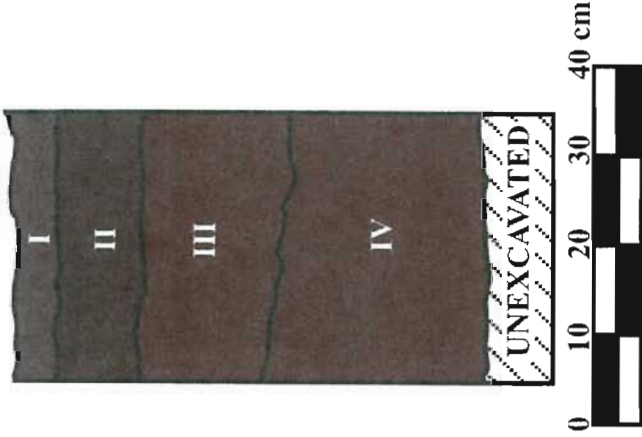
**II** - LAYER II: DARK REDDISH BROWN (2.5YR 2.5/4, DRY) CLAYEY SILT

Figure 24: SP-2 North Wall Profile.



**Figure 25: SP-2 Post Excavation Plan View. View to Northeast.**

**SP-3 NORTHEAST FACE PROFILE**



**KEY**

- I** - LAYER I: DARK REDDISH BROWN (2.5YR 3/4) LOOSE LOAMY CLAY
- II** - LAYER II: DARK REDDISH BROWN (2.5YR 2.5/4) LOOSE HUMIC CLAY
- III** - LAYER III: DARK RED (2.5YR 3/6) CLAY SILT
- IV** - LAYER IV: DARK RED (2.5YR 3/6) FINE VERY COMPACT CLAY

Figure 26: SP-3 Northeast Wall Profile.



Figure 27: SP-3 Post Excavation Plan View. View to North.

below the soil surface. No archaeological cultural material was found during the excavation of SP-3. The excavation of SP-3 revealed the presence of four soil strata (Figures 21 and 22).

- Layer I (0-5 cmbs) was a dark reddish brown (2.5YR 3/4) loose loamy clay with much leaf litter and decomposing organics. No cultural materials were observed.
- Layer II (5-14 cmbs) was a dark reddish brown (2.5YR 2.5/4) loose, humic clay with micro roots and rootlets. Thin, black modern plastic (agricultural covering) was found. Due to the presence of the plastic, LI is interpreted as an agriculturally disturbed natural stratum.
- Layer III (14-27/31 cmbs) was a very compact, dark red (2.5YR 3/6) medium coarse crumb clay. The lower boundary was indistinct and only differed in texture. No cultural materials were observed
- Layer IV (27/31-52 cmbs) was a dark red (2.5YR 3/6) fine clay. No cultural materials were observed

Excavation of Shovel Probe 3 revealed the natural stratigraphy of the landscape. Despite the agriculturally disturbed Layer I, the subsurface of this portion of the project area has not been strongly impacted by mechanical or human activities.

#### **SHOVEL PROBE 4 (E 600755/ N 2368323)**

The archaeological purpose of Shovel Probe 4 (SP-4) was to locate archaeological cultural material, archaeological subsurface features, or buried cultural deposits. Shovel Probe 4 was placed approximately 24 m south of SP-2, particularly on the south side of a tall (about 2 m) mechanically created earthen berm. SP-4 was also placed based on a polished basalt flake that was found on the surface 2 m north of SP-2. Measuring approximately 0.5 m long and 0.4 m wide, SP-4 was excavated to a maximum depth of 0.55 m below the soil surface. The west wall of SP-4 was oriented north-south (000°/180° magnetic). No archaeological cultural material was found during the excavation of SP-4. The excavation of SP-4 revealed the presence of two soil strata (Figures 23 and 24).

- Layer I (0-15 cmbs) was a loose, dark reddish brown (2.5YR 2.5/4, dry) clayey silt with grass and short tree roots. The lower boundary is solid. A piece of thin, black plastic agricultural covering was observed. The presence of the thin black plastic suggest LI is a natural stratum disturbed by former agricultural activities.
- Layer II (15-55 cmbs) was a compact, dark reddish brown (2.5YR 2.5/4, dry) clayey silt with a few short tree roots. The lower boundary is diffuse. No cultural material observed. The presence of a diffuse lower boundary suggests LII is a natural stratum.



Excavation of Shovel Probe 4 revealed the natural stratigraphy of the landscape. Despite the agriculturally disturbed Layer I, mechanical or human activities have not adversely impacted the area below ground.

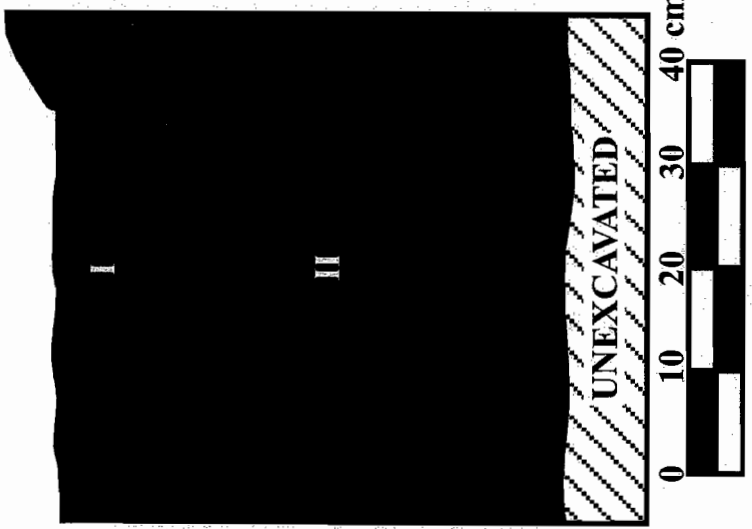
#### **SHOVEL PROBE 5 (E 600301/ N 2368953)**

The archaeological purpose of Shovel Probe 5 (SP-5) was to locate archaeological cultural material, archaeological subsurface features, or buried cultural deposits associated with four structures on the 1927 USGS map (see Figure 6). Shovel Probe 5 was placed approximately 6 m to the southeast of SP-6. The dirt road that passes by the four structures ends up at the location where SP-5 and SP-6 were excavated. The surface of SP-5 was relatively level and covered with live and decomposing grass and angular basalt gravel was scattered on SP-5's ground surface. Measuring approximately 0.4 m long and 0.4 m wide, SP-5 was excavated to a maximum depth of 0.60 m below the soil surface. The west wall of SP-5 was oriented south-north (150°/330° magnetic). Both Modern and Historic cultural material were found. The excavation of SP-5 revealed the presence of one soil strata (Figures 25 and 26).

- Layer I (0-60 cmbs) was a compact, mottled dark brown (7.5YR 3/4, dry) clayey silt and dark reddish brown (2.5 YR 3/4, dry) silty clay with grass roots. Cultural material observed included asphalt chunks, mortar with angular basalt gravel, red ceramic sherds from subsurface utility lines, a vitrified ceramic sherd, a ceramic vessel sherd with decorated, black dust fence cloth, leather, tan colored plastic, and a flat, clear glass sherd.

Excavation of Shovel Probe 5 revealed a disturbed stratigraphy. The presence of the black dust fence cloth and the decorated ceramic sherd suggest modern and historic-type cultural material got mixed in the process of mechanically pushing local fill matrices where SP-5 was located.

**SP-4 WEST WALL PROFILE**



**KEY**

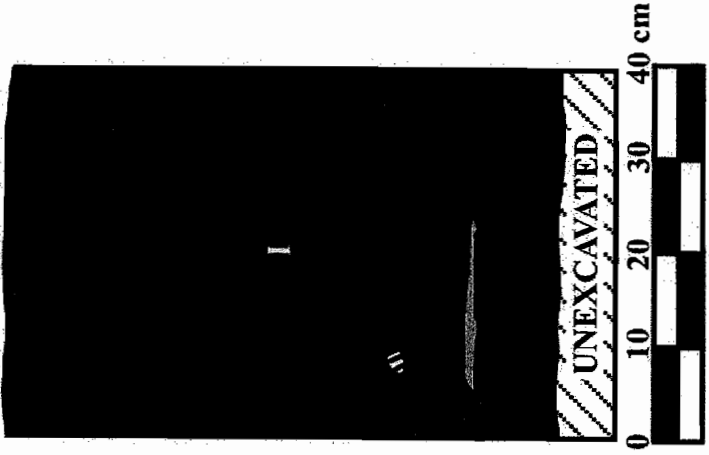
- I** - LAYER I: DARK REDDISH BROWN (2.5YR 2.5/4, DRY) CLAYEY SILT WITH GRASS
- II** - LAYER II: DARK REDDISH BROWN (2.5YR 2.5/4, DRY) CLAYEY SILT WITH ROOTS

Figure 28: SP-4 West Wall Profile.



**Figure 29: SP-4 Post Excavation Plan View. View to West.**

**SP-5 WEST WALL PROFILE**



**KEY**

●	- ASPHALT CHUNKS
○	- ANGULAR BASALT GRAVEL
I	- LAYER I: DARK BROWN (7.5YR 3/4, DRY) CLAYEY SILT AND DARK REDDISH BROWN (2.5YR 3/4, DRY) SILTY CLAY

Figure 30: SP-5 West Wall Profile.



Figure 31: SP-5 Post Excavation Plan View. View to Northwest.

### **SHOVEL PROBE 6 (E 600293/ N 2368963)**

The archaeological purpose of Shovel Probe 6 (SP-6) was to locate archaeological cultural material, archaeological subsurface features, or buried cultural deposits likely associated with four structures on the 1927 USGS map (see Figure 6). Shovel Probe 6 measured approximately 0.4 m long and 0.4 m wide and was excavated to a maximum depth of 0.65 m below the soil surface. The surface of SP-6 was covered with live and decomposing grasses and was relatively level. The east wall of SP-6 was oriented north-south (015°/195° magnetic). Both Historic and Modern cultural material were found. The excavation of SP-6 revealed the presence of one soil strata (Figures 27 and 28).

- Layer I (0-65 cmbs) was a compact, mottled dark brown (7.5YR 3/4, dry) clayey silt and dark reddish brown (2.5 YR 3/4, dry) silty clay with grass roots and a few short tree roots. Cultural material observed includes asphalt chunks, mortar with angular basalt gravel, a ferrous metal framing nail, a ferrous metal round shaft nail, a pink rock, a plastic potato chip bag, basalt gravel, a white PVS pipe fragment, milled wood fragment, a clear glass jalousie fragment, and a piece of thin, black plastic agricultural covering.

Excavation of Shovel Probe 6 revealed the presence of various Historic and Modern cultural material fragments. These fragments and the mottling of two soil types suggests LI was a local fill stratum

### **ARTIFACT ANALYSIS**

The cultural material collected from the surface survey and the shovel probes were analyzed by lab manager Guerin Tome, B.A. at the SCS O'ahu office. Twenty (20) artifacts were collected from the TS-1 artifact scatter site. All 20 artifacts were analyzed and found to be from the Historic Period or Modern. Seven artifacts, all ferrous metal railroad spikes, were collected from TS-2. Three pre-Contact artifacts were found on the project area surface. The artifacts are a basalt adze perform and two basalt flakes with polished facets. All three artifacts were found in the vicinity of SP-1 and SP-2. Only SP-5 and SP-6 produced cultural materials that were collected. Eleven (11) artifacts were collected and analyzed from SP-5. Artifact analysis places the artifacts in the Historic and Modern Periods. Similar to SP-5, SP-6 produced eleven (11) artifacts that were collected and analyzed. The analysis concludes that the artifacts are Historic and Modern materials. For a complete analysis of all cultural materials, including photographs, see Appendix A.

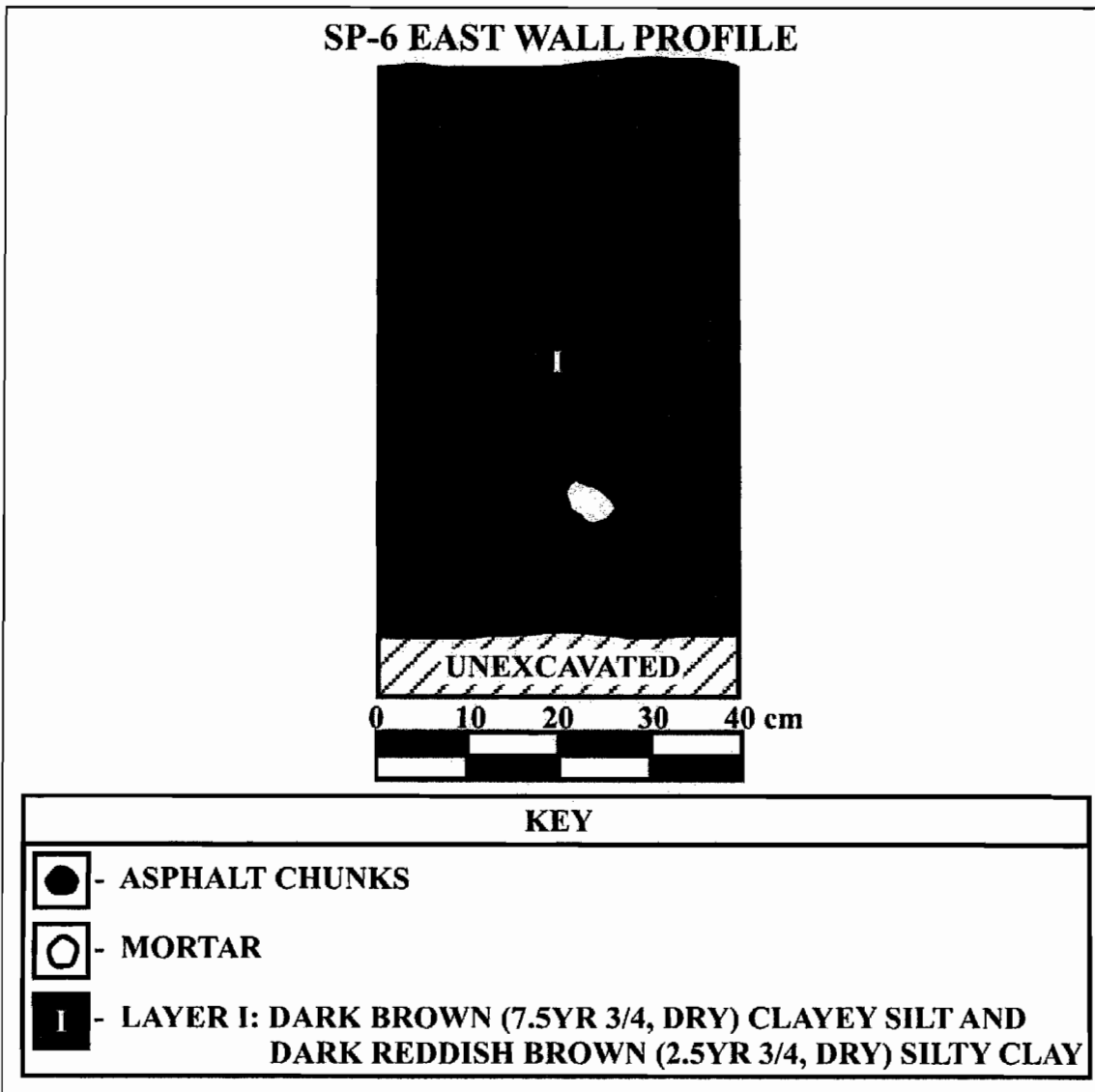


Figure 32: SP-6 East Wall Profile.



Figure 33: SP-6 Post Excavation Plan View. View to Northeast.



## **DISCUSSION AND CONCLUSION**

Scientific Consultant Services (SCS), Inc. conducted an Archaeological Inventory Survey of approximately 161-acres of land in preparation for the placement of a solar panel farm located in Kunia, Waikele Ahupua'a, 'Ewa District, Island of O'ahu, Hawai'i [TMK: (1) 9-4-002:052]. The current archaeological investigation followed one earlier Archaeological Walk-Through Survey conducted by Archaeological Consultants of Hawaii in 1988 (Kennedy 1988). No archaeological sites were identified

The current SCS archaeological study identified two new above ground surface and subsurface features interpreted as archaeological sites (SCS Site TS-1 and State Site 50-80-08-7671). Both the previously undocumented sites are early to mid 20<sup>th</sup> century historic sites that did not require archaeological excavation.

The dearth of archaeological sites in the project area could be largely attributed to the impact of human activities on the area. As the current archaeological investigation has revealed, there has been mechanical disturbance to the surface and subsurface of a large portion of the project area due to agricultural activities.

## **SIGNIFICANCE ASSESSMENTS AND RECOMMENDATIONS**

A total of two newly identified sites, SCS Site TS-1 and State Site 50-80-08-7671, were found during the current Archaeological Inventory Survey in the Ho'ohana project area. These two sites were assessed for their significance as outlined in Hawai'i Administrative Rules §13-275-6. To be assessed as significant, a site must be characterized by one or more of the following five criteria:

- a) It must be associated with events that have made a significant contribution to the broad patterns of our history, or be considered a traditional cultural property.
- b) It must be associated with the lives of persons significant in the past.
- c) It must embody distinctive characteristics of a type, period, or method of construction, or represent a significant and distinguishable entity whose components may lack individual distinction.
- d) It must have yielded or may be likely to yield, information important in prehistory or history.

- e) Have important value to native Hawaiian people or other ethnicities in the state, due to associations with cultural practices and traditional beliefs that were, or still are, carried out.

Both sites identified within the project area are significant under Criteria *d*, and are attributable to Historic land usage. SCS Site TS-1, artifact scatter, is associated with habitation. State Site 50-80-08-7671, Historic road and railroad alignment, included an alignment and a wall associated with water diversion, as well as scattered, highly disturbed remnants of crushed coral pavement.

Given that two archaeological studies have been conducted in the current project area, and the agricultural aspect of recent land use, it seems likely that little new information would be gleaned from additional study of the area. As such, no further archaeological work is recommended for the 124-acre portion of TMK: (1) 9-4-002:052.

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**APPENDIX A**

**PROJECT I544 CULTURAL MATERIAL INVENTORY**

Lab Bag	Site	Feature	Excavation Unit	Layer	Depth	Collected Item	Measurements	Count	Remarks
1A	TS-1	1	-	Surface	-	Porcelain Base Sherd	Thickness: 0.8-1.2 cm	1	Vessel type unknown; exterior and interior glazed, interior hand painted with blue lines under glaze. Designated Artifact #1.
1B	TS-1	1	-	Surface	-	Porcelain Bowl Rim Sherd	Thickness: 0.4-0.5 cm	1	Exterior and interior glazed, interior hand painted with two blue lines under glaze parallel to rim circumference, exterior hand painted tan colored leaves under glaze. Designated Artifact #2.
1C	TS-1	1	-	Surface	-	Porcelain Body Sherd	Thickness: 0.4-0.5 cm	1	Vessel type unknown; exterior and interior glazed, interior and exterior hand painted with blue, indistinguishable lines under glaze. Designated Artifact #3.
1D	TS-1	1	-	Surface	-	1908 Copper Indian Head Penny	Diameter: 1.9 cm Thickness: 0.1 cm Weight: 2.9 g	1	Origin of manufacture corroded. Designated Artifact #4.
1E	TS-1	1	-	Surface	-	Brass Strap Buckle Fragment	Length: 2.7 cm Width: 2.5 cm Weight: 7.1 g	1	Gripped portion of artifact stamped Pat 1225.06. Artifact patented December 25, 1906. Designated Artifact #5.
1F	TS-1	1	-	Surface	-	Ferrous Metal Nail	Length: 2.6 cm Weight: 1.0 g	1	Extremely corroded, bent shaft. Designated Artifact #6.
1G	TS-1	1	-	Surface	-	Bottle Glass Heel Sherd	-	1	See below. Designated Artifact #7.

Clear, at least three piece mold, heel and base embossed. Heel embossment: 8-1 manufacturer's stamp. Base embossment indistinguishable. The manufacturer's stamp is an isosceles triangle encompassing a smaller triangle over an IPG. The artifact manufacturer is either Illinois Pacific Glass Co. of San Francisco, CA (1902-1925) or Illinois Pacific Glass Corp. of San Francisco, CA (1925-1930).

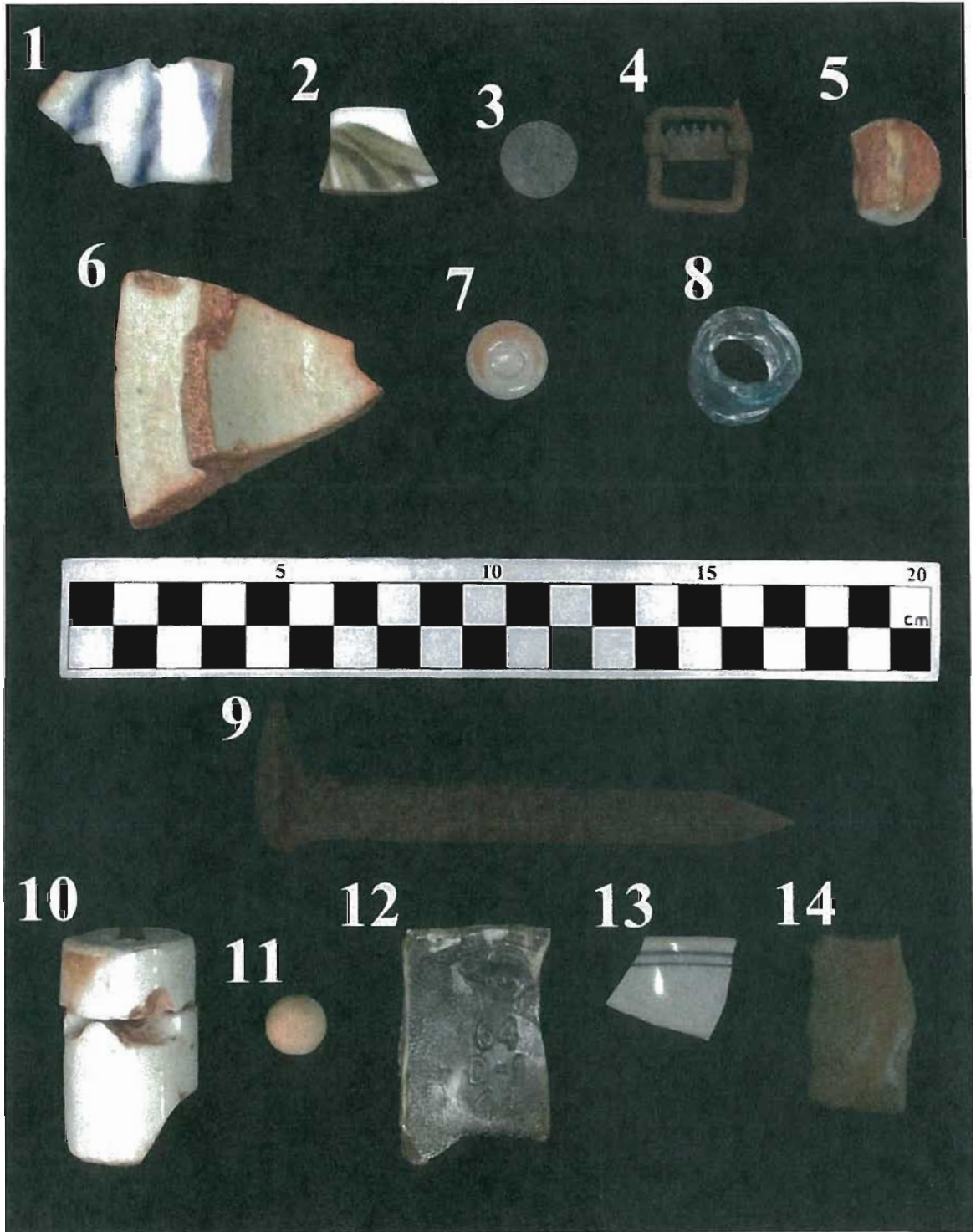


PROJECT 1544 CULTURAL MATERIAL INVENTORY (CONT.)									
Lab Bag	Site	Feature	Excavation Unit	Layer	Depth	Collected Item	Measurements	Count	Remarks
IH	TS-1	1	-	Surface	-	Porcelain Lightning Stopper Fragment	Diameter: 2.5 cm	1	Designated Artifact #8.
II	TS-1	1	-	Surface	-	Whiteware Jar Lid Sherd	-	1	Interior ring foot for lid interior seating present. Designated Artifact #9.
IJ	TS-1	1	-	Surface	-	Quarried Basalt Rock	-	1	Also known as construction gravel. Designated Artifact #10.
IK	TS-1	1	-	Surface	-	Milk Glass Button	Diameter: 1.9 cm Thickness: 0.4 cm Weight: 2.3 g	1	Obverse convex, reverse flat with missing knob. Designated Artifact #11.
IL	TS-1	1	-	Surface	-	Glass Bottle Finish Sherd	Mouth diameter (inner): 1.8 cm	1	Light blue, inner mouth offset, tooled finish (1880s to 1920s). Designated Artifact #12.
IM	TS-1	1	-	Surface	-	Glass Bottle Shoulder Sherd	-	1	Light green, embossed. Embossment: 1st line (horizontal): ...ADE, 2nd line (horizontal): <b>REGISTE</b> ... Designated Artifact #13.
IN	TS-1	1	-	Surface	-	Ferrous Metal Railroad Spike	Length: 12.1 cm Weight: 156.6 g	1	Semi-oval head in plan view, square shaft, two shaft sides come to a bevel; artifact corroded. Designated Artifact #14.
IO	TS-1	1	-	Surface	-	Glass Bottle Heel Sherd	-	1	Light aqua-marine, embossed. Embossment: <b>WAIP</b> ... Designated Artifact #15.
IP	TS-1	1	-	Surface	-	Glass Bottle Neck Sherd	-	1	Clear, automatic machine made, one side flat with an embossed five leaf tree branch. Designated Artifact #16.

PROJECT 1544 CULTURAL MATERIAL INVENTORY (CONT.)									
Lab Bag	Site	Feature	Excavation Unit	Layer	Depth	Collected Item	Measurements	Count	Remarks
1Q	TS-1	1	-	Surface	-	Porcelain Knob and Tube Wiring Insulator	Length: 4.6 cm Diameter: 2.8 cm Weight: 58.0 g	1	Ferrous metal nail through porcelain length, top half of artifact embossed with indistinguishable letters and numbers. Designated Artifact #17.
1R	TS-1	1	-	Surface	-	Clay Marble	Diameter: 1.3 cm Weight: 2.7 cm	1	Tan colored, undulated surface. Designated Artifact #18.
1S	TS-1	1	-	Surface	-	Glass Bottle Base Sherd	-	1	See below. Designated Artifact #19.
Clear, textured with dots and embossed. Base embossment: 1st line (horizontal): manufacturer's stamp, 2nd line (horizontal): <b>64</b> , 3rd line (horizontal): <b>D-1</b> , 4th line (horizontal): <b>44</b> . The manufacturer's stamp is a vertical oval intersected by a horizontal diamond and within the intersection is a capital <b>I</b> . The manufacturer is Owens Illinois Glass Company of Toledo, Ohio. This particular manufacturer's stamp was utilized between 1929 to 1954. Bottle manufacture date (based on the manufacturer's stamp and the 44): 1944.									
1T	TS-1	1	-	Surface	-	Porcelain Bowl Rim Sherd	Thickness: 0.3-0.4 cm	1	Exterior and interior glazed, exterior hand painted with two teal colored lines parallel to the bowl's rim under glaze. Designated Artifact #20.
2	TS-2	2	-	Surface	-	Ferrous Metal Railroad Spike	Length: 10.6 cm Weight: 56.0 g	1	Artifact severely corroded, semi-oval head, square shaft with two sides creating a bevel.
3	-	-	SP-5	Surface	-	Quarried Basalt Rock	-	1	Also known as construction gravel.
4	-	-	SP-5	I	10 cmbs	Creamware Base Sherd	Thickness: 1.1 cm	1	Vessel type unknown, exterior and interior glazed white, interior hand painted with thin, silver streaks over glaze, exterior surface is orange peel-like.

PROJECT 1544 CULTURAL MATERIAL INVENTORY (CONT.)										
Lab Bag	Site	Feature	Excavation Unit	Layer	Depth	Collected Item	Measurements	Count	Remarks	
5A	-	-	SP-5	I	24 cms	Red Ceramic Utility Pipe Sherd	Thickness: 1.2 cm	1	Sherd from subsurface utility pipe sherd, exterior and interior fired.	
5B	-	-	SP-5	I	33 cms	Red Ceramic Utility Pipe Sherd	Thickness: 1.2 cm	1	Sherd from subsurface utility pipe sherd, exterior and interior fired.	
6	-	-	SP-5	I	0-60 cms	Flat Glass Sherd	Thickness: 0.3 cm	1	Clear, non-diagnostic.	
6	-	-	SP-5	I	0-60 cms	Quarried Basalt Rock	-	1	Also known as construction gravel.	
6	-	-	SP-5	I	0-60 cms	Mortar with Basalt Gravel	-	1	-	
6	-	-	SP-5	I	0-60 cms	Leather Fragment	-	1	Tan colored.	
6	-	-	SP-5	I	0-60 cms	Dust Fence Cloth	-	1	Black colored.	
6	-	-	SP-5	I	0-60 cms	Red Ceramic Utility Pipe Sherd	Thickness: 1.2 cm	1	Sherd from subsurface utility pipe sherd, exterior and interior fired.	
6	-	-	SP-5	I	0-60 cms	Red Ceramic Utility Pipe Sherd	Thickness: 1.4 cm	1	Sherd from subsurface utility pipe sherd, exterior and interior vitrified.	
7	-	-	SP-6	I	0-65 cms	Glass Jalousie Window Sherd	-	1	One side textured with short curvy lines, opposite side smooth and non-textured.	
7	-	-	SP-6	I	0-65 cms	Ferrous Metal Duplex Nail	-	1	Corroded, bent.	
7	-	-	SP-6	I	0-65 cms	Ferrous Metal Wire Nail	-	1	Round head with round shaft.	
7	-	-	SP-6	I	0-65 cms	Plastic PVC Pipe Fragment	-	1	White colored.	

PROJECT 1544 CULTURAL MATERIAL INVENTORY (CONT.)									
Lab Bag	Site	Feature	Excavation Unit	Layer	Depth	Collected Item	Measurements	Count	Remarks
7	-	-	SP-6	I	0-65 cms	Plastic Potato Chip Bag Fragment	-	1	-
7	-	-	SP-6	I	0-65 cms	Styrofoam Fragment	-	1	White colored.
7	-	-	SP-6	I	0-65 cms	Plastic Agricultural Cover Fragment	-	1	Thin, black colored.
7	-	-	SP-6	I	0-65 cms	Milled Wood Fragment	-	1	-
7	-	-	SP-6	I	0-65 cms	Construction Rock	-	1	Pink colored.
7	-	-	SP-6	I	0-65 cms	Mortar with Basalt Gravel	-	1	-
7	-	-	SP-6	I	0-65 cms	Asphalt Fragment	-	1	-
8	Project Area Surface	-	-	Surface	-	Basalt Adze Preform	Length: 4.1 cm Width: 2.5 cm Thickness: 1.8 cm Weight: 26.7 g	1	Distal end, dorsal displays cortex, irregular trapezoidal cross-section. Artifact found at GPS coordinates ( $\pm 2$ m accuracy): East 600635/ North 2368391 on existing dirt road.
9	Project Area Surface	-	-	Surface	-	Basalt Flake with Polished Facets	-	1	Flake has two adjoining, polished facets. Artifact found at GPS coordinates ( $\pm 2$ m accuracy): East 600750/ North 2368349.
10	Project Area Surface	-	-	-	-	Basalt Flake with Polished Facets	-	1	Flake has two adjoining, polished facets. Artifact found at GPS coordinates ( $\pm 2$ m accuracy): East 600669/ North 2368381.



SCS Project 1544 Selected Artifacts Photo

1. Lab Bag 1A: Porcelain base sherd, interior.
2. Lab Bag 1B: Porcelain bowl rim sherd, exterior.
3. Lab Bag 1D: 1908 Copper U.S. Indian-Head penny obverse.
4. Lab Bag 1E: Brass strap buckle fragment, ventral.
5. Lab Bag 1H: Porcelain Lightning stopper fragment, underside.
6. Lab Bag 1I: Whiteware jar lid sherd, underside.
7. Lab Bag 1K: Milk glass button, reverse.
8. Lab Bag 1L: Glass bottle flat ring finish sherd.
9. Lab Bag 1N: Ferrous metal railroad spike.
10. Lab Bag 1Q: Porcelain knob and tube wiring insulator.
11. Lab Bag 1R: Clay marble.
12. Lab Bag 1S: Glass bottle base sherd.
13. Lab Bag 1T: Porcelain bowl rim sherd, exterior
14. Lab Bag 8: Basalt adze preform, dorsal.