ALOHA SOLAR ENERGY FUND II - KALAELOA

TMK (1) 9-1-013:070 and portion of 30-foot-wide
State of Hawai'i, Department of Transportation, Highways (DOT-H)
Division Right-of-Way (ROW) along eastern edge of Coral Sea Road that border
(1) 9-1-013:039, 040, 043, 044, 072, 099, 100 Honouliuli (Kalaeloa), 'Ewa, O'ahu, Hawai'i

Final Environmental Assessment

This environmental document is prepared in accordance with the requirements of Chapter 343, HRS and Hawai'i Administrative Rules, Title 11, Department of Health.

Volume II: Appendix B - G

October 2017

Applicant:

ASEF II
ALOHA SOLAR ENERGY FUND II

905 Kalanianaole Hwy. #21
Kailua, Hawai'i 96734

Prepared by:

GZO

925 Bethel Street, 5th Floor
Honolulu, HI 96813

APPENDIX B
PRELIMINARY ENGINEERING REPORT

G70

Aloha Solar Energy Fund 2, LLC

Honouliuli (Kalaeloa), Ewa, Island of Oahu, Hawaii
Tax Map Key: (1) 9-1-013:070

Kalaeloa Solar Farm

Prepared for:
Aloha Solar Energy Fund 2, LLC
2969 Mapunapuna Place, Suite 220
Honolulu, Hawaii 96819

Prepared by:

925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813
Phone: (808)523-5866
Fax: (808)523-5874

April 2017

G70 Project No. 215073-01

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1 Introduction

1.1 Project Site and Proposed Development

The onsite project area is an undeveloped parcel in Barbers Point, slightly east of Kalaeloa Airport. The 44.280-acre parcel is identified by TMK (1) 9-1-013:070 and is owned by the State of Hawaii. The Hawaii Community Development Authority (HCDA) is the governing authority for the project site and classifies the site as T2 Rural/Open Space Zone. The developer is proposing a long-term lease on the property to construct a solar farm that consists of 900 elevated, photovoltaic panel racks (mounted on posts embedded in micro-piles), gravel access/perimeter driveways for equipment maintenance, a chain-link perimeter fence and concrete pads for electrical equipment.

The offsite project area consists of 10,000-feet of Coral Sea Road, between the project site and Roosevelt Avenue. Offsite work consists of electrical overhead and underground lines that will distribute power from the solar farm to the connection with HECO's system near the intersection of Coral Sea Road and Roosevelt Avenue. The offsite electrical alignment is proposed on unimproved land along the east edge of the existing, paved roadway.

1.2 Purpose

The purpose of this report is to disclose proposed improvements, potential environmental impacts and mitigation of impacts associated with the proposed development.

2 Infrastructure

2.1 Roadways and Vehicular Access

2.1.1 Existing Condition

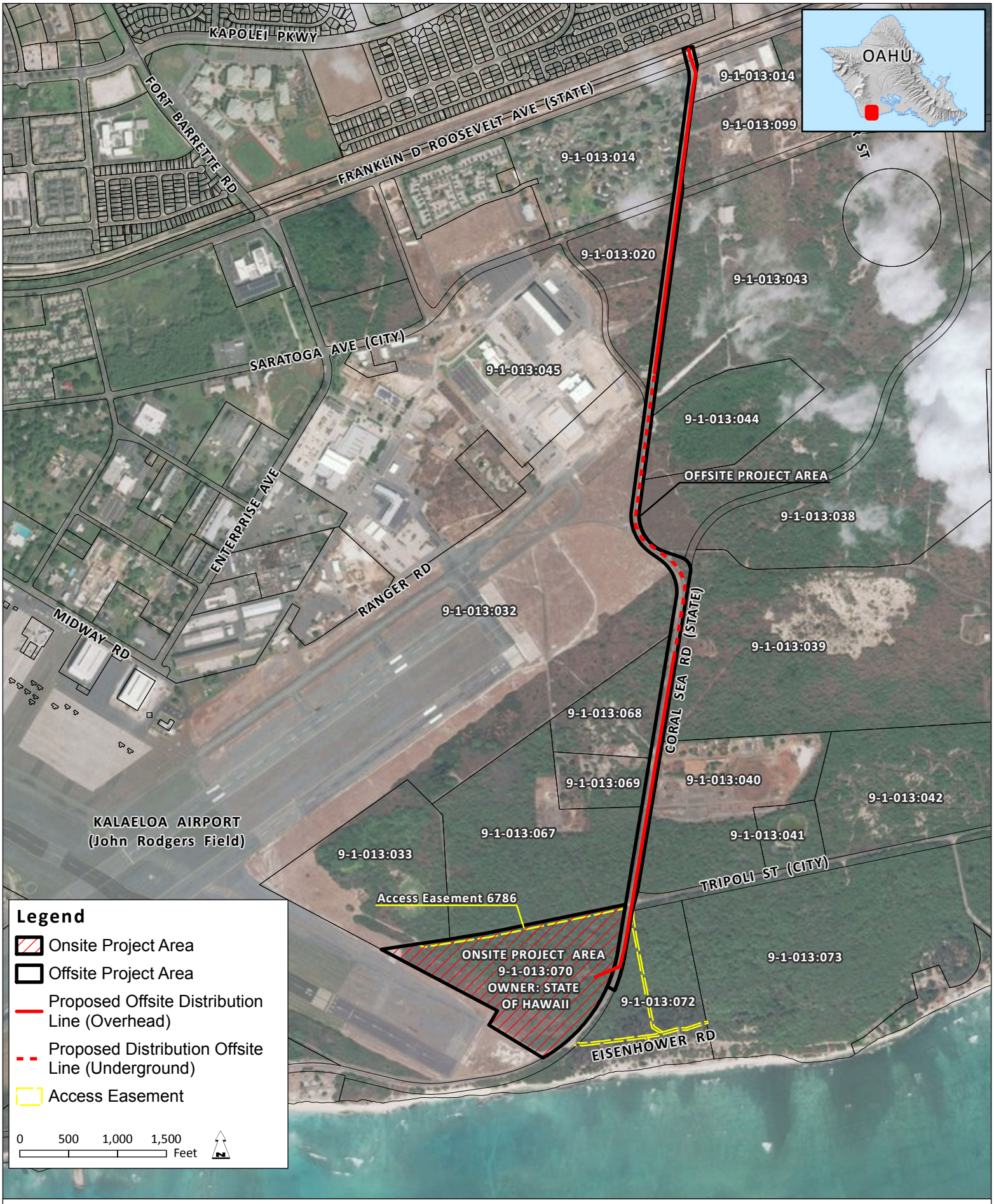
The offsite project area is along a portion of Coral Sea Road that extends from Roosevelt Avenue to the onsite project area. See Figure 1. Coral Sea Road is an unsignalized, two-lane, asphalt roadway that is owned and maintained by the Hawaii Department of Transportation (DOT). Following HCDA's Master Plan improvements that bring the road to current City and County standards in the future (>20 years), the City plans to take over ownership and maintenance.

Access into the onsite project area is off Coral Sea Road through an existing dirt driveway at the northeast corner of the property. The 16-foot wide, dirt driveway is along the north property line in an access easement that also provides access to an adjacent, landlocked parcel. There are no existing access restrictions along the property frontage with Coral Sea Road.

2.1.2 Proposed Condition and Anticipated Impact

Access to the onsite project area will be through a 16-foot wide, raised gravel driveway that connects to Coral Sea Road at its intersection with Eisenhower Road. A network of 16-foot wide, raised gravel access aisles will be constructed to provide onsite circulation and access to the solar arrays. The aisles will provide minimum 20-foot clear space and are intended for light use by operation and maintenance provisions only. See Appendix A.

There are no anticipated impacts resulting from the proposed access improvements.



Kalaeloa Solar Farm
Location Map

Figure 1

2.2 Grading and Drainage

2.2.1 Existing Condition

The offsite project area is relatively flat and generally slopes makai, while the crowned roadway discharges stormwater onto the adjacent vegetated ground. There were no visible signs of erosion and a subsurface stormwater system was not observed along Coral Sea Road. See Appendix A.

The onsite project area is currently undeveloped and wooded. The north edge of the property generally slopes toward the southernmost corner with an elevation drop ranging between 6 and 12 feet. Elevations onsite range from 4 feet above mean sea level (MSL) at the southern corner of the site to approximately 16 feet above MSL near the northeast corner of the site. The USDA's Web Soil Survey classifies the soils as coral outcrop which is defined as excessively drained. See Appendix A and Figure 2.

Based on the Federal Emergency Management Agency Flood Insurance Rate Maps, offsite and onsite areas are wholly within Flood Zone D. Zone D consists of areas with possible, but undetermined flood hazards since no flood hazard analysis was previously conducted. Although a detailed drainage assessment was not preformed, flooding is not anticipated because there are no nearby streams, the surrounding areas gradually slope toward the ocean, soils in the general area are well drained and the coast is protected by barrier reef. See Figure 3.

2.2.2 Proposed Condition and Anticipated Impact

Impervious area is limited to equipment pads, cross-sectional areas of the foundation posts (two foundation posts per rack), and cross-sectional areas of utility poles. Archaeological features of significance, as described in the archaeological report, will be avoided during design and construction of grading improvements. Grading will be limited to the items below.

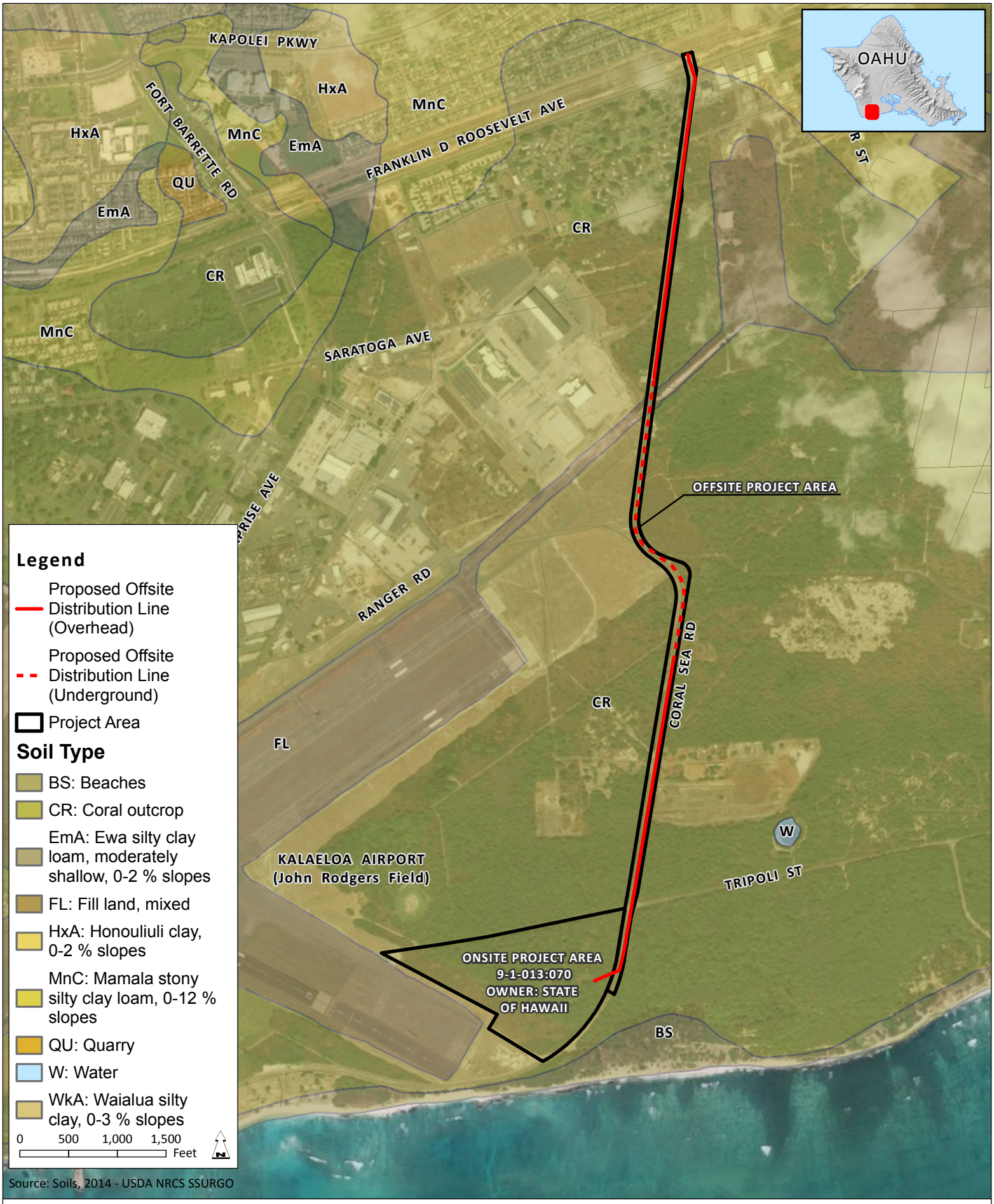
- Placement of crushed rock for raised gravel driveways/aisles
- Local leveling for equipment pads, substation and photovoltaic panel racks
- Placement of non-combustible base (e.g., potentially gravel) within the solar farm and surrounding area to meet fire code requirements

The general drainage pattern will not be altered. Stormwater will continue to sheet flow southward through the site and proposed stormwater discharge from the project site will not exceed existing discharge rates.

Work performed after August 2017 will be subject to the updated Department of Planning and Permitting *Rules Relating to Storm Drainage Standards* which requires implementation of Low Impact Development (LID). The revised standard does not provide specific requirements associated with solar farms. The City will be consulted to ensure compliance with stormwater regulations. Retention of stormwater may be implemented with infiltration facilities (e.g., trenches, etc.).

The project will comply with National Pollutant Discharge Elimination System (NPDES) permit requirements for construction activity and a NPDES permit for discharge of construction stormwater will be obtained. The requirements of the approved NPDES permit and erosion control plan will be adhered to during construction as appropriate. Construction, grading and drainage plans for the project will also be submitted to the City and State DOT for review and approval.

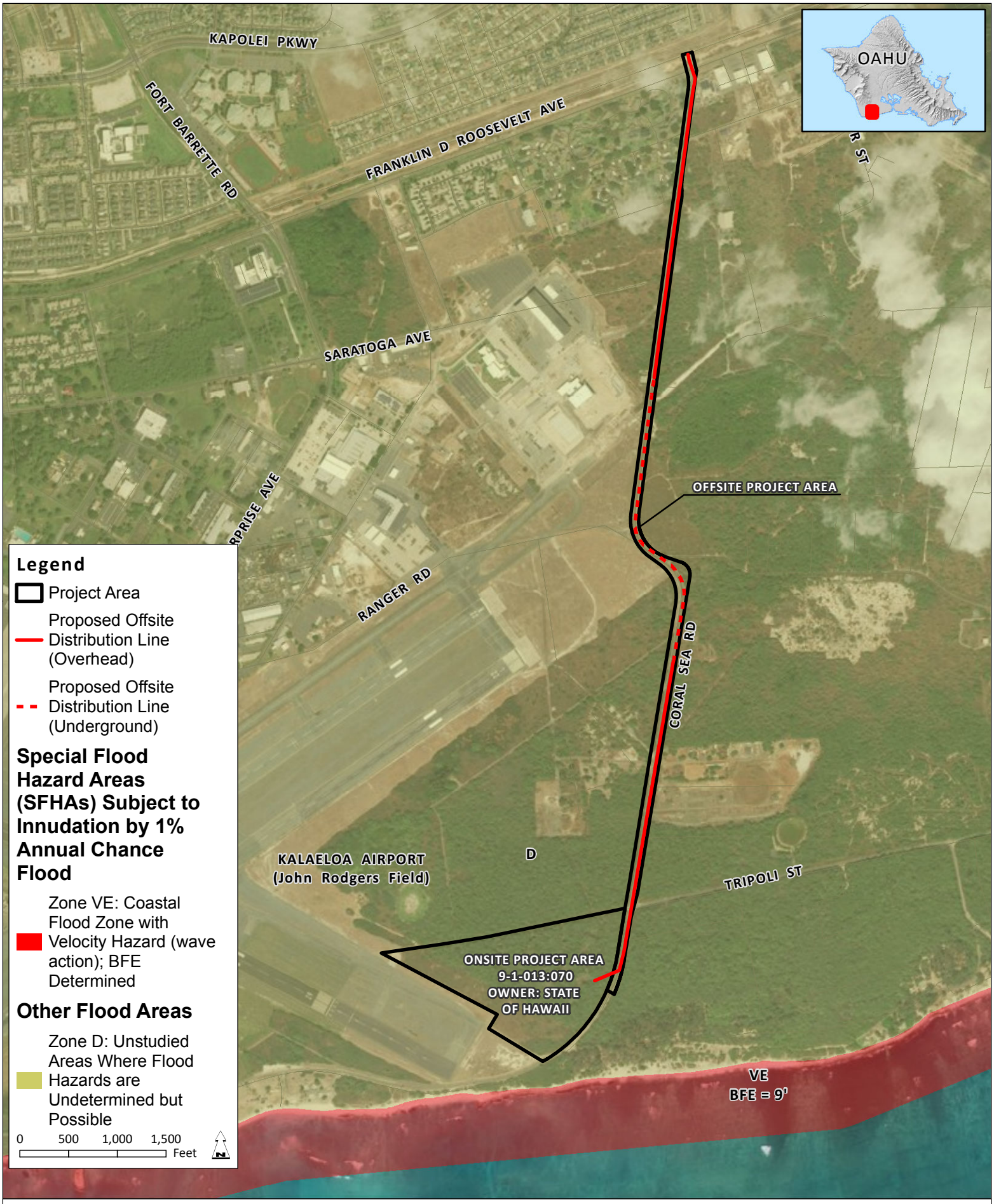
There are no anticipated impacts from proposed grading and drainage improvements.



Source: Soils, 2014 - USDA NRCS SSURGO

Kalaeloa Solar Farm
Soils Map

Figure 2



Kalaeloa Solar Farm
Flood Zone Map

Figure 3

2.3 Water

2.3.1 Existing Condition

The existing water system at Kalaeloa is owned and operated by the Navy. Service to the general area is provided through an existing water main, which varies between 12 and 18-inches, along Coral Sea Road. See Figure 4.

There is no domestic water service to the offsite and onsite project areas. Based on the 2006 Kalaeloa Master Plan, the Navy's responsibility is provision of water to federal agencies and any proposed water service for non-federal entities will require installation of new water infrastructure that meets current BWS standards.

There is no existing fire protection within the onsite project area. An existing fire hydrant was observed along Coral Sea Road, but was not assessed for flow or pressure data. The existing hydrant is connected to the Navy water line and does not appear to be compliant with the Navy hydrant spacing requirements. It is located approximately 1,250 feet away from the onsite project area.

2.3.2 Proposed Condition and Anticipated Impact

The offsite electrical alignment is not anticipated to require realignment of the existing water line. Since water trucks will provide water for panel washing twice a year through proposed access driveways, there are no proposed domestic water system improvements.

The adopted fire code, NFPA 2012, does not require fire hydrant coverage for ground mounted solar arrays. As such, there are no proposed fire protection water system improvements.

There are no anticipated impacts.

2.4 Wastewater

2.4.1 Existing Condition

There is no wastewater service at the onsite and offsite project areas. An existing 18-inch sewer force main along the western edge of Coral Sea Road conveys wastewater from Kalaeloa Airport to the City treatment plant two (2) miles northeast of the project site. See Figure 4. The system is owned by the U.S. Navy and operated under license by the City Department of Environmental Services and is not intended to serve development in the general area.

The project area is located makai of the Underground Injection Control (UIC) line and the BWS pass/No-Pass line. However, there are no cesspools or septic tanks recorded with the Department of Health.

2.4.2 Proposed Condition and Anticipated Impact

There are no proposed sewer improvements and no anticipated impacts.

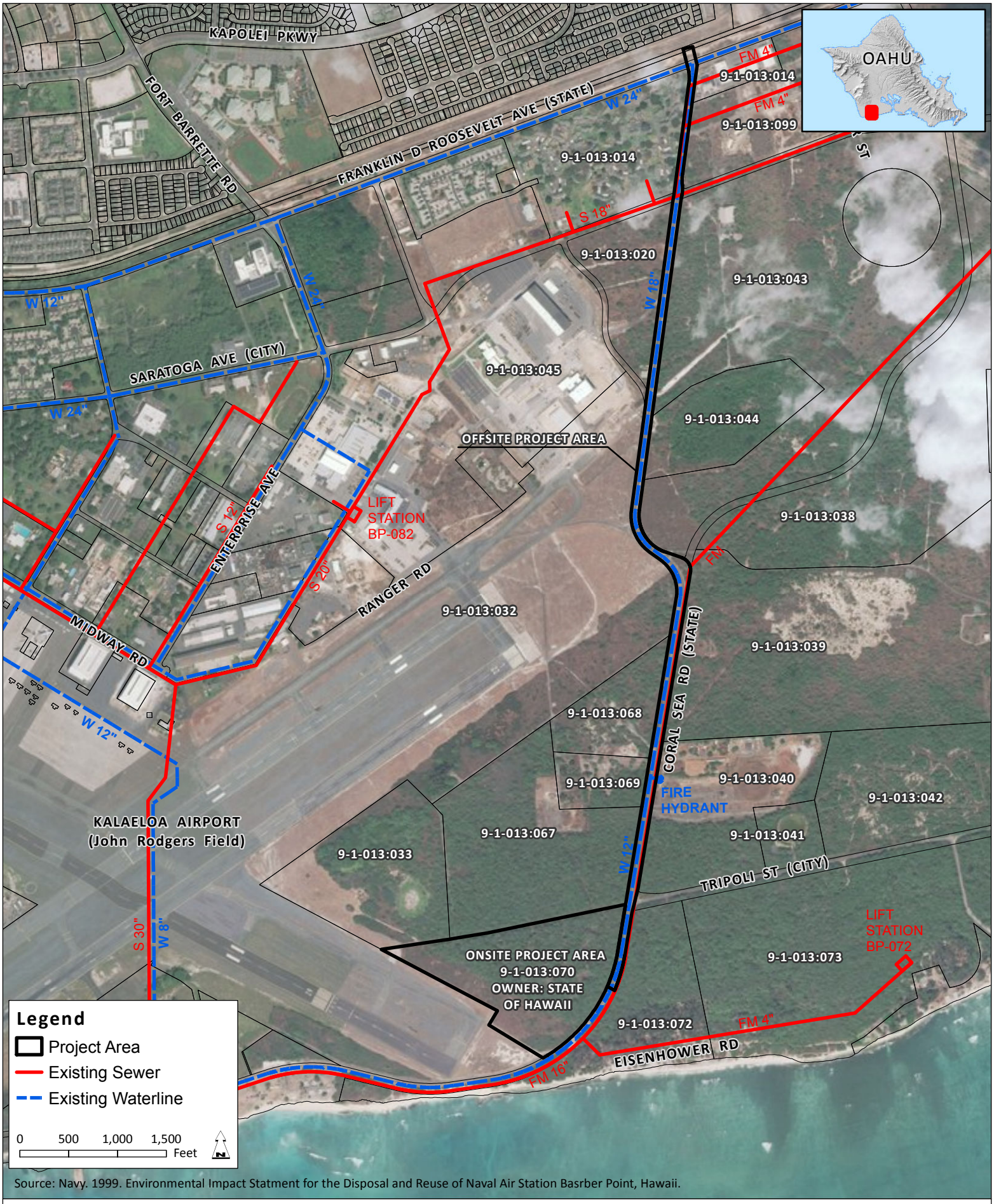
2.5 Gas and Fuel

2.5.1 Existing Condition

There are no known gas or fuel lines near the onsite or offsite project areas.

2.5.2 Proposed Condition and Anticipated Impact

There are no proposed gas or fuel improvements and no anticipated impacts.



Source: Navy. 1999. Environmental Impact Statment for the Disposal and Reuse of Naval Air Station Basrber Point, Hawaii.

Kalaeloa Solar Farm
Existing Utilities

Figure 4

2.6 Electrical

2.6.1 Existing Condition

An existing overhead electrical line was observed along a portion of Coral Sea Road. The line is owned by the Naval Engineering Command Hawaii and extends approximately 1450-feet from the intersection of Coral Sea Road and Tripoli Road to the southwest corner of TMK (1) 9-1-013:039. Existing overhead electrical lines along Roosevelt Avenue are owned and maintained by Hawaiian Electric Company (HECo).

Overhead communication lines were observed on the same utility poles as the overhead electrical lines along Coral Sea Road and Tripoli Road. The communication lines extend along the west side of Coral Sea Road from the project site to Roosevelt avenue. Communication lines within Kalaeloa are owned by Naval Computer and Telecommunications Area Master Station (NCTAMS), Hawaiian Telecom (HTCO), and Oceanic Time Warner (OTWC). See Figure 5.

Existing electrical and communication lines were not observed along the property frontage and there is currently no service to the onsite project area. The 2006 Kalaeloa Master Plan indicates that that new users shall not be served off existing electrical lines.

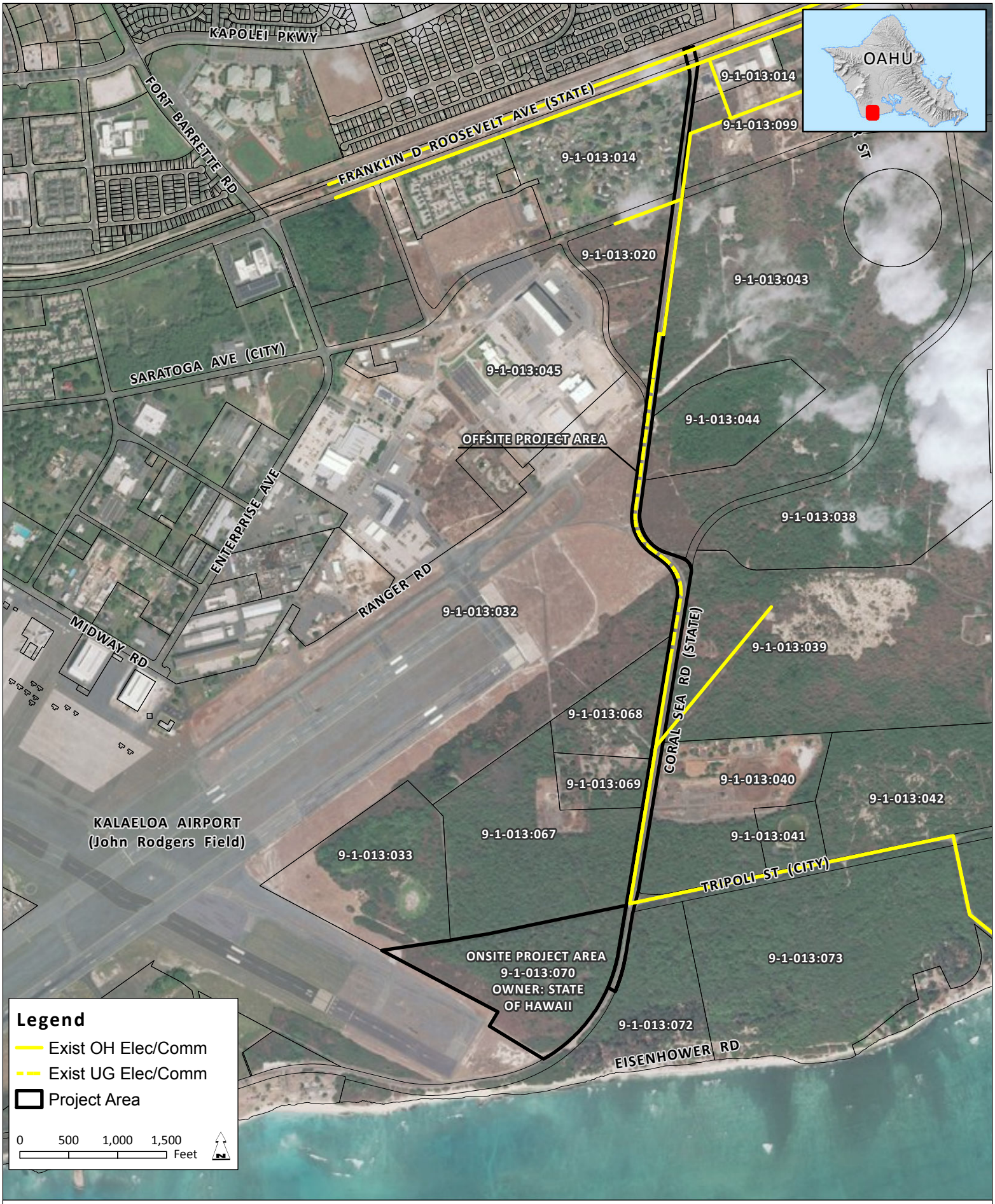
2.6.2 Proposed Condition and Anticipated Impact

A proposed electrical transmission line is proposed along the east side of Coral Sea Road. The new line will consist of 6,850-feet of overhead electrical line, utility poles and 3,150-feet of underground electrical infrastructure. The proposed electrical line will connect to the existing overhead electrical line along Roosevelt Avenue. See Appendix A. The design and construction of electrical infrastructure will be developed to the specifications and standards of HECo.

There are no anticipated impacts.

3 Conclusion

The proposed solar farm includes development of an undeveloped property east of Kapolei Airport [TMK (1) 9-1-013:070] and the installation of offsite electrical transmission infrastructure along Coral Sea Road. The project will not require water, wastewater, or gas services and will not impact existing utility lines. Existing electrical and communication lines will not be modified. Access improvements consist of gravel driveways/aisles, do not alter drainage patterns and do not include impervious surfaces. Proposed stormwater discharge rates will not exceed existing conditions and low impact development will be used to mitigate potential stormwater impacts. Based on this report, the project is not expected to have any adverse effects to the existing site or the surrounding environment.



Kalaeloa Solar Farm
Existing Electrical and Communication

Figure 5

Appendix A
Onsite and Offsite Project Area

NORTH

TMK (1) 9-1-013:033
LOT 13073-A
(MAP 971)
STATE OF HAWAII

TMK (1) 9-1-013:067
LOT 13073-B
(MAP 971)
HAWAII COMMUNITY DEVELOPMENT AUTHORITY

ACCESS EASEMENT 6786

PROJECT SITE
TMK (1) 9-1-013:070
HAWAII COMMUNITY
DEVELOPMENT AUTHORITY

ARCH TRAIL
WITH BUFFER

ARCH FEATURE WITH 20'
RADIUS BUFFER, TYP.

TMK (1) 9-1-013:072
LOT 13074-C
(MAP 972)
UNITED STATE OF AMERICA

PROPOSED SOLAR
PANEL ARRAY

TMK (1) 9-1-013:023
LOT 13072-A
(MAP 975)
HAWAII DOT AIRPORTS DIVISION

CORAL SEA ROAD (STATE)

EISENHOWER ROAD

LEGEND

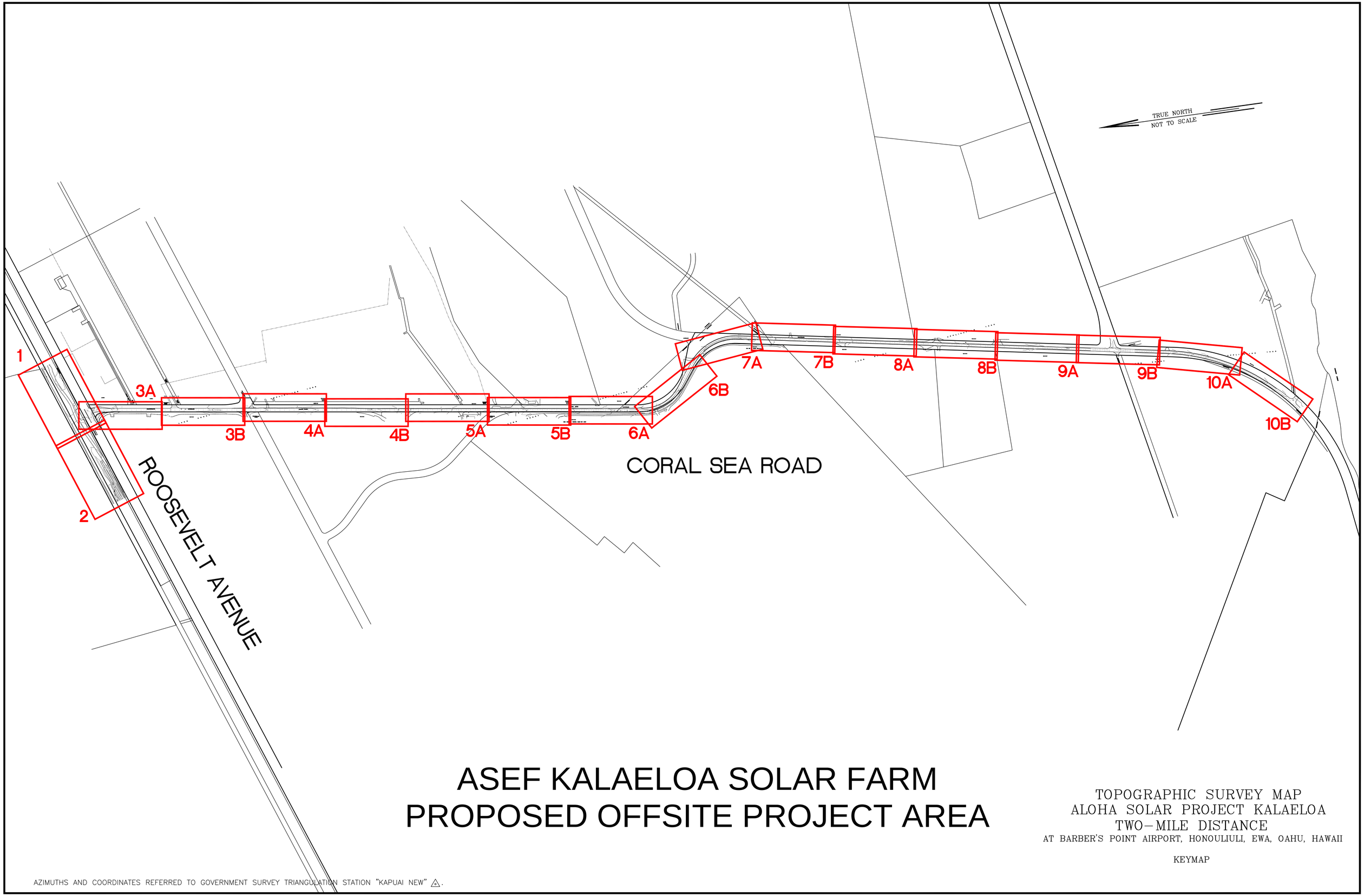
- PROPERTY LINE
- ADJACENT PROPERTY LINE
- 10 EXISTING CONTOURS
- EXISTING EASEMENT
- PROPOSED ACCESS AISLE/DRIVEWAY
- PV PANEL RACKS
- ARCHAEOLOGICAL FEATURE
- EQUIPMENT PADS

GROUP 70 INTERNATIONAL, INC.
925 BETHEL STREET, 5TH FLOOR
HONOLULU, HAWAII 96813-4398
808-523-5866
WWW.G70.DESIGN

ASEF KALAELOA SOLAR FARM
PROPOSED ONSITE PROJECT AREA
TMK (1) 9-1-013:070

CAD DRAWING: Figure 2 Site Plan
SCALE: 1" = 200'
DATE: 04/2017
PROJECT #: 215073-01

FIGURE
-

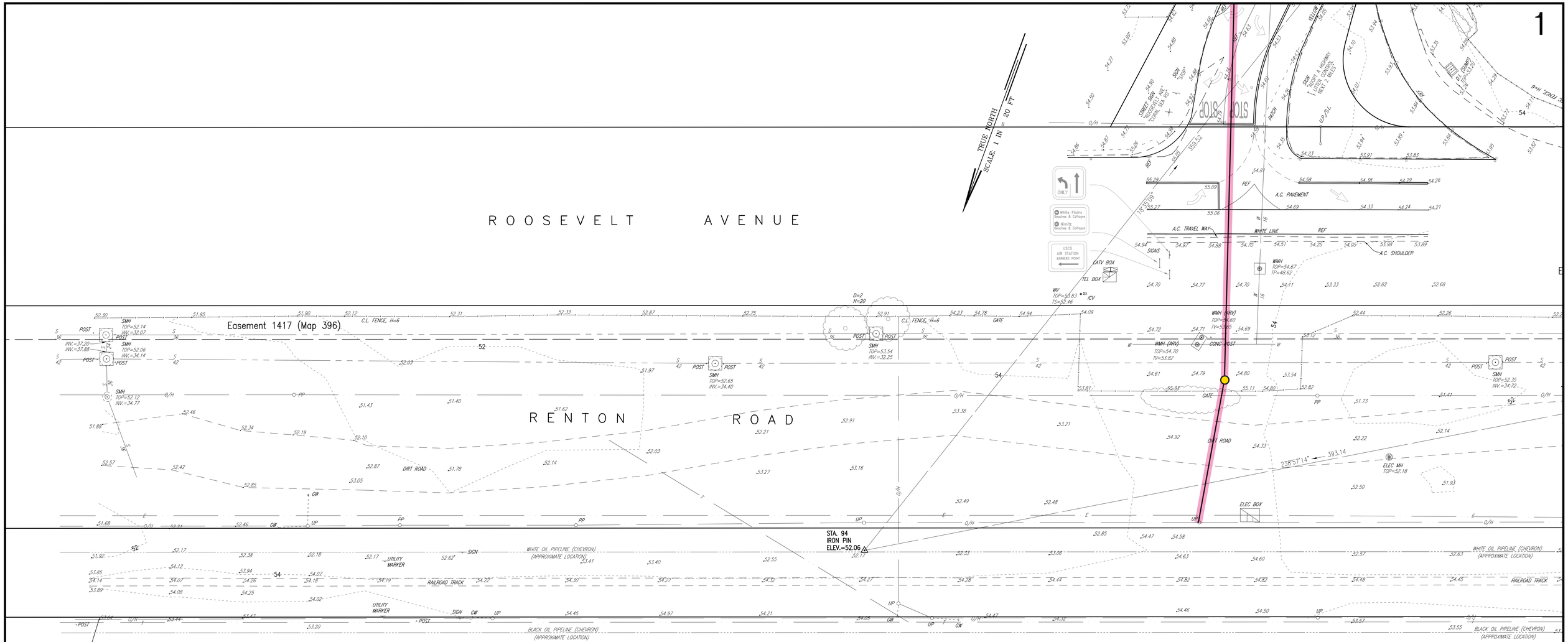


ASEF KALAELOA SOLAR FARM
PROPOSED OFFSITE PROJECT AREA

TOPOGRAPHIC SURVEY MAP
ALOHA SOLAR PROJECT KALAELOA
TWO-MILE DISTANCE
AT BARBER'S POINT AIRPORT, HONOULIULI, EWA, OAHU, HAWAII

KEYMAP

AZIMUTHS AND COORDINATES REFERRED TO GOVERNMENT SURVEY TRIANGULATION STATION "KAPUAI NEW" △.



BENCHMARK

ELEVATIONS ORIGINATED FROM USC&GS
BRASS DISK "J-14" (DESTROYED)
ELEV= 54.47 FT, MSL.
(SEE TRANSFERRED BENCHMARK STA. 12 "Y" CUT)

ABBREVIATIONS:

A.C.	ASPHALT CONCRETE	MH	MANHOLE
ARV	AIR RELEASE VALVE	REF.	REFLECTOR
BC	BOTTOM CURB	S.L.	STREET LIGHT
BFP	BACK FLOW PREVENTER	SFM	SEWER FORCE MAIN
BW	BOTTOM WALL	SMH	SEWER MANHOLE
C.L.	CHAIN LINK	TC	TOP CURB
CATV	CABLE TELEVISION	TEL	TELEPHONE
CONC	CONCRETE	TP	TOP PIPE
D	DIAMATER	TS	TOP STEM
D.I.	DRAIN INLET	TV	TOP VALVE
E/ELEC.	ELECTRICAL	TW	TOP WALL
ELEV	ELEVATION	U.P.	UTILITY POLE
F.H.	FIRE HYDRANT	WMH	WATER MANHOLE
G.W.	GUY WIRE	WV	WATER VALVE
H	HEIGHT		

TOPOGRAPHIC SURVEY MAP
ALOHA SOLAR PROJECT KALAELOA
TWO-MILE DISTANCE

AT BARBER'S POINT AIRPORT, HONOULIULI, EWA, OAHU, HAWAII

TMK: 9-1-13
SCALE: 1 in. = 20 ft. MAY 26, 2016
JOB NO. 16030 FIELD BOOK : 3578B: 20
DRN: SN-M FLD: AG

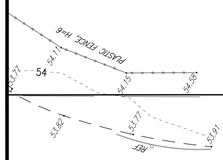
CONTROLPOINT SURVEYING, INC.
615 Piikoi Street, Suite 700
HONOLULU, HAWAII 96814

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

AZIMUTHS AND COORDINATES REFERRED TO GOVERNMENT SURVEY TRIANGULATION STATION "KAPUAI NEW".



BENCHMARK
ELEVATIONS ORIGINATED FROM USC&GS
BRASS DISK "J-14" (DESTROYED)
ELEV= 54.47 FT, MSL.
(SEE TRANSFERRED BENCHMARK STA. 12 "Y" CUT)

TRUE NORTH
SCALE: 1 IN. = 20 FT.

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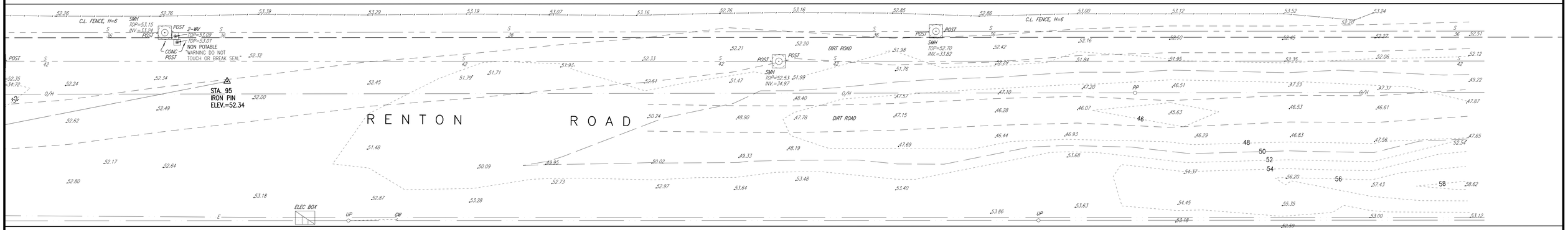
F.H.	FIRE HYDRANT	WMH	WATER MANHOLE
G.W.	GUY WIRE	WV	WATER VALVE
H	HEIGHT		

ROOSEVELT AVENUE

Lot 13076 (Map 957)

Easement 6938 (Map 1008)



TOPOGRAPHIC SURVEY MAP
ALOHA SOLAR PROJECT KALAELOA
TWO-MILE DISTANCE
AT BARBER'S POINT AIRPORT, HONOULIULI, EWA, OAHU, HAWAII

TMK: 9-1-13
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CONTROLPOINT SURVEYING, INC.
615 Piikoi Street, Suite 700
HONOLULU, HAWAII 96814

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

AZIMUTHS AND COORDINATES REFERRED TO GOVERNMENT SURVEY TRIANGULATION STATION "KAPUAI NEW".

3A

TRUE NORTH
SCALE: 1 IN = 20 FT

CORAL SEA ROAD

Easement 6944 (Map 1008)

ROAD RIGHT OF WAY

C.L. FENCE W/ BARBED WIRE, H=8

EDGE OF VEGETATION

A.C. SHOULDER

A.C. PAVEMENT

RUMBLE STRIPS

DOUBLE YELLOW LINES

YELLOW LINE

PATCH

STA. 5
MAG NAIL W/ SHINER
ELEV=53.97

STREET SIGN
"ROOSEVELT AVE"
"CORAL SEA RD"

SIGN
"STOP"

SIGN
"ADOPT A HIGHWAY
LITTER CONTROL
NEXT 2 MILES"

SIGN
"YIELD"

SIGN
"SPEED LIMIT 35"

SIGN
"KALAELOA RENTAL HOMES REAL LIVING"

UTILITY COVER
TOP=54.12
TP=53.02

MW
TOP=54.10

MW
TOP=53.73

MW
TOP=53.67

CATV BOX
TOP=53.53

TEL. BOX

ELEC. MH
TOP=53.68

POST

TRANSFORMER

CATV BOX
TOP=54.52

TEL. BOX

ICV

ELEC. BOX

PLASTIC FENCE, H=6

TREES
D=3
H=45

D=3
H=55

8°17'26"
486.41

359.52

18°35'09"

D.I. (SUMP)
TOP=53.20

INVH (TYP)

WATER LINE

A.C. PAVEMENT

A.C. TRAVEL WAY

A.C. SHOULDER

U.P./S.L.

SIGNS

ROOSEVELT AVENUE

54

BENCHMARK

ELEVATIONS ORIGINATED FROM USC&GS
BRASS DISK "J-14" (DESTROYED)
ELEV= 54.47 FT, MSL.
(SEE TRANSFERRED BENCHMARK STA. 12 "Y" CUT)

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H	HEIGHT		

TOPOGRAPHIC SURVEY MAP
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TWO-MILE DISTANCE
AT BARBER'S POINT AIRPORT, HONOULIULI, EWA, OAHU, HAWAII

TMK: 9-1-13
SCALE: 1 in. = 20 ft. MAY 26, 2016
JOB NO. 16030 FIELD BOOK : 3578B: 20
DRN: SN-M FLD: AG

CONTROLPOINT SURVEYING, INC.
615 Piikoi Street, Suite 700
HONOLULU, HAWAII 96814

3B

TRUE NORTH
SCALE: 1 IN = 20 FT

℄ Easement 7409
(25 ft. wide)
(Map 1067)

VINSON ROAD

Easement 7036
(Map 1014)

U.P.

G.W.

O/H

ROAD RIGHT OF WAY

EDGE OF VEGETATION

STA. 9
MAG NAIL
ELEV=53.12

STA. 11
MAG NAIL W/ SHINER
ELEV=54.75

TEL MH
TOP=53.99

WV
TOP=55.51
TS=52.46

WV
TOP=55.16
TS=52.46

538°14"
471.79

142.57

354°55'33"

Lot 13082 (Map 957)

A.C. PAVEMENT

PATCH

STA. 13
"Y" CUT
ELEV=54.99

CROSSWALK

SIGN
"STOP"
"BOUGAINVILLE AVE"
"CORAL SEA RD"

SIGN
"WARNING THIS IS A
CRIME WATCH COMMUNITY"

CONC CURB

METAL COVER

DOUBLE YELLOW LINES

STOP

SMH
TOP=54.34
INV=49.90

PLASTIC FENCE, H=6

A.C. CURB

COCONUT TREES
D=1
H=45

D=1
H=50

D=1
H=50

D=4
H=45

TBM
STA. 12
"Y" CUT
ELEV=55.30

TMK: 9-1-13: 14

LAND COURT APPLICATION 1069

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

AZIMUTHS AND COORDINATES REFERRED TO GOVERNMENT SURVEY TRIANGULATION STATION "KAPUAI NEW" △.

24 X 36

4A

(Map 1008)

957)

LAND COURT APPLICATION 1069

TRUE NORTH

SCALE: 1 IN = 20 FT

BENCHMARK
ELEVATIONS ORIGINATED FROM USC&GS
BRASS DISK "J-14" (DESTROYED)
ELEV= 54.47 FT, MSL.
(SEE TRANSFERRED BENCHMARK STA. 12 "Y" CUT)

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D.I.	DRAIN INLET	TV	TOP VALVE
E/ELEC.	ELECTRICAL	TW	TOP WALL
ELEV	ELEVATION	U.P.	UTILITY POLE
F.H.	FIRE HYDRANT	WMH	WATER MANHOLE
G.W.	GUY WIRE	WV	WATER VALVE
H	HEIGHT		

TMK: 9-1-13: 43

Lot 13059-B

(Map 963)

EASEMENT 10007

ROAD RIGHT OF WAY

WV BOX
TOP=53.20
TP=47.28

WV
TOP=52.72
TS=49.72

WV
TOP=52.50
TS=48.60

CHAIN GATE

CHAIN GATE

DIRT ROAD

DIRT ROAD

EDGE OF VEGETATION

SIGN
"SPEED LIMIT 35"

SIGN
"SLOW
U.S. GOVERNMENT
HOUSING
ZONE"

POST

EDGE OF VEGETATION

WMH
TOP=49.97
TP=41.74

WMH
TOP=49.75
TP=40.83

WV
TOP=49.77
TS=43.76

C O R A L S E A R O A D

A.C. PAVEMENT

24°18'07"

160.90

Easement 6944 (Map 1008)

STA. 8
MAG NAIL W/ SHINER
ELEV=52.11

STA. 17
CONC. NAIL
ELEV=50.16

7°55'09"

407.38

ROAD RIGHT OF WAY

SIGN
"SPEED LIMIT 35"

SIGN
"STOP"
"INDEPENDENCE ST"
"CORAL SEA RD"

STOP

SIGN
"KALAELOA LEASING CENTER"

A.C. CURB

Easement 6943 (Map 1008)

(LOT 13081)

U.P.

4B

TRUE NORTH

SCALE: 1 IN = 20 FT

ROAD RIGHT OF WAY

EDGE OF VEGETATION

SDMH (SUMP)
TOP=48.17
BOTTOM=46.17

POST

TEL. BOX

EDGE OF VEGETATION

STA. 19
MAG NAIL W/ SHINER
ELEV=49.11

A.C. PAVEMENT

8°21'08"

491.12

STA. 22
MAG NAIL W/ SHINER
ELEV=48.89

0°11'31"

228.77

ROAD RIGHT OF WAY

SIGN
"U.S. GOVERNMENT PROPERTY
NO TRESPASSING
NO LITTERING
NO DUMPING"

EDGE OF VEGETATION

MH (SEALED)
TOP=47.59

CONC. BARRIERS

TMK: 9-1-13: 20

TOPOGRAPHIC SURVEY MAP
ALOHA SOLAR PROJECT KALAELOA
TWO-MILE DISTANCE
AT BARBER'S POINT AIRPORT, HONOULIULI, EWA, OAHU, HAWAII

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

TMK: 9-1-13
SCALE: 1 in. = 20 ft. MAY 26, 2016
JOB NO. 16030 FIELD BOOK : 3578B: 20
DRN: SN-M FLD: AG

CONTROLPOINT SURVEYING, INC.
615 Piikoi Street, Suite 700
HONOLULU, HAWAII 96814

AZIMUTHS AND COORDINATES REFERRED TO GOVERNMENT SURVEY TRIANGULATION STATION "KAPUAI NEW" △.

24 X 36

5A

5B

EASEMENT 1008B

TRUE NORTH
SCALE: 1 IN = 20 FT

BENCHMARK
ELEVATIONS ORIGINATED FROM USC&GS
BRASS DISK "J-14" (DESTROYED)
ELEV= 54.47 FT, MSL.
(SEE TRANSFERRED BENCHMARK STA. 12 "Y" CUT)

ABBREVIATIONS:

A.C.	ASPHALT CONCRETE	MH	MANHOLE
ARV	AIR RELEASE VALVE	REF.	REFLECTOR
BC	BOTTOM CURB	S.L.	STREET LIGHT
BFP	BACK FLOW PREVENTER	SFM	SEWER FORCE MAIN
BW	BOTTOM WALL	SMH	SEWER MANHOLE
C.L.	CHAIN LINK	TC	TOP CURB
CATV	CABLE TELEVISION	TEL	TELEPHONE
CONC	CONCRETE	TP	TOP PIPE
D	DIAMATER	TS	TOP STEM
D.I.	DRAIN INLET	TV	TOP VALVE
E/ELEC.	ELECTRICAL	TW	TOP WALL
ELEV	ELEVATION	U.P.	UTILITY POLE
F.H.	FIRE HYDRANT	WMH	WATER MANHOLE
G.W.	GUY WIRE	WV	WATER VALVE
H	HEIGHT		

℄ Easement 7456
(25 ft. wide)
(Map 1071)

TMK: 9-1-13: 43

TMK: 9-1-13: 44
Lot 13059-C
(Map 963)

ROAD RIGHT OF WAY

C O R A L S E A R O A D

STA. 26
"X" CUT
ELEV=40.10

STA. 28
MAG NAIL W/ SHINER
ELEV=41.44

STA. 33
MAG NAIL W/ SHINER
ELEV=39.75

STA. 25
MAG NAIL W/ SHINER
ELEV=38.90

10°44'41" 544.54

359°38'11" 241.08

9°15'23" 351.01

13°07'26" 283.34

EDGE OF VEGETATION

DENSE VEGETATION

DIRT ROAD

GRAVEL SERVICE ROAD

A.C. PAVEMENT

WHITE LINE

YELLOW LINE

CONC. BARRIER

CONC. BARRIERS

SIGN
"U.S. GOVERNMENT PROPERTY
NO TRESPASSING
NO LITTERING
NO DUMPING"

SIGN
"SPEED LIMIT 35"

CHAIN GATE

C.L. FENCE W/ BARBED, H=9

C.L. FENCE W/ BARBED WIRE, H=9

FENCE ENCLOSURE, H=6

GATE

BUILDING

SWING GATE

CATHODIC TEST
TOP=40.29

POST

POSTS

ELEC. BOX

D.I. (SUMP)
TOP=39.96
MORE THAN 25' DEEP

FH #201 W/ GUARD RAIL

EMH (ABANDONED)
TOP=40.95

EMH (ABANDONED)
TOP=40.02

WMH
TOP=40.07
TP=34.87

WV
TOP=41.37
TS=37.61

TW 41.29
BW 40.06

TW 41.61
BW 40.62

TW 42.12
BW 40.70

Easement 6943 (Map 1008)
(LOT 13081)

LAND COURT APPLICATION 1069

AZIMUTHS AND COORDINATES REFERRED TO GOVERNMENT SURVEY TRIANGULATION STATION "KAPUAI NEW" △.

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

TOPOGRAPHIC SURVEY MAP
ALOHA SOLAR PROJECT KALAELOA
TWO-MILE DISTANCE
AT BARBER'S POINT AIRPORT, HONOULIULI, EWA, OAHU, HAWAII

TMK: 9-1-13
SCALE: 1 in. = 20 ft. MAY 26, 2016
JOB NO. 16030 FIELD BOOK : 3578B: 20
DRN: SN-M FLD: AG

CONTROLPOINT SURVEYING, INC.
615 Piikoi Street, Suite 700
HONOLULU, HAWAII 96814

UNITED STATES NAV

24 X 36

6A

LAND COURT APPLICATION 1069

TMK: 9-1-13: 43

TRUE NORTH
SCALE: 1 IN = 20 FT

Easement 6773 (Map 963)

ROAD RIGHT OF WAY

DIRT ROAD

SIGN
"U.S. GOVERNMENT PROPERTY
NO TRESPASSING
NO LITTERING
NO DUMPING"

Lot 13082 (Map 957)

CORAL SEA ROAD

STA. 37
MAG NAIL W/ SHINER
ELEV=35.24

Easement 6777 (Map 964)

EDGE OF VEGETATION

A.C. PAVEMENT

5°02'56"
490.31

12°36'53"
314.58

DOUBLE YELLOW LINES

RUMBLE STRIPS

WHITE LINE

DOUBLE YELLOW LINE

CENTERLINE RUMBLE STRIP

ELEC. BOX

SIGN
"20 MPH"

SIGNS

CONC. BARRIERS

C.L. FENCE W/ BARBED WIRE, H=6'

C.L. FENCE W/ BARBED WIRE, H=7'

GRAVEL SERVICE ROAD

TMK: 9-1-13: 32

25 MPH

NAVAL RESERVATION, BARBERS POINT AIRPORT

BENCHMARK

ELEVATIONS ORIGINATED FROM USC&GS
BRASS DISK "J-14" (DESTROYED)
ELEV= 54.47 FT, MSL.
(SEE TRANSFERRED BENCHMARK STA. 12 "Y" CUT)

ABBREVIATIONS:

A.C.	ASPHALT CONCRETE	MH	MANHOLE
ARV	AIR RELEASE VALVE	REF.	REFLECTOR
BC	BOTTOM CURB	S.L.	STREET LIGHT
BFP	BACK FLOW PREVENTER	SFM	SEWER FORCE MAIN
BW	BOTTOM WALL	SMH	SEWER MANHOLE
C.L.	CHAIN LINK	TC	TOP CURB
CATV	CABLE TELEVISION	TEL	TELEPHONE
CONC	CONCRETE	TP	TOP PIPE
D	DIAMATER	TS	TOP STEM
D.I.	DRAIN INLET	TV	TOP VALVE
E/ELEC.	ELECTRICAL	TW	TOP WALL
ELEV	ELEVATION	U.P.	UTILITY POLE
F.H.	FIRE HYDRANT	WMH	WATER MANHOLE
G.W.	GUY WIRE	WV	WATER VALVE
H	HEIGHT		

EDGE OF VEGETATION

DOUBLE YELLOW LINES W/ RUMBLE STRIP

WHITE LINE

CONC. BARRIERS

SIGN
"MILE 1.0"

ROAD RIGHT OF WAY

STA. 35
MAG NAIL W/ SHINER
ELEV=29.16

302°15'30"
374.79

328°17'02"
284.49

DOUBLE YELLOW LINES

WHITE LINE

ELEC. BOX

C.L. FENCE, H=7'

GRAVEL SERVICE ROAD

CONTERLINE RUMBLE STRIP

CONC. BARRIERS

SIGNS

SIGN

STA. 30
MAG SPIKE
ELEV=33.44

SWING GATE

TRUE NORTH
SCALE: 1 IN = 20 FT.

GRAPHIC SCALE

20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

TOPOGRAPHIC SURVEY MAP
ALOHA SOLAR PROJECT KALAELOA
TWO-MILE DISTANCE

AT BARBER'S POINT AIRPORT, HONOULIULI, EWA, OAHU, HAWAII

TMK: 9-1-13
SCALE: 1 in. = 20 ft. MAY 26, 2016
JOB NO. 16030 FIELD BOOK : 3578B: 20
DRN: SN-M FLD: AG

CONTROLPOINT SURVEYING, INC.
615 Piikoi Street, Suite 700
HONOLULU, HAWAII 96814

AZIMUTHS AND COORDINATES REFERRED TO GOVERNMENT SURVEY TRIANGULATION STATION "KAPUAI NEW" △.

6B

24 X 36

7A

SAN JUACINTO STREET

Easement 6773 (Map 963)

Easement 6777 (Map 964)

ROAD RIGHT OF WAY

CORAL SEA ROAD

TRUE NORTH
SCALE: 1 IN = 20 FT

Easement 70830 (Map 10

Easement 6770 (Map 962)

STA. 49
MAG. NAIL W/ SHINER
ELEV = 28.87

SCARRED RUMBLE STRIP

WHITE LINE

DOUBLE YELLOW LINES

RUMBLE STRIP

PATCH

SIGNS

ELEC. BOX

1" PIPE
D.I.
TOP=25.89
BOTTOM=18.24

346°38'50"
424.34

C.L. FENCE W/ BARBED WIRE, H=6

CONC. 30.02
GND 27.61

STA. 48
MAG. NAIL W/ SHINER
ELEV=28.58

SIGN
"U.S. GOVERNMENT PROPERTY
NO TRESPASSING
NO LOITERING
NO DIVING"

A.C. PAVEMENT

EDGE OF VEGETATION

CONC. BARRIERS

SIGN
WALL 1.0'

ABBREVIATIONS:

A.C.	ASPHALT CONCRETE	MH	MANHOLE
ARV	AIR RELEASE VALVE	REF.	REFLECTOR
BC	BOTTOM CURB	S.L.	STREET LIGHT
BFP	BACK FLOW PREVENTER	SFM	SEWER FORCE MAIN
BW	BOTTOM WALL	SMH	SEWER MANHOLE
C.L.	CHAIN LINK	TC	TOP CURB
CATV	CABLE TELEVISION	TEL	TELEPHONE
CONC	CONCRETE	TP	TOP PIPE
D	DIAMATER	TS	TOP STEM
D.I.	DRAIN INLET	TV	TOP VALVE
E/ELEC.	ELECTRICAL	TW	TOP WALL
ELEV	ELEVATION	U.P.	UTILITY POLE
F.H.	FIRE HYDRANT	WMH	WATER MANHOLE
G.W.	GUY WIRE	WV	WATER VALVE
H	HEIGHT		

BENCHMARK
ELEVATIONS ORIGINATED FROM USC&GS
BRASS DISK "J-14" (DESTROYED)
ELEV= 54.47 FT, MSL.
(SEE TRANSFERRED BENCHMARK STA. 12 "Y" CUT)

UNITED STATES NAVAL RESERVATION,

TMK: 9-1-1

7B

TOPOGRAPHIC SURVEY MAP
ALOHA SOLAR PROJECT KALAELOA
TWO-MILE DISTANCE
AT BARBER'S POINT AIRPORT, HONOULIULI, EWA, OAHU, HAWAII

TMK: 9-1-13
SCALE: 1 in. = 20 ft. MAY 26, 2016
JOB NO. 16030 FIELD BOOK : 3578B: 20
DRN: SN-M FLD: AG

CONTROLPOINT SURVEYING, INC.
615 Piikoi Street, Suite 700
HONOLULU, HAWAII 96814

Easement 6944 (Map 1008)

SIGN "SPEED LIMIT 35"

SIGN "PROCEED WITH CAUTION"

STA. 50
MAG. NAIL W/ SHINER
ELEV=24.79

403.58
13°48'56"

405.32
6°19'45"

A.C. SHOULDER

YELLOW LINE

DOUBLE YELLOW LINE

WMH (ARV)
TOP=25.67
TV=25.27

POST

TREES
D=1
H=40

GRAVEL SERVICE ROAD

SFM
(C&C GIS) (APPROXIMATE LOCATION)

TMK: 9-1-13: 32

UNITED STATES NAVAL RESERVATION, BARBERS POINT AIRPORT

AZIMUTHS AND COORDINATES REFERRED TO GOVERNMENT SURVEY TRIANGULATION STATION "KAPUAI NEW" △.

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

24 X 36

8A

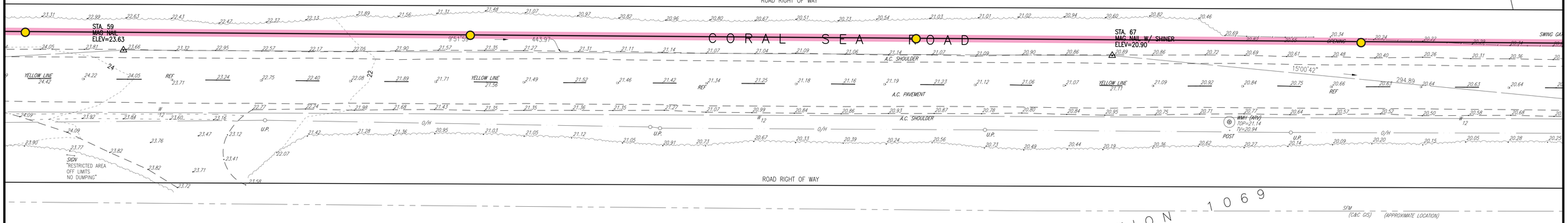
TRUE NORTH
SCALE: 1 IN = 20 FT

BENCHMARK
ELEVATIONS ORIGINATED FROM USC&GS
BRASS DISK "J-14" (DESTROYED)
ELEV= 54.47 FT, MSL.
(SEE TRANSFERRED BENCHMARK STA. 12 "Y" CUT)

ABBREVIATIONS:

A.C.	ASPHALT CONCRETE	MH	MANHOLE
ARV	AIR RELEASE VALVE	REF.	REFLECTOR
BC	BOTTOM CURB	S.L.	STREET LIGHT
BFP	BACK FLOW PREVENTER	SFM	SEWER FORCE MAIN
BW	BOTTOM WALL	SMH	SEWER MANHOLE
C.L.	CHAIN LINK	TC	TOP CURB
CATV	CABLE TELEVISION	TEL	TELEPHONE
CONC	CONCRETE	TP	TOP PIPE
D	DIAMATER	TS	TOP STEM
D.I.	DRAIN INLET	TV	TOP VALVE
E/ELEC.	ELECTRICAL	TW	TOP WALL
ELEV	ELEVATION	U.P.	UTILITY POLE
F.H.	FIRE HYDRANT	WMH	WATER MANHOLE
G.W.	GUY WIRE	WV	WATER VALVE
H	HEIGHT		

TMK: 9-1-13: 39



TMK: 9-1-13: 68

LAND COURT APPLICATION 1069

8B

TOPOGRAPHIC SURVEY MAP
ALOHA SOLAR PROJECT KALAELOA
TWO-MILE DISTANCE
AT BARBER'S POINT AIRPORT, HONOULIULI, EWA, OAHU, HAWAII

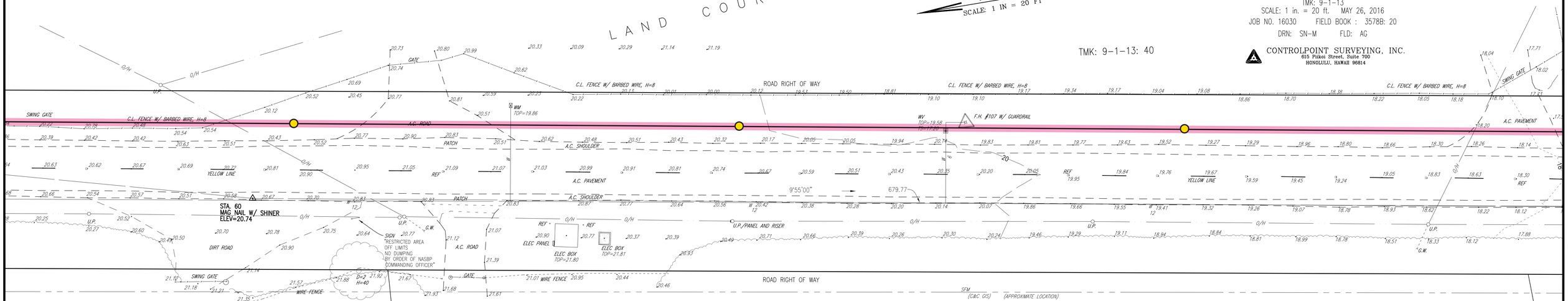
TMK: 9-1-13
SCALE: 1 in. = 20 ft. MAY 26, 2016
JOB NO. 16030 FIELD BOOK : 3578B: 20
DRN: SN-M FLD: AG

CONTROLPOINT SURVEYING, INC.
615 Piikoi Street, Suite 700
HONOLULU, HAWAII 96814

LAND COURT APPLICATION 1069

TRUE NORTH
SCALE: 1 IN = 20 FT

TMK: 9-1-13: 40



TMK: 9-1-13: 69

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

AZIMUTHS AND COORDINATES REFERRED TO GOVERNMENT SURVEY TRIANGULATION STATION "KAPUAI NEW" △.

24 X 36

9A

TRUE NORTH
SCALE: 1 IN = 20 FT

ABBREVIATIONS:

A.C.	ASPHALT CONCRETE	MH	MANHOLE
ARV	AIR RELEASE VALVE	REF.	REFLECTOR
BC	BOTTOM CURB	S.L.	STREET LIGHT
BFP	BACK FLOW PREVENTER	SFM	SEWER FORCE MAIN
BW	BOTTOM WALL	SMH	SEWER MANHOLE
C.L.	CHAIN LINK	TC	TOP CURB
CATV	CABLE TELEVISION	TEL	TELEPHONE
CONC	CONCRETE	TP	TOP PIPE
D	DIAMATER	TS	TOP STEM
D.I.	DRAIN INLET	TV	TOP VALVE
E/ELEC.	ELECTRICAL	TW	TOP WALL
ELEV	ELEVATION	U.P.	UTILITY POLE
F.H.	FIRE HYDRANT	WMH	WATER MANHOLE
G.W.	GUY WIRE	WV	WATER VALVE
H	HEIGHT		

BENCHMARK
ELEVATIONS ORIGINATED FROM USC&GS
BRASS DISK "J-14" (DESTROYED)
ELEV= 54.47 FT, MSL.
(SEE TRANSFERRED BENCHMARK STA. 12 "Y" CUT)

SWING GATE
C.L. FENCE W/ BARBED WIRE, H=8
DIRT ROAD
ROAD RIGHT OF WAY
A.C. SHOULDER
A.C. PAVEMENT
STA. 65
MAG NAIL W/ SHINER
ELEV=17.32
STA. 71
MAG NAIL W/ SHINER
ELEV=16.05
CORAL SEA ROAD
231.08
3°41'54"
536.99
12°37'57"
YELLOW LINE
REF
EDGE OF VEGETATION
SIGN
"NILE 1.5"
U.P.
O/H
SFM
(C&C GIS) (APPROXIMATE LOCATION)

TMK: 9-1-13: 67

TRUE NORTH
SCALE: 1 IN = 20 FT

TOPOGRAPHIC SURVEY MAP
ALOHA SOLAR PROJECT KALAELOA
TWO-MILE DISTANCE
AT BARBER'S POINT AIRPORT, HONOULIULI, EWA, OAHU, HAWAII

TMK: 9-1-13
SCALE: 1 in. = 20 ft. MAY 26, 2016
JOB NO. 16030 FIELD BOOK : 3578B: 20
DRN: SN-M FLD: AG

CONTROLPOINT SURVEYING, INC.
615 Piikoi Street, Suite 700
HONOLULU, HAWAII 96814

TRIPOLI ROAD
STOP
NIMITZ BEACH/COVE COTTAGES
PANEL BOX
SIREN POST
DOUBLE YELLOW LINES
STREET SIGN
"CORAL SEA RD"
"TRIPOLI ST"
CONC CURB
PATCH
CATHODIC TEST
TOP=14.91
WV TOP=14.96 TS=11.74
WV TOP=15.16 TS=13.02
WV TOP=14.38 TS=11.12
STA. 70
MAG NAIL W/ SHINER
ELEV=15.31
STA. 76
MAG NAIL W/ SHINER
ELEV=14.98
256.83
4°14'11"
434.04
10°36'06"
WHITE LINE
DOUBLE YELLOW LINES
A.C. PAVEMENT
A.C. SHOULDER
EDGE OF VEGETATION
SIGN
"SPEED LIMIT 35"
"NO OUTLET"
"GOVERNMENT PROPERTY NO UNAUTHORIZED PERSONNEL TRESPASSING DUMPING CAMPING VIOLATORS WILL BE PROSECUTED"
DIRT ROAD
SWING GATE
ROAD RIGHT OF WAY
EASEMENT 7444 (MAP 1070)
Easement 6786 (Map 971)
LAND COURT APPLICATION 1069
TRIPOLI ST.
WHITE POINT BEACH/ BEACH COTTAGES
NIMITZ BEACH/ COVE COTTAGES
"WHITE POINT" COTTAGES
NIMITZ COTTAGES
USDOE AIR STATION BARBERS POINT
SPEED LIMIT 25
SFM
(C&C GIS) (APPROXIMATE LOCATION)

TMK: 9-1-13: 70

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

AZIMUTHS AND COORDINATES REFERRED TO GOVERNMENT SURVEY TRIANGULATION STATION "KAPUAI NEW" △.

9B

24 X 36

10A

LAND COURT APPLICATION 1069

CORAL SEA ROAD

ROAD RIGHT OF WAY

A.C. PAVEMENT

STA. 82
MAG NAIL W/ SHINER
ELEV=13.44

REF

W

DOUBLE YELLOW LINES

25°37'37"

468.70

SFM
(C&C GIS) (APPROXIMATE LOCATION)

EASEMENT 7051 (MAP 1016)

STA. 87
MAG NAIL W/ SHINER
ELEV=8.27

TRUE NORTH
SCALE: 1 IN = 20 FT

BENCHMARK

ELEVATIONS ORIGINATED FROM USC&GS
BRASS DISK "J-14" (DESTROYED)
ELEV= 54.47 FT, MSL.
(SEE TRANSFERRED BENCHMARK STA. 12 "Y" CUT)

ABBREVIATIONS:

A.C.	ASPHALT CONCRETE	MH	MANHOLE
ARV	AIR RELEASE VALVE	REF.	REFLECTOR
BC	BOTTOM CURB	S.L.	STREET LIGHT
BFP	BACK FLOW PREVENTER	SFM	SEWER FORCE MAIN
BW	BOTTOM WALL	SMH	SEWER MANHOLE
C.L.	CHAIN LINK	TC	TOP CURB
CATV	CABLE TELEVISION	TEL	TELEPHONE
CONC	CONCRETE	TP	TOP PIPE
D	DIAMATER	TS	TOP STEM
D.I.	DRAIN INLET	TV	TOP VALVE
E/ELEC.	ELECTRICAL	TW	TOP WALL
ELEV	ELEVATION	U.P.	UTILITY POLE
F.H.	FIRE HYDRANT	WMH	WATER MANHOLE
G.W.	GUY WIRE	WV	WATER VALVE
H	HEIGHT		

10B

TMK: 9-1-13: 72

ROAD RIGHT OF WAY

EASEMENT 7071 (MAP 1023)

EDGE OF VEGETATION

SIGN
"SPEED LIMIT 25"

A.C. SHOULDER

A.C. PAVEMENT

DOUBLE YELLOW LINES

WHITE LINE

STA. 91
MAG NAIL W/ SHINER
ELEV=7.36

54°06'24"

185.48

375.87

33°26'52"

SIGN
"STOP"

STREET SIGN
"EISENHOWER RD"
"CORAL SEA RD"

WMH (APP)
TOP=5.02
TV=4.22

WV (RUSTED SHUT)
TOP=5.23

WV
TOP=5.21
TS=0.63

WMH
TOP=5.30
TP=0.18

WV (RUSTED SHUT)
TOP=5.31

STA. 93
MAG NAIL W/ SHINER
ELEV=4.82

KAHETZ BEACH

EISENHOWER RD

TRUE NORTH
SCALE: 1 IN = 20 FT

TOPOGRAPHIC SURVEY MAP
ALOHA SOLAR PROJECT KALAELOA
TWO-MILE DISTANCE
AT BARBER'S POINT AIRPORT, HONOULIULI, EWA, OAHU, HAWAII

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

TMK: 9-1-13
SCALE: 1 in. = 20 ft. MAY 26, 2016
JOB NO. 16030 FIELD BOOK : 3578B: 20
DRN: SN-M FLD: AG

CONTROLPOINT SURVEYING, INC.
615 Piikoi Street, Suite 700
HONOLULU, HAWAII 96814

AZIMUTHS AND COORDINATES REFERRED TO GOVERNMENT SURVEY TRIANGULATION STATION "KAPUAI NEW" △.

24 X 36

APPENDIX C
BIOLOGICAL SURVEY

AECOS, INC.

Flora and fauna surveys for the Aloha Solar Energy Fund II, LLC photovoltaic site at Kalaeloa, ʻEwa District, Oʻahu

April 6, 2017 *AECOS* No. 1315B

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Introduction

Aloha Solar Energy Fund II, LLC (ASEF II) is proposing a commercial photovoltaic (PV) system for a 44.28-ac (17.9-ha) site in Kalaeloa (Figure 1). The roughly triangular parcel (TMK: 9-1-013:070; see Figure 2) is bordered by Coral Sea Road on the east, lies south of an unimproved access road that is an extension of Tripoli Road, and is directly northeast of the taxiway for Runway 29 at Kalaeloa Airport (former Barbers Point Naval Air Station). The project was modified in 2017 to include an approximately 1.78 mi long 12 kV transmission line from the PV site along Coral Sea Road to a HECO circuit located on the *mauka* side of Franklin D. Roosevelt Avenue. The transmission line would be located within a state Department of Highways right-of-way on the east side of Coral Sea Road and include both an overhead segment on poles and an underground ductline. This report provides results of surveys of natural resources (plants and vertebrates) made within the project parcel and the proposed transmission route along Coral Sea Road from the project site to just beyond the intersection with Roosevelt Avenue. The primary purpose of the surveys was to establish that no botanical, avian, or terrestrial mammalian species currently listed or proposed for listing under either federal or state endangered species statutes on or adjacent to the project. We also evaluate the potential impacts that the development of the project might pose to any sensitive or protected native botanical, avian, or mammalian species, and to propose appropriate minimization or mitigation measures that might be implemented to reduce or eliminate any such impacts.

[1] Rana Biological Consulting, Inc., Kailua-Kona, Hawaiʻi.

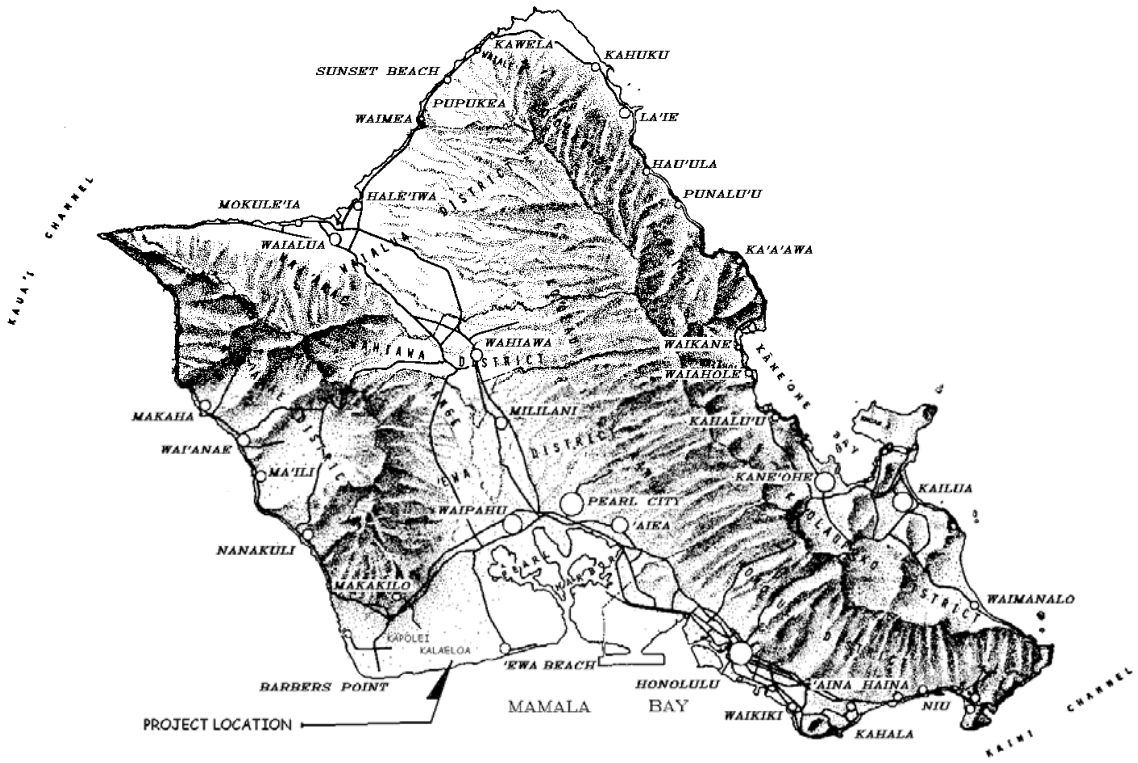

Figure 1. Project location on the Island of O'ahu.

Methods

Plants

A botanical survey of the property was undertaken on June 6, 2013 by Eric Guinther. The survey consisted of walking over the site and identifying all plants encountered within the survey area (shown in Fig. 2). A GNSS field unit (Trimble GeoXH), with the boundary of the property preloaded as a background file, was used to guide the survey track within the project area and maintain efficiency of coverage with the wandering transects. Although the site survey was undertaken in the early part of the dry season, signs of stress were just being manifested by some elements of the vegetation and only a few ruderal annuals would not have been observable or, more likely, present in lower abundances than during a wet season survey. The proposed transmission line route was surveyed on February 17, 2017 by the author. Both sides of Coral Sea Road were surveyed for a distance of approximately 10 m (33 ft) off to the side

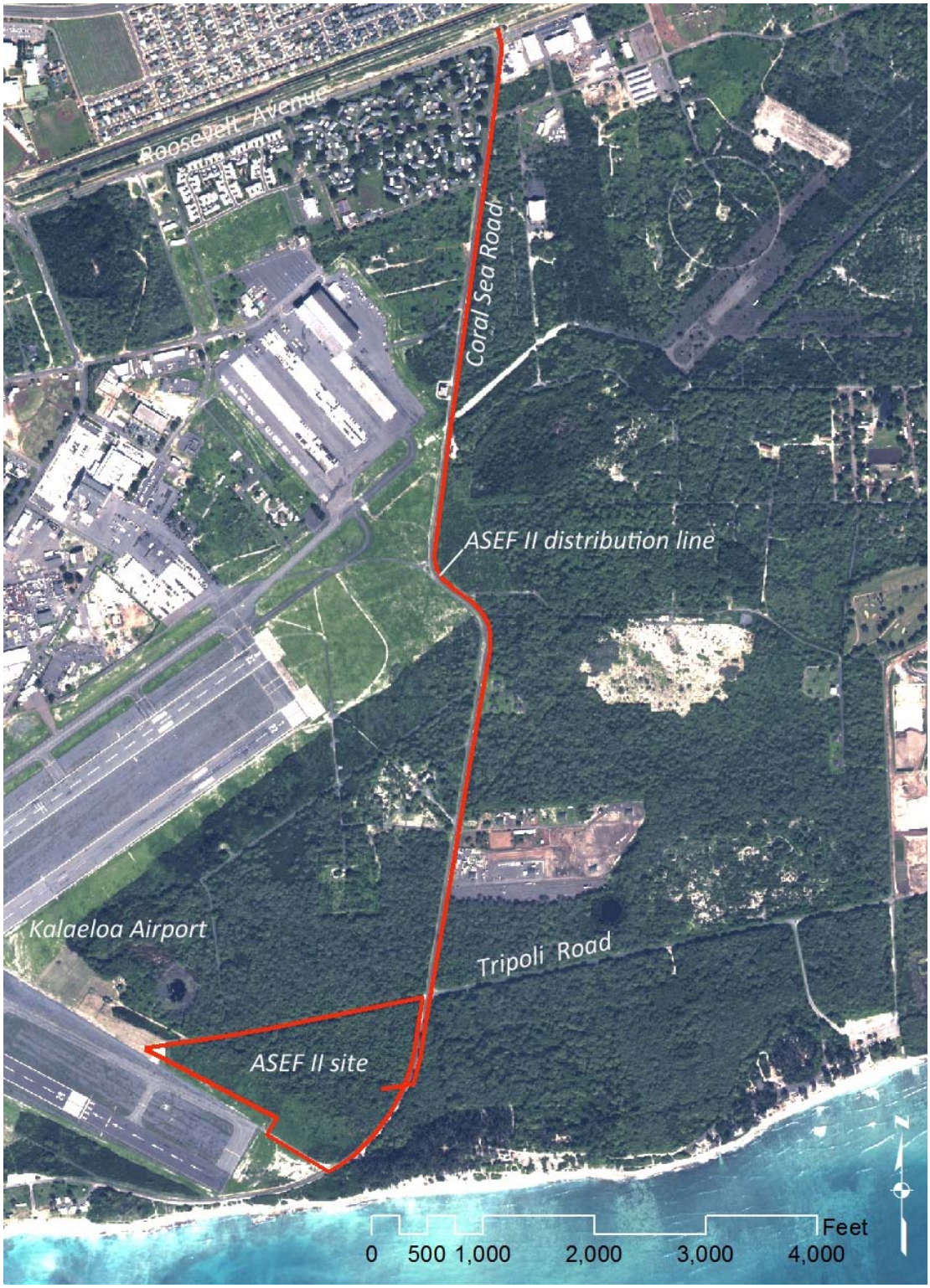

Figure 2. Project site outlined in red and distribution line route in red.

of the pavement. This pedestrian survey started at the intersection of Eisenhower Road and Coral Sea Road (Fig. 2) and extended to the Oahu Railway & Land Co. tracks north of the intersection of Coral Sea Road and Roosevelt Avenue.

Plant names follow *Manual of the Flowering Plants of Hawai'i* (Wagner *et al*., 1990, 1999) for native and naturalized flowering plants, *Hawai'i's Ferns and Fern Allies* (Palmer, 2003) for ferns, and *A Tropical Garden Flora* (Staples and Herbst, 2005) for crop and ornamental plants. Recent taxonomic name changes for plant species follow Imada (2012).

Birds

Point-counts for birds at the project site were conducted on the morning of June 6, 2013 and along the proposed transmission line route on the morning of February 17, 2017 by Reginald David. Eight avian count stations were sited approximately equidistant from each other within the site; nine avian point-count stations were sited roughly equidistant from each other along the transmission corridor. A single six-minute avian point-count was made at each count station. When not conducting point-counts, the zoologist searched the site for species and habitats not detected during the point-counts. Field observations were made with the aid of Leica 8 X 42 binoculars and by listening for vocalizations. Weather conditions were ideal with unlimited visibility, no rain, and winds of one to five kilometers per hour on June 6 and between 3 and 10 kilometers per hour on February 17.

The avian phylogenetic order and nomenclature used in this report follows the *AOU Check-List of North American Birds* (American Ornithologists' Union, 1998), and the 42nd through the 57th supplements to the Check-List (American Ornithologists' Union, 2000; Banks et al., 2002, 2003, 2004, 2005, 2006, 2007, 2008; Chesser et al., 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016).

Mammals

With the exception of the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), or *'ōpe'ape'a* as it is known locally, all terrestrial mammals currently found on the Island of O'ahu are alien species, and most are ubiquitous. The survey of mammals was limited to visual and auditory detection, coupled with visual observation of scat, tracks, and other animal sign. A running tally was kept of all terrestrial vertebrate mammalian species detected within the survey areas. Mammal scientific names follow (Wilson & Reeder, 2005).

Results

Vegetation

The vegetation on the project site can be divided into three distinct types: 1) *kiawe* (*Prosopis pallida*) forest, 2) mixed grassland and shrubland, and 3) ruderal (highly disturbed) areas along roads and road verges.

Kiawe forest covers most of the site. Much of the terrain is uneven and rocky, with limestone rubble and outcrops (Figure 3). A mixed understory of grasses and shrubs is present. Where cuts for geotechnical drilling have been made (Fig. 2), ruderal plants are becoming established. However, most of the forested land has not been disturbed by development.

Figure 3. Interior of forest showing *kiawe* trees, juvenile *koa haole*, and limestone rock substratum.

An area of grassland mixed with shrubland occurs along the southern part of the site (see Figure 4). The grassland is an open field of buffel grass (*Cenchrus ciliaris*) with shrubs encroaching in various areas. Shrubland varies from

scattered bushes to very dense growth. The dominant species are sourbush (*Pluchea indica* and *P. carolinensis*) in some areas and *koa haole* (*Leucaena leucocephala*) scrub in others (Figure 5). This area represents land that was graded as part of the adjacent airfield. The graded land was formerly maintained as grassland verge for decades, but is now being invaded by shrubs.

Figure 4. Grassland and edge of shrubland (here, *koa haole* with a large *kiawe* tree) on southern portion of site.

Ruderal refers to land that is greatly (and relatively recently or continuously) disturbed. Typically, ruderal land develops a vegetation type of herbaceous plants that spread rapidly and are adapted to continuing disturbances, such as mowing. Ruderal plants at this location are found along the highway verge, on the unimproved roadways, and in relatively recent cuts made through the forest. Ruderal plants are sometimes what one would call "weeds." The verge of Coral Sea Road is regularly mowed to a width of several meters (Fig. 5).

Flora

The survey of plants on the Aloha Solar Energy PV site yielded 64 species of flowering plants (no ferns or conifers or their allies were found on the site; see

Figure 5. Coral Sea Road looking north showing maintained verge and *koa haole* scrub on left (west) side and abandoned fenced storage yard on right (east). The proposed transmission line would be routed along the far side where much of the route is the same *koa haole* scrub pictured here.

Table 1). Of the 65 plant taxa, four (6%) are native species and two (3%) are early Polynesian introductions. The addition to Table 1 of plants observed along the distribution line route resulted in a total plant list of 96 species. While representing a considerable increase in species numbers over the number observed in 2013, this result is not unusual considering much of the transmission line route is a ruderal environment and extends north into more recently developed land. This second survey added no new natives and only one Polynesian introduction: *ʻihiʻai* (*Oxalis corniculata*), a common yard weed.

The two indigenous species—*ʻilieʻe* (*Plumbago zeylanica*) and *ʻilima* (*Sida fallax*)—are common species on Oʻahu in dry and mesic environments. *ʻilima* is especially abundant in places along Coral Sea Road. The endemic native observed is *kūpala* (*Sicyos pachycarpus*), an annual climbing vine that can be very common in the ʻEwa District at certain times of the year. This vine climbs

Table 1. Listing of plants (flora) at the Aloha Solar Energy Fund II, LLC site, Kalaeloa, west Oʻahu, Hawaiʻi.

Family *Species*	Common name	Status	Abundance* (site / line)	Notes
	FERNS			
POLYPODIACEAE				
Phymatosorus grossus (Langsd. & Fisch.) Brownlie	*laua'e*	Nat	- / R	<1>
	FLOWERING PLANTS DICOTYLEDONES			
ACANTHACEAE				
Asystasia gangetica (L.) T. Anderson	Chinese violet	Nat	O3 / A	
Dicliptera chinensis (L.) Juss.	---	Nat	- / R	<1>
Ruellia blechum L.	---	Nat	- / U	<1>
AMARANTHACEAE				
Achyranthes aspera L.	---	Nat	R / -	
Alternanthera pungens Kunth	khaki weed	Nat	O / C	
Ameranthus viridis L.	slender amaranth	Nat	- / R	
ANACARDIACEAE				
Schinus terebinthefolius Raddi	Christmas berry	Nat	U / -	
ASCLEPIADACEAE				
Cryptostegia cf. *grandifolia Roxb.* ex R. Br.	rubber vine	Nat	A / O	
Stapelia gigantea N.E. Brown	giant toad plant	Nat	/ U1	
ASTERACEAE (COMPOSITAE)				
Ageratum conyzoides L.	*maile hohono*	Nat	R	
Bidens alba (L.) DC.	beggartick	Nat	- / U2	
Bidens pilosa L.	beggartick	Nat	O2 / -	
Calyptocarpus vialis Less.	---	Nat	U / C	
Conyza bonariensis (L.) Cronq.	hairy horsewed	Nat	U / R	
Emilia fosbergii Nicolson	Flora's paintbrush	Nat	- / U	
Flaveria trinerva (Spreng.) C. Mohr	---	Nat	O1 / -	
Lactuca serriola L.	prickly lettuce	Nat	R / -	
Pluchia carolinensis (Jacq.) G. Don	sourbush	Nat	O2 / O	
Pluchea indica (L.) Less.	Indian fleabane	Nat	A2 / -	
Pluchia x *fosbergii* Cooperr. & Galang	---	Nat	R / U2	
Sonchus oleraceus L.	sow thistle	Nat	U / U	
Taraxacum officinale W.W. Weber ex Wigg.	common dandelion	Nat	- / R	<1>

Table 1 (continued).

Family *Species*	Common name	Status	Abundance	Notes
ASTERACEAE (continued)				
Tridax procumbens L.	coat buttons	Nat	U / O2	
Verbesina enceliodes (Cav.) Benth. & Hook.	golden crown-beard	Nat	O2 / -	
BIGNONIACEAE				
Spathodea campanulata P. Beauv.	African tulip	Nat	R / -	
BORAGINACEAE				
Heliotropum procumbens Mill.	---	Nat	R / O3	
CHENOPODIACEAE				
Atriplex semibaccata R. Br.	Australian saltbush	Nat	R / R	
Chenopodium carinatum R. Br.	---	Nat	U1 / R	
Chenopodium murale L.	*ʻaheahea*	Nat	O / -	
CONVOLVULACEAE				
Ipomoea obscura (L.) Ker-Gawl.	---	Nat	O2 / U2	
Merremia aegyptia (L.) Urb.	hairy merremia	Nat	R / -	
CUCURBITACEAE				
Cucumis dipsaceus Ehrenb. ex Spach	teasel gourd	Nat	U / R	
Sicyos pachycarpus Hook. & Arnott	*kūpala*	**End**	O / -	<2>
EUPHORBIACEAE				
Codiaeum variegatum (L.) Blume	croton	Orn	R	<1>
Euphorbia hirta L.	garden spurge	Nat	R / U3	
Euphorbia prostrata L.	prostrate spurge	Nat	- / U	
Ricinus communis L.	castor bean	Nat	R / -	
FABACEAE				
Acacia farnesiana (L.) Willd.	*klu*	Nat	- / R	
Desmanthus virgatus (L.) Willd.	virgate mimosa	Nat	C3 / O2	
Desmodium tortuosum (Sw.) DC.	Florida beggarweed	Nat	R / R	
Leucaena leucocephala (Lam.) deWit	*koa haole*	Nat	A / AA	
Indigofera hendecaphylla Jacq.	creeping indigo	Nat	R / U	
Macroptilium lathyroides (L.) Urb.	wild bean, cow pea	Nat	R / R	
Pithecelobium dulce (Roxb.) Benth.	*ʻopiuma*	Nat	U / O	
Prosopis pallida (Humb. & Bonpl. ex Willd.) Kunth	*kiawe*	Nat	AA/AA	
Senna sp.	unidenified	Nat	- / R	
GENTIANACEAE				
Centaurium erythraea Raf.	bitter herb	Nat	- / R	
LAMIACEAE				
Leonotis nepetifolia (L.) R. Br.	lion's ear	Nat	O / -	
Ocimum gratissimum L.	wild basil	Nat	R / -	

Table 1 (continued).

Family *Species*	Common name	Status	Abundance	Notes
LAURACEAE				
Cassytha filiformis L.	*kauna'oa pehu*	Nat	O / O	
MALVACEAE				
Abutilon grandifolium (Willd.) Sweet	hairy abutilon	Nat	R / -	
Malva parviflora L.	cheese weed	Nat	- / O	
Malvastrum coromandelianum (L.) Garck	false mallow	Nat	U / A	
Sida ciliaris L.	---	Nat	A / AA	
Sida fallax Walp.	*`ilima*	**Ind**	C1 / A	
Sida rhombifolia L.	Cuba jute	Nat	R / -	
Sida spinosa L.	prickly sida	Nat	R / U3	
Waltheria indica L.	*'uhaloa*	**Ind**?	O / A	
MORACEAE				
Morus alba L.	white mulberry	Nat	- / R	<2>
MORINGACEAE				
Moringa oleifera Lam.		Nat	- / R	<1>
NYCTAGINACEAE				
Boerhavia coccinea Mill.	false *alena*	Nat	- / O2	
OXALIDACEAE				
Oxalis corniculata L.	yellow wood sorrel, *'ihi'ai*	**Pol?**	- / R	
PASSIFLORACEAE				
Passiflora foetida L.	running pop	Nat	R / -	
Passiflora suberosa L.	*huehue haole*	Nat	R / -	
PHYTOLACCACEAE				
Rivina humilis L.	coral berry	Nat	O / -	
PLUMBAGINACEAE				
Plumbago zeylanica L.	*'ilie'e*	**Ind**	U2 / -	
PORTULACACEAE				
Portulaca oleracea L.	pigweed	Nat	- / U	
Portulaca pilosa L.	---	Nat	- / O	
RUBIACEAE				
Morinda citrifolia L.	*noni*	**Pol**	R / -	
Spermacoce assurgens Ruiz & Pav.	buttonweed	Nat	- / U	
SOLANACEAE				
Nicotiana glauca R.C. Graham	tree tobacco	Nat	R / R	
Solanum americanum Mill.	*pōpolo*	**Pol**	O / R	

Table 1 (continued).

Family *Species*	Common name	Status	Abundance	Notes
SOLANACEAE (continued)				
Solanum lycopersicum var. *cerasiforme* (Dunal) Spooner, G.J. Anderson & R.K. Jansen	cherry tomato	Nat	O / -	
Solanum seaforthianum Andr.	---	Nat	R / O	
VERBENACEAE				
Duranta erecta L.	golden dewdrop	Orn	- / R	<1>
Stachytarpheta jamaicensis (L.) Vahl.	Jamaican vervain	Nat	- / U	
MONOCOTYLEDONES				
AGAVACEAE				
Agave sisalana Perrine	sisal	Nat	- / R	
ALOEACEAE				
Aloë vera (L.) N.L. Burman	aloe vera	Nat	- / R	
CYPERACEAE				
Cyperus rotundus L.	nut grass	Nat	- / R	<1,2>
LILIACEAE				
Crinujm asiaticum L.	giant lily	Orn	- / R	<1>
POACEAE				
Axonopus compressus (Swartz) P. Beauv.	broad-leaved carpetgrass	Nat	- / A	<1>
Bothriochloa pertusa (L.) A. Camus	pitted beardgrass	Nat	- / A	<1>
Cenchrus ciliaris L.	buffelgrass	Nat	AA/AA	
Cenchrus echinatus L.	common sandbur	Nat	- / R	<1>
Chloris barbata (L.) Sw.	swollen fingergrass	Nat	O2 / C3	
Cynodon dactylon (L.) Pers.	Bermuda grass	Nat	O / A	
Digiteria insularis (L.) Mez. ex Ekman	sourgrass	Nat	U / -	
Eleusine indica (L.) Gaertn.	beach wiregrass	Nat	C / U	
Eragrostis amabilis (L.) Wight & Arnott	lovegrass	Nat	U / R	
Eragrostis pectinacea (Michx.) Nees	Carolina lovegrass	Nat	C / U2	
Megathyrsus maximus (Jacq.) B.K. Simon & W.L. Jacobs	Guinea grass	Nat	AA/AA	
Melinus repens (Willd.) Zizka	Natal redtop	Nat	- / R	
Setaria verticillata (L.) P. Beauv.	bristly foxtail	Nat	O / -	
Sporobolus diandrus (Retz.) P. Beauv.	Indian dropseed	Nat	R / O	
Indet. grass	"grey grass"	Nat	O	<1,2>

Table 1 (continued).

Legend to Table 1

STATUS = distributional status for the Hawaiian Islands:

end = endemic; native to Hawaii and found naturally nowhere else.

ind = indigenous; native to Hawaii, but not unique to the Hawaiian Islands.

nat = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation.

orn = exotic, ornamental or cultivated; plant not naturalized (not well-established outside of cultivation).

pol = Polynesian introduction before 1778.

ABUNDANCE = occurrence ratings for plants by area:

* Arranged in column as follows: site survey / transmission line survey; "-" not found.

R – Rare seen in only one or perhaps two locations.

U - Uncommon- seen at most in several locations

O - Occasional seen with some regularity

C - Common observed numerous times during the survey

A - Abundant found in large numbers; may be locally dominant.

AA - Very abundant abundant and dominant; defining vegetation type.

Numbers following an occurrence rating indicate clusters within the survey area.

The ratings above provide an estimate of the likelihood of encountering a species within the specified survey area; numbers modify this where abundance, where encountered, tends to be greater than the occurrence rating:

1 = several plants present ; with C or A = in one area only.

2 = many plants present ; with C or A = in a few areas.

3 = locally abundant; with C or A = in several to many areas but still limited.

NOTES:

<1> – Plant associated with lawn fronting Navy housing area or planted there as an ornamental.

<2> – Plant observed was lacking fruit or flowers; identification uncertain.

over the vegetation, flowers profusely, and then disappears early in the dry season, resurrecting from seeds the next wet season.

The early Polynesian introduced plants are *noni* (*Morinda citrifolia*) and *pōpolo* (*Solanum americanum*). Pōpolo is a herbaceous plant as common as the three natives and, like *kūpala*, an annual herb in dry, leeward environments, disappearing with the dry season. *Noni* is a small tree valued by some for its fruits with purported medicinal properties and common in the wild. The remaining 89 species (93%) recorded in our survey are all non-natives—species introduced to the Islands after 1778 and since naturalized (that is, growing in the wild) or planted as ornamentals.

The only other plant of interest or concern is the rubber vine (*Cryptostegia* cf. *grandifolia*[2]). This vine is rampant within the *kiawe* forest on the eastern half of the property. The plant is considered an invasive pest in Hawai'i (HISC, undated).

Avian Survey

A total of 390 individual birds in 16 species representing nine separate families, were recorded during station counts in 2013 (Table 2 "Site"). While moving between point-count stations, one species, White Tern (*Gygis alba*), was recorded as an incidental observation flying over the southwestern corner of the site. White Tern is an indigenous, breeding seabird species. The O'ahu population is listed as an endangered species under the state endangered species statute; this species is not protected under the federal endangered species statute. The other 16 species recorded are all alien to the Hawaiian Islands.

Table 2. Avian species detected during point-counts at the Aloha Solar Energy Fund II, LLC site ("Site") and along Coral Sea Road ("Line").

		Site		Line	
Common Name	Scientific Name	ST	RA	ST	RA
	GALLIFORMES				
	PHASIANIDAE – Pheasants & Partridges				
	Phasianinae – Pheasants & Allies				
Gray Francolin	*Francolinus pondicerianus*	A	0.88	A	1.67
Chicken	*Gallus gallus*	D	0.50	D	0.44
	LARIDAE - Gulls, Terns & Skimmers				
	Sterninae - Terns				
White Tern	*Gygis alba*	**IE**	**I-1**	--	--

[2] This species is not previously reported from O'ahu (Imada, 2012), but the closely related *C. madagascariensis* is. The two species are difficult to distinguish in the field, and close examination of the flower structure was not possible because the few flowers seen were high in the *kiawe* trees. Nonetheless, this author believes the vines present are a better fit to the description of *C. grandifolia* (Klackenberg, 2001) in several respects. Both species are regarded as undesirable invasives. Seen in 2017, the plants were in poor condition and the species could not be confirmed either way.

Table 2 (continued).

Common Name	Scientific Name	Site ST	Site RA	Line ST	Line RA
	COLUMBIFORMES				
	COLUMBIDAE – Pigeons & Doves				
Spotted Dove	*Streptopelia chinensis*	A	1.50	A	2.33
Zebra Dove	*Geopelia striata*	A	1.88	A	4.33
	CHARADRIIFORMES				
	CHARADRIIDAE - Lapwings & Plovers				
	Charadriinae – Plovers				
Pacific Golden-Plover	*Pluvialis fulva*	--	--	IM	0.56
	PELECANIFORMES				
	ARDEIDAE - Herons, Bitterns & Allies				
Cattle Egret	*Bubulcus ibis*	--	--	A	0.22
	PASSERIFORMES				
	ALAUDIDAE – Larks				
Eurasian Skylark	*Alauda arvensis*	--	--	A	2.22
	PYCNONOTIDAE - Bulbuls				
Red-vented Bulbul	*Pycnonotus cafer*	A	4.25	A	4.67
Red-vented Bulbul	*Pycnonotus jocosus*	A	0.63	A	1.33
	CETTIIDAE - Cettia Warblers & Allies				
Japanese Bush-Warbler	*Cettia diphone*	A	0.13	--	--
	ZOSTEROPIDAE - White-eyes				
Japanese White-eye	*Zosterops japonicus*	A	4.25	A	3.44
	TURDIDAE - Thrushes				
White-rumped Shama	*Copsychus malabaricus*	A	1.25	A	0.33
	STURNIDAE – Starlings				
Common Myna	*Acridotheres tristis*	--	--	A	3.00
	THRAUPIDAE – Tanagers				
	Thraupinae - Core Tanagers				
Red-Crested Cardinal	*Paroaria coronata*	--	--	A	1.56
	CARDINALIDAE – Cardinals Saltators & Allies				
Northern Cardinal	*Cardinalis cardinalis*	A	3.00	A	2.22
	FRINGILLIDAE – Fringilline and Carduleline Finches & Allies				
	Carduelinae – Carduline Finches				
House Finch	*Haemorhous mexicanus*	A	7.88	A	0.67
	PASSERIDAE - Old World Sparrows				
House Sparrow	*Passer domesticus*	--	--	A	0.44
	ESTRILDIDAE – Estrildid Finches				
	Estrildinae – Estrildine Finches				
Common Waxbill	*Estrilda astrild*	A	14.13	A	3.89
Red Avadavat	*Amandava amandava*	A	0.50	A	0.22
African Silverbill	*Lonchura cantans*	A	1.75	A	1.44
Scaly-breasted Munia	*Lonchura punctulata*	--	--	A	8.11
Chestnut Munia	*Lonchura atricapilla*	A	6.00	A	2.56
Java Sparrow	*Padda oryzivora*	A	0.25	--	--

Table 2 (continued).

Key to Table 2

ST	Status
A	Alien Species – Introduced to the Hawaiian Islands by humans
D	Domestic Species – Not currently considered to be established in the wild on O'ahu
I	Indigenous Species – Native to the Hawaiian Islands, but found elsewhere naturally
IE	Indigenous Species Listed as Endangered under State law
RA	Relative Abundance - Number of birds detected divided by the number of count stations (8)
I -	Incidental - A species recorded as an incidental observation while transiting between count station with number recorded

A total of 315 individual birds of 21 species, representing 14 separate families was recorded during point-counts (Table 2 , "Line") along Coral Sea Road. Of the 21 avian species recorded, Pacific Golden-Plover (*Pluvialis fulva*), is an indigenous migratory species. The remaining 20 species detected are alien to the Hawaiian Islands.

Mammalian Survey

One terrestrial mammalian species was detected during the course of the site survey: an Indian mongoose (*Herpestes auropunctatus*) was seen crossing the extension of Tripoli Road along the northern edge of the parcel. Four small Indian mongooses were seen within the transmission line survey area. Additionally, scat and tracks of this species was observed at multiple locations along roads and trails within the site.

Five other terrestrial mammalian species were detected along the transmission line corridor. Dogs (*Canis familiaris*) were heard barking from outside of the survey area. Additionally, scat of this species was encountered in several locations within the survey corridor. One cat (*Felis catus*) was seen crossing Coral Sea Road. Four domestic cattle (*Bos Taurus*), eight goats (*Capra hircus*), and 10 sheep (*Ovis areis*) were seen within a fenced paddock on the east side of Coral Sea Road.

Discussion

Botanical Resources

Although the project site is overwhelmingly dominated by non-native *kiawe* trees and buffelgrass, the potential exists for several listed plant species known from generally similar environments in the area extending from Campbell

Industrial Park to ʻEwa Beach and inland to the *mauka* border of the ancient coral reef that formed the ʻEwa Plain (Char and Balakrishnan, 1979). Notable from this region are an *ʻakoko* (*Euphorbia skottsbergii skottsbergii*) and *ʻEwa hinahina* (*Achyranthes spectabilis*). Not listed as threatened or endangered, but generally rare on Oʻahu, are *maiapilo* (*Capparis sandwichiana*) and *maʻo* (*Gossypium tomentosum*), endemic plants from the coastal lowlands. Any one of these species could occur on the property given the distribution of the species in ʻEwa as known at the present time (see David & Guinther, 2005; *AECOS*, 2010; USFWS, 2012). Indeed, critical habitat units for *ʻakoko* and *A. splendens* have been designated recently in the vicinity by U.S. Fish and Wildlife Service (USFWS, 2012; see page 18, below). Thus, our botanical surveys focused particularly on locating any of these rare native species if present; however, none was found.

Avian Resources

Avian diversity and densities were in keeping with the nature of the habitats present on the site, the site location on the ʻEwa Plain, and results of several other recent faunal surveys conducted in similar habitats in the general vicinity (David and Guinther, 2005, 2006, 2007, 2010; David et al., 2013). Avian diversity and densities recorded along the transmission corridor were in keeping with the highly disturbed environments present. Four species: Scaly-breasted Munia[3] (*Lonchura punctulata*), Common Waxbill (*Estrilda astrild*), Zebra Dove (*Geopilia striata*), and Red-vented Bulbul (*Pycnonotus cafer*) were the most commonly observed species, accounting for 56% of all birds recorded during station counts. The most frequently recorded species was Scaly-breasted Munia, which accounted for 23% of the total number of individual birds recorded during the 2017 station point counts.

One migratory shorebird, *kolea* or Pacific Golden-Plover (*Pluvialis fulva*), was recorded during the course of the 2017 survey; this species would not have been expected in the June site survey. *Kolea* are regularly recorded in this area between September and late April each year. This species nests in the high Arctic during the late spring and summer months, returning to Hawaiʻi and the tropical Pacific to spend the fall and winter months each year. The birds usually leave Hawaiʻi for the Arctic in late April or the very early part of May (USFWS, 2016).

[3] The American Ornithological Union changed the common name of Nutmeg Mannikin (*Lonchura punctulata*) to Scaly-breasted Munia in 2014 (Chesser et al., 2014)

White Tern is an indigenous seabird species and a year-round breeding resident of the Island of Oʻahu. The population is concentrated on the leeward coast, with greatest numbers found in Waikīkī and parts of downtown Honolulu (Vanderwerf, 2003). White Tern is a species listed as threatened under State of Hawaiʻi endangered species statutes (DLNR, 1998). This species is not listed as either endangered or threatened under the federal Endangered Species Act (ESA)

No other listed seabirds were detected during the course of the surveys. Several protected, nocturnal-flying seabird species potentially overfly the site on occasion and in low numbers on a seasonal basis. The primary cause of mortality in resident seabirds is thought to be predation by alien mammalian species at the nesting colonies (USFWS, 1983; Simons and Hodges, 1998; Ainley et al., 2001). Collision with man-made structures is considered second-most significant as a cause of mortality in locally nesting seabird species in Hawaiʻi. Nocturnally flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting. When disoriented, these birds may collide with man-made structures and, if not killed outright, become targets of opportunity for feral mammals (Hadley, 1961; Telfer, 1979; Sincock, 1981; Reed et al., 1985; Telfer et al., 1987; Cooper and Day, 1998; Podolsky et al., 1998; Ainley et al., 2001; Hue et al., 2001; Day et al., 2003).

There are no known nesting colonies of any of these seabird species on or within close proximity of the project site (David, 2013). None of the avian species detected during the course of these two surveys are listed under either the federal Endangered Species Act of 1973, as amended (ESA), or the State of Hawaii's endangered species statute Hawaii Revised Statutes (HRS) 195D (HDLNR, 1998; USFWS, 2013).

Mammalian Resources

The findings of the mammalian survey are consistent with the results of several recent faunal surveys conducted in similar habitats on the ʻEwa Plain (David and Guinther, 2005, 2006, 2007, 2010; David et al., 2013). Although no rodents were detected during the course of the surveys, it is likely that the four established alien Muridae found on Oʻahu—roof rat (*Rattus rattus*), brown rat (*Rattus norvegicus*), European house mouse (*Mus musculus domesticus*), and possibly black rat (*Rattus exulans hawaiiensis*)—use various resources found within the general project area on a seasonal basis. All of these introduced rodents are deleterious to native ecosystems and the native species dependent on them.

Hawaiian hoary bat was not detected during the course of our survey. Given the paucity of documented records of this species from the ʻEwa Plain, the chance that this species utilizes resources on the subject property is extremely low (USFWS, 1998; David, 2017). Additionally the only tall trees on the site are *kiawe*, a species not usually identified as a bat roosting tree due to its scant leaf cover and arched branching pattern. Very few trees occur close to the road along the transmission line route.

No mammalian species currently protected or proposed for protection under either the federal or State of Hawaiʻi endangered species programs was detected during the course of this survey, nor were any expected (DLNR, 1998; USFWS; 2005a, 2005b, 2013).

Potential Impacts to Protected Species and Critical Habitat

Seabirds

The principal potential impact that construction of the project and the operation of the PV facility poses to protected seabirds is the increased threat that birds will be downed after becoming disoriented by lights associated with the project during the seabird nesting season. The two ways that outdoor lighting could pose a threat to these nocturnally-flying seabirds is: 1) during construction it is deemed expedient or necessary to conduct night-time construction activities with bright lights; or, 2) following build-out, streetlights or security and safety lighting is used within the facility during the seabird nesting season. The impacts on seabirds can be minimized by properly shielding outdoor lighting.

Hawaiian hoary bat

The principal potential impact that construction of the project poses to bats is during clearing and grubbing phases of construction as vegetation is removed. The removal of vegetation within the project site might temporarily displace individual bats, which use the vegetation for roosting. As bats use multiple roosts within their home territories, the potential for disturbance from the removal of vegetation is likely to be minimal. During the pupping season, females carrying pups may be less able to rapidly vacate a roost site when vegetation is being cleared. Additionally, adult female bats sometimes leave their pups in the roost tree while they forage. Very small pups may be unable to flee a tree that is being felled. Potential adverse effects from such disturbance can be avoided or minimized by not clearing woody vegetation taller than 15 ft (4.6 m) between June 1 and September 15, the bat pupping season. With that said, the tall trees on the site are all *kiawe*, a species not usually identified as a

bat roosting tree. Therefore, any risk from clearing activity on this species is highly unlikely at this project site.

Blackburn's hawk moth

The endangered Blackburn's hawk moth (*Manduca blackburni*) is not known from O'ahu. On Maui and Hawai'i islands, this species can be found feeding in the larval phase on various plants in the Family Solanaceae, most particularly tree tobacco (*Nicotiana glauca*). A single tree tobacco plant was observed on the transmission line survey. This plant was growing out of a central post hole for a gate into a paved area on the east side of the road. The plant (about 4 ft tall) showed no signs of any lepidopteran larva present or feeding on leaves.

Critical Habitat

No federally delineated Critical Habitat incorporates any part of the project site or transmission line route. The nearest critical habitat is Lowland Dry - Unit 11, at its closest point 1900 ft (575 m) to the northeast of the site and about 300 ft (90 m) east of Coral Sea Road where the Unit 11 boundary parallels the Road. Three other units (Lowland Dry-Unit 09 and Unit 10, and Coastal - Unit 15) have been designated in Kalaeloa (USFWS, 2012), but these are at distances over 1 mi to the west. There is no equivalent statute under state law.

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APPENDIX D
GLINT AND GLARE ANALYSIS

POWER ENGINEERING

ALOHA SOLAR ENERGY FUND II

SOLAR FARM GLARE STUDY

May 11, 2017 | Prepared by POWER Engineers for Aloha Solar Energy Fund II

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Solar Farm Glare Study

PREPARED FOR: *ALOHA SOLAR ENERGY FUND II LLC*

PREPARED BY: *POWER ENGINEERS, INC.*

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1.0 INTRODUCTION

The Federal Aviation Administration (FAA) has expressed concern for glare resulting from photovoltaic systems potentially causing distractions to pilots or air traffic control tower personnel. For this reason, the FAA has asked solar developers to perform a glare analysis to evaluate and document potential occurrences of glare. POWER Engineers, Inc. (POWER) has prepared this Glare Study for Aloha Solar Energy Fund II's (ASEF II) Solar Farm Project (Project). The Project is located in Kalaeloa, Oahu, Hawaii (see Figure 1), and immediately adjacent to the Kalaeloa Airport, approximately 700 feet east of Runway 29 (see Figure 2). The proposed Project will utilize fixed panel photovoltaic solar technology to produce up to 5.0 megawatts (MW) of electricity. The Glare Study was prepared for Kalaeloa Airport officials and the FAA. Specifically, this study does the following:

- Identifies the Air Traffic Control Tower (ATC Tower) and approach slopes associated with the Kalaeloa Airport (see Section 3.1).
- Characterizes typical glare behavior experienced from the solar project throughout the day and year (see Section 3.2).
- Evaluates when and where glare may be visible to ATC Tower personnel and pilots on final approach (see Section 4.0).

2.0 DEFINITIONS AND DESCRIPTIONS

The following definitions and descriptions are important for understanding the methodology and results of the study:

Fixed Photovoltaic Panel – Photovoltaic (PV) panels, are deigned to absorb solar energy and retain as much of the solar spectrum as possible in order to produce electricity. ASEF II utilized fixed, non-rotating, PV panels mounted directly to a stationary foundation (see Figure 3).

Glare – A continuous source of brightness, relative to diffuse or surface scattered lighting. For purposes of this study, glare is caused by the sun reflecting off solar panels (see Figure 4).

Air Traffic Control Tower – The Air Traffic Control (ATC) Tower directs aircraft on the ground and in the air. The primary purpose of ATC Tower systems is to separate aircraft to prevent collisions; to organize and expedite the flow of traffic; and to provide information and other support for pilots when able.

Final Approach – The angle of descent maintained by pilots during landing procedures. The FAA defines this as two miles total distance from 50 feet above the landing threshold using a standard three degree angle of decent. During these procedures, the aircraft is directly in line with the runway.

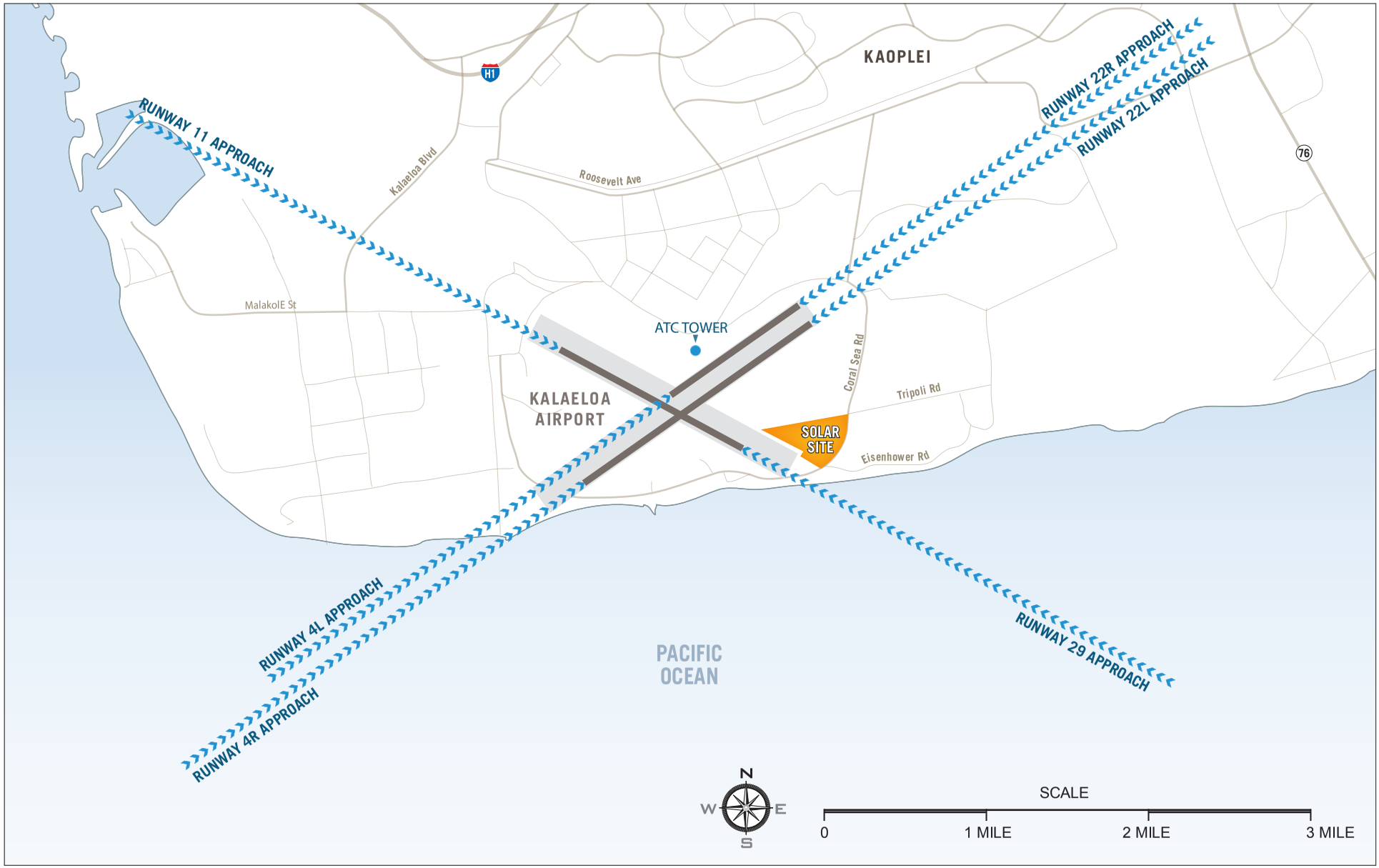
GlareGauge – The GlareGauge uses Solar Glare Hazard Analysis Tool (SGHAT) technology, developed by Sandia National Laboratories and is a web-based tool that predicts the potential for solar glare and ocular impacts from an array of PV panels. The GlareGauge is compatible with FAA glare guidelines for analysis of any solar energy installation proposed at a federally obligated airport.

Prepared For,

Prepared By,

ASEF II Solar Farm Glare Study

Figure 1 - Project Location Map



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Prepared By,

ASEF II Solar Farm Glare Study

Figure 2 - Site Map

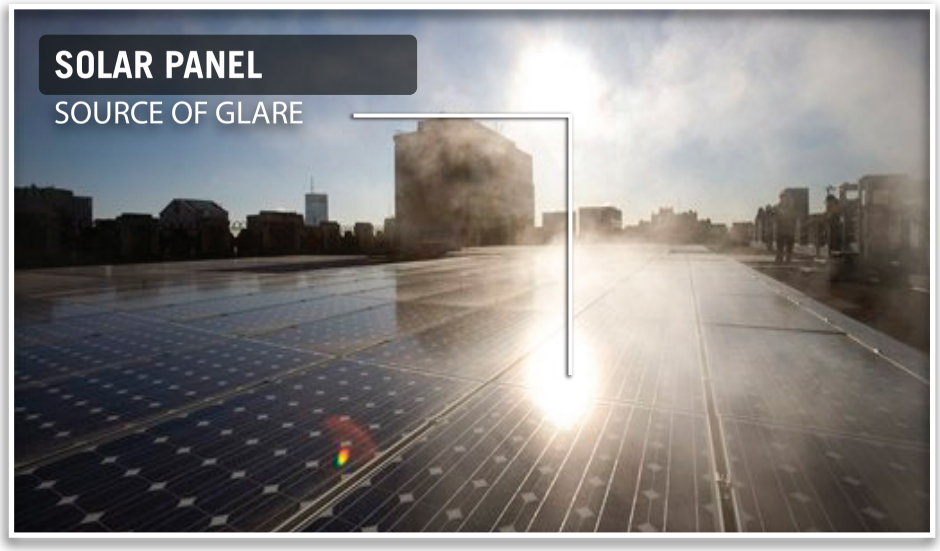
Prepared For,

ASEF II
ALOHA SOLAR ENERGY FUND II

Prepared By,

POWER ENGINEERS

Figure 3 - Photovoltaic Solar Technology


SOLAR PANEL
SOURCE OF GLARE

GLASS
SOURCE OF GLARE

METAL
SOURCE OF GLARE

WATER
SOURCE OF GLARE

3.0 METHODOLOGY

This study was commissioned by ASEF II to determine if glare will be visible to either ATC Tower personnel or pilots while on final approach. The analysis considers the changing positions of the sun throughout the day and year, and its influence on a fixed PV Panel.

Identify Potential Glare Issues – This study focused on potential issues where glare may be considered a hazard to the safe operation of aircraft or to ATC Tower personnel directing air traffic. POWER studied the six landing approaches for three runways, and the ATC tower associated with the Kalaeloa Airport. POWER prepared the study based on these locations (see Section 3.1).

Characterize Glare Behavior – POWER utilized the GlareGauge to determine when and where solar glare may occur throughout the year (see www.forgesolar.com/tools/glaregauge). Technical specifications of proposed solar equipment were provided by ASEF II and include panel dimensions, type, panel coating/texture, angle, orientation, and placement (see Section 3.2).

Evaluate – Once glare was characterized, visual analysts documented when glare may be visible to pilots and/or ATC Tower personnel (see Section 4.0).

3.1 Identify Potential Glare Issues

The FAA has expressed concern for glare resulting from PV systems potentially causing distractions to pilots. For this reason, the FAA has asked solar developers to perform a glare hazard analysis to evaluate and document potential occurrences of glare. Proposed solar operations were studied for six landing approach scenarios and the ATC Tower at Kalaeloa Airport (see Figure 5). POWER used information derived from the website (www.airnav.com/airport/PHJR) to determine the distance and angle of final approaches used in the glare analysis (see Results, Appendix A). Each landing approach is described below:

- **Runway 4R Landing Approach:**
    - Distance from Project: 1.0 mile
    - Heading: NE
    - Runway Elevation: 11 feet
    - Final Approach Slope: 3.0 degrees

- **Runway 4L Landing Approach:**
    - Distance from Project: 0.53 mile
    - Heading: NE
    - Runway Elevation: 21 feet
    - Final Approach Slope: 3.0 degrees

- **Runway 22R Landing Approach:**
    - Distance from Project: 0.63 mile
    - Heading: SW
    - Runway Elevation: 29 feet
    - Final Approach Slope: 3.0 degrees

- **Runway 22L Landing Approach:**
    - Distance from Project: 0.52 mile
    - Heading: SW
    - Runway Elevation: 27 feet
    - Final Approach Slope: 3.0 degrees

- **Runway 11 Landing Approach:**
    - Distance from Project: 1.2 miles
    - Heading: SE
    - Runway Elevation: 30 feet
    - Final Approach Slope: 3.0 degrees

- **Runway 29 Landing Approach:**
    - Distance from Project: 0.1 mile
    - Heading: NW
    - Runway Elevation: 10 feet
    - Final Approach Slope: 3.0 degrees

In addition to the Kalaeloa runway approaches, POWER analyzed any potential solar operations that would impact the ATC tower. The physical characteristics of the tower are described below:

- **ATC Tower**: Centrally located between Runway 11 and Runway 22R
    - Distance from Project: 0.6 mile
    - Ground Elevation: 30 feet
    - Field of View: 360 degrees

4R RUNWAY 4R APPROACH

DISTANCE FROM PROJECT: 1.0 MILE
FINAL APPROACH SLOPE: 3.0 DEGREES
HEADING: NORTHEAST

4L RUNWAY 4L APPROACH

DISTANCE FROM PROJECT: 0.53 MILES
FINAL APPROACH SLOPE: 3.0 DEGREES
HEADING: NORTHEAST

22R RUNWAY 22R APPROACH

DISTANCE FROM PROJECT: 0.63 MILES
FINAL APPROACH SLOPE: 3.0 DEGREES
HEADING: SOUTHWEST

22L RUNWAY 22L APPROACH

DISTANCE FROM PROJECT: 0.52 MILES
FINAL APPROACH SLOPE: 3.0 DEGREES
HEADING: SOUTHWEST

11 RUNWAY 11 APPROACH

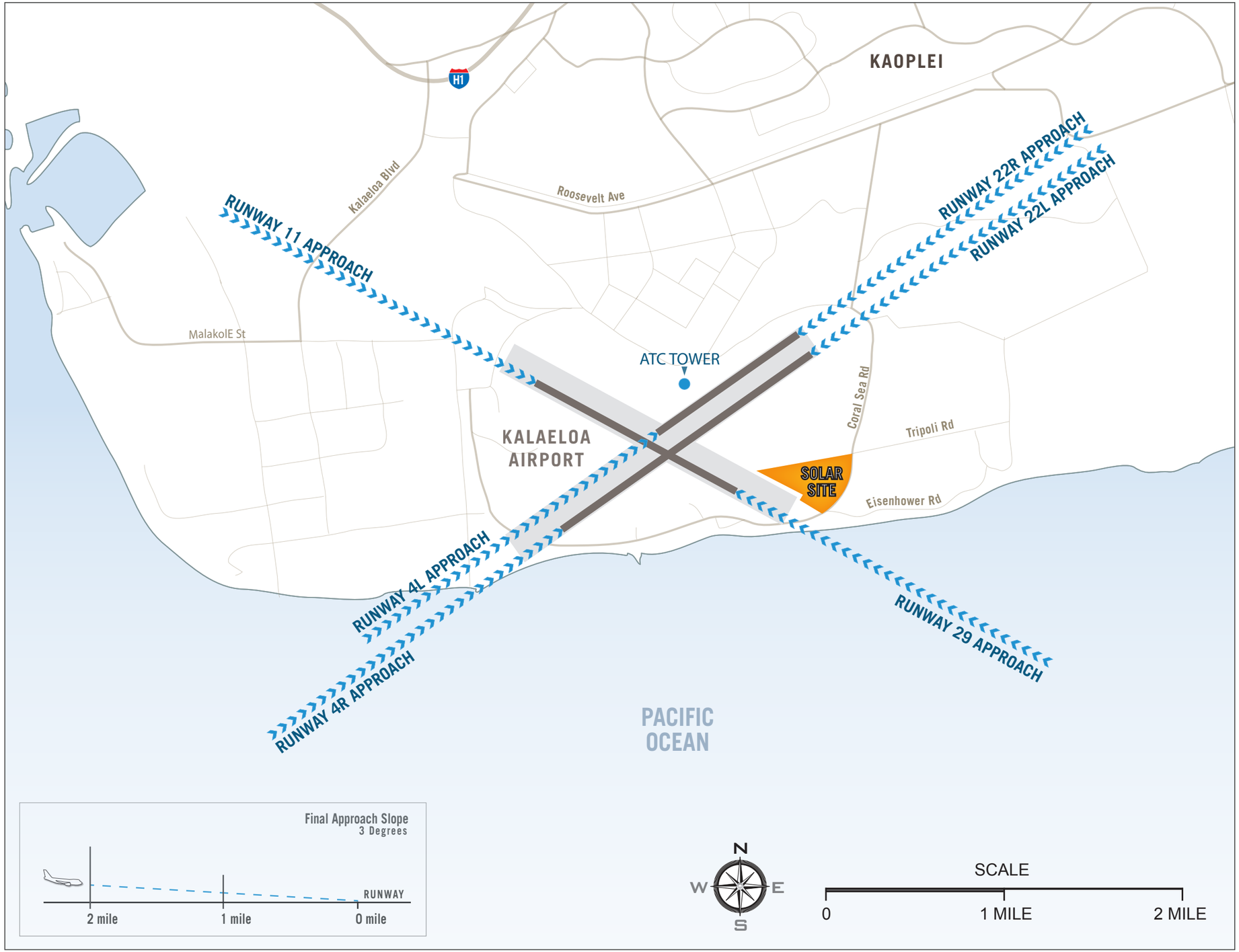
DISTANCE FROM PROJECT: 1.2 MILES
FINAL APPROACH SLOPE: 3.0 DEGREES
HEADING: SOUTHEAST

29 RUNWAY 29 APPROACH

DISTANCE FROM PROJECT: 0.1 MILES
FINAL APPROACH SLOPE: 3.0 DEGREES
HEADING: NORTHWEST

ATC AIR TRAFFIC CONTROL TOWER

DISTANCE FROM PROJECT: 0.52 MILES
GROUND ELEVATION: 30 FEET
FIELD OF VIEW: 360 DEGREES



Prepared For, ASEF II ALOHA SOLAR ENERGY FUND II

Prepared By, POWER ENGINEERS

ASEF II Solar Farm Glare Study

Figure 5 - Approach Slopes

3.2 Characterize Glare Behavior

POWER utilized the GlareGauge to determine when and where solar glare may occur throughout the year (see https://share.sandia.gov/phlux/). Technical specifications of proposed solar equipment were provided by ASEF II (see Figure 6) and are described below:

Fixed Photovoltaic Solar Panels:

- Rack mounted at existing surface grade
- Orientation: 180 due south
- Angle: Fixed 10 degrees
- Coating/Texture: Non-smooth, lightly textured

3.3 Glare Evaluation

To identify the occurrence of glare, POWER utilized GlareGauge licensed by ForgeSolar. The GlareGauge uses Solar Glare Hazard Analysis Tool technology and is a web based glare assessment tool allowing input of viewer position, solar facility location, solar technology, and elevation data. The GlareGauge provides a quantified assessment of when and where glare may occur throughout the year from a solar installation, as well as identifies the potential effects on the human eye when glare does occur. Glare was analyzed at one minute intervals throughout the entire year to determine when and where glare may be visible to pilots and ATC personnel. The GlareGauge meets FAA glare analysis requirements (for more information see Appendix B – 78 FR 63276). Refer to Section 4.0 and Appendix A for glare results.

4.0 RESULTS

Review of the analysis determined glare will be limited to final approach of Runways 4R and 4L during the early morning hours from March to October. All occurrences of glare reported were categorized “green” for ocular impact levels with low potential for temporary after-image. These occurrences are within acceptable FAA limitations for glare on final approach (for more information see Appendix B – 78 FR 63276). Due to the orientation of the approach slope relative to the proposed solar operations, the ATC Tower and approach slopes associated with Runways 11, 29, 22L, and 22R will not experience any glare. The following is a detailed description of each final approach where glare was reported (see Appendix A for graphical results). Conditions where no glare is reported were not listed (see Appendix A for description of all approach slopes).

- **Runway 4R**: Brief periods of green glare were recorded between 6:30 AM and 7:00 AM from Mid-March to Mid-September. Glare was recorded for 760 total minutes throughout the year with daily glare limited to less than 10 minutes in duration. All glare recorded is within the acceptable “green” category for ocular impact levels with low potential for temporary after-image.

- **Runway 4L**: Brief periods of green glare were recorded between 6:30 AM and 7:00 AM from March to October. Glare was recorded for 696 total minutes throughout the year with daily glare limited to less than 10 minutes in duration. All glare recorded is within the acceptable “green” category for ocular impact levels with low potential for temporary after-image.

NOTE: Image is demonstrative of a generic fixed PV panel. Actual design may vary.

5.0 CONCLUSION

Occurrences of glare at Kalaeloa Airport resulting from proposed solar operations are anticipated to be minimal. Any glare experienced would occur intermittently in morning when the sun is lowest in the sky and not for a period longer than ten minutes. Glare intensity levels are within acceptable FAA limits for aircraft on final approach. Overall glare impacts are anticipated to be low.

6.0 SOURCES

Federal Aviation Administration (FAA). 2010. *Technical Guidance for Evaluating Selected Solar Technologies on Airports*. November 2010. Full report can be downloaded at: http://www.faa.gov/airports/environmental/policy_guidance/media/airport_solar_guide.pdf.

National Oceanic and Atmospheric Administration (NOAA). Accessed 2017. http://www.esrl.noaa.gov/gmd/grad/solcalc.

SunPower Corporation. 2009. SunPower Solar Module Glare and Reflectance Report. September 2009.

ForgeSolar GlareGauge Web Application. Accessed 2017. https://www.forgesolar.com/tools/glaregauge.

Files provided by Group 70/Aloha Solar Energy Fund:

20170508 – ASEF II Letter – Glare Study Inputs.pdf

NGALidar5FtContours_Kalaeloa.dxf

212017 X-Base – rev for RM.dwg

212017 X-Topo.dwg

2013 05 14 Sunetric Kalaeloa Concept.pdf

20120720_Sunetric_Waianae 240W 4x7_PRELIMINARY GEOMETRY.pdf

APPENDIX A GLARE RESULTS

ForgeSolar (/)

Site config: Aloha 10 Degree 180 Orientation-temp-35

No site config description provided.

Created **May 8, 2017 11:12 a.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 ft pupil diameter
0.017 ft eye focal length
9.3 mrad sun subtended angle

Summary of Results Glare with low potential for temporary after-image predicted

PV name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	"Red" Glare	Energy Produced
	deg	deg	min	min	min	kWh
PV array 1	10.0	180.0	1456	0	0	11,900,000.0

Component Data

Flight Paths

Name: FP 11
Description:
Threshold height: 50 ft
Direction: 298.0 deg
Glide slope: 3.0 deg
Pilot view restricted? Yes
Vertical view restriction: 30.0 deg
Azimuthal view restriction: 120.0 deg

Point	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
Threshold	21.310500	-158.081492	29	50	79
2-mile point	21.324073	-158.108926	27	605	632

Name: FP 22L
Description:
Threshold height: 50 ft
Direction: 55.0 deg
Glide slope: 3.0 deg
Pilot view restricted? Yes
Vertical view restriction: 30.0 deg
Azimuthal view restriction: 120.0 deg

Point	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
Threshold	21.312584	-158.060203	26	50	76
2-mile point	21.329168	-158.034751	32	597	629

Name: FP 22R
Description:
Threshold height: 50 ft
Direction: 55.0 deg
Glide slope: 3.0 deg
Pilot view restricted? Yes
Vertical view restriction: 30.0 deg
Azimuthal view restriction: 120.0 deg

Point	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
Threshold	21.313994	-158.061258	29	50	79
2-mile point	21.330577	-158.035805	32	600	632

Name: FP 4L
Description:
Threshold height: 50 ft
Direction: 235.0 deg
Glide slope: 3.0 deg
Pilot view restricted? Yes
Vertical view restriction: 30.0 deg
Azimuthal view restriction: 120.0 deg

Point	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
Threshold	21.306882	-158.072078	20	50	70
2-mile point	21.290298	-158.097529	0	624	624

Name: FP 4R
Description:
Threshold height: 50 ft
Direction: 235.0 deg
Glide slope: 3.0 deg
Pilot view restricted? Yes
Vertical view restriction: 30.0 deg
Azimuthal view restriction: 120.0 deg

Point	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
Threshold	21.299965	-158.079395	13	50	63
2-mile point	21.283381	-158.104845	0	616	616

Name: Runway 29
Description:
Threshold height: 50 ft
Direction: 118.0 deg
Glide slope: 3.0 deg
Pilot view restricted? Yes
Vertical view restriction: 30.0 deg
Azimuthal view restriction: 120.0 deg

Point	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
Threshold	21.302665	-158.066009	9	50	59
2-mile point	21.289092	-158.038577	0	613	613

Observation Points

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
1	21.310393	-158.070865	29	50	79

PV Array Results

PV array 1 low potential for temporary after-image

Predicted energy output (assuming sunny, clear skies all year): 11,900,000.0 kWh

Axis tracking: Fixed (no rotation)
Tilt: 10.0 deg
Orientation: 180.0 deg
Rated power: 5000.0 kW
Panel material: Light textured glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 9.16 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	21.303947	-158.063854	9	5	14
2	21.304222	-158.063857	9	5	14
3	21.304239	-158.062123	9	5	14
4	21.303848	-158.062119	9	5	14
5	21.303787	-158.060170	10	5	15
6	21.304037	-158.059019	11	5	16
7	21.304032	-158.058597	12	5	17
8	21.303477	-158.058593	9	5	14
9	21.303472	-158.058198	9	5	14
10	21.302357	-158.058221	6	5	11
11	21.301450	-158.059104	3	5	8
12	21.301473	-158.060153	5	5	10
13	21.302088	-158.061247	9	5	14
14	21.302447	-158.061011	9	5	14

Summary of component results

Component	Green glare (min)	Yellow glare (min)	Red glare (min)
FP: FP 11	0	0	0
FP: FP 22L	0	0	0
FP: FP 22R	0	0	0
FP: FP 4L	696	0	0
FP: FP 4R	760	0	0
FP: Runway 29	0	0	0
OP: 1	0	0	0

Flight path: FP 11

No glare found

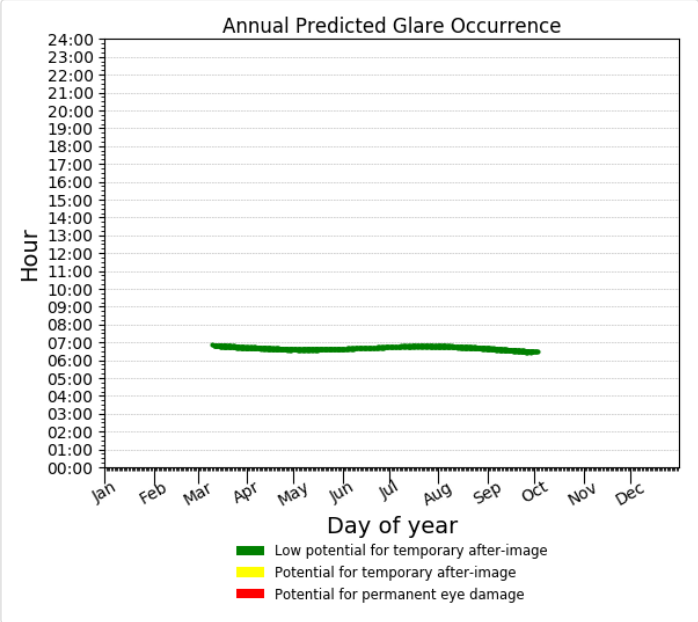
Flight path: FP 22L

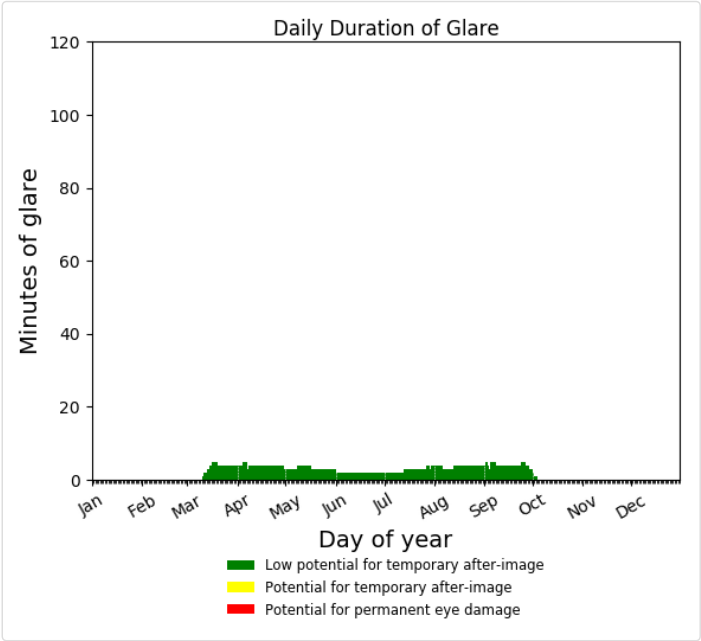
No glare found

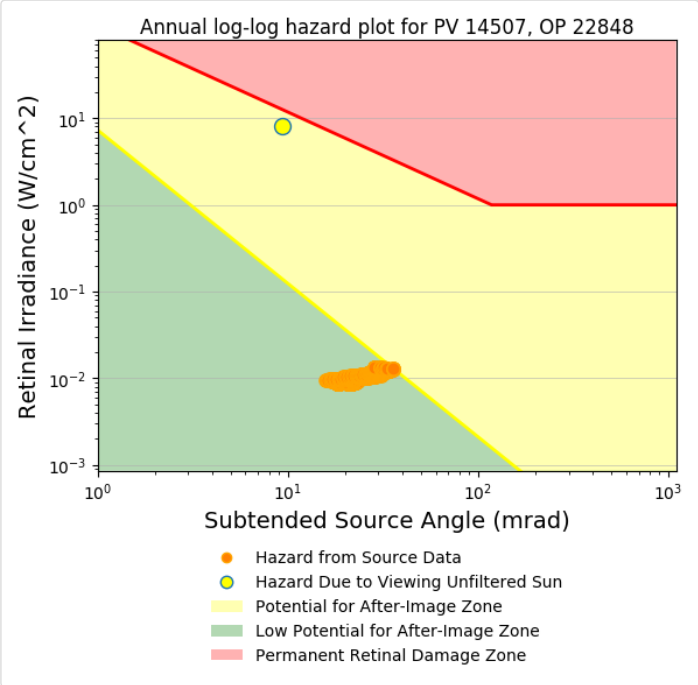
Flight path: FP 22R

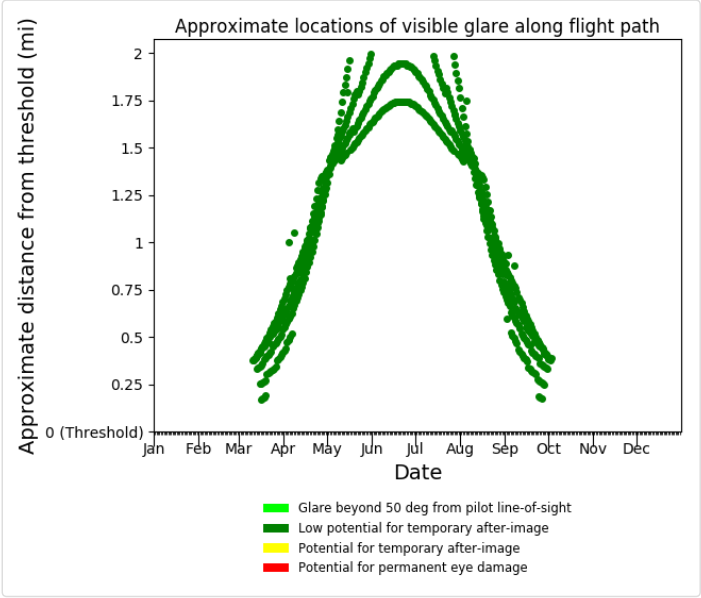
No glare found

Flight path: FP 4L

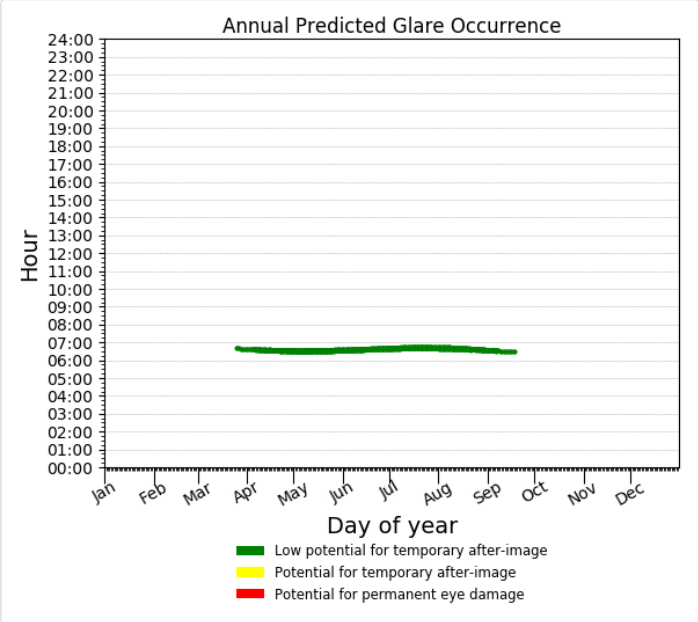


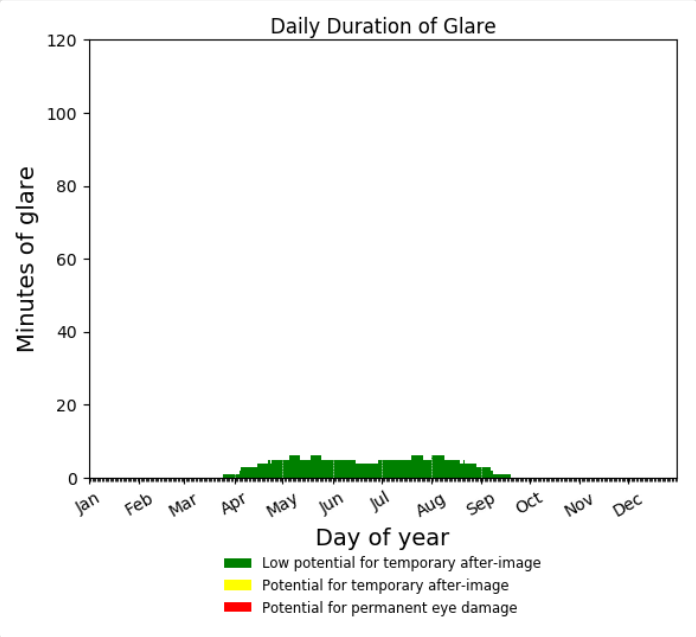


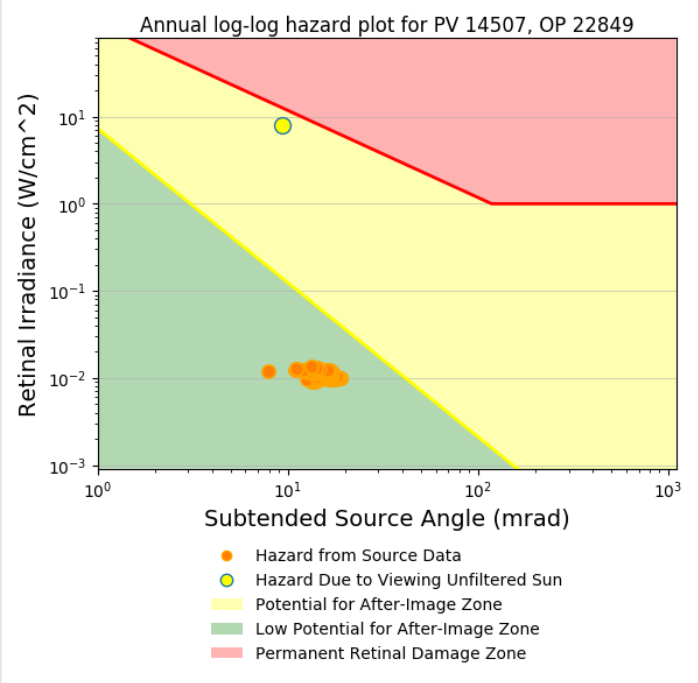


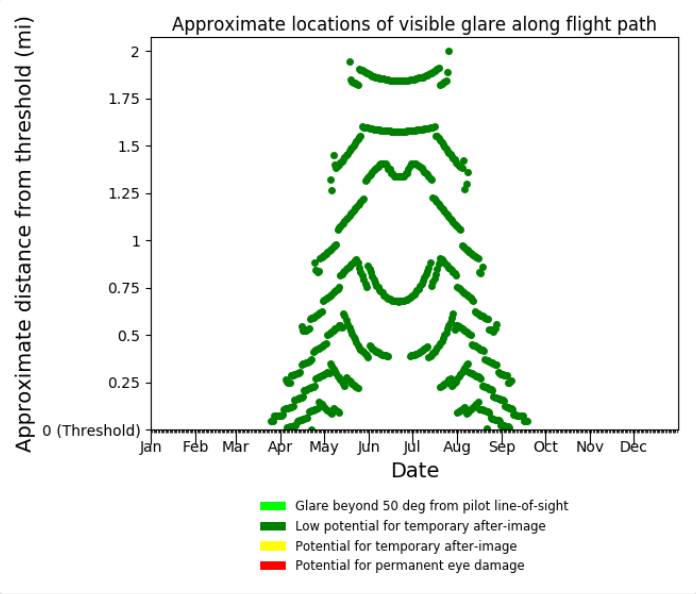


Flight path: FP 4R









Flight path: Runway 29

No glare found

Observation point: 1

No glare found

Assumptions

- Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
- Glare analyses do not account for physical obstructions between reflectors and receptors. This includes buildings, tree cover and geographic obstructions.

- The glare hazard determination relies on several approximations including observer eye characteristics, angle of view, and typical blink response time. Actual values may differ.
- Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.

APPENDIX B 78 FR 63276

Research and Innovative Technology Administration

Aylward, Anne D.; Brecht-Clark, Jan M.; Farley, Audrey L.; Hu, Patricia S.; Ishihara, David S.; Johns, Robert C.; Lang, Steven R.; Partridge, Ellen L.; Schmitt, Rolf R.; Womack, Kevin C.

Saint Lawrence Seaway Development Corporation

Middlebrook, Craig H.; Pisani, Salvatore L.

[FR Doc. 2013–24813 Filed 10–22–13; 8:45 am]

BILLING CODE 4910–9X–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

Interim Policy, FAA Review of Solar Energy System Projects on Federally Obligated Airports

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of interim policy; opportunity to comment.

SUMMARY: This notice establishes interim FAA policy for proposals by sponsors of federally obligated airports to construct solar energy systems on airport property. FAA is adopting an interim policy because it is in the public interest to enhance safety by clarifying and adding standards for measuring ocular impact of proposed solar energy systems which are effective upon publication. FAA will consider comments and make appropriate modifications before issuing a final policy. The policy applies to any proposed on-airport solar energy system that has not received from the FAA either an unconditional airport layout plan approval or a ''no objection'' finding on a Notice of Proposed Construction or Alteration Form 7460–1.

DATES: The effective date of this interim policy is October 23, 2013.

Comments must be received by November 22, 2013.

ADDRESSES: You can get an electronic copy of the interim policy and the comment form on the FAA Airports Web site at *http://www.faa.gov/airports/environmental/.*

You can submit comments using the Comments Matrix, using any of the following methods:

Electronic Submittal to the FAA: Go to *http://www.faa.gov/airports/environmental/* and follow the instructions for sending your comments electronically.

Mail: FAA Office of Airports, Office of Airport Planning and Programming, Routing Symbol APP–400, 800 Independence Avenue SW., Room 615, Washington, DC 20591. Please send two copies.

Fax: 1–202–267–5302.

Hand Delivery: To FAA Office of Airports, Office of Airport Planning and Programming, Routing Symbol APP–400, 800 Independence Avenue SW., Room 615, Washington, DC 20591; between 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays. Please provide two copies.

For more information on the notice and comment process, see the **SUPPLEMENTARY INFORMATION** section of this document.

Privacy: We will post all comments we receive, without change, to *http://www.faa.gov/airports/environmental/*, including any personal information you provide.

Comments Received: To read comments received, go to *http://www.faa.gov/airports/environmental/* at any time.

FOR FURTHER INFORMATION CONTACT: Ralph Thompson, Manager, Airport Planning and Environmental Division, APP–400, Federal Aviation Administration, 800 Independence Ave. SW., Washington, DC 20591, telephone (202) 267–3263; facsimile (202) 267–5257; email: *ralph.thompson@faa.gov.*

SUPPLEMENTARY INFORMATION: The FAA invites interested persons to join in this notice and comment process by filing written comments, data, or views. The most helpful comments reference a specific portion of the proposal, explain the reason for any recommended change, and include supporting data.

Availability of Documents

You can get an electronic copy of this interim policy by visiting the FAA's Airports Web page at *http://www.faa.gov/airports/environmental/.*

Authority for the Policy

This notice is published under the authority described in Subtitle VII, part B, chapter 471, section 47122 of title 49 United States Code.

Background

There is growing interest in installing solar photovoltaic (PV) and solar hot water (SHW) systems on airports. While solar PV or SHW systems (henceforth referred to as solar energy systems) are designed to absorb solar energy to maximize electrical energy production or the heating of water, in certain situations the glass surfaces of the solar energy systems can reflect sunlight and produce glint (a momentary flash of bright light) and glare (a continuous source of bright light). In conjunction with the United States Department of Energy (DOE), the FAA has determined that glint and glare from solar energy systems could result in an ocular impact to pilots and/or air traffic control (ATC) facilities and compromise the safety of the air transportation system. While the FAA supports solar energy systems on airports, the FAA seeks to ensure safety by eliminating the potential for ocular impact to pilots and/or air traffic control facilities due to glare from such projects.

The FAA established a cross-organizational working group in 2012, to establish a standard for measuring glint and glare, and clear thresholds for when glint and glare would impact aviation safety. The standards that this working group developed are set forth in this notice.

A sponsor of a federally-obligated airport must request FAA review and approval to depict certain proposed solar installations (e.g., ground-based installations and collocated installations that increase the footprint of the collocated building or structure) on its airport layout plan (ALP), before construction begins.[1] A sponsor of a federally-obligated airport must notify the FAA of its intent to construct any solar installation [2] by filing FAA Form 7460–1, ''Notice of Proposed Construction or Alteration'' under 14 CFR Part 77 for a Non-Rulemaking case (NRA) [3] [4]. This includes the intent to permit airport tenants, including Federal agencies, to build such

[1] FAA Technical Guidance for Evaluating Selected Solar Technologies on Airports, Section 2.3.5, states that ''solar installations of any size, located on an airport, that are not collocated on an existing structure (i.e., roof of an existing building) and require a new footprint, need to be shown on the Airport Layout Plan (ALP). Collocated solar installations need to be shown on the ALP only if these installations substantially change the footprint of the collocated building or structure. *Available at: http://www.faa.gov/airports/environmental/policy_guidance/media/airport_solar_guide_print.pdf.* Title 49 of the United States Code (USC), sec. 47107(a), requires, in part, a current ALP approved by the FAA prior to the approval of an airport development project. See Grant Assurance No. 29, AC No. 150/5070–6B, and FAA Order No. 5100.38.

[2] Any solar installation means any ground-based solar energy installation and those solar energy installations collocated with a building or structure (i.e., rooftop installations).

[3] FAA Technical Guidance for Evaluating Selected Solar Technologies on Airports Section 3.1 reads in part ''All solar projects at airports must submit to FAA a Notice of Proposed Construction Form 7460 . . .''. This section further states ''Even if the project will be roof mounted . . . the sponsor must still submit a case'' [i.e., file a Form 7460–1].

[4] The requirements of this policy are not mandatory for a proposed solar installation that is not on an airport and for which a form 7460–1 is filed under part 77 and is studied under the Obstruction Evaluation Program. However, the FAA urges proponents of off-airport solar-installations to voluntarily implement the provisions in this policy.

installations. The sponsor's obligation to obtain FAA review and approval to depict certain proposed solar energy installation projects at an airport is found in 49 U.S.C. 47107(a)(16) and Sponsor Grant Assurance 29, ''Airport Layout Plan.'' Under these latter provisions, the sponsor may not make or permit any changes or alterations in the airport or any of its facilities which are not in conformity with the ALP as approved by the FAA and which might, in the opinion of the FAA, adversely affect the safety, utility or efficiency of the airport.

Airport sponsors and project proponents must comply with the policies and procedures in this notice to demonstrate to the FAA that a proposed solar energy system will not result in an ocular impact that compromises the safety of the air transportation system. This process enables the FAA to approve amendment of the ALP to depict certain solar energy projects or issue a ''no objection'' finding to a filed 7460–1 form. The FAA expects to continue to update these policies and procedures as part of an iterative process as new information and technologies become available.

Solar energy systems located on an airport that is not federally-obligated or located outside the property of a federally-obligated airport are not subject to this policy. Proponents of solar energy systems located off-airport property or on non-federally-obligated airports are strongly encouraged to consider the requirements of this policy when siting such systems.

This interim policy clarifies and adds standards for measurement of glint or glare presented in the 2010 Technical Guidance document. Later this year the FAA plans to publish an update to the ''Technical Guidance for Evaluating Selected Solar Technologies on Airports,'' (hereinafter referred to as ''Technical Guidance'') dated November 2010. This update to the technical guidance will include the standards for measuring glint and glare outlined in this notice. It will also provide enhanced criteria to ensure the proper siting of a solar energy installation to eliminate the potential for harmful glare to pilots or air traffic control facilities.

In advance of the planned update, as part of this Notice, we are clarifying one aspect of the Technical Guidance relating to airport sponsor and FAA responsibilities for evaluating the potential for solar energy systems installed on airports to either block, reflect, or disrupt radar signals, NAVAIDS, and other equipment required for safe aviation operations. Section 3.1 of the Technical Guidance, entitled ''Airspace Review,'' correctly states that this role is exclusively the responsibility of FAA Technical Operations (Tech Ops). However subsection 3.1.3, ''System Interference,'' states: ''[s]tudies conducted during project siting should identify the location of radar transmission and receiving facilities and other NAVAIDS, and determine locations that would not be suitable for structures based on their potential to either block, reflect, or disrupt radar signals.''

Reading the two sections together, what is meant is that the airport sponsor, in siting a proposed solar energy system, is responsible for limiting the potential for inference with communication, navigation, and surveillance (CNS) facilities. The sponsor should do so by ensuring that solar energy systems remain clear of the critical areas surrounding CNS facilities. FAA Advisory Circular (AC) 5300–13, ''Airport Design,'' Chapter 6, defines the critical areas for common CNS facilities located on an airport. Sponsors may need to coordinate with FAA Technical Operations concerning CNS facilities not in AC 5300–13. As stated in Section 3.1, the FAA is responsible for evaluating if there are any impacts to CNS facilities. The FAA will conduct this review after the Form 7460–1 is filed for the construction of a new solar energy system installation on an airport. In summary, airport sponsors do not need to conduct studies on their own to determine impacts to CNS facilities when siting a solar energy system on airport. Section 3.1.3 will be revised accordingly in the next version of the Technical Guidance.

Interim Policy Statement

The following sets forth the standards for measuring ocular impact, the required analysis tool, and the obligations of the Airport Sponsor when a solar energy system is proposed for development on a federally-obligated airport.

The FAA is adopting an interim policy because it is in the public interest to enhance safety by clarifying and adding standards for measuring ocular impact of proposed solar energy systems. FAA will consider comments and make appropriate modifications before issuing a final policy in a future **Federal Register** Notice. The policy applies to any proposed solar energy system that has not received unconditional airport layout plan approval (ALP) or a ''no objection'' from the FAA on a filed 7460–1, Notice of Proposed Construction or Alteration.

Standard for Measuring Ocular Impact

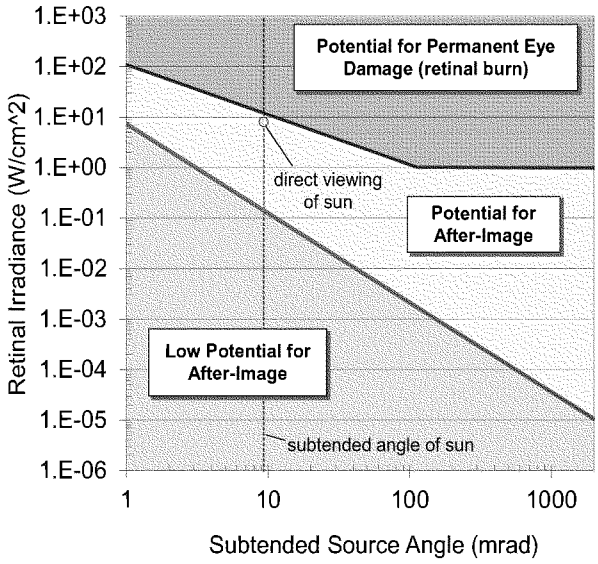
FAA adopts the *Solar Glare Hazard Analysis Plot* shown in Figure 1 below as the standard for measuring the ocular impact of any proposed solar energy system on a federally-obligated airport. To obtain FAA approval to revise an airport layout plan to depict a solar installation and/or a ''no objection'' to a Notice of Proposed Construction Form 7460–1, the airport sponsor will be required to demonstrate that the proposed solar energy system meets the following standards:

1. No potential for glint or glare in the existing or planned Airport Traffic Control Tower (ATCT) cab, and

2. No potential for glare or ''low potential for after-image'' (shown in green in Figure 1) along the final approach path for any existing landing threshold or future landing thresholds (including any planned interim phases of the landing thresholds) as shown on the current FAA-approved Airport Layout Plan (ALP). The final approach path is defined as two (2) miles from fifty (50) feet above the landing threshold using a standard three (3) degree glidepath.

Ocular impact must be analyzed over the entire calendar year in one (1) minute intervals from when the sun rises above the horizon until the sun sets below the horizon.

Figure 1



Solar Glare Ocular Hazard Plot: The potential ocular hazard from solar glare is a function of retinal irradiance and the subtended angle (size/distance) of the glare source. It should be noted that the ratio of spectrally weighted solar illuminance to solar irradiance at the earth's surface yields a conversion factor of ~100 lumens/W. Plot adapted from Ho et al., 2011.

Chart References: Ho, C.K., C.M. Ghanbari, and R.B. Diver, 2011, Methodology to Assess Potential Glint and Glare Hazards from Concentrating Solar Power Plants: Analytical Models and Experimental Validation, J. Solar Energy Engineering, August 2011, Vol. 133, 031021-1 – 031021-9.

Tool To Assess Ocular Impact

In cooperation with the DOE, the FAA is making available free-of-charge the *Solar Glare Hazard Analysis Tool* (SGHAT). The SGHAT was designed to determine whether a proposed solar energy project would result in the potential for ocular impact as depicted on the *Solar Glare Hazard Analysis Plot* shown above.

The SGHAT employs an interactive Google map where the user can quickly locate a site, draw an outline of the proposed solar energy system, and specify observer locations (Airport Traffic Control Tower cab) and final approach paths. Latitude, longitude, and elevation are automatically recorded through the Google interface, providing necessary information for sun position and vector calculations. Additional information regarding the orientation and tilt of the solar energy panels, reflectance, environment, and ocular factors are entered by the user.

If glare is found, the tool calculates the retinal irradiance and subtended source angle (size/distance) of the glare source to predict potential ocular hazards ranging from temporary after-image to retinal burn. The results are presented in a simple, easy-to-interpret plot that specifies when glare will occur throughout the year, with color codes indicating the potential ocular hazard. The tool can also predict relative energy production while evaluating alternative designs, layouts, and locations to identify configurations that maximize energy production while mitigating the impacts of glare.

Users must first register for the use of the tool at this web address: *www.sandia.gov/glare.*

Required Use of the SGHAT

As of the date of publication of this interim policy, the FAA requires the use of the SGHAT to demonstrate compliance with the standards for measuring ocular impact stated above for any proposed solar energy system located on a federally-obligated airport. The SGHAT is a validated tool specifically designed to measure glare according to the *Solar Glare Hazard Analysis Plot.* All sponsors of federally-obligated airports who propose to install or to permit others to install solar energy systems on the airport must attach the SGHAT report, outlining solar panel glare and ocular impact, for each point of measurement to the Notice of Proposed Construction Form 7460–1. The FAA will consider the use of alternative tools or methods on a case-by-case basis. However, the FAA must approve the use of an alternative tool or method prior to an airport sponsor seeking approval for any proposed on-airport solar energy system. The alternative tool or method must evaluate ocular impact in accordance with the *Solar Glare Hazard Analysis Plot.*

Please contact the Office of Airport Planning and Programming, Airport Planning and Environmental Division, APP–400, for more information on the validation process for alternative tools or methods.

Airport sponsor obligations have been discussed above under Background. We caution airport sponsors that under preexisting airport grant compliance policy, failure to seek FAA review of a solar installation prior to construction could trigger possible compliance action under 14 CFR Part 16, ''Rules of Practice for Federally-Assisted Airport Enforcement Proceedings.'' Moreover, if a solar installation creates glare that interferes with aviation safety, the FAA could require the airport to pay for the elimination of solar glare by removing or relocating the solar facility.

Issued in Washington, DC, on September 27, 2013.

Benito De Leon,

Director, Office of Airport Planning and Programming.

[FR Doc. 2013–24729 Filed 10–22–13; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

Third Meeting: RTCA Tactical Operations Committee (TOC)

AGENCY: Federal Aviation Administration (FAA), U.S. Department of Transportation (DOT)

ACTION: Third Meeting Notice of RTCA Tactical Operations Committee.

SUMMARY: The FAA is issuing this notice to advise the public of the third meeting of the RTCA Tactical Operations Committee.

DATES: The meeting will be held November 7, 2013 from 9 a.m.–3 p.m.

ADDRESSES: The meeting will be held at RTCA Headquarters, 1150 18th Street NW., Suite 910, Washington, DC 20036.

FOR FURTHER INFORMATION CONTACT: The RTCA Secretariat, 1150 18th Street NW., Suite 910, Washington, DC 20036, or by telephone at (202) 833–9339, fax at (202) 833–9434, or Web site *http://www.rtca.org.* Andy Cebula, NAC Secretary can also be contacted at *acebula@rtca.org* or 202–330–0652.

SUPPLEMENTARY INFORMATION: Pursuant to section 10(a)(2) of the Federal Advisory Committee Act (Pub. L. No. 92–463, 5 U.S.C., App.), notice is hereby given for a meeting of the Tactical Operations Committee (TOC). The agenda will include the following:

November 19, 2013

- Opening of Meeting/Introduction of TOC Members
- Official Statement of Designated Federal Official
- Approval of July 23, 2013 Meeting Summary
- FAA Report
- Notice to Airmen (NOTAM) Activity Prioritization
- Regional Task Groups (RTGs)
- Reports on current activities underway by Regional Task Groups: Eastern, Central, Western
- VHF Omni-directional Range (VOR) Minimum Operating Network
- New Tasking: Obstacle Clearance
- Anticipated Issues for TOC consideration and action at the next meeting
- Other Business
- Adjourn

Attendance is open to the interested public but limited to space availability. With the approval of the chairman, members of the public may present oral statements at the meeting. Persons wishing to present statements or obtain information should contact the person listed in the **FOR FURTHER INFORMATION CONTACT** section. Members of the public may present a written statement to the committee at any time.

Issued in Washington, DC, on October 18, 2013.

Edith V. Parish,

Senior Advisor, Mission Support Services, Air Traffic Organization, Federal Aviation Administration.

[FR Doc. 2013–24968 Filed 10–22–13; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

Public Notice for Waiver of Aeronautical Land-Use Assurance

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of intent of waiver with respect to land; French Lick Airport; French Lick, Indiana.

SUMMARY: The FAA is considering a proposal to change a portion of airport land from aeronautical use to non-aeronautical use and to authorize the sale of airport property located at French Lick Airport, French Lick, Indiana. The aforementioned land is not needed for aeronautical use. The proposal consists of 18.606 acres located in the southern section of airport property which is not being used by the airport presently. The land is to be sold to Commissioners of Orange County for the construction of County Road CR 300 South/Airport Road to facilitate access to the airport.

DATES: Comments must be received on or before November 22, 2013.

ADDRESSES: Documents are available for review by appointment at the FAA Airports District Office, Azra Hussain, Program Manager, 2300 E. Devon Avenue, Des Plaines, Illinois 60018 Telephone: (847) 294–8252/Fax: (847) 294–7046 and Zachary D. Brown, French Lick Municipal Airport, 9764 West County Road 375 South, French Lick, Indiana, 47933.

Written comments on the Sponsor's request must be delivered or mailed to: Azra Hussain, Program Manager, Federal Aviation Administration, Airports District Office, 2300 E. Devon Avenue, Des Plaines, Illinois (847) 294–7046.

FOR FURTHER INFORMATION CONTACT: Azra Hussain, Program Manager, Federal Aviation Administration, Airports District Office, 2300 E. Devon Avenue, Des Plaines, Illinois 60018. Telephone Number: (847) 294–8252/FAX Number: (847) 294–7046.

SUPPLEMENTARY INFORMATION: In accordance with section 47107(h) of Title 49, United States Code, this notice is required to be published in the **Federal Register** 30 days before modifying the land-use assurance that requires the property to be used for an aeronautical purpose.

The subject land consists of two parcels. Parcel 1 (approx. 16.667 acres) was acquired through the Federal Aid to Airport Program dated July 28, 1963 and Parcel 2 (approx. 1.939 acres) was acquired by the sponsor as part of a larger parcel (approx. 9.97 acres) for the nominal sum of One Dollar and zero cents ($1.00) on April 19, 2010. The Commissioners of Orange County intend to purchase the property for a nominal sum of One Dollar and zero cents ($1.00) for the construction of County Road CR 300 South/Airport Road. Construction of the road will facilitate access to the airport. The aforementioned land is not needed for aeronautical use, as shown on the Airport Layout Plan. There are no impacts to the airport by allowing the airport to dispose of the property.

This notice announces that the FAA is considering the release of the subject airport property at French Lick Airport, French Lick, Indiana, subject to easements and covenants running with the land. Approval does not constitute a commitment by the FAA to financially assist in the disposal of the subject airport property nor a determination that all measures covered by the program are eligible for grant-in-aid funding from the FAA. The disposition of proceeds from the sale of the airport property will be in accordance with FAA's Policy and Procedures Concerning the Use of Airport Revenue, published in the **Federal Register** on February 16, 1999 (64 FR 7696).

Issued in Des Plaines, Illinois on September 30, 2013.

James Keefer,

Manager, Chicago Airports District Office, FAA, Great Lakes Region.

[FR Doc. 2013–24738 Filed 10–22–13; 8:45 am]

BILLING CODE 4910–13–P

APPENDIX E
ARCHAEOLOGICAL INVENTORY SURVEY
AUGUST, 2014

SCIENTIFIC CONSULTANT SERVICES, INC.

(SHPD APPROVAL LETTER – FEBRUARY, 2014)

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ESTHER KIA'AINA
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

HISTORIC PRESERVATION DIVISION
DEPARTMENT OF LAND AND NATURAL RESOURCES

601 Kamokila Boulevard, Suite 555
Kapolei, HI 96806

February 25, 2014

Dr. Robert Spear
Scientific Consultant Services, Inc.
1347 Kapiolani Boulevard, Suite 408
Honolulu, Hawaii 96814

LOG NO: 2013.6641, 2014.00823, 2014.00528
DOC NO: 1402SL27
Archaeology

Dear Dr. Spear:

SUBJECT: **Chapter 6E-8 Historic Preservation Review–**
Archaeological Inventory Survey Report for a Proposed Solar Farm in Kalaeloa Honouliuli Ahupua'a, 'Ewa District, O'ahu Island, Hawai'i
TMK: (1) 9-1-013:070

Thank you for the opportunity to review this revised report titled *Archaeological Inventory Survey Report for a Proposed Solar Farm in Kalaeloa, Honouliuli Ahupua'a,'Ewa District, O'ahu Island, Hawai'i [TMK: (1) 9-1-013:070]* (Medrano et al., February 2014). We received this submittal on February 25, 2014.

The archaeological inventory survey (AIS) was conducted by Scientific Consultant Services, Inc. (SCS) of 44 acres of undeveloped land in support of a proposed solar farm. The property owner is Hawai'i Community Development Authority (HCDA). The AIS identified 23 historic properties (Table 1), of which two were previously identified (Sites 5119 and 5120). The sites mainly consist of complexes of Traditional Hawaiian habitation and/or agricultural, refuse, and storage features. Also present are two probable burial features (Site 7483, Feature 4, and Site 7486, Feature 2), one site containing a military airplane wreckage (Site 7487) and one site containing military structural remnants (Site 5120).

Data recovery is recommended for Site 7487, Features 2A-2C and for Site 7502, Feature 1, while all other sites and/or features are recommended for preservation. Site 7487, Features 2A-2C (airplane crash wreckage) were recommended for data recovery because the Pacific Aviation Museum expressed interest in having the site further documented and having all materials collected for possible display. Site 7502, Feature 1 (agricultural rock mound) was recommended for data recovery because it will be impacted during installation of the solar farm structures. All of the sites are recommended as significant pursuant to Hawai'i Administrative Rules (HAR) §13-275-6 under Criterion d (have yielded, or has potential to yield, information important to prehistory or history). Sites 7483 and 7486 also are recommended as significant under Criterion e (importance to Native Hawaiians) because of the probable presence of Native Hawaiian burials. Four mitigation measures are recommended to address potential for construction of the solar farm to adversely affect historic properties. These consist of (1) a preservation plan for all historic properties recommended for preservation (see Table 1); (2) a burial treatment plan for Site 7483, Feature 4 and for Site 7486, Feature 2 which have been identified as probable burial features; (3) a data recovery plan for Site 7487, Features 2A-2C and for Site 7502, Feature 1; and (4) an archaeological monitoring plan for on-site monitoring during all project-related ground disturbing activities to address any potential subsurface historic properties that may be encountered and to ensure that the sites recommended for preservation are not adversely impacted during construction. We concur with the site assessments and mitigation recommendations.

The report provides adequate discussion of the project environs, cultural and historical background, previous archaeological investigations, field and laboratory methods and results, and the site assessment and mitigation recommendations. The revisions adequately address the issues and concerns raised in our earlier review correspondence (October 18, 2013; Log No. 2013.4819, Doc. No. 1310SL16), and in our project meetings and email correspondence pertaining to several interim drafts (November 22, 2013; February 5, 21, and 25, 2014).

The archaeological inventory survey report meets the requirements specified in HAR §13-276-5. It is accepted by SHPD. Please send one hardcopy of the document, clearly marked FINAL, along with a copy of this review letter and a text-searchable PDF version on CD to the Kapolei SHPD office.

Please contact me at (808) 692-8019 or at Susan.A.Lebo@hawaii.gov if you have any questions regarding this letter.

Aloha,

Susan A. Lebo

Susan A. Lebo, PhD
Oahu Lead Archaeologist

Table 1. Archaeological Historic Properties Identified During AIS.

SIHP	Total Features	Feature Types	Function	Significance Recommendation	Mitigation Recommendation
7483	10	Karst pits, mounds (possible burial), mounds (agriculture)	Ag/refuse, w/possible burial component	d, e (Feature 4)	Preservation
7484	3	Karst pits, midden scatter	Ag/refuse, habitation complex	d	Preservation
7485	2	Karst pit, mound	Ag/refuse	d	Preservation
7486	5	Karst pits, linear path, and rock mound	Ag/refuse, ranching, transportation, w/possible burial component	d, e (Feature 2)	Preservation
7487	12	Karst pits, airplane crash remnants, concrete pads, L-shaped structure, and platform/wall	Ag/refuse, storage, military, and boundary	d	Preservation, Data Recovery (Features 2A-2C)
7488	1	Karst pit	Ag/refuse	d	Preservation
7489	2	Karst pits	Ag/refuse	d	Preservation
7490	3	Karst pits, walled karst pit	Ag/refuse	d	Preservation
7491	1	Path	Transportation	d	Preservation
7492	45	Rock mounds, enclosures, and C-, reverse J-, L-, T-, and U-shaped structures	Ag/habitation complex	d	Preservation
7493	1	Karst pit	Storage/refuse	d	Preservation
7494	1	Walled karst pit	Ag/storage	d	Preservation
7496	2	Platform, platform/mound	Ag/habitation and storage complex	d	Preservation
7497	1	Rock mound	Ag	d	Preservation
7498	3	Karst pits	Ag/refuse, storage complex	d	Preservation
7499	3	Karst pits, walled karst pit	Ag/storage and refuse complex	d	Preservation
5119	37	Karst pits, and C-, L-, and U-shaped structures	Ag/refuse, storage, habitation complex	d	Preservation
5120	9	Karst pit, wall, concrete pad, guard shack, and concrete enclosure, foundations, and pillbox	Ag/refuse, military, boundary	d	Preservation
7500	1	Karst pit	Ag/refuse	d	Preservation
7501	1	Mound	Dozer push pile	d	Preservation
7502	1	Mound	Ag	d	Data Recovery (Feature 1)
7503	1	C-shaped structure	Habitation	d	Preservation
7504	2	Karst pit, mound	Ag/refuse	d	Preservation

SCS Project Number 1276-AIS-5

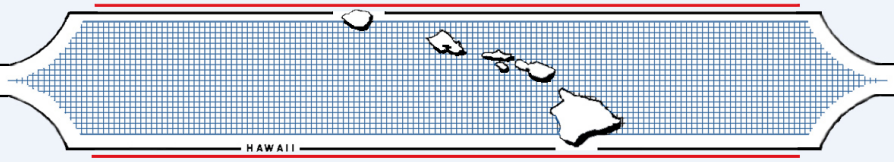
ARCHAEOLOGICAL INVENTORY SURVEY REPORT FOR A PROPOSED SOLAR FARM IN KALAELOA HONOULIULI AHUPUA`A, `EWA DISTRICT, ISLAND OF O`AHU, HAWAI`I TMK: (1) 9-1-013:070

Prepared by:
Stephanie Medrano, B.A.,
Cathleen A. Dagher, B.A.,
Michael Dega, Ph.D.
and
Robert L. Spear, Ph.D.

August 2014
FINAL

Prepared for:
Sean Mullen
Aloha Solar Energy Fund LLC
905 Kalanianaole Highway #21
Kailua, HI 96834

SCIENTIFIC CONSULTANT SERVICES Inc.



1347 Kapiolani Blvd., Suite 408 Honolulu, Hawai`i 96814

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ABSTRACT

At the request of Sean Mullen of Aloha Solar Energy Fund LLC, in conjunction with Group 70 International, Scientific Consultant Services, Inc. (SCS) conducted Archaeological Inventory Survey (AIS) on approximately 44-acres of undeveloped land in advance of a proposed 5.0 megawatt solar farm power facility in Kalaeloa, Honouliuli Ahupua`a, `Ewa District, Island of O`ahu, Hawai`i [TMK: (1) 9-1-013:070]. The purpose of the study was to identify and document historical properties, to assess their historical significance for eligibility for listing on the Hawaii Register of Historic Places, to make project effect recommendations, and to make mitigation recommendations.

Archaeological Inventory Survey resulted in the identification of twenty-three archaeological sites (State Sites 50-80-12-5119, and -5120, and 50-80-12-7483 through -7494, and 50-80-12-7496 through -7504, comprised of 146 features. Twenty-one sites were newly identified and two previously identified sites (State Sites 50-80-12-5119 and -5120) were re-located and documented with additional features added to each site. State Sites 50-80-12-5119 and -5120 were initially identified by Tuggle and Tomonari-Tuggle (1994). Of the 146 features found during the current Archaeological Inventory Survey within TMK: (1) 9-1-013:070 a total of eight features recorded by Wickler and Tuggle (1997) were re-located. Of the remaining 138 features nine features could not be confirmed as having been recorded by Wickler and Tuggle (1997) based on the current Archaeological Inventory Survey results and the site descriptions of Wickler and Tuggle (1997). The remaining 129 features are newly recorded. Based on feature type, construction methods, and construction materials, Sites -5119, -7483 through -7485, -7487 (Features 1 and 4), -7488 through -7494, -5120 (Features 1 and 2), and -7496 through -7504 were interpreted to be associated with the pre- and /or post-Contact Period. Based on a 1928 aerial coastal photo, a 1927 USGS quadrangle (Barber's Point) map, general feature horizontal shape, and feature location within the project area, State Sites 50-80-12-7486 (Feature 5) and 50-80-12-7491 were interpreted as trails associated with the pre- and/or post-Contact Period, with use possibly extending into the Historic Ranching Period. State Sites 50-80-12-7487 (Feature 3 and 5) and -5120 (Features 3 though 9) were interpreted to be associated with United States Military occupation of the area during the Historic Period. Based on feature type, construction methods, construction materials, and observed artifacts, Site -5119, Feature 30 was interpreted as having associations with Traditional Hawaiian and historic (military) occupation of the project area.

A variety of site types were documented during the study. The majority of the features recorded represent Traditional Hawaiian occupation of the area. These features include rock mounds, various small enclosures and structures, modified pits (karst), unmodified pits (karst), platforms, and small coastal trails. Most of the sites were composed of limestone, a locally available resource. They represent a range of features often associated with residential complexes. Military use of the landscape was also well-represented, as evidenced by a concrete building foundation, a pillbox, and a guard shack.

All sites have been evaluated for significance, as outlined in Hawai‘i Administrative Rules §13-275-6 and found to be significant under Criterion d, with Site -7483 (Feature 4) and Site -7486

(Feature 2) also being assessed as Significant under Criterion e due to the potential presence of a burial. Most Traditional Hawaiian sites documented during this study are recommended for Preservation, including Site -7486 (Feature 5) and Site -7491 (Feature 1), both trail segments. Features within two sites are recommended for Data Recovery, namely State Sites 50-80-12-7487 (Features 2A through 2C) and -7502 (Feature 21).

A Preservation Plan will be prepared under separate cover to discuss interim and long-term preservation of multiple sites being preserved in the project area. A Burial Treatment Plan also will be prepared under separate cover for Site -7483 (Feature 4) and Site -7486 (Feature 2). A Data Recovery Plan will be developed to further investigate Sites -7483 and -7486. Archaeological Monitoring is recommended for any future ground disturbance within the project area due to potential to expose undocumented archaeological sites as well as ensure that archaeological sites deemed for preservation will not be physically affected. Scientific Consultant Services, Inc. will continue working with the cultural stakeholders through the different phases of the project.

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INTRODUCTION

At the request of Sean Mullen of Aloha Solar Energy Fund LLC, in conjunction with Group 70 International, Scientific Consultant Services, Inc. (SCS) conducted an Archaeological Inventory Survey (AIS) on approximately 44-acres of undeveloped land in advance of a proposed 5.0 megawatt solar farm power facility in Kalaeloa, Honouliuli Ahupua`a, `Ewa District, Island of O`ahu, Hawai`i [TMK: (1) 9-1-013:070] (Figures 1 through 3). The solar "farm" will consist of a PV array, concrete pads, a single-story generator building, and a transfer substation. The project area is located east of the Kalaeloa Airport on the former United States Naval Air Station Barbers Point currently called Kalaeloa. According to the City and County of Honolulu's Department of Planning and Permitting website identified as the Honolulu Land Information System (HoLIS; http://gis.hicentral.com/) the land on which the AIS was conducted is owned by the Hawai`i Community Development Authority (HCDA). Scientific Consultant Services, Inc. would like to extend a special "*mahalo*" to Uncle Shad Kane and the group Ahahui Siwila Hawai`i o Kapolei for their participation and efforts as cultural ethnohistorians for this project.

The Archaeological Inventory Survey was conducted to identify and document historical properties, to assess their historical significance for eligibility for listing on the Hawaii Register of Historic Places, to make project effect recommendations, and to make mitigation recommendations. Fieldwork was conducted from February 20 through April 10, 2013, by SCS archaeologists Guerin Tome, B.A., and Stephanie Medrano, B.A., under the direction of Robert L. Spear, Ph.D., Principal Investigator. It should be noted that in 2012, prior to the commencement of the current Archaeological Inventory Survey, Geolabs, Inc. conducted mechanical ground alterations within the survey area which did impacted portions of the project area (see Figure 37).

During the current survey, twenty-three historic properties (State Sites 50-80-12-5119, -5120 and 50-80-12-7483 through 50-80-12-7504), comprised of 146 features, were documented. Twenty-one sites (50-80-12-7483 through -7494 and 50-80-12-7496 through -7504) were newly identified. Two sites (State Sites 50-80-12-5119 and -5120), previously identified by Tuggle and Tomonari-Tuggle (1994), were re-located and documented with new features being added to each site. Of the 146 features found within TMK: (1) 9-1-013:070 a total of eight features recorded by Wickler and Tuggle (1997) were re-located. Of the remaining 138 features nine features could not be confirmed as having been recorded by Wickler and Tuggle (1997) based on the current Archaeological Inventory Survey results and the site descriptions of Wickler and Tuggle (1997). The remaining 129 features are newly recorded. Based on feature type, construction methods, and construction materials, State Site -5119, -7483 through -7485, -7487 (Features 1 and 4), -7488 through -7494, -5120 (Features 1 and 2), and -7496 through -7504 were interpreted to be associated with the pre - and/or post-

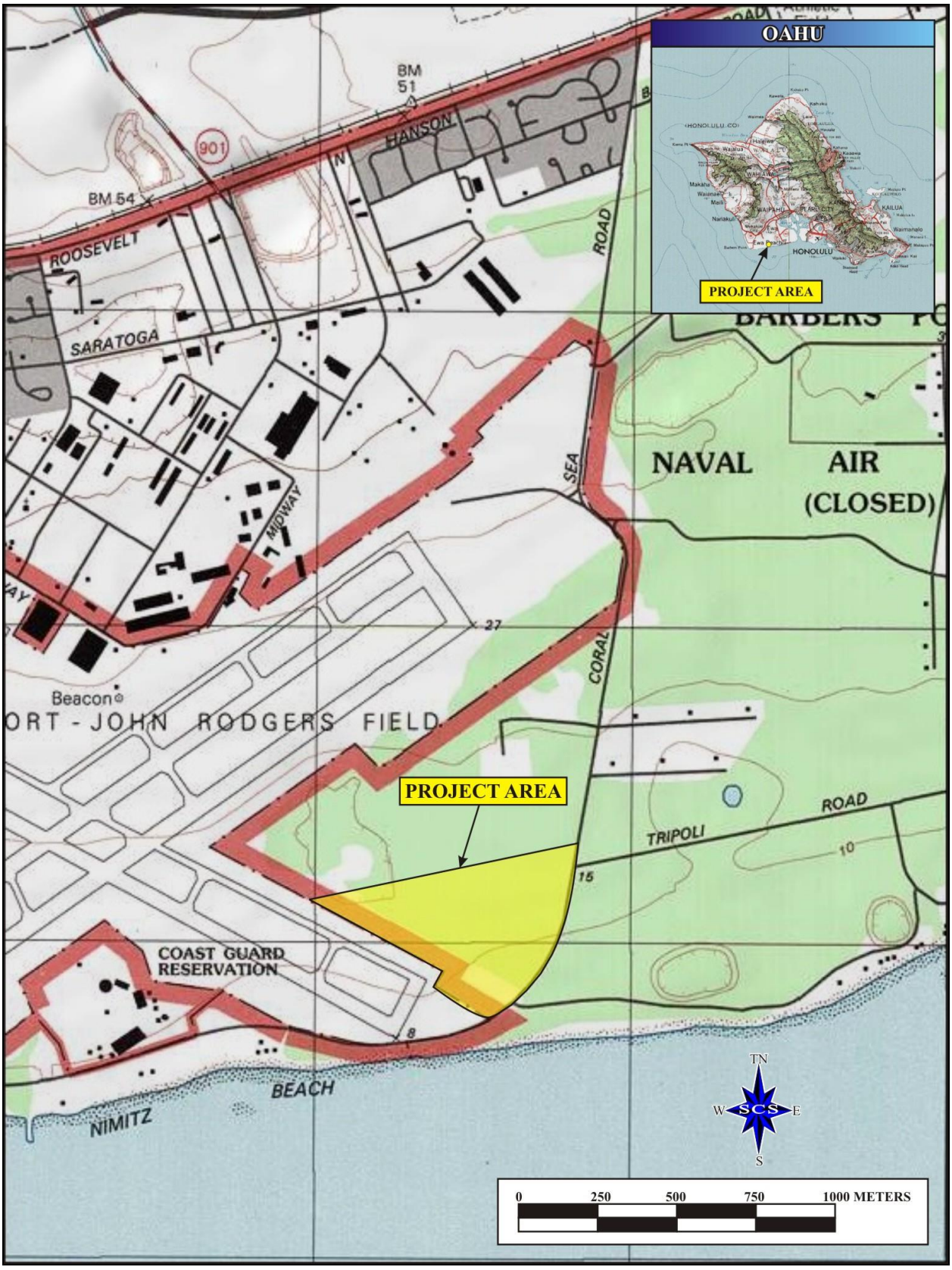

Figure 1: 1983 USGS 7.5 `Ewa Quadrangle Map Showing Project Area.

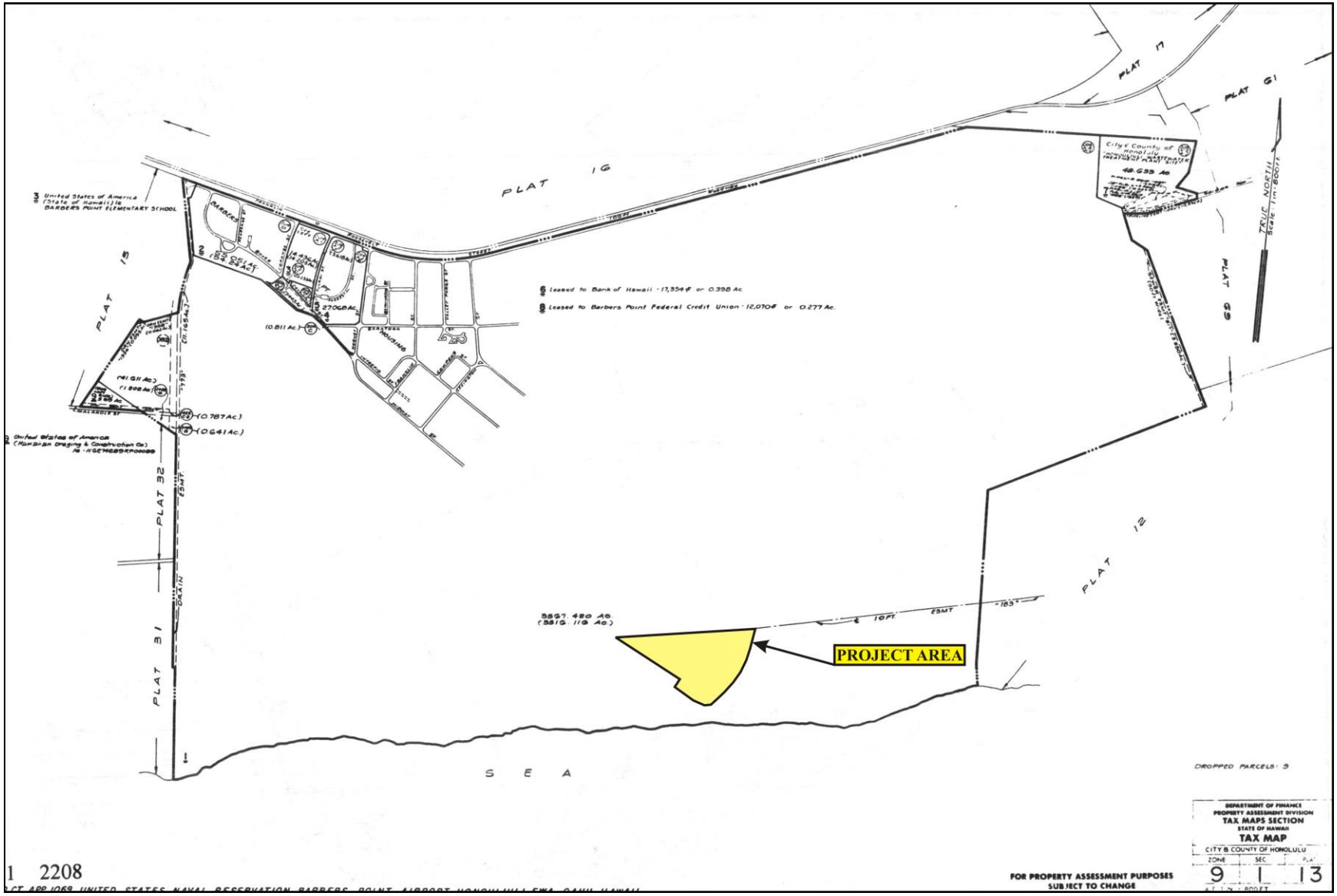

Figure 2: Tax Map Key (1) 9-1-013 Showing Project Area.

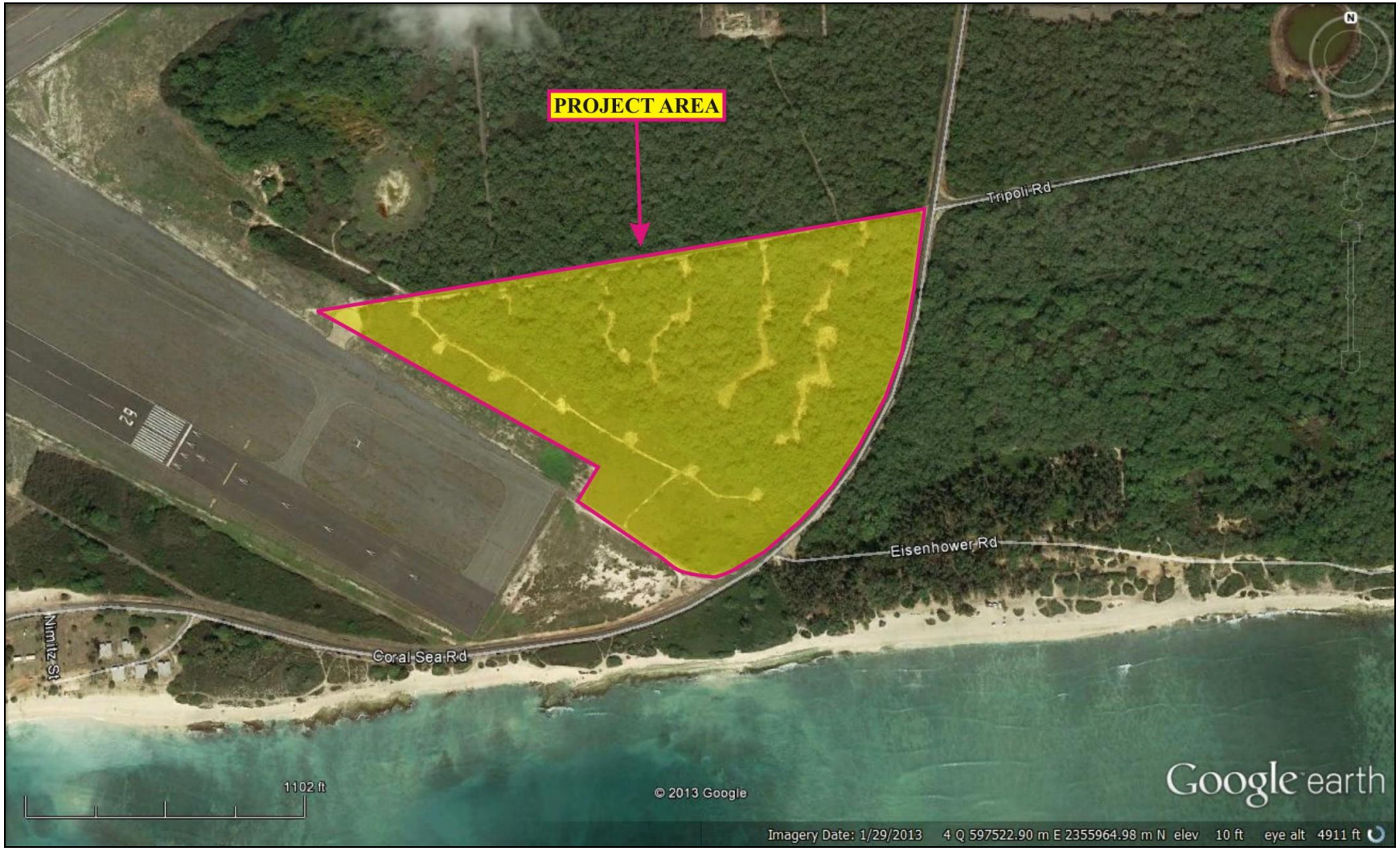

Figure 3: Google Earth Aerial Image Showing Project Area.

Contact Period. Based on a 1928 aerial coastal photo, a 1927 USGS Quadrangle (Barber's Point) Map, general feature horizontal shape, and feature location within the project area, State Sites 50-80-12-7486 (Feature 5) and 50-80-12-7491 were interpreted as trails associated with the pre- and/or post-Contact Period, with use possibly extending into the Historic Ranching Period. State Site 50-80-12-7487 (Feature 3 and 5) and State Site 50-80-12-5120 (Features 3 though 9) were interpreted to be associated with United States military occupation of the area during the Historic Period.

ENVIRONMENTAL SETTING

PROJECT AREA

The project area is located approximately 110 m north of the `Ewa coastline at an elevation to 40 feet above mean sea level (amsl). Located in Honouliuli Ahupua`a, `Ewa District, Island of O`ahu, Hawai`i [TMK (1) 9-1-013:70] (see Figures 1 through 3), the project area comprises 44 acres and is located on the former Naval Air Station (NAS) Barbers Point. The project area is bounded on the north by Tripoli Street, to the east/southeast by Coral Street, and to the west and south by the current Kalaeloa Airport Runway 29.

CLIMATE

The project area lies is the dry, southwest portion of O`ahu. Rainfall indicators show that project area environs receive between 300 to 500 mm inches per *annum*, although some fluctuations do occur on a year to year basis (Price 1983:62). Higher elevations within Honouliuli Ahupua`a are prone to receive more precipitation due to increased rainfall, fog drip, and lower temperature climates. The frequency of the project area receiving much upland runoff is unlikely. No visible linear water sources (*e.g.*, a stream or river) occur within or near the current project area. The water table, however, is between 10 to 20 feet below surface in areas and may yield small amounts of brackish-fresh water. In addition, while dissolution pits or caves trap soil, they also trap some moisture. Temperatures in the area range between 60° and 90°F, with the highest typically occurring in August and September (Price 1983).

PHYSICAL SETTING

The natural environment of the `Ewa Plain, particularly the coastal and near-coastal zones, has been examined in various degrees of detail in a number of studies (*e.g.*, Ripperton and Hosaka 1942; Selling 1948; Stearns 1946; Stearns and Vaksvic 1935; Davis 1990; Moberly *et al.* 1975; Colbourn *et al*. 1988; Barry 1995; Hampton *et al*. 2002; Allen 1990; Charvet-Pond and Davis 1992; Athens *et al*. 1999, and Dunn *et al*. 1991). The `Ewa Plain or `Ewa Coral Plain, is an emergent reef platform formed in the late Pleistocene during the high level sea stand

approximately 125,000 years ago (MacDonald *et al*. 1979:355). Fringing the southern flanks of the Wai`anae Mountain Range and the central Wahiawa Plateau, the plain extends continuously from Kahe Point east to Pearl Harbor and beyond, beneath Honolulu and Waikīkī to Diamond Head. At its widest, the `Ewa Plain reaches approximately 5 to 8 kilometers (km) seaward from the Wai`anae Mountains. Poorly defined fringing reefs run the length of the coast where the near-shore zone is largely comprised of hard coral and calcareous algae reef bottoms interrupted by small sand channels. The region is very arid and removed from the drainages of the Ko`olau and Wai`anae Mountain ranges.

The subject parcel includes the near-coastal coralliferous lowlands. Here, the coral substrate was found to be largely exposed to sub-aerial weathering, which has produced a shallow, karst topography of ridges, hollows, pinnacles, and "sinkholes" interspersed among flat surfaces (see Kennedy 2010). The marine-terrestrial interface where the reef adjoins the volcanic foundation of the island is situated further inland. However, as has been documented during previous archaeological projects conducted in the region, a thin mantle of terrestrial sediments may extend into the project area as alluvial encroachment and aeolian transport are deposited from the volcanic uplands and elsewhere (Davis 1986, 1990; Dega *et al*. 2002, Kennedy 2010).

The `Ewa Plain is essentially flat, although it does exhibit moderate sloping to seaward. The only significant relief is provided by the eroded bluffs bordering the West Loch of Pearl Harbor and the volcanic cores of Pu`u o Kapolei and Pu`u Palailai. The latter is important archaeologically as it is one of only three known sources of volcanic glass on the Island of O`ahu (see Davis 1986). Volcanic glass was an important component of traditional Hawaiian tool kits and has proven to be a consistent element in the archaeological assemblages from the `Ewa Plain. Topographic relief in the project area is primarily restricted to artificial mounding and small uplifted karstic areas.

The `Ewa Plain is a semi-arid region composed of coastal marshlands containing primarily xeric (dry) vegetation. The shoreline area most likely supported wetland habitats dominated by sedge and other hydrophytic vegetation. Palynological studies of the coastal environment (Athens *et al*. 1999) have shown that the area contained savannah-like vegetation regimes of grasslands with thickets and small groves of trees. This contrasts sharply with windward environments in which vegetation systems are widely varied and prolific (see Athens and Ward 1991). The marginality of the leeward environment is perhaps best known through rainfall and groundwater studies. Essentially, rainfall averages only 300 to 500 mm per annum

and primary fresh water is gleaned from sheet wash and groundwater in the aquifers. Water in the area is primarily brackish in nature (*e.g.*, Athens *et al*. 1999).

However marginal the environment, exploitation of other natural resources made the area hospitable. Archaeological evidence (see Davis 1986, 1990; Tuggle and Tomonari-Tuggle 1994) has shown that Hawaiian settlers of the `Ewa Plain exploited both marine and terrestrial resources to various degrees. Subsistence-related tasks such as fishing, collecting shellfish, gathering, bird hunting, and gardening would have, to some degree, supported the economy of the area during pre-Contact times. The main subsistence resources in the area were birds, terrestrial plants (breadfruit, sweet potato), fish, shellfish, and seaweed. These subsistence regimes have been confirmed through several studies (*e.g*., Davis 1990) but require refinement in terms of the degree each contributed to the diet along the coast and in chronologically ordering adaptations and the nature of settlement in the area. While the subsistence of the `Ewa Plain population has been interpreted to have followed the pattern of combined cultivation and marine exploitation (see Davis 1990), several important questions remain. These include determining any temporal changes in subsistence patterns; including variation in the subsistence base over time and settlement organization that may have provided for such change in subsistence activity over time (see Tuggle and Tomonari-Tuggle 1997).

SOILS

According to Foote *et al*. (1972:29, Sheet Map 45), the project area is primarily located within a Coral outcrop (CR) series. "Coral outcrops consist of coral or cemented calcareous sand on the Island of O`ahu. The coral reefs formed in shallow ocean water during the time the ocean stand was at a higher level. Small areas of coral outcrop area exposed on the ocean shore, on the coastal plains, and at the foot of the uplands" (Foote *et al*. 1972:29).

Coral outcrop makes up about 80 to 90 percent of the acreage with the remaining 10 to 20 percent consisting of a thin layer of friable, red soil material in cracks, crevices, and depressions within the coral outcrop, similar to that of Mamala series deposits (Foote *et al*. 1972:29). Mamala Series deposits consist of shallow, well drained soils along the coastal plains on the island of O`ahu. These soils formed in alluvium deposited over coral limestone and consolidated calcareous sand. This land type is used for military installations, quarries, and urban development (Foote *et al*. 1972:93).

LANDFORM: KARST ENVIRONMENT

Several important natural features dominate the `Ewa Plain, and the formation of the area itself is integral to understanding cultural use of the environment. Over 80% of the `Ewa Plain

consists of a karstic limestone landscape. The current project area occurs wholly within this karstic zone.

It is known that the reef limestone formed during the Pleistocene at the high level sea stand. From that point, the water receded through time to present day levels. The water recession has left behind an undulating topography due to the dendritic nature of reef formation, as well as the formation of "sinkholes" and collapse of thin limestone mantles near the surface (see Halliday 2001). Archaeologists working in the `Ewa Plain have focused much research on the sinkholes, given the results of early studies showing the presence of cultural materials, burials, and extinct bird bones, among others (see Tuggle and Tomonari-Tuggle 1997). However, is the term "sinkhole" geologically accurate?

SINKHOLES?

Halliday (2001:31) states that "Readers of the Hawaiian archaeological literature receive the impression that innumerable karstic sinkholes are present in elevated reef limestones. This is a fallacy." He cites the following characteristics as to why these features do not conform to standard sinkhole definitions: most occur in pseudokarstic terrain and many are not funnel-shaped (Halliday 2001:31). The question then arises: What does one call the many depressions, fissures, or holes occurring across the `Ewa Plan landscape? Certainly sinkholes are present, but what of the 1000s of other features in the landscape? This problem is genuine as the current project contains many "pseudokarstic sinkholes."

A reading of the geologic literature attests to several more accurate descriptions (Halliday 1998, 2001; Mylroie and Carew 1995). The features archaeologists often designate as "sinkholes" in Hawai`i have been classified by karstographers, speleologists, and geologists as "small pit caves," "small dissolution pit caves," and/or "flank margin caves" (Halliday 1998, 2001; Mylroie and Carew 1995). For general classification, the phreatic dissolution caves are often called "banana holes" in the Caribbean Islands and Central America. The "small dissolution pit caves" appear to best fit the cavities in the current project area, although there is variation, as is discussed below. A good example of a true sinkhole is the Makauwahi sinkhole on the southern shore of Kaua`i. David Burney and colleagues have extensively explored the sink and recovered numerous species of fossil; including ubiquitous bird bones of antiquity (see Burney *et al*. 2001).

Thus, most of the natural features previously termed "sinkholes" in the `Ewa Plain appear to be caves or fissures of one sort or another. As Halliday (2001:31) notes, "Although the

archaeological literature contains references to a large number of sinkholes in reef limestone, most of these actually are small pit caves, as defined by Mylroie and Carew (1995), one to four meters deep. These are commonly impacted by man, rather than the reverse." While the definitions may be important for scientific classification, the main point for archaeologists is that these numerous "pits" occur across the `Ewa Plain, most contain soil, and have the potential to yield important paleoenvironmental and anthropological data.

VEGETATION

Vegetation identification within the project area [TMK: (1) 9-1-013:070] was conducted June 6, 2013 by Eric Guinther and Reginald David of AECOS Inc. Table 1 contains the identified vegetation (Guinther and David 2013).

Table 1: TMK: (1) 9-1-013:070 Identified Vegetation.

Family *Species*	Common name	Status	Abundance	Notes
	FLOWERING PLANTS			
	DICOTYLEDONES			
ACANTHACEAE				
Asystasia gangetica (L.) T. Anderson	Chinese violet	Nat	O3	
AMARANTHACEAE				
Achyranthes aspera L.	---	Nat	R	
Alternanthera pungens Kunth	khaki weed	Nat	O	
ANACARDIACEAE				
Schinus terebinthefolius Raddi	Christmas berry	Nat	U	
ASCLEPIADACEAE				
Cryptostegia cf. *grandifolia Roxb.* ex R. Br.	rubber vine	Nat	A	
ASTERACEAE (COMPOSITAE)				
Ageratum conyzoides L.	*maile hohono*	Nat	R	
Bidens pilosa L.	Beggartick	Nat	O2	
Calyptocarpus vialis Less.	---	Nat	U	
Conyza bonariensis (L.) Cronq.	Hairyhorsewed	Nat	U	
Flaveria trinerva (Spreng.) C. Mohr	---	Nat	O1	
Lactuca serriola L.	prickly lettuce	Nat	R	
Pluchia carolinensis (Jacq.) G. Don	Sourbush	Nat	O2	
Pluchea indica (L.) Less.	Indian fleabane	Nat	A2	
Pluchia x *fosbergii* Cooperr. & Galang	---	Nat	R	
Sonchus oleraceus L.	sow thistle	Nat	U	
Tridax procumbens L.	coat buttons	Nat	U	
Verbesina enceliodes (Cav.) Benth. & Hook.	golden crown-beard	Nat	O2	

BIGNONIACEAE				
Spathodea campanulata P. Beauv.	African tulip	Nat	R	
BORAGINACEAE				
Heliotropum procumbens Mill.	---	Nat	R	
CHENOPODIACEAE				
Atriplex semibaccata R. Br.	Australian saltbush	Nat	R	
Chenopodium carinatum R. Br.	---	Nat	U1	
Chenopodium murale L.	*ʻaheahea*	Nat	O	
CONVOLVULACEAE				
Ipomoea obscura (L.) Ker-Gawl.	---	Nat	O2	
Merremia aegyptia (L.) Urb.	hairy merremia	Nat	R	
CUCURBITACEAE				
Cucumis dipsaceus Ehrenb. ex Spach	teasel gourd	Nat	U	
Sicyos pachycarpus Hook. & Arnott	*Kūpala*	**End**	O	<1>
EUPHORBIACEAE				
Euphorbia hirta L.	garden spurge	Nat	R	
Ricinus communis L.	castor bean	Nat	R	
FABACEAE				
Desmanthus virgatus (L.) Willd.	virgate mimosa	Nat	C3	
Desmodium totuosum (Sw.) DC.	Florida beggarweed	Nat	R	
Leucaena leucocephala (Lam.) deWit	*koa haole*	Nat	A	
Indigofera spicata Forssk.	creeping indigo	Nat	R	
Macroptilium lathyroides (L.) Urb.	wild bean, cow pea	Nat	R	
Pithecelobium dulce (Roxb.) Benth.	*`opiuma*	Nat	U	
Prosopis pallida (Humb. & Bonpl. ex Willd.) Kunth	*Kiawe*	Nat	AA	
LAMIACEAE				
Leonotis nepetifolia (L.) R. Br.	lion's ear	Nat	O	
Ocimum gratissimum L.	wild basil	Nat	R	
LAURACEAE				
Cassytha filiformis L.	*Kauna`oa pehu*	Nat	O	
MALVACEAE				
Abutilon grandifolium (Willd.) Sweet	hairy abutilon	Nat	R	
Malvastrum coromandelianum (L.) Garck	false mallow	Nat	U	
Sida ciliaris L.	---	Nat	A	
Sida fallax Walp.	*`ilima*	Ind	C1	
Sida rhombifolia L.	Cuba jute	Nat	R	
Sida spinosa L.	prickly sida	Nat	R	
Waltheria indica L.	*`uhaloa*	Nat	O	
PASSIFLORACEAE				
Passiflora foetida L.	running pop	Nat	R	
Passiflora suberos L.	*huehue haole*	Nat	R	

PHYTOLACCACEAE			
Rivina humilis L.	coral berry	Nat	O
PLUMBAGINACEAE			
Plumbago zeylanica L.	*`ilie`e*	**Ind**	U2
RUBIACEAE			
Morinda citrifolia L.	*Noni*	Pol	R
SOLANACEAE			
Nicotiana glauca R.C. Graham	tree tobacco	Nat	R
Solanum americanum Mill.	*Pōpolo*	**Pol**	O
Solanum lycopersicum var. *cerasiforme* (Dunal) Spooner, G.J. Anderson & R.K. Jansen	cherry tomato	Nat	O
Solanum seaforthianum Andr.	---	Nat	R
MONOCOTYLEDONES			
POACEAE			
Cenchrus ciliaris L.	Buffelgrass	Nat	AA
Chloris barbata (L.) Sw.	swollen fingergrass	Nat	O2
Cynodon dactylon (L.) Pers.	Bermuda grass	Nat	O
Digiteria insularis (L.) Mez. ex Ekman	Sourgrass	Nat	U
Eleusine indica (L.) Gaertn.	beach wiregrass	Nat	C
Eragrostis amabilis (L.) Wight & Arnott	Lovegrass	Nat	U
Eragrostis pectinacea (Michx.) Nees	Carolina lovegrass	Nat	C
Setaria verticillata (L.) P. Beauv.	bristly foxtail	Nat	O
Sporobolus diandrus (Retz.) P. Beauv.	Indian dropseed	Nat	R
Urochloa maxima var. trichoglume (K. Schum) Hibberd	Guinea grass	Nat	AA

Legend to Table 1

STATUS = distributional status for the Hawaiian Islands:

- end = endemic; native to Hawaii and found naturally nowhere else.
- ind = indigenous; native to Hawaii, but not unique to the Hawaiian Islands.
- nat = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation.
- orn = exotic, ornamental or cultivated; plant not naturalized (not well-established outside of cultivation).
- pol = Polynesian introduction before 1778.

ABUNDANCE = occurrence ratings for plants by area:

- R – Rare - seen in only one or perhaps two locations.
- U - Uncommon- seen at most in several locations
- O - Occasional - seen with some regularity
- C - Common - observed numerous times during the survey
- A - Abundant - found in large numbers; may be locally dominant.
- AA - Very abundant - abundant and dominant; defining vegetation type.

Numbers following an occurrence rating indicate clusters within the survey area.
The ratings above provide an estimate of the likelihood of encountering a species within the specified survey area; numbers modify this where abundance, where encountered, tends to be greater than the occurrence
rating:

1 = several plants present ; with C or A = in one area only.
2 = many plants present ; with C or A = in a few areas.
3 = locally abundant; with C or A = in several to many areas but still limited.

NOTES:
<1> – Plant observed was lacking fruit or flowers; identification uncertain.

Prior to Contact (*i.e.*, 1778), the `Ewa Plain presumably would have been dominated by scrub-type vegetation able to survive in this very arid climate. These include *wili wili* (*Erythina sandwicensis*), *lama* (*Diospyros ferrea*), sandalwood *(Santalum* sp.), *`a`ali`i* (*Dodonea ericarpa*), *ohia* (*Metrosideros collina*), and *pili* grass (*Heteropogon contortus*) (Whistler 1995).

TRADITIONAL AND CULTURAL CONTEXT

PRE-CONTACT HISTORY

`Ewa was famous for its *`awa*, *māmaki*, and for a variety of *kalo* called *kāi`i*. In wet lowlands, it was planted in mounds, a method called *pu`epu`e* (Handy and Handy 1978). As one went upland, bananas (*mai`a, Musa* sp.) and yams (*uhi, Dioscorea alata*) were grown on the *kula* land and in the lower sections of the valleys. *`Awa* (*Piper methysticum*) would have been cultivated deeper in the valleys along with *olonā (Touchardia latifolia)* for cordage. Birds, valued as food (Malo 1951:38-40) and for their feathers, would have covered the extensive lowland forest. A large area was set aside for growing *wauke (Broussonetia papyrifera)*and *māmaki (Pipturus albidus)* (Handy and Handy 1978). This area was so productive that the *ali`i* (royalty, chiefly status) established there residence on the point of Waipi`o peninsula giving rise to some of the most powerful chiefs on O`ahu (Fornander 1980, Vol 2:318).

`Ewa was one of the largest of the six districts on the Island of O`ahu. According to Fornander (1980,Vol 2: 47), in the early to middle part of the eleventh century, Māweke, a direct lineal descendant of the illustrious Nanaulu (the founder of Hawaiian royalty (*ibid*:168 Vol I]), was a chief on O`ahu. The second of his three sons, Keaunui, became the head of the powerful `Ewa chiefs and tradition reports his cutting of a navigable channel allowing access to the Pu`u Loa River by canoe (*ibid*:48). His son, Lakona, became the progenitor of the `Ewa chiefs. The line continued to Elani, a powerful `Ewa chief at the time of Kahekili, and his nephew Kahahana, the ruler of O`ahu in the late 1700s (*ibid*:217). Kahekili's treachery toward Kahahana provoked a

rebellion of O`ahu chiefs, resulting ultimately in the almost complete annihilation of the island's aristocracy. Oral tradition records that the stream of Hoaiai in `Ewa was choked with the bodies of slain men, women, and children (*ibid*:224-226; Kamakau 1961:138). It is said that one of the Maui chiefs, Kalaikoa, used the bones of the slain to build a wall around his house at Lapakea in Moanalua. The house was known as Kauwalua and could be seen as one passed by the "old upper road to ``Ewa" (Fornander 1996:290). With the demise of the island's *ali`i* went much of our knowledge of the history of the district's individual *ahupua`a*.

`Ewa is depicted as an abundant and populated land where chiefs of distinguished lineages were born and resided. The land was fertile and well fed by mountain streams that helped sustain the agricultural lifestyle needed to support the chiefs, their households and their people. An examination of the place names reveal that water was a very important factor in this district. Six of the twelve *ahupua`a* names begin with wai, the Hawaiian word for water (Waikele, Waipi`o, Waiawa, Waimano, Waiau, and Waimalu). At least twenty-six fishponds and many fish traps were established by the *ali`i* at various points around `Ewa District and in the Pu`uloa area, more than any other district on O`ahu (McAllister 1933:101-109), indicates that agricultural/aquacultural intensification was a direct link to the chiefs who resided there and, also, to the increasing needs of the population.

KALAELOA

The project area lies within the *ahupua`a* of Honouliuli in the *moku* of `Ewa and is part of the unique geological feature known as the ``Ewa Plain (or the ``Ewa Karst). Oral histories cited in *Sites of Oahu* (Sterling and Summers 1978) tell of the traditional importance of the *mauka* or upland areas of Honouliuli Ahupua`a. Being one of the largest traditional Hawaiian land units on O`ahu, Honouliuli served as a crossroads to many points east (towards Pearl Harbor and Honolulu), west (towards Wai`anae) and north (towards Wahiawā and Waialua).

There are several places within Honouliuli Ahupua`a that are associated with traditional Hawaiian land uses, including Kalaeloa (or Barbers Point). The original Hawaiian name for this area was either Lae Loa or Kalaeloa; both names are seen in historic maps and text. *Lae* meaning cape or point and *loa* meaning distance or length. Lae Loa is also a point south of Hōnaunau Bay on Hawai'i Island (Pukui *et al*. 1974). Kalaeloa may translate to "clear or calm stretch" of either water or land. According to Pukui *et al*. (1971), *kala`e* means "clear or calm."

Comparatively, no major population centers occurred in Kalaeloa. Land utilization was likely minimal until sugarcane production began in earnest during the 1920s. The general

opinion regarding this area in archaeological literature (see Davis 1990), at least, is that it has always been, in an ecological sense, an impoverished land vacant of perennial streams, alluvial plains, and rich soils. Given these hardships, traditional Hawaiian settlement of the area would likely have related to people "on the edge of survival" if they did not have regular and abundant access to resources outside of this area (Tuggle and Tomonari-Tuggle 1997).

> In 1793, Vancouver anchored off the entrance to West Loch and described the area as follows:
>
> > . . . The part of the island opposite to us was low, or rather only moderately elevated, forming a level country between the mountains that compose the east [Ko`olau] and west [Wai`anae] ends of the island. This tract of land was of some extent but did not seem to be populous, nor to possess any great degree of natural fertility; although we were told that at a little distance from the sea, the soil is rich and all necessities of life are abundantly produced. [Vancouver 1984:884]

Early settlement of the area was most likely made possible by a subsistence strategy aimed at both marine and avifauna resources. Handy (1940:82) reported that the *ahupua`a* of Honouliuli supported large agricultural terraces boarding West Loch (outside the current project area), which were still being cultivated in the 1930s. In addition, J. Gilbert McAllister suggested that in the coral plains of Honouliuli:

> > . . . It is probable that the holes and pits in the coral were formerly used by the Hawaiians. Frequently the soil on the floor of the larger pits was used for cultivation, and even today one comes upon bananas and Hawaiian sugar cane still growing in them. [1933:109]

However, occupation of the area would have been temporary rather then permanent, owing simply to the lack of reliable water resources in the area and the difficulty in obtaining these resources. As faunal resources became depleted and as population density increased, a shift towards domestic and terrestrial resources *(i.e.*, animal husbandry, horticulture, and agriculture) likely occurred.

Early settlement of the `Ewa region, in general, is thought to have involved significant attention to avifauna resources (Davis 1990:136; James *et al*. 1987; Olson and James 1982). Visiting bird hunters may have been the first people to carry on traditional use of the project area, contributing to the utilization of temporary task-specific bird hunting sites. According to Sinoto (1976), sinkholes on the coast are full of bones of extinct bird species, which indicate that the general area witnessed large-scale depletion of avifauna. Humans are thought to have played

a major role in the depletion of bird life throughout the Pacific Islands (Steadman 1989, 1995, 1997).

Overall, the environmental setting of the project area provides a set of limiting factors to traditional settlement. The dry `Ewa Plain may be considered similar to other extremely dry regions of leeward Hawaii where the was found to be of small communities have been found in agriculturally-impoverished lands (Tuggle and Tomonari-Tuggle 1997). Some of these dry leeward areas witnessed the development of complex dryland agricultural field systems as along the western coast of Hawai`i Island (Kirch 1985:228-230; Rosendahl 1994). In contrast, the `Ewa Plain more closely fits the model proposed for dry areas of Moloka`i (Tuggle 1993; Weisler and Kirch 1985) and for lower Makaha Valley on O`ahu (Hommon 1969; Green 1980), where settlements represented "gardening families on the edge of survival" (Tuggle and Tomonari-Tuggle 1997).

According to Davis (1990:342), during the early period of human occupation, the `Ewa Plain was an "open savannah-like grassland" where "trees such as Pritchardia, *wiliwili*, *noni*, and *kou*, formed small groves in favorable locations ..." This model is the most prevailing based on information derived from botanical data (Char and Balakrishan 1979:12), as well as from land snail analysis (Kirch and Christensen 1981).

THE KARST OF HONOULIULI

`Ewa was famous for the many limestone caves formed in the uplifted coral, called the "`Ewa Karst." This Pleistocene limestone outcrop, where not covered by alluvium or stockpiled material, has characteristic dissolution "pit caves" (Mylroie and Carew 1995), which are nearly universally, but erroneously, referred to as "sink holes" (Halliday 2005; see above). Traditional Hawaiian utilization of limestone sinkholes is a hallmark of `Ewa Plain sites. These pit caves, or sinkholes, vary widely in spatial extent and depth. Tuggle and Tomonari-Tuggle (1997:68) state that "sinkholes range in size from several centimeters to 400 m in diameter and 50 cm to at least 60 cm in depth." In Traditional Hawaiian times (pre-1778), the areas of exposed coral outcrop were undoubtedly more extensive.

According to Tuggle and Tomonari-Tuggle (1994:8), "although arid by the measure of annual rainfall, the `Ewa Plain probably had much greater water availability in general than is now perceived." It is uncertain whether rainfall was greater in pre-Contact times than it is today; it is however, unquestioned that the water table was higher. It has been estimated that with the drilling of artesian wells and water use for cane, the water table may have "been drained to a third of its former level" (Culiney 1988:233). Today, the water table is from one to three meters

below the surface up to about 500 m from the coast and thus is accessible from sinkholes. With a higher water table and the hundreds of sinkholes that are found in the `Ewa Plain, there would have been significant water availability from small sinkholes within the project area (Tuggle and Tomonari-Tuggle 1994:8).

TRADITIONAL LAND TERMS

The concepts of the Hawaiian land system are helpful in understanding traditional land use in and around the project area. In general, several terms, such as *moku, ahupua`a, `ili* or *`ili`āina* were used to delineate various land sections. 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. Ideally, this situation allowed each *ahupua`a* to be self-sufficient by supplying needed resources from different environmental zones (Lyons 1875:111). The *`ili* or *`ili `āina* were smaller land divisions next in importance to the *ahupua`a* and were administered by the chief who controlled the *ahupua`a* in which they were located (Lyons 1875:33; 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 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, Kauikeaouli (Kamehameha III) was forced to establish laws changing the traditional Hawaiian economy to that of a market economy (Kame`eleihiwa 1992:169–70, 176; Kelly 1983:45, 1998:4; Daws 1962:111; Kuykendall 1938 Vol. I:145). The Māhele of 1848 divided Hawaiian lands between the king, the chiefs, the government, and began the process of private ownership of lands. The subsequently awarded parcels were called Land Commission Awards (LCAs). Once lands were made available and private ownership was instituted, the *maka`āinana* (commoners), if they 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, *`okipū* (on O`ahu), 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).

Kamehameha's successful conquest of O`ahu had resulted in a large-scale redistribution of lands which set the stage for an ongoing series of land sales and transfers of ownership. Honouliuli Ahupua`a was originally given as *punala`au* (conquered land) to Kalanimoku (Kame`eleihiwa 1992:58, 112). Subsequently, Kalanimoku gave this land to his sister Wahinepi`o, whose daughter Kekau`onohi in turn received the land during the Māhele of the late 1840s (LCA 11216; Royal Patent 6971) (Waihona `Aina Corporation 2013).

Although no lands were awarded within the project area, 96 individual claims were made in the *ahupua`a* of Honouliuli and, of these, 72 individual claims were registered and awarded by King Kamehameha III to commoners (Tuggle and Tomonari-Tuggle 1997:34). The 72 *kuleana* awards were mainly adjacent to Honouliuli Gulch which contained fishponds and irrigated taro fields. Soil suitable for cultivation was rare in the upland portions of Honouliuli where small soil pockets are distributed unevenly. Irregularly located sinkholes and small gulches often served to catch soil deposition appropriate for limited gardening activity. Stone mounds were also prepared for the cultivation of sweet potato in dryer areas (McAllister 1933:109).

HISTORIC PERIOD

Despite the rapid and widespread changes of land ownership in Hawai`i in the late 1800s, Honouliuli Ahupua`a retained a semblance of its traditional form. After the death of Kekau`ōnohi in 1851, the titles for Honouliuli and her other lands were transferred to her husband Ha`alelea. In the few decades following Ha`alelea's death in 1864, his extensive lands became fragmented as they were sold or auctioned. Over subsequent decades, land parcels became increasingly fragmented and subdivided with further sales. The *ahupua`a* of Honouliuli fortunately escaped this fate, as it was under lease to Captain John Meek for ranching at the time when Ha`alelea's lands were auctioned. Three years later, in 1867, Ha`alelea's survivors regained a clear title to Honouliuli, and the *ahupua`a* was immediately sold in its entirety to John Coney (Kelly 1991; Tuggle and Tomonari-Tuggle 1997:23). One decade later, in 1877, John Coney's wife sold Honouliuli Ahupua`a (again in its entirety) to James Campbell for a sum of US $95,000 (Kelly 1991; Tuggle and Tomonari-Tuggle 1997:24).

James Campbell was convinced that the coast of the `Ewa Plain could be used successfully for sugar plantation land despite the overwhelming public opinion at the time that `Ewa was a barren wasteland best utilized for cattle ranching. Campbell hired an expert well digger from California to sink a well in Honouliuli in 1879. At a depth of 240 feet (71 m), water commenced to flow. This well gained recognition as Hawaii's first artesian well, called

Wai Aniani (“crystal waters”). This well was productive until it was sealed in 1939 by the City & County of Honolulu. Additional wells found equal success in water flow. James Campbell proceeded to establish profitable cattle ranches and engaged in sugar plantation ventures in Honouliuli (James Campbell Estate n.d.).

Honouliuli played an important role in the sugar plantation business in Hawai`i. In 1890, James Campbell leased land in Honouliuli to Benjamin F. Dillingham (Conde and Best 1973). Dillingham subleased the Honouliuli lowlands to W.R. Castle. Castle and Cooke then were in a position to organize the `Ewa Plantation Company (Frierson 1972; Tuggle and Tomanari-Tuggle 1997:24). A few years later, in 1897, Dillingham formed the O`ahu Sugar Company, Ltd., utilizing the artesian well water to irrigate sugarcane plantations in the Honouliuli uplands (Conde and Best 1973). In 1970, the O`ahu Sugar Company merged with the `Ewa Plantation Company (Dorrance and Morgan 2000). The lease to the Honouliuli lands lasted through 1996.

Subsequent to western contact in the area, the landscape of the ``Ewa plains and Wai`anae slopes was adversely affected by the removal of the sandalwood forest, and the introduction of domesticated animals and new vegetation species. Domesticated animals, including goats, sheep and cattle, were brought to the Hawaiian Islands by Vancouver in the early 1790s, and allowed to graze freely about the land for some time after. It is unclear when the domesticated animals were brought to O`ahu; however, L.A. Henke reports the existence of a longhorn cattle ranch in Wai`anae by at least 1840 (Frierson 1972:10). During this same time, perhaps as early as 1790, exotic vegetation species were introduced to the area. These typically included vegetation best suited to a terrain disturbed by the logging of sandalwood forest and eroded by animal grazing. Within the current project area, the majority of the (non-cultivated) vegetation is comprised of introduced species, mainly *kiawe* and grasses (Frierson 1972).

THE DEVELOPMENT OF NAVAL AIR STATION BARBERS POINT

Barbers Point is the post-contact name of the area and is attributed to Captain Henry Barber, whose ship ran aground on the shoals of Kalaeloa in 1796. According to Kamakau (1992:174):

> On October, 1796, a ship [Arthur, under Henry Barber] went aground at Kalaeloa, Oahu. This ship had visited the island on several occasions during the rule of Ka-lani-ku-pule. This was the first time a foreign ship had grounded on these shores. Kamehameha was on Hawaii, but Young had remained on Oahu. All the men on the ship came ashore at night in their boats. At daylight when the ship was seen ashore Ku-ihelani placed a ban on the property of the ship and took care of the foreigners. Hawaiian divers recovered the valuables, and they were given

over to the care of Ku-i-helani, but parts were given by Captain Barber to the men who had recovered them.

There are several other accounts related to Captain Barber, mostly re-telling the same event(s) with slight variations. One of the stories recalls an incident just prior to the ship going aground when Captain Barber tried to dupe Kamehameha by giving the king a gift of a keg of diluted brandy because he felt that keg of good brandy would be a waste. After the wreck of his ship, Barber appealed to the king for assistance in retrieving goods that had been stolen off the ship. During a feast, the ship's captain found the *'awa* he was given had been similarly diluted by Kamehameha (Joseph Emerson, as told to Mrs. Beatrice Greenwell, in Sterling and Summers 1978:39). Some accounts describe Barber as an unscrupulous man whose primary interest was in trading sea otter pelts and transporting supplies to and from penal colonies in Australia (Sterling and Summers 1978:39-40). Personality aside, Captain Barber's visit to Kalaeloa made a lasting mark on Hawaiian history, so much so that the point was relabeled (especially in written literature) in his name from 1796 (www.hawaii.gov/hawaiiaviation.com).

In the 1930s, the United States (U.S.) military moved into the `Ewa Plain. Among the various military facilities established in the area was Barbers Point Training Area. In 1931, the U.S. Army began construction of an artillery battery at Barbers Point Training Area to contain two 16-inch guns that had an effective range of 44,000 yards (Denfeld 1994). These were the largest guns installed in an American coastal defense at the time. Battery Hatch was built on the top and into the sides of Pu`u o Kapolei and was comprised of two emplacements with 360 degree fields of fire. A railroad connected the dispersed emplacements, barracks, and pillboxes for machine guns. During World War II, the emplacements were casemated with 12-foot thick walls and an 8-foot thick roof covered with soil. The military reservation on which the battery stood was named Fort Barrette (Tuggle and Tomonari-Tuggle 1994).

In 1932, the U.S. Navy leased a little over 206 acres of the Campbell Estate for a steel tower mooring mast for the dirigible *Akron* (Denfeld 1994) and an oil-surfaced 150 by 1500-foot emergency landing field (Anonymous 1947). Crashes of both the *Akron,* in 1933, and the dirigible, the *Macon,* in 1935, caused the Navy to abandon its large dirigible program and the mooring mast, located about 1.5 km inland of the coast. Active military use was reinstituted when the Navy increased its lease holdings to 3,500 acres in 1940 in order to expand the air strip for the U.S. Marine Corps. The mooring mast was used as a control tower and gave the field its name, the `Ewa Mooring Mast Field. Paving of the landing strip and a new cross-runway was completed by June 1941 (Anonymous 1947:144)

In late 1941, the construction of the Naval Air Station (NAS) at Barbers Point began. Several 400-foot sections of the dense *kiawe* forest had to be cut before survey sights could be taken (Collins 1977:33, in Kelly 1991:166). The Naval Air Station was intended as an auxiliary airfield for the Navy's Ford Island facility (Anonymous 1947) and was designed to accommodate the land-based operations of two aircraft carrier groups.

On December 7, 1941, the `Ewa Mooring Mast Field was one of the targets of the Japanese attack on Pearl Harbor. At the time, there were 49 planes neatly lined up along the edge of the airfield. In the initial wave, 20 Japanese aircraft strafed the field in repeated passes, destroying nine Wildcat fighters, 18 Scout bombers, and all six utility planes. A second attack wave of dive bombers dropped bombs on surviving aircraft and strafed the airfield as well. A third wave crossed the airfield, but found little remaining intact suitable for attack (Tuggle and Tomonari-Tuggle 1994).

With the onset of war, construction at the station accelerated. The station's operational capacity was increased to handle four aircraft carrier groups and a mix of both permanent and temporary buildings was quickly constructed. Yoklavich *et al*. (1992: 17) relates that "of the 251 buildings remaining from the 1940's two are listed as being built in 1941, 187 were built in 1942-43, 53 were completed in 1944, 3 in 1945, and only 6 in the next four years, 1946 to 1949." A series of aerial photographs indicates that runway construction was underway in February of 1942 and was completed by June of that year (Yoklavich *et al*.1992). The station was commissioned on April 15, 1942; `Ewa Marine Corps Air Station was formally established in September 1942 (Anonymous 1947:144).

There are numerous abandoned military features scattered across Naval Air Station Barbers Point that probably are of World War II age. These include coastal bunkers, inland anti-aircraft battery complexes, and training facilities (Tuggle and Tomonari-Tuggle 1994).

From the 1950s to the present, NAS Barbers Point has been an important mid-Pacific military installation, with a variety of functions, including anti-submarine patrol, headquarters of the Pacific Airborne Barrier Command (1958-1965), guided missile units, and the Pacific Sound Surveillance System. In 1990, base tenants included Headquarter Patrol Wing Two; Fleet Composite Squadron One; five Patrol Squadrons; Fleet Reconnaissance Squadron Three; Helicopter Anti-Submarine (Light; HSL-37); U.S. Coast Guard Station Barbers Point; Hawaii Air National Guard; U.S. Army (Company B**,** 214th Aviation Regiment), and Naval Reserve units (Tuggle and Tomonari-Tuggle 1994). Naval Air Station Barbers Point was closed in 1993

by Defense Base Closure and Realignment Commission in accordance with the DBCRA act of 1990 (Honolulu Star Bulletin.com 1999).

PREVIOUS ARCHAEOLOGY

The antiquated notion that leeward settlement in some form (temporary or permanent) followed protracted windward settlement is actually well supported from archaeological data (Davis 1990). Initial settlement of the Hawaiian Islands, conservatively estimated at around the A.D. 900-1000+ range (Athens and Ward 1993; Athens *et al*. 1995), is believed to have occurred along the wetter and more fertile windward areas where "conditions were optimal for marine and terrestrial exploitation along lines followed previously in Eastern Polynesia" (Green 1980:1). Leeward settlement is thought to have commenced only after windward areas were settled. More than 75 archaeological studies have been conducted on the `Ewa Plain, extending from `Ewa Beach to West Beach. Synthesis of recent archaeological and paleoenvironmental projects conducted on the `Ewa Plain, particularly in near coastal and coastal settings, sheds much light on pre-Contact settlement patterns for the area (Figures 4 and 5).

When assessing settlement pattern models for the `Ewa area, it is apparent that most archaeological studies have been conducted in the lowland karst zone, with general settlement pattern models somewhat skewed towards human adaptations to this semi-arid, soil-poor region (Tuggle and Tomonari-Tuggle 1997:12). During pre-Contact times, the `Ewa Plain contained habitation and agricultural settlements, with "sinkholes" and stone mounds being the chief cultivation media. As Davis (1986) notes, the sinks and mounds provided moisture conservation to the plants in an otherwise marginal environment. It is with adaptations such as these that the Hawaiians proliferated the area with features. Hawaiian features have been identified in almost every area of the `Ewa Plain not damaged by sugar cane cultivation or twentieth century construction (Tuggle and Tomonari-Tuggle 1997:49).

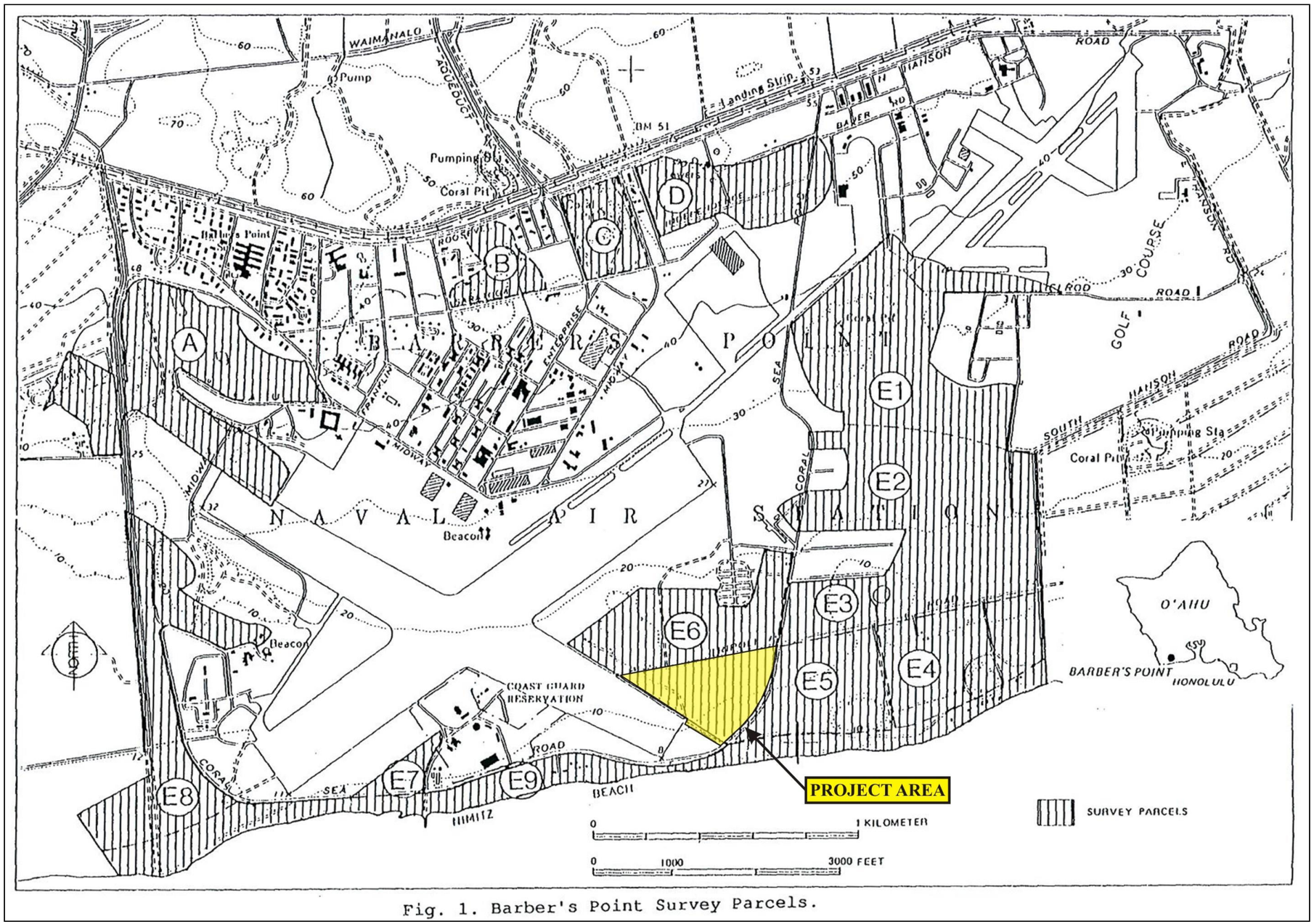

Fig. 1. Barber's Point Survey Parcels.

Figure 4: Location Map of Previous Archaeological Survey Areas (Haun 1991).

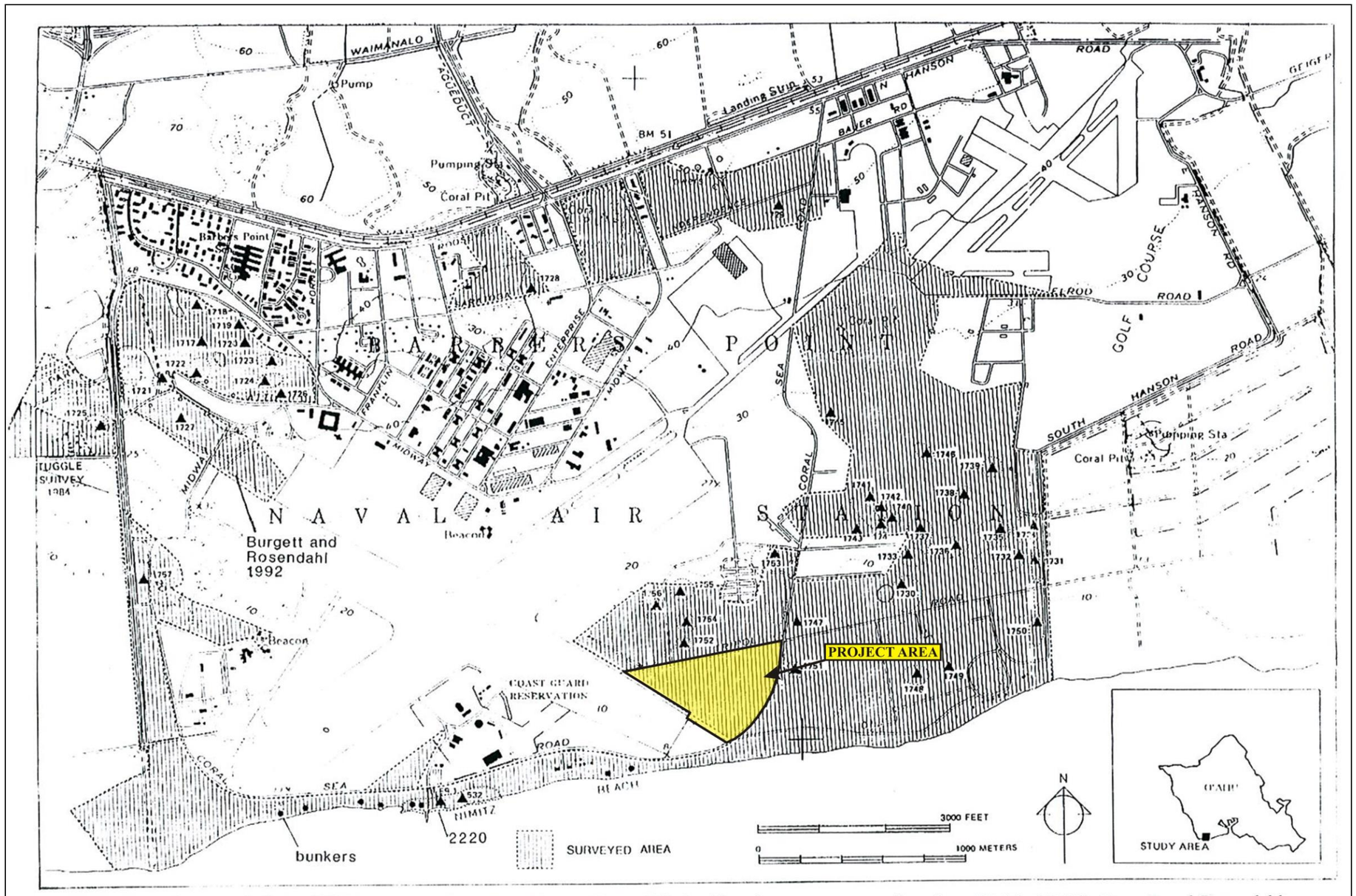

Figure 6. Areas and sites of 1985 survey (Haun 1991:Figure 3), modified with subsequent survey data from Welch (1987), Burgett and Rosendahl (1992), and Landrum (1993).

Figure 5: Archaeological Survey Areas and Historic Property Locations (Adapted from Tuggle and Tomonari-Tuggle 1994).

Many of the previously documented sites occur within or very close to perceived coastal dunes or beach deposits. According to Tuggle and Tomonari-Tuggle (1997:60), cultural deposits recorded in dunes or beach sand have only been reported at four features along the entirety of the `Ewa Plain coastline. Human burials, commonly associated with coastal sand deposits (see Kirch 1985), have been documented in all contexts of the `Ewa Plain and were not clustered or centered in coastal beach deposits. Cultural resources such as midden, hearths or ovens, and modest cultural strata have revealed coastal `Ewa features to be of short-term habitation loci most often associated with fishing activities. However, just inland of this beach sand zone are backwater marsh areas and soil-poor areas dominated by vertically protruding limestone benches on which architectural structures are often constructed. The project area appears representative of the latter area, although no standing architecture was identified.

The following presentation of archaeological projects previously conducted near the current project area is not meant to be listing of all projects ever conducted, rather it is intended to present site, and feature, classes previously identified in the `Ewa Plain. This identification will allow for the presentation of the expected project findings. The reports utilized for research purposes were obtained from the State Historic Preservation Division, Kapolei; and the SCS library, Honolulu.

In 1962, Lloyd Soehren of the Bernice Pauahi Bishop Museum recorded a human burial (Bishop Museum Site 50-0a-B6-9) at Naval Air Station Barbers Point (see Haun 1991:10). The human burial, described as a secondary interment, was cached in a "coral pit," presumably a sinkhole, located near house sites and modified pits. This human burial is most likely State Site 50-80-12-1753 Feature 1, however there are no maps or descriptions sufficient enough to verify this hypothesis (Haun 1991:32).

In 1974, State Historic Sites Section (now the State Historic Preservation Division, SHPD) archaeologists removed two human burials from the NAS Barbers Point property. These were from State Site 50-80-12-532, now subsumed under State Site 50-80-12 -2220, and from an eroding burial at a beach deposit at Kualaka`i and a limestone cavity exposed in the drainage canal on the west side of the Naval Air Station (records of the SHPD; Haun 1991:31)

In 1977, Bernice Pauahi Bishop Museum staff conducted Archaeological and Paleontological Salvage at NAS Barbers Point for the U.S. Army Corps of Engineers, Pacific Ocean Division (Sinoto 1978). The project was located in the proposed barge harbor area. Excavation associated with the project included preliminary sampling and analytical studies of

avifaunal was found to be and terrestrial gastropods (land snails) and a geological study of the emerged coral reef based on the excavation of one sinkhole (Sinoto 1978). In Sinoto's (1979) cultural resources survey for the new dredged material disposal sites at NAS Barbers Point, sinkholes were found to be dispersed throughout the project area. Of these, nineteen sinkholes were tested and only three (16%) contained extinct species. Sinoto (1979:34) indicates that between 1,100 and 2,500 species existed, also that the proposed disposal site had formerly been utilized as a location for chemical dumps and coral stockpiling.

In 1984, International Archaeological Research Institute, Inc. conducted a reconnaissance survey of the NAS Barbers Point Runway 11, clear zone, outlease parcel (Tuggle 1984). Nine sites were identified, all subsumed under State Site 50-80-12 -1725 (Haun 1991), and included three sinkholes, two coral vaults, a quadrangular coral alignment, and several features associated with historic ranching and military occupation. The coral vaults and two sinkholes were considered to have been prehistorically utilized. Excavation testing of the sinkholes revealed bird and fish bone and charcoal fragments (Tuggle 1984; Haun 1991:32).

In 1984 and 1985, staff from the Bernice Pauahi Bishop Museum and the Pacific Division of the Naval Facilities Engineering Command conducted an Archaeological Survey of the Naval Air Station Barbers Point. The survey area totaled approximately 1,230 acres and resulted in a total identification of forty-three archaeological sites comprised of 385 discrete features (State Sites 50-80-12-1725 through -2220, non-consecutive; see Haun 1991). Sites included enclosures, sinkholes (karsts), modified sinkholes, cairn (rock mound), platforms, alignments, walls, pavements, core-filled walls, stone-lined trails, and such. According to Haun (1991:137), of these, approximately 73 percent are most likely pre-Contact sites, and 27 percent are most likely historical, and approximately 47 percent of the pre-Contact sites are probably related to habitation activities. Most of these sites are architecturally complex, suggesting occupational permanence. Subsurface testing resulted in datable charcoal, small samples of midden, and volcanic glass. Radiocarbon dates suggest occupation of the area from at least the 15th century A.D. The current project area is within area E6 of the Haun (1991) investigation (see Figure 4).

In 1987, International Archaeological Research Institute, Inc. conducted an archaeological reconnaissance in the vicinity of the former `Ewa Marine Corps Air Station, NAS Barbers Point (Welch 1987). The survey located four stone structures, designated as State Sites 50-80-12-3721 and -3722, including a C-shape and a small enclosure (Welch 1987; Tuggle and Tomonari- Tuggle 1997:26).

In 1990, an isolated human burial, temporary site number NL-63 (see Tuggle and Tomonari- Tuggle 1997:32), of possible Polynesian ancestry was encountered during a cottage construction at the eastern end of the Naval Air Station Barbers Point coastline, west of White Plains Beach (Miller 1990). Ogden Environmental and Energy Services Co., Inc., later conducted archaeological monitoring of the area, however no additional skeletal material was found and no cultural material were collected (Schilz and Landrum 1994).

In 1992, Paul H. Rosendahl, Ph.D., Inc., conducted an Archaeological Inventory Survey on the west side of Naval Air Station Barbers Point (Burgett and Rosendahl 1992). The survey resulted in the identification of several sinkholes and a number of Hawaiian features (State Sites 50-80-12-1727 and -4548 through -4567). In the same year, Ogden Environmental and Energy Services Co., Inc., conducted an archaeological reconnaissance with limited subsurface testing on the north side of Naval Air Station Barbers Point (Landrum 1993). This survey located several walls associated with sisal cultivation and three traditional Hawaiian sites. Subsurface testing resulted in the identification of Hawaiian occupational debris (*i.e.*, shell midden).

In 1992 and 1993, International Archaeological Research Institute, Inc. conducted an Archaeological Inventory Survey for construction projects at NAS Barbers Point (Tuggle 1997). The survey was conducted in two phases (I and II) to the west and northwest of the Naval Air Station. Phase I identified a total of 274 features, including five sites (State Sites 50-80-12-1718, -1719, -1720, -1723, and -1726) that were previously recorded by (Haun 1991). Features identified during this project were grouped into five sites (State Sites 50-80-12-4701, -4702, -1723, -1724, and -1726), three of which use previous site numbers. Features identified during Phase I included linear alignments, circular mounds, elongated mounds, modified outcrops, enclosures, sinkholes, C-, U-, and L-shaped structures, platforms, cairns, hearth and linear-stacked rock, the majority of which are related to pre-contact and early post-Contact Hawaiian occupation. Features from the 19th and 20th centuries also were recorded, including wall sections, a stone-lined irrigation ditch, concrete cistern, and a stone cattle tank. Military features include a concrete bunker and trash scatters. Phase II, was conducted in of a portion of Phase I (Area A) in order to provide detailed information on the cultural resources of the project area adequate for evaluation and management within the framework of historic preservation regulations (Tuggle 1997).

In 1994, International Archaeological Research Institute, Inc., conducted two archaeological projects, a Reconnaissance Survey and a Phase I Inventory Survey of the entire Naval Air Station Barbers Point property. All relatively undeveloped areas of the Naval Air

Station were covered by intensive survey, moderately developed areas were covered by either intensive survey or reconnaissance sweeps, and developed areas were covered by a general reconnaissance (Tuggle and Tomonari-Tuggle 1997:50). The 1994 Phase I survey covered the Haun (1991) survey areas (A through E), including four new areas (F through I) (see Figure 5; Tuggle and Tomonari-Tuggle 1997: Fig 20). Thirty-five archaeological sites, including a human burial site, were newly identified (State Sites 50-80-12-5119 through -5130), horizontal boundaries were modified for eight previously recorded archaeological sites, several areas were identified for subsurface investigation, and locations were clarified for State Sites -1727 and -4548 through -4567. During the 1994 project, State Sites 50-80-12-5119 and 50-80-12-5120 were identified in an area described as E6c, which was re-identified during the current project and are discussed below.

Phase II of the 1994 Archaeological Inventory Survey (Tuggle and Tomonari-Tuggle 1997) was divided between International Archaeological Research Institute, Inc. (Wicker and Tuggle 1997) and Paul H. Rosendahl, Ph.D., Inc. (O'Hare *et al*. 1996). Work completed by International Archaeological Research Institute, Inc., consisted of mapping, and testing of feature complexes at two Hawaiian sites and detail mapping of military structures, including State Sites 50-80-12-5119 and 50-80-12-5120 (Wicker and Tuggle 1997). State Sites 50-80-12-5119 and 50-80-12-5120 were also identified in an area described as E6c, during the Paul H. Rosendahl, Ph.D., Inc. (O'Hare *et al*. 1996) Phase II Inventory Survey. State Sites 50-80-12-5119 and 50-80-12-5120 were re-identified during the current Archaeological Inventory Survey and are discussed below.

To summarize these last few projects with the concurrent research area, two previously identified sites, State Sites 50-80-12-5119 and -5120, occur in the current project area. State Sites 50-80-12-5119 and 50-80-12-5120 were originally recorded by Tuggle and Tomonari-Tuggle (1994) and again by Tuggle and Tomonari-Tuggle (1997). State Site 50-80-12-5119 was described in the latter report as a Hawaiian Agricultural Complex composed of seven rock mounds and one karst pit (*ibid*:169). The current Archaeological Inventory Survey added 20 additional limestone rock mounds, two additional karst pits, and eight other substantial features to the State Site 50-80-12-5119. State Site 50-80-12-5120 was originally recorded by Tuggle and Tomonari-Tuggle (1994) and re-identified during the International Archaeological Research Institute, Inc. survey (Tuggle and Tomonari-Tuggle (1997:169). State Site 50-80-12-5120 was recorded then as a World War Two battery complex, bivouac, bulldozed, crash site (*ibid*) with 10+ features. The current Archaeological Inventory Survey study has added multiple archaeological features to the site, including structural concrete pads and a karst pit.

In 2002, Aki Sinoto Consulting conducted an Archaeological Inventory Survey of the desalination facility at NAS Barbers Point, south of the east end of Ola`i Street (Sinoto and Titchenal 2002). Three sites, two cultural and one paleontological, were identified. Cultural features included a circular enclosure, a capped sinkhole, a cist-like structure and a lime kiln. A possible human bone toggle artifact was the only *iwi* was found to be recovered (Sinoto and Titchenal 2002:58). In addition, thirteen species of birds were identified including many extinct species.

FEATURE TYPES: ARCHAEOLOGICAL SUMMARY

ENCLOSURES AND PLATFORMS

Based on previous archaeological work on Naval Air Station Barbers Point and institutional knowledge, a discussion of feature types occurring in the `Ewa Plain is presented. This analysis of site types and discussion of such is treated both as a synthesis of previous work conducted in the area (see above) and the academic work of Scientific Consultant Services, Inc., in the area. References to specific site types are presented above.

Numerous stone-walled enclosures representing habitation loci proliferate in this inland zone beyond the coast where the soil mantle is shallow and deposits are most accurately assessed by their horizontal context rather than their vertical context. Features in this near-coastal zone consist of two common structural classes: platforms and mounds. Platforms are perhaps the vaguest of features in the `Ewa Plain, a characteristic not common to the feature type in other parts of the islands. The low, small, and poorly constructed platforms are so impecunious that Davis (1986) even suggested these platforms to be possible pavings. Typically associated with a habitation function, free-standing platforms are basically unknown in the area and no large, well-constructed platforms typically associated with ceremonial or larger habitation dwellings have been recently documented in the `Ewa Plain (Tuggle and Tomonari-Tuggle 1997:64). Both C-shapes and small rectangular enclosures are thought to have been the primary habitation loci on the `Ewa Plain. No house platforms have been documented to date. The rectangular house features themselves are typically small, with only modest quantities of artifacts and midden having been recovered from the features. This pattern is one that intimates limited feature occupational duration. Again, the question of permanent residences (and when) versus temporary/seasonal habitation loci emerges.

MOUNDS

Mounds are only slightly less ambiguous, with most researchers prescribing an agricultural function to these features. Sweet potato cultivation may be the primary function of most mounds, but these features take on many forms and sizes such that they have been designated as cairns, boundary markers, or even the very general term *ahu*. The mounds are variable in size, morphology, construction technique, and the presence/absence of cultural resources.

OTHER ARCHAEOLOGICAL FEATURE TYPES

Other classes of archaeological features occurring on the `Ewa Plain consist of C- and U-shaped habitation loci, circular enclosures (likely collapsed rectangular-shaped structures; Tuggle and Tomonari-Tuggle 1997:104), and the ubiquitous limestone "sinkholes," which have been described above. Paleoenvironmental features such as the "sinkholes" and wetlands have revealed a wealth of cultural and natural resources allowing researchers to further document paleoenvironmental change on local and regional levels. It is from the environmental research specifically that more robust arguments pertaining to human settlement patterns, adaptation, and chronology have been established for the area.

TRAILS

Finally, trails are known to occur across the `Ewa Plain but are, for the most part, not defined by constructed stone architecture such as other well known trails *(e.g.*, Stepping Stone Trail, Kealakekua, Hawai`i Island). Trails, often overlooked as significant features, are important for facilitation between features and between resource zones. The trails in this area are coastal trails and not part of a regional system. Dating prehistoric trails is difficult, at best, and is typically done through relative dating of archaeological features or features which the trail course around or through.

CHRONOLOGY

Chronology has been one issue at the center of many debates revolving around the timing of initial settlement of the `Ewa Plain and the terminus of settlement following Western Contact (*i.e.,* 1778). Tuggle and Tomonari-Tuggle (1997:78) note that over 142 samples have been processed for radiocarbon analysis of `Ewa Plain features. While a fairly complex argument with many competing theories, more conservative researchers intimate that the `Ewa Plain was not settled prior to A.D. 900-1100, with most settlement occurring from A.D. 1400-1800 (*ibid*).

Finally, as discussed above, much historic-era activity occurred across the `Ewa Plain and should not be dismissed. In the 1800s, salt works were established and by the late 1800s, the lands were utilized for grazing, sugar cane, and railroads, along with many permanent settlements were established. Commencing in the 1930s with the building of defensive batteries to support Pearl Harbor, by 1945, hundreds of military buildings were constructed, as well as landing strips, bunkers, and additional gun placement locations. The historic record of the `Ewa Plain is as rich as the pre-Contact record. Also, the Historic Period (post-1778) includes pre-Contact type sites that continued to be used at least into the 1800s.

EXPECTED FINDINGS WITHIN THE SURVEY AREA

Based on the findings of past archaeological studies (noted above) and archival research, prior to fieldwork there was reason to believe that this area was a fairly high activity area and that a number of sites could be expected. The archaeological data show a fairly consistent and important history for occupation of the area from pre-Contact times. Subsistence activities appear to have centered on marine exploitation, cultivation, and bird hunting. The types of archaeological sites that are primarily found in the `Ewa Plain are utilized sinkholes, habitation shelters and structures, stone piles or mounds, small enclosures, and both surface and subsurface deposits.

Utilized karst pits include a few that are large enough for temporary occupation, although many were also used for cultivation, trash deposition, in rare cases human interment, or some combination of these functions. Many of these karst pits were modified. Wickler and Tuggle (1997:105) found that structurally-modified sinkholes include a variety of formal types, including sinkholes with rock mounds or walls in close proximity, enclosed sink opening, filled or capped sinks, and stone structures built within sinkholes. In some cases, there are no associated structures. As such, karst pits were expected to be present in the current study area.

Recorded rock mounds and enclosures have often occurred in clusters thought to represent habitation complexes including sinkholes. Stone piles are interpreted as agricultural features, primarily for sweet potato cultivation (Davis 1990:240-243). Enclosures, including C-, U-, and L-shaped structures have been interpreted as habitation features (*ibid*). The habitation structures vary in size and intensity of occupation, but most are usually small. According to Wickler and Tuggle (1997:19), trails constitute a site category where there are fewer examples than would be expected. Based on these findings, each of these site types may be expected to occur in the current project area. However, trails, if present, are likely to be present in a fragmented stated due to military construction of roads.

Military features previously recorded have included concrete bunkers, concrete bunkers remnants, coastal bunkers, inland anti-aircraft battery complexes, training facilities, pavements, and trash scatters. The likelihood of encountering these types of historic features is expected to be high because of their recent age and intensive military construction and past use of the current project area.

FIELD AND LABORATORY METHODS

FIELD METHODS

Multiple field tasks were completed during the Archaeological Inventory Survey. A 100% pedestrian survey was conducted from February 20 through April 10, 2013 by SCS archaeologists Guerin Tome, B.A. and Stephanie Medrano, B.A., under the direction of Robert L. Spear, Ph.D., Principal Investigator. Transect spacing of ten to fifteen meter (32.8 to 49.2 feet) intervals was employed as ground visibility was moderate to good. Each surface archaeological feature was marked with biodegradable flagging tape. During the pedestrian survey, results were recorded on standard graph paper as well as with digital photography. Based on spatial context (*i.e.*, proximity) surface architectural features were consolidated into sites. Each site was given an SCS temporary site designation (*e.g.*, TS-1) and plotted on a United States Geological Survey (USGS) map with a handheld Garmin GPSMap60CSx and Garmin GPSMap72CSx global positioning system (GPS) units. The datum and coordinate system used for the GPS unit was NAD83 and UTM (Universal Transverse Mercator). True north and magnetic north compass orientations also were employed. All measurements were recorded in metric units. Archaeological sites containing multiple surface features were not drawn on singular Plan View Drawings to show spatial relationships to one another mostly due to distances between individual features and taller growth vegetation which effectively rendered feature sight lines difficult to discern. However, site maps comprised of GPS points were generated that show site boundaries, the types of features within each site, and also the spatial relationship to features within each site.

Subsurface testing involved hand excavation of seven test units (TU) and ten shovel probes (SP) in order to identify and record subsurface cultural deposits and artifacts directly associated with feature architecture on the ground surface. Subsurface testing was terminated when sterile soil was encountered. All excavated material was screened through 1/4" and 1/8" inch wire mesh and visually inspected for the presence of cultural material. Equipment utilized to perform these excavations included shovels, trowels, whisk brooms, and metric tape measures. Soil matrices were recorded using United States Department of Agriculture (USDA) Munsell

(2000) soil color descriptions. Stratigraphic profiles were completed for each excavated unit. Representative profiles of the test units and shovel probes are presented below.

LABORATORY METHODOLOGY

Non-fieldwork methods commenced with consultation and a review of documents pertaining to the project area. Consultation was conducted with Mr. Shad Kane (`Ewa Moku representative for the Oahu Island Burial Council) who served the current project as a contracted ethnohistorian from `Ahahui Siwila Hawai`i o Kapolei. Mr. Kane, who is well know for his knowledge of the general project area, was consulted before field work began as to the types of sites/features that might be encountered as well as other information he might feel was important. In addition, Mr. Kane worked in the field with the archaeological staff on an almost daily basis. His knowledge and assistance were invaluable.

Multiple documents were reviewed prior to fieldwork and after fieldwork to understand the historical setting of the project area and environs, as well as previous archaeological work conducted in the area. Maps were acquired from the Hawai`i State Archives; previously archaeological reports were research at the Bishop Museum and the State Historic Preservation Division in Kapolei.

All samples collected during the project have undergone analysis at the SCS laboratory in Honolulu. All photographs, illustrations, and field notes accumulated during the project are being curated at the SCS laboratory. All collected artifacts samples have been cleaned, sorted, and analyzed at the SCS laboratory. Significant artifacts have been photographed and classified (qualitative analysis) and all metric measurements and weights have been recorded (quantitative analysis). These data are presented in tabular form within this report. Midden samples have been minimally identified to major class (*e.g.,* bivalve, gastropod mollusk, echinoderm, fish, bird, and mammal). All data have been recorded on standard laboratory forms including the number and weight (as appropriate) of each constituent category. These counts are included in this report.

Representative plan view sketches showing the location and morphology of sites, features, and/or deposits identified during the current Archaeological Inventory Survey have been compiled and illustrated. Non-modified or naturally occurring karst pit features are simply described per each site below. The karst pits are natural (see discussion on dissolution pits, etc. above) and contain some sediment. For the purposes of this study, these features were simply noted and measured due to their affinity with other karst pits across the `Ewa coastal plain, some which are simply natural, some that have been modified, and some pits which have yielded paleoecological information and cultural materials (archaeological and non-archaeological).

Note that "archaeological sites" are used herein as being synonymous with "historic property," as is common in cultural resource management literature.

ARCHAEOLOGICAL INVENTORY SURVEY RESULTS

Archaeological Inventory Survey was conducted on approximately 44-acres of land in Kalaeloa, Honouliuli Ahupua`a, `Ewa District, Island of O`ahu, Hawai`i [TMK: (1) 9-1-013:070]. Twenty-one historic properties (State Sites 50-80-12-7483 through 50-80-12-7494 and 50-80-12-7496 through 50-80-12-7504), comprised of 146 features, were identified during the project (Figure 6). Two previously identified archaeological sites were re-located (State Sites 50-80-12-5119 and -5120). Of the 146 features found within TMK: (1) 9-1-013:070 a total of eight features recorded by Wickler and Tuggle (1997) were re-located. Of the remaining 138 features nine features could not be confirmed as having been recorded by Wickler and Tuggle (1997) based on the current Archaeological Inventory Survey results and the site descriptions of Wickler and Tuggle (1997). The remaining 129 features are newly recorded. Based on feature type, construction methods, and construction materials, State Sites 50-80-12-5119, -5120 (Features 1 and 2), -7483 through -7485, -7487 (Features 1 and 4), -7488 through -7494, and -7496 through -7504 were interpreted to be associated with the pre- and/or post-Contact Period. Based on a 1927 aerial photograph, a 1927 USGS quadrangle (Barber's Point) map, aerial coastal photo, general feature horizontal shape, and feature location within the project area, State Sites 50-80-12-7486 (Feature 5) and 50-80-12-7491 were interpreted as trails associated with the pre-and/or post-Contact Periods, with use possibly extending into the Historic Ranching Period. State Site 50-80-12-7487 (Feature 3 and 5) and State Site 50-80-12-5120 (Features 3 through 9) were interpreted to be associated with United States Military occupation of the area during the Historic Period based on construction methods, and construction materials. One feature was interpreted as have both associations with Pre-and/or early Post-Contact and Historic (military) periods based on feature type, construction methods, construction materials, and artifacts; this feature is identified during the current Archaeological Inventory Survey as State Site 50-80-12-5119, Feature 30 (C-shaped structure).

Site descriptions are presented below and are summarized in Table 2. Site GPS points have been tabulated and are presented in Appendix A. Please note that feature descriptions for the unmodified karst pits and agricultural mounds are described, and organized by feature type, rather than in numerical sequence, within the site descriptions (*e.g.* within State Site 50-80-12-5119, all of the karst pits are described in the same section, all of the tock mounds are discussed in the same section, etc.). Also, please, also, note that while feature

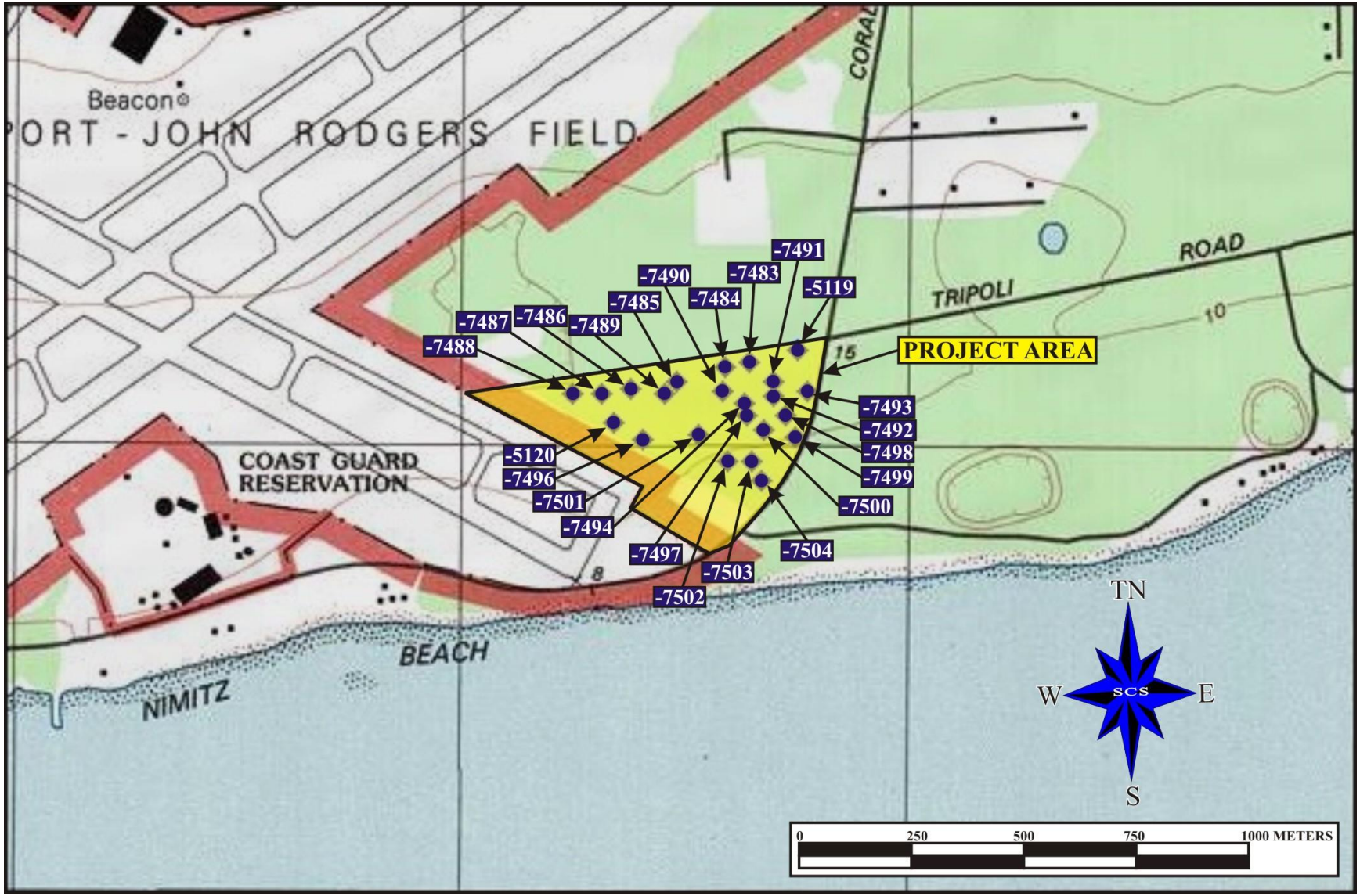

Figure 6: 1983 USGS 7.5 Quadrangle Map Showing Site Distributions in Project Area.

Table 2: Site Designation, Type, Function, and Significance Assessments.

Site Number	SCS Temp. Site #	Feature Totals	Feature Numbers	Feature Type	Function	Site Significance	Recommendations
50-80-12-5119	TS-1	37			Ag/ Habitation/ Refuse/ Storage	d	Preservation
			1	Karst Pit, Unmodified	Ag/Refuse		Preservation
			3	U-Shape	Habitation		
			15	Reverse F-Shape	Habitation		
			17	Karst Pit, Unmodified	Storage/Refuse		
			18	Karst Pit, Unmodified	Storage/Refuse		
			22	C-Shape	Habitation		
			24	L-Shape	Habitation		
			30	C-Shape	Habitation		
			34	Enclosure	Habitation		
			35	C-Shape	Habitation		
			37	U-Shape	Habitation		
			2, 4-14, 16, 19-21, 23, 25-26, 27A-27B, 28-29, 31-33, 36	Rock Mound	Agriculture		
50-80-12-5120	TS-14	9			Ag/ Refuse/Military/ Boundary	d	Preservation/No Further Work
			1	Karst Pit	Agriculture		Preservation
			2	Wall	Habitation		Preservation
			3	Concrete Pad	Military Building		No Further Work
			4	Guard Shack	Military Building		No Further Work
			5	Concrete Enclosure	Military Building		No Further Work

Site Number	SCS Temp. Site #	Feature Totals	Feature Numbers	Feature Type	Function	Site Significance	Recommendations
			6	Concrete Foundations	Military Building		No Further Work
			7	Pillbox	Military Building		No Further Work
			8	Concrete Foundations	Military Building		No Further Work
			9	Concrete Foundations	Military Building		No Further Work
50-80-12-7483	TS-2	10			Agricultural/Refuse Complex w/Pos. Burial Component	d, e	Preservation
			1	Karst Pit, Unmodified	Ag/Refuse		
			2	Karst Pit, Unmodified	Ag/Refuse		
			3	Karst Pit, Unmodified	Ag/Refuse		
			4	Rock Mound	Pos. Human Burial		
			5	Karst Pit, Unmodified	Ag/Refuse		
			6, 7, 8	Rock Mound	Agriculture		
			9	Karst Pit, Unmodified	Ag/Refuse		
			10	Karst Pit, Unmodified	Ag/Refuse		
50-80-12-7484	TS-3	3			Ag/Refuse Complex w/Habitation Component	d	Preservation
			1	Karst Pit, Unmodified	Ag/Refuse		
			2	Karst Pit, Unmodified	Ag/Refuse		
			3	Midden Scatter	Habitation		
50-80-12-7485	TS-4	2			Ag/Refuse Complex	d	Preservation
			1	Rock Mound	Agriculture		

Site Number	SCS Temp. Site #	Feature Totals	Feature Numbers	Feature Type	Function	Site Significance	Recommendations
			2	Karst Pit, Unmodified	Ag/Refuse		
50-80-12-7486	TS-5	5			Ag/refuse/storage/ Travel/ Ranching/with Pos. Burial Component	d, e	Preservation
			1	Karst Pit	Agriculture/Storage		
			2	Rock Mound	Pos. Human Burial		
			3	Karst Pit, Unmodified	Ag/Refuse		
			4	Karst Pit, Unmodified	Ag/Refuse		
			5	Linear Path	Transport		
50-80-12-7487	TS-6	12			Ag/ Refuse/Storage/ Military/Boundary	d	Data Recovery/Preservation/No Further Work
			1A	Karst Pit, Unmodified	Ag/Refuse		Preservation
			1B	Karst Pit, Unmodified	Ag/Refuse		Preservation
			1C	Karst Pit, Unmodified	Ag/Refuse		Preservation
			1D	Karst Pit, Unmodified	Ag/Refuse		Preservation
			1E	Karst Pit, Unmodified	Ag/Storage		Preservation
			1F	Karst Pit, Unmodified	Ag/Refuse		Preservation
			2A	Airplane Crash	Modern; Transport		Data Recovery
			2B	Airplane Crash	Modern; Transport		Data Recovery
			2C	Airplane Crash	Modern; Transport		Data Recovery
			3	Concrete Pads	Military Foundation		No Further Work
			4	L-Shape	Boundary Wall		Preservation
			5	Platform/Wall	Historic Foundation		Preservation
50-80-12-7488	TS-7	1		Karst Pit	Ag/Refuse	d	Preservation
50-80-12-7489	TS-8	2			Ag/Refuse	d	Preservation

Site Number	SCS Temp. Site #	Feature Totals	Feature Numbers	Feature Type	Function	Site Significance	Recommendations
			1	Karst Pit	Ag/Refuse		
			2	Karst Pit	Ag/Refuse		
50-80-12-7490	TS-9	3			Multi-functional w/Ag/Storage Component	d	Preservation
			1	Walled Karst Pit	Ag/Refuse		
			2	Karst Pit, Unmodified	Ag/Refuse		
			3	Karst Pit, Unmodified	Ag/Refuse		
50-80-12-7491	TS-10	1		Linear Path	Transport	d	Preservation
50-80-12-7492	TS-11	45			Ag/Habitation Complex	d	Preservation
			1	C-Shape	Habitation		
			2	Karst Pit, Unmodified	Storage/Refuse		
			3A, 3B	Rock Mound	Agriculture		
			4A- 4D	Rock Mound Complex	Agriculture		
			5	C-Shape	Habitation		
			6A - 6Y	Rock Mound Complex	Agriculture		
			7	Enclosure	Habitation		
			8	C-Shape	Habitation		
			9	U-Shape	Habitation		
			10	U-Shape	Habitation		
			11	Enclosure	Habitation		
			12	T-Shape	Habitation		
			13	Reverse J-Shape	Habitation		
			14	L-Shape	Habitation		
			15	C-Shape	Habitation		
			16	C-Shape	Habitation		
			17	Enclosure	Habitation		
50-80-12-7493	TS-12	1		Karst Pit	Storage/Refuse	d	Preservation

Site Number	SCS Temp. Site #	Feature Totals	Feature Numbers	Feature Type	Function	Site Significance	Recommendations
50-80-12-7494	TS-13	1		Walled Karst Pit	Agriculture/Storage	d	Preservation
50-80-12-7496	TS-15	2			Hab/Ag/Storage Complex	d	Preservation
			1	Platform	Habitation		
			2	Platform/Mound	Agriculture/Storage		
50-80-12-7497	TS-16					d	Preservation
			1	Rock Mound	Agriculture		
50-80-12-7498	TS-17	3			Ag/Refuse/Storage/ Undetermined	d	Preservation
			1	Karst Pit	Storage/Refuse		
			2A	Karst Pit	Undetermined		
			2B	Karst Pit	Agriculture/Refuse		
50-80-12-7499	TS-18	3		Karst Pit Complex	Ag/Storage/Refuse	d	Preservation
			1	Karst Pit	Refuse/Storage		
			2	Karst Pit	Refuse/Storage		
			3	Walled Karst Pit	Ag/Refuse		
50-80-12-7500	TS-19	1		Karst Pit	Ag/refuse	d	Preservation
50-80-12-7501	TS-20	1	1	Rock Mound	Dozer Push Pile	d	Data Recovery
50-80-12-7502	TS-21	1	1	Rock Mound	Agriculture	d	Data Recovery
50-80-12-7503	TS-22	1	1	C-Shape	Habitation	d	Preservation
50-80-12-7504	TS-23	2			Ag/Refuse	d	Preservation
			1	Karst Pit	Ag/Refuse		
			2	Rock Mound	Agriculture		

dimensions and orientation are provided, plan view drawings were not compiled for the unmodified karst pits or for the agricultural mounds. However, representative photographs are provided for these feature types within the appropriate site description. Information pertaining to the agricultural mounds has been tabulated and is presented in Table 3.

A single radiocarbon sample was submitted to Beta Analytic, Inc. for radiocarbon dating and the results appear in Appendix B. Representative photographs were taken. Artifacts and other cultural material collected from ground surface and subsurface contexts during the project (see Appendix C).

CONSULTED PROJECT ORGANIZATIONS

Various agencies, organizations, and firms involved in the current solar farm project on TMK: (1) 9-1-013:070 were consulted at prior to, during, and after completion of the archaeological fieldwork. Consultation with these interested parties will continue until the project is completed. These parties are listed below:

- Hawaii Community Development Authority (HCDA),
- State Historic Preservation Division (SHPD),
- O`ahu Island Burial Council (OIBC),
- Kalaeloa Heritage Park (KHP),
- `Ahahui Siwila o Hawai`i o Kapolei Hawaiian Civic Club (ASHOK),
- Group 70 International (G70), and
- Scientific Consultant Services (SCS), Inc.

On April 8, 2013 representatives from each if the interested parties listed above attended an in-field walkthrough of the project area. The purpose of the walkthrough was to familiarize everyone with the types of historic properties found during the Archaeological Inventory Survey. The names of the people who attended of the walkthrough are listed below:

- Tesha Malama (HCDA Kalaeloa Director),
- Craig Uemura (HCDA Assets Management Specialist),
- Susan Lebo (SHPD O`ahu Lead Archaeologist),
- Miss Hinaleimoana Wong-Kalu (OIBC Chairwoman),
- Mr. Shad Kane (OIBC, KHP, and ASHOK),
- Mr. Kawika McKeague (G70 Project Senior Planner and Director of Cultural Planning),
- Michael Bungcayao (G70 Project Civil Engineer), and
- Robert L. Spear (SCS Project Archaeological Principal Investigator), and
- Guerin Tome (SCS Archaeological Field Supervisor).

Table 3: Rock Mounds

SCS PROJECT 1276 Agricultural Mounds							
State Site Number	**Temporary Site and Feature Number**	**GPS Coordinates Easting/Northing**		**Length in meters**	**Width in meters**	**Height in meters**	**Notes**
50-80-12-5119	TS-1 F2	E 597731	N 2356202	2.4	1.36	0.5	
50-80-12-5119	TS-1 F4	E 597733	N 2356193	2.14	1.23	0.48	
50-80-12-5119	TS-1 F5	E 597740	N 2356196	2.13	1.8	0.49	
50-80-12-5119	TS-1 F6	E 597727	N 2356186	2.25	1.5	0.55	
50-80-12-5119	TS-1 F7	E 597726	N 2356182	2.73	1.9	0.45	
50-80-12-5119	TS-1 F8	E 597719	N 2356184	2.65	1.5	0.34	
50-80-12-5119	TS-1 F9	E 597723	N 2356190	2.2	1.55	0.4	
50-80-12-5119	TS-1 F10	E 597720	N 2356182	2.34	1.8	3.4	
50-80-12-5119	TS-1 F11	E 597722	N 2356182	1.8	1.55	0.24	
50-80-12-5119	TS-1 F12	E 597723	N 2356181	3	1.25	0.3	
50-80-12-5119	TS-1 F13	E 597723	N 2356185	2.56	1.15	0.55	
50-80-12-5119	TS-1 F14	E 597720	N 2356185	3.25	1.54	0.34	
50-80-12-5119	TS-1 F16	E 597716	N 2356189	2.55	1.53	0.36	
50-80-12-5119	TS-1 F19	E 597736	N 2356196	2.2	3.36	0.45	
50-80-12-5119	TS-1 F20	E 597739	N 2356173	2.83	1.63	0.52	
50-80-12-5119	TS-1 F21	E 597731	N 2356181	4.14	1.7	0.4	
50-80-12-5119	TS-1 F23	E 597734	N 2356188	4.02	1.42	0.38	
50-80-12-5119	TS-1 F25	E 597741	N 2356194	1.78	1.2	0.3	
50-80-12-5119	TS-1 F26	E 597743	N 2356194	2.36	1.46	0.35	
50-80-12-5119	TS-1 F27 A	E 597741	N 2356186	4.85	1.82	0.48	
50-80-12-5119	TS-1 F27 B	E 597750	N 2356172	3.64	1.58	0.48	
50-80-12-5119	TS-1 F28	E 597750	N 2356172	2.8	1.7	0.5	
50-80-12-5119	TS-1 F29	E 597748	N 2356181	2.4	1.4	0.35	
50-80-12-5119	TS-1 F31	E 597709	N 2356198	2.2	1.13	42	

SCS PROJECT 1276 Agricultural Mounds							
State Site Number	**Temporary Site and Feature Number**	**GPS Coordinates Easting/Northing**		**Length in meters**	**Width in meters**	**Height in meters**	**Notes**
50-80-12-5119	TS-1 F32	E 597707	N 2356194	3.03	2.5	0.43	
50-80-12-5119	TS-1 F33	E 597700	N 2356191	3.6	1.7	0.42	
50-80-12-5119	TS-1 F36	E 597706	N 2356195	1.85	1.25	0.45	
50-80-12-7483	TS-2 F6	E 597627	N 2356144	4.45	1.55	1.98	
50-80-12-7483	TS-2 F7	E 597617	N 2356154	2.51	1.39	0.59	
50-80-12-7483	TS-2 F8	E 597617	N 597617	1.72	1.1	0.47	
50-80-12-7485	TS-4 F1	E 597479	N 2356141	6.3	.5 to 1.1	.2 to .55	Linear Limestone Mound
50-80-12-7492	TS-11 F3 A	E 597752	N 2356115	4.47	2.23	0.43	
50-80-12-7492	TS-11 F3 B	E 597749	N 2356109	2.17	1.53	0.58	
50-80-12-7492	TS-11 F4 A	E 597740	N 2356098	3	2.45	0.63	Limestone Mound Complex
50-80-12-7492	TS-11 F4 B	E 597746	N 2356117	1.9	1.2	0.42	Limestone Mound Complex
50-80-12-7492	TS-11 F4 C	E 597736	N 2356103	3.55	2.12	0.59	Limestone Mound Complex
50-80-12-7492	TS-11 F4 D	E 597739	N 2356103	2.15	1.27	0.45	Limestone Mound Complex
50-80-12-7492	TS-11 F6 A	E 597732	N 2356131	2.3	2	0.62	Limestone Mound Complex
50-80-12-7492	TS-11 F6 B	E 597736	N 2356134	2.15	1.8	0.59	Limestone Mound Complex
50-80-12-7492	TS-11 F6 C	E 597723	N 2356130	2.1	1.38	0.54	Limestone Mound Complex
50-80-12-7492	TS-11 F6 D	E 597722	N 2356129	2.55	1.54	0.5	Limestone Mound Complex
50-80-12-7492	TS-11 F6 E	E 597715	N 2356129	2.27	1.43	0.3	Limestone Mound Complex
50-80-12-7492	TS-11 F6 F	E 597715	N 2356129	2.7	1.46	0.34	Limestone Mound Complex
50-80-12-7492	TS-11 F6 G	E 597711	N 2356127	2	1.15	0.5	Limestone Mound Complex
50-80-12-7492	TS-11 F6 H	E 597716	N 2356125	2.72	1.05	0.46	Limestone Mound Complex
50-80-12-7492	TS-11 F6 I	E 597719	N 2356125	2.47	1.5	0.47	Limestone Mound Complex
50-80-12-7492	TS-11 F6 J	E 597722	N 2356130	1.43	1.02	0.36	Limestone Mound Complex
50-80-12-7492	TS-11 F6 K	E 597733	N 2356130	2.03	1.56	0.47	Limestone Mound Complex
50-80-12-7492	TS-11 F6 L	E 597723	N 2356123	1.06	0.94	0.38	Limestone Mound Complex

SCS PROJECT 1276 Agricultural Mounds							
State Site Number	**Temporary Site and Feature Number**	**GPS Coordinates Easting/Northing**		**Length in meters**	**Width in meters**	**Height in meters**	**Notes**
50-80-12-7492	TS-11 F6 M	E 597723	N 2356119	2.06	1.33	0.44	Limestone Mound Complex
50-80-12-7492	TS-11 F6 N	E 597716	N 2356120	1.7	1.43	0.42	Limestone Mound Complex
50-80-12-7492	TS-11 F6 O	E 597726	N 2356110	1.62	1.35	0.5	Limestone Mound Complex
50-80-12-7492	TS-11 F6 P	E 597728	N 2356108	2.03	1.1	0.5	Limestone Mound Complex
50-80-12-7492	TS-11 F6 Q	E 597726	N 2356110	2.1	1.94	0.5	Limestone Mound Complex
50-80-12-7492	TS-11 F6 R	E 597728	N 2356109	2.12	1.74	0.63	Limestone Mound Complex
50-80-12-7492	TS-11 F6 S	E 597728	N 2356108	2.09	2.07	0.49	Limestone Mound Complex
50-80-12-7492	TS-11 F6 T	E 597728	N 2356107	2.33	2.12	0.43	Limestone Mound Complex
50-80-12-7492	TS-11 F6 U	E 597725	N 2356098	3.2	2.15	0.76	Limestone Mound Complex
50-80-12-7492	TS-11 F6 V	E 597721	N 2356102	3.1	2.34	0.57	Limestone Mound Complex
50-80-12-7492	TS-11 F6 W	E 597721	N 2356102	2.27	2.08	0.64	Limestone Mound Complex
50-80-12-7492	TS-11 F6 X	E 597705	N 2356133	3.8	2.9	0.52	Limestone Mound Complex
50-80-12-7492	TS-11 F6 Y	E 597698	N 2356135	1.92	1.73	0.44	Limestone Mound Complex
50-80-12-7497	TS-16 F1	E 597634	N 2356062	3.05	1.93	0.5	
50-80-12-7501	TS-20 F1	E 597527	N 2356021	3.5	2.1	40	Possible Historic Push Pile
50-80-12-7502	TS-21 F1	E 597590	N 2355962	1	1	0.5	
50-80-12-7504	TS-23 F2	E 597659	N 2355905	3.15	2.9	0.65	

Amongst the historic properties shown to the representatives were State Site 50-80-12-7483 (Feature 4) and State Site 50-80-12-7486 (Feature 2) which were limestone rock mounds thought to possibly contain human burials based on feature morphology (size and shape, particularly in comparison to other features within the project area), construction methods, and construction materials. State Site 50-80-12-7483 (Feature 4) and State Site 50-80-12-7486 (Feature 2) are among several historic properties found during the current Archaeological Inventory Survey selected for preservation.

SITE DESCRIPTIONS

STATE SITE 50-80-12-5119 (SCS SITE TS-1)

State Site 50-80-12-5119 is a previously identified site with newly identified features. State Site 50-80-12-5119 was initially identified by Tuggle and Tomonari-Tuggle (1994) and subsequently re-described in Tuggle and Tomonari-Tuggle (1997: 87) as "...a set of ambiguous stone mounds of uncertain origin and as ... a complex of rough, possible agricultural stone mounds. It falls in an area that was heavily developed as part of the WWII Station construction and may be military in origin..." (*ibid*:108). State Site 50-80-12-5119 is summarized by Tuggle and Tomonari-Tuggle (*ibid:*112: Table 8) as consisting of 7 features interpreted to represent a Hawaiian agricultural complex.

During the current survey, SCS identified a total of thirty-seven (37) surface features. It is likely that the seven limestone rock mounds previously identified by Tuggle and Tomonari-Tuggle (1994) were among the features documented during the current survey. Given the brief nature of the Tuggle and Tomonari-Tuggle (1997) description of State Site 50-80-12-5119 and the unavailability of Tuggle and Tomonari-Tuggle's report (1994), SCS was unable to discern which 7 seven features had been previously identified. State Site 50-80-12-5119 currently measures 62.5 by 49.0 meters (m) and is oriented along an east/west axis with a compass bearing of 90/270 degrees (Magnetic).

The identified features consist of three karst pits, 26 rock mounds, two U-shaped structures, one semi-walled structure, three C-shaped structures, one L-shape structure, and one enclosure (Figure 7) (see Table 2). State Site 50-80-12-5119 was found to be in good condition. Based on the previously, and newly, identified feature types and functions, State Site 50-80-12-5119 has been interpreted as a habitation/agriculture/refuse/storage/military complex associated with the pre-and/or early post-Contact through Historic Period. State Site 50-80-12-5119 has been evaluated for significance, as outlined in HAR

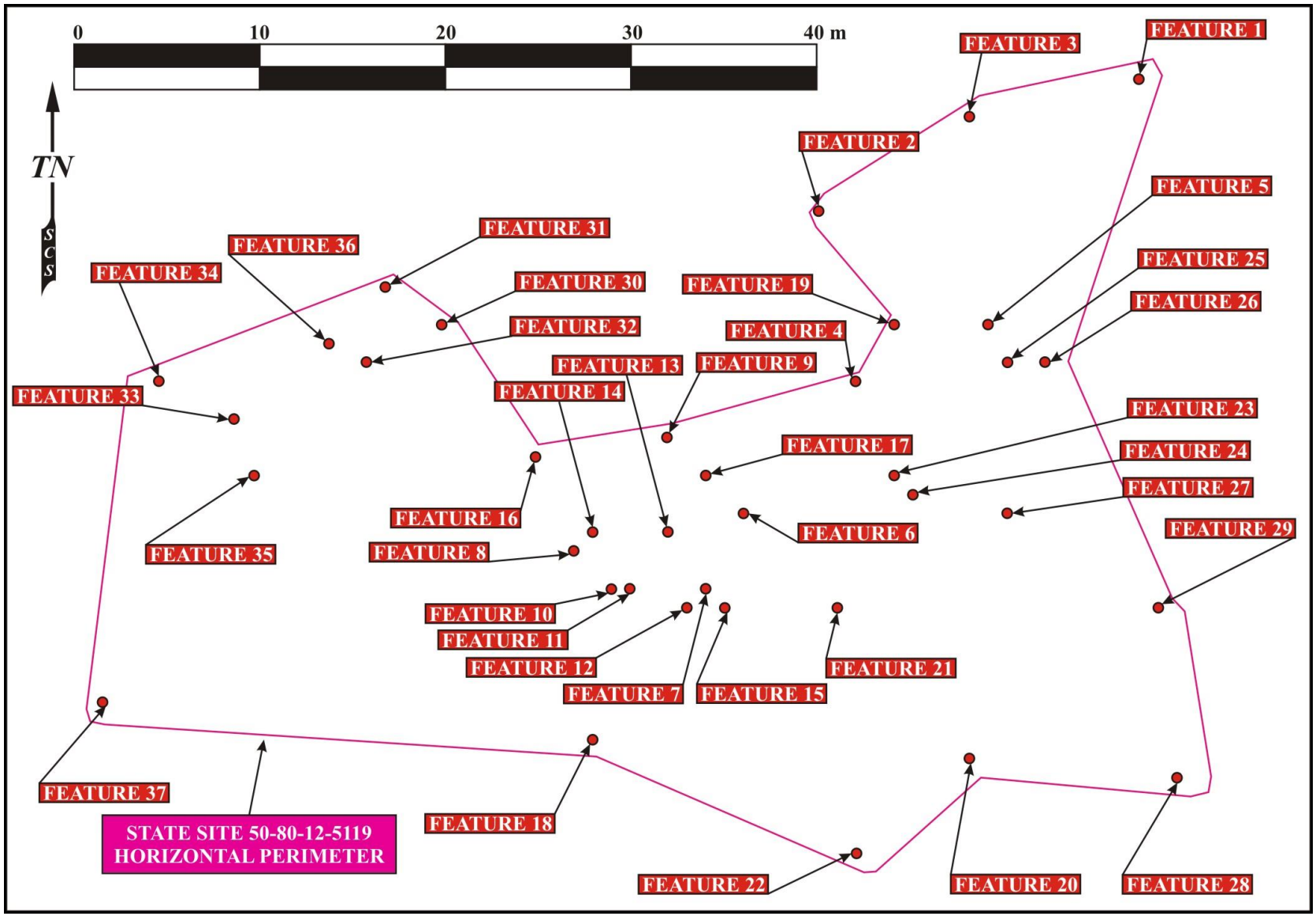

Figure 7: Map of State Site 50-80-12-5119 Showing Feature Locations and Spatial Relationships Between Features.

§13-275-6, and found to be significant under Criterion d, for information content. As archaeological subsurface testing was not conducted for all the features, the potential remains for additional cultural information to be present in subsurface contexts. Thus, a recommendation of preservation has been made for the features within State Site 50-80-12-5119. It should be noted that during the Geolabs Inc. (2012) mechanical disturbance to the project area, a portion of State Site 50-80-12-5119 was bulldozed (Figure 8). The Hawaii Community Development Authority (HCDA) investigative report of the unauthorized earthmoving by Geolabs, Inc. within Tax Map Key (1) 9-1-013:070 is located in Appendix D.

Feature: Type: Karst Pit
GPS Coordinates (average): E 597748 N 2356209
Feature: 1, 17, and 18
Function: Agriculture/Storage/Refuse
Age: Pre-and/or early Post-Contact Period
Condition: Good

Description: State Site 50-80-12-5119, included three karst pits with no observed cultural modifications or cultural materials (Features 1, 17, and 18). The three pits measure between 1.10 and 1.30 m long, 0.74 to 0.88 m wide, and extend from 0.52 to 1.10 m below the surface (bs) and were found to be in good condition. Based on feature type, these karst pits are interpreted as associated with the pre-and/or early post-Contact Period. At present, only modern materials were observed in these three pits. As archaeological subsurface testing was not conducted of Features 1, 17, and 18 potential exists for these features to contain additional cultural information. Thus, they are recommended for preservation.

State Site 50-80-12-5119, Feature 1

State Site 50-80-12-5119, Feature 1 (1.10 by 0.74 by 0.56 m deep) consisted of an irregularly shaped and unmodified karst pit. Feature 1 was oriented along a north/south axis with a compass bearing of 355 degrees (Magnetic). The soil within Feature 1 is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 1 may have functioned as a refuse pit. Thus, Feature 1 was interpreted as having an agriculture/refuse function. Feature 1 was found to be in good condition. A representative photograph of Features 1, 17 and 18 is provided in Figure 9.

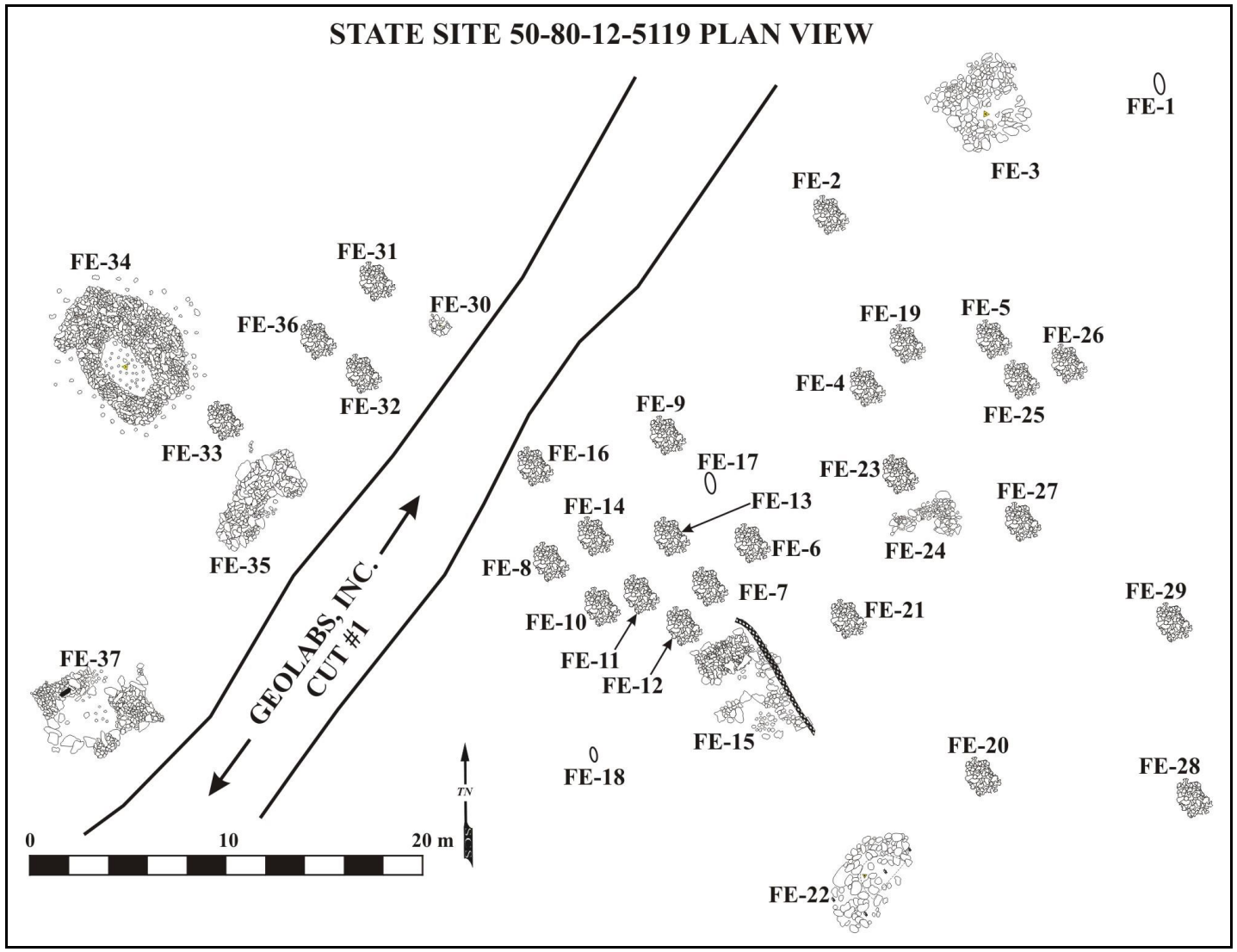

Figure 8: State Site 50-80-12-5119 Plan View Drawing Showing Spatial Relationship of the Features to Geolabs, Inc. Disturbance (2012).

Figure 9: Representative Photographic View of State Site 50-80-12-5119, Features 1 Karst Pit. View to Northwest.

State Site 50-80-12-5119, Feature 17

State Site 50-80-12-5119, Feature 17 (1.60 by 1.10 by 0.80 m deep) consisted of an irregularly shaped and unmodified karst pit. Feature 17 was oriented along an east/west axis with a compass bearing of 290 degrees (Magnetic). A single bovine vertebrae and limestone cobbles were found in the interior of Feature 17. Feature 17 was interpreted as a having a storage or refuse function as the karst pit contains a cavity in which items (*i.e.,* gourds containing water) may be stored. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 17 may have functioned as a refuse pit. Feature 17 was found to be in good condition.

State Site 50-80-12-5119, Feature 18

State Site 50-80-12-5119, Feature 18 (0.88 by 0.52 by 1.30 m deep) consisted of an irregularly shaped and unmodified karst pit. Feature 18 was oriented along a northeast/southwest axis with a compass bearing of 51 degrees (Magnetic). Feature 18 was interpreted as a having a storage or refuse function as the karst pit contains a cavity in which items (*i.e.,* gourds containing water) can be stored. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 18 may have functioned as a refuse pit. Feature 18 was found to be in good condition.

Feature Type: Rock mound
Features: 2, 4, 5, 6, 7, 8, 9, 10 11, 12, 13,14, 16, 19, 20, 21, 23, 25, 26, 27, 28, 29, 31, 32, 33, 36
GPS Coordinates (average): E 597731 N 2356202
Function: Agriculture
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-12-5119, included multiple features (N=26) consisting of irregular- and linear-shaped limestone mounds located on flat ground surfaces across Site -5119 (see Table 3). On average, the mounds measure 2.70 m long by 1.40 m wide, with an average height of 0.46 m above the surface. Mound length varies from a minimum 1.80 m to 4.14 m while width varies from 1.13 m to 3.36 m. The height range of the mounds is variable, from a minimum 0.24 m to a maximum 3.40 m above the surface. The features were constructed of dry-laid limestone cobbles and small boulders, both being sub-rounded and angular. The rocks were piled a variable two to five courses high, with the cobbles and boulders being interspersed. A majority of the mounds were in fair condition. Based on feature type, construction methods, and construction materials, the thirty-three features were interpreted as agricultural mounds

associated with the pre- and/or early post-Contact Period. These were not interpreted as clearing mounds but rather, locations of piled rocks that could trap moisture and allow for crops such as sweet potato to grow. As archaeological subsurface testing was not conducted of Features 2, 4, 5, 6, 7-14, 16, 19, 20, 21, 23, 25, 26, 27, 28, 29, 31, 32, 33, and 36, the potential was found to be for these features to contain additional cultural information. Thus, a recommendation of preservation has been made for these features within State Site 50-80-12-5119. Representative photographs of the irregular and linear agricultural mounds identified at Site -5119 are provided in Figure 10 and 11).

Feature Type: C-Shaped structure
Feature: 3
GPS Coordinates (average): E 597738 N 2356207
Function: Temporary Habitation
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-12-5119, Feature 3 consists of a U-shaped structure (Figures 12 and 13) with surface feature exterior dimensions of 4.8 m long by 4.2 m wide and surface feature interior dimensions of 1.5 m long x 90 cm wide. Wall thickness measured an average 0.60 m. Surface feature heights above ground surface ranged between a minimum of 10 cm to a maximum of 60 cm. The long axis of the feature is oriented on a southeast/northwest axis (126°/306°, Magnetic).

The feature was constructed of locally available dry-laid limestone cobbles and small boulders. The cobbles and small boulders are angular and sub-angular in shape and ran two to four courses high. The opening of the enclosure faces northeast. Although Feature 3 exhibited the effects of disturbance by root wedging of *kiawe* trees, the feature was found to be in fair condition. Based on feature type, construction method, and construction materials, this feature has been interpreted as a habitation feature associated with pre-and/or early post-Contact Period.

Figure 10: Photographic View of State Site 50-80-12-5119, Feature 28. View to Southwest.

Figure 11: Photographic View of Linear-Shaped Rock Mound Feature 14 of State Site 50-80-12-5119. View to Northeast.

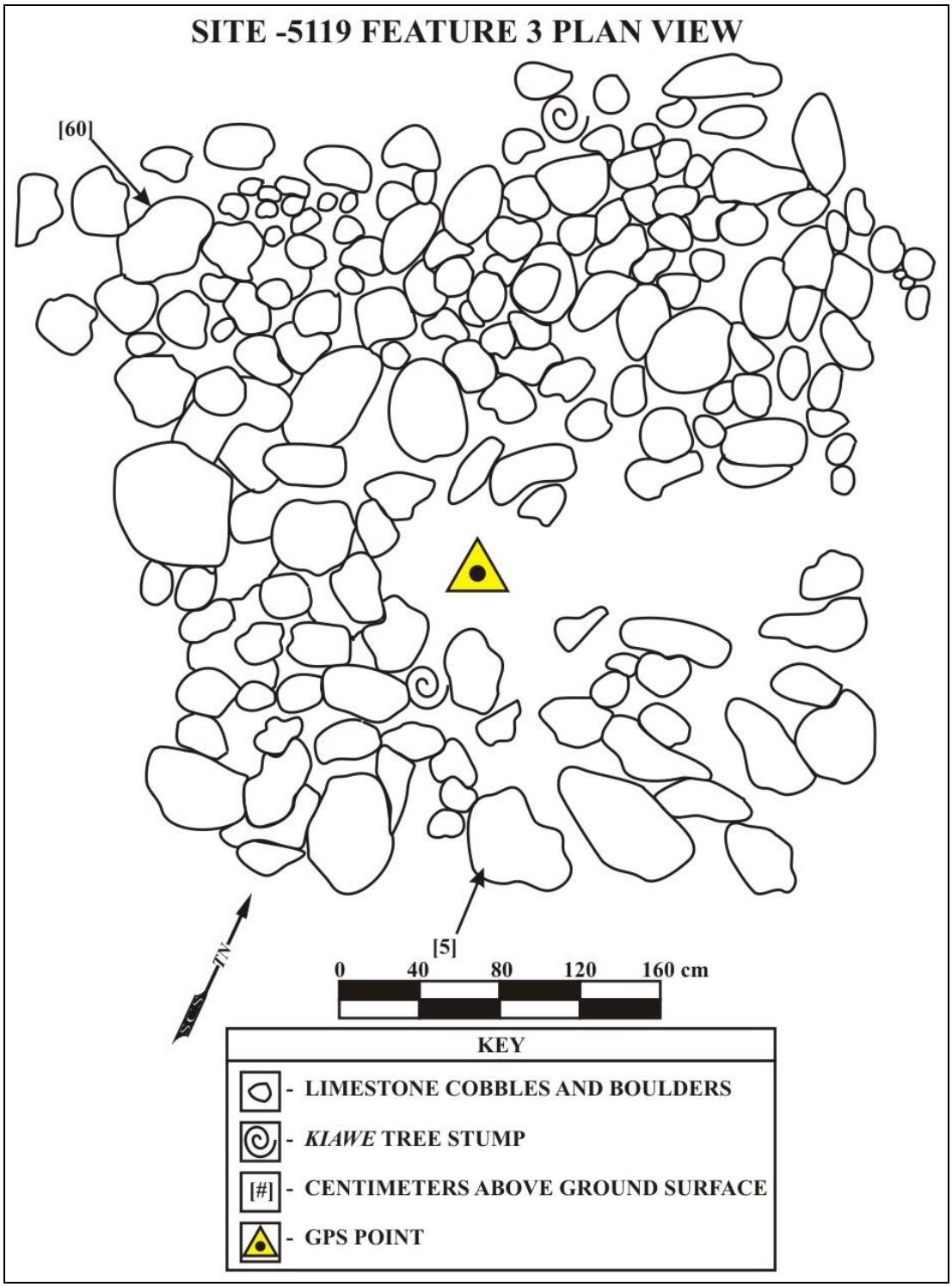

Figure 12: Plan View Drawing of State Site 50-80-12-5119, Feature 3.

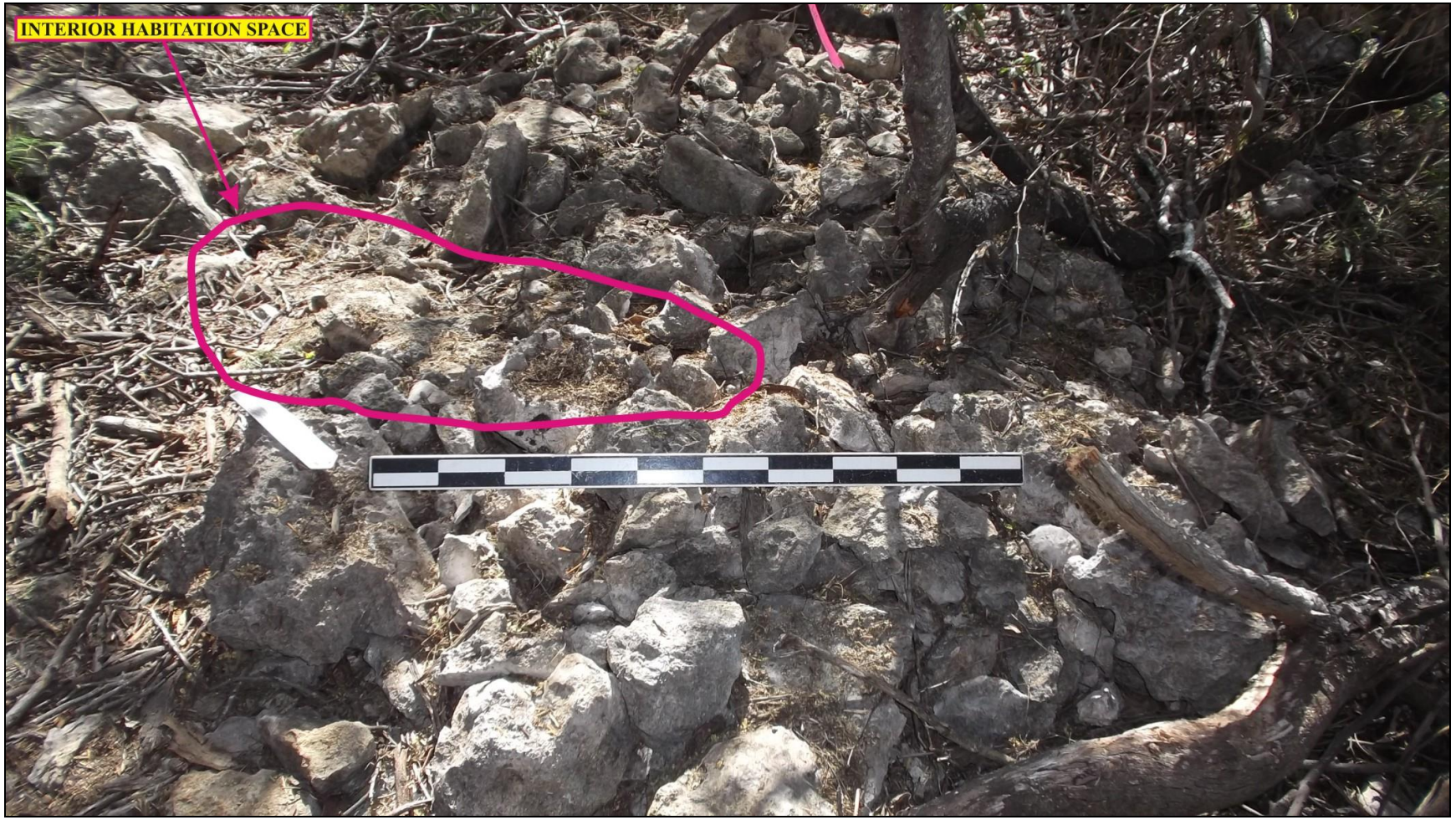

Figure 13: Photographic View of State Site 50-80-12-5119, Feature 3. View to Southwest.

Feature Type: Semi-walled structure
Feature: 15
GPS Coordinates: E 597726 N 2356181
Function: Habitation
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-12-5119, Feature 5 consists of a semi-walled structure with a long axis and parallel wall that runs perpendicular to the long axis (Figures 14 and 15). Surface feature exterior dimensions measure 7.25 m long by 5.5 m wide, with surface feature heights above ground ranging between 12 cm to 46 cm. The long axis of the feature is oriented northeast/southwest (36/216 degrees, Magnetic). The wall measures 6.50 m long, 0.25-0.30 m wide, and rises to 0.80 m above the surface.

The feature was constructed of dry-laid limestone cobbles and small boulders. The cobbles and small boulders are angular and sub-angular in shape and stacked two to five courses high. Although Feature 15 exhibited disturbance, including root wedging of *kiawe* trees, it was found to be in fair condition. Based on feature type, construction methods, and construction materials, this feature has been interpreted as a habitation feature associated with pre-and/or early post-Contact Period.

Feature Type: C-Shaped structure
Feature: 22
GPS Coordinates: E 597733 N 2356168
Function: Habitation
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-12-5119, Feature 22 consists of an C-shaped structure (Figures 16 and 17) with surface feature exterior dimensions of 5.2 m long by 2.8 m wide, and surface feature interior dimensions of 2.1 m long by 1.8 m wide. Surface feature height above the ground surface reached a maximum 0.52 m. The long axis of the feature is oriented southeast/northwest (140/320 degrees, Magnetic).

Feature 22 was also constructed of dry-laid limestone cobbles and small boulders. The cobbles and small boulders are sub-rounded and sub-angular in shape and piled (not stacked) no more than two courses high. The opening of the enclosure faces east/southeast. The feature exhibited the effects of weathering, including root wedging of grasses and weeds, as well as portions of collapse and scattering of feature rocks. The feature was assessed as in fair

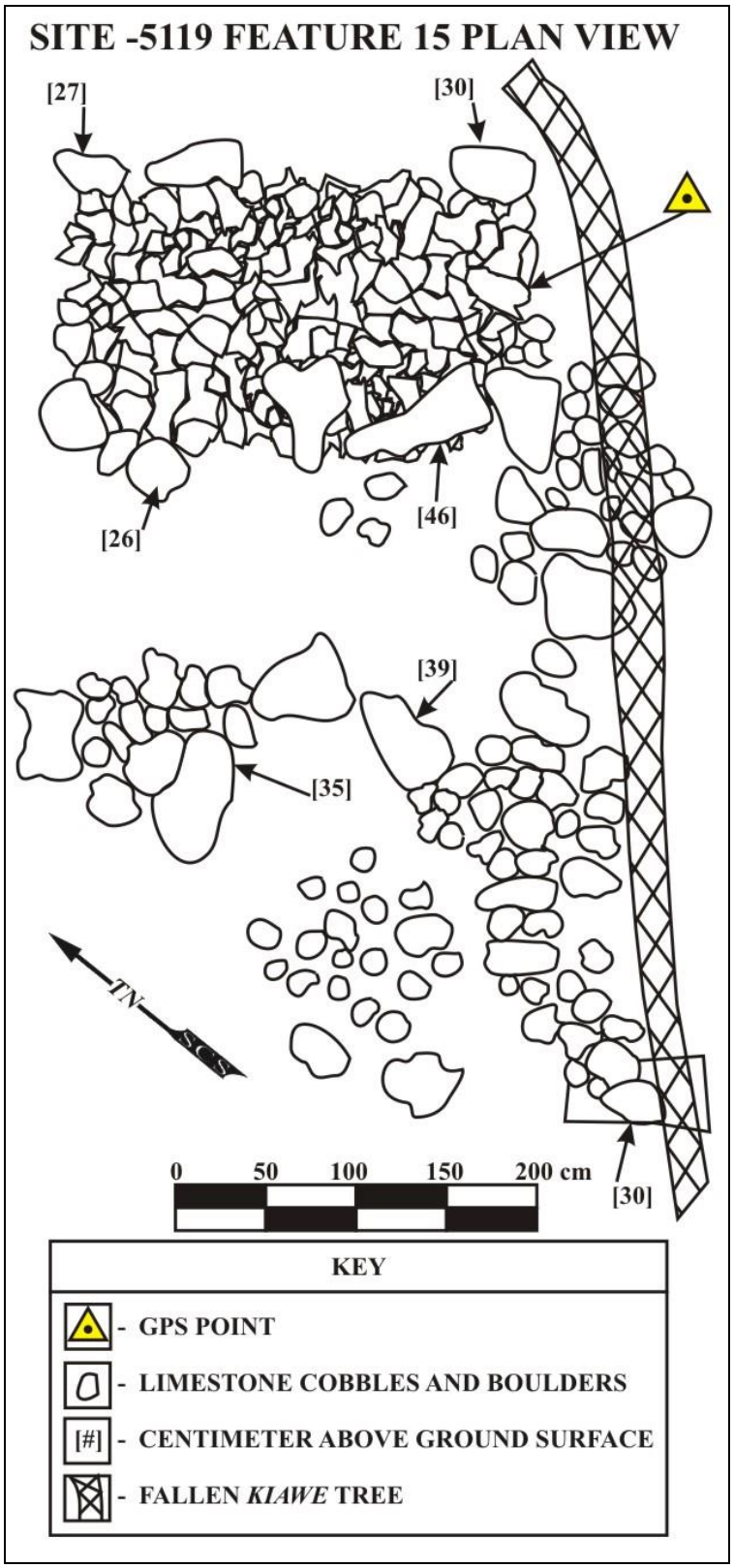

Figure 14: Plan View Drawing of State Site 50-80-12-5119, Feature 15.

Figure 15: Photographic View of State Site 50-80-12-5119, Feature 15. View to Southwest.

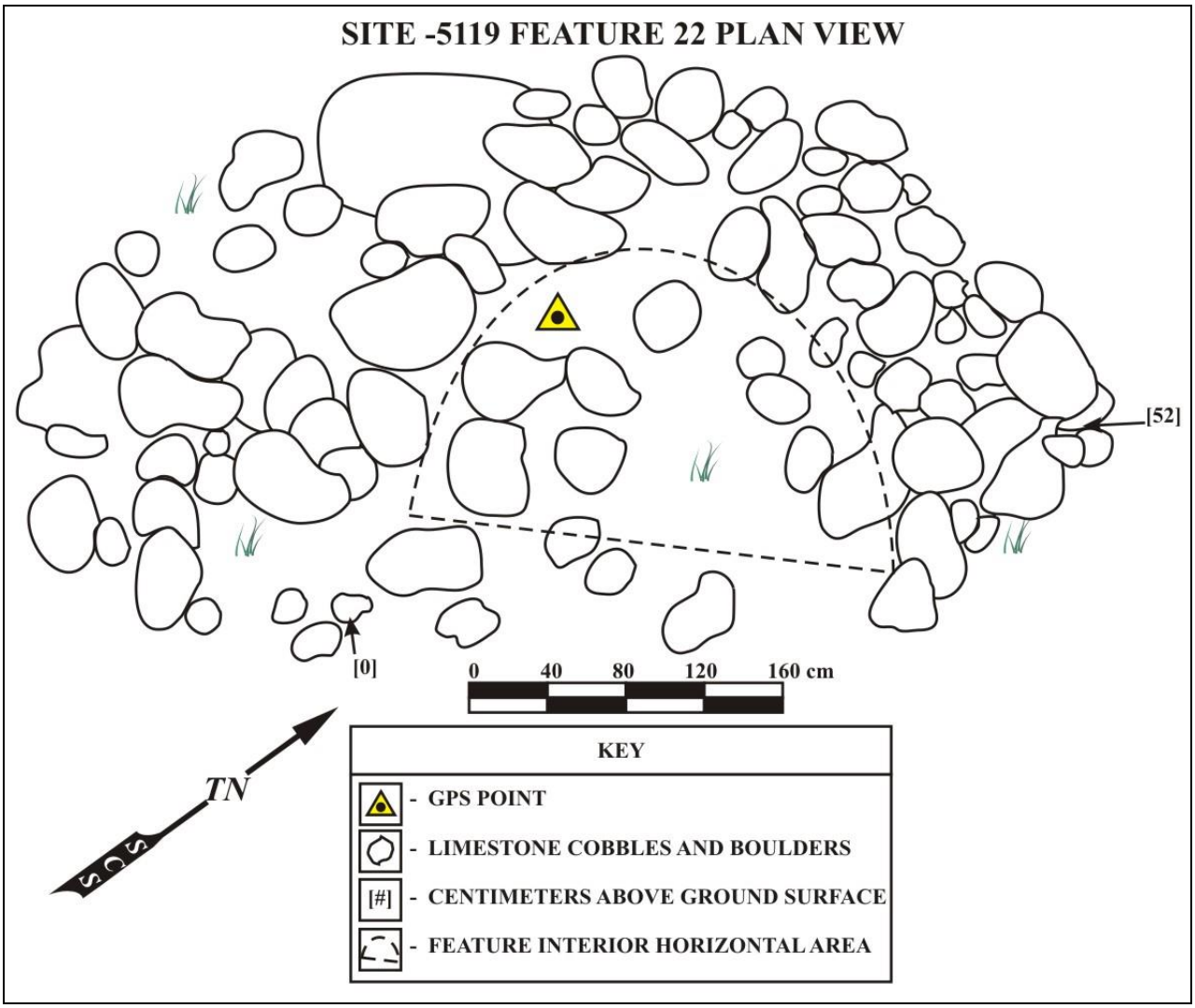

Figure 16: Plan View Drawing of State Site 50-80-12-5119, Feature 22.

Figure 17: Photographic View of State Site 50-80-12-5119, Feature 22. View to Northwest.

condition. Based on feature type, construction methods, and construction materials, this feature has been interpreted as a habitation feature associated with pre-and/or early post-Contact Period.

Feature Type: L-Shaped structure
Feature: 24
GPS Coordinates: E 597736 N 2356187
Function: Habitation
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-12-5119, Feature 24 consists of an L-shaped structure (Figures 18 and 19) with surface feature dimensions of the long segment measuring 4.20 m long x 2.6 m wide and surface feature dimensions of the shorter segment measuring 2.8 m long x 1.5 m wide. The longer segment is 0.90 m thick while the short segment measures 1.40 m thick. The interior space is fairly level (natural) and measures 2.40 m long by 1.60 m wide. Surface feature heights above ground ranged between 0.05 m to 0.50 m. The long axis of the feature is oriented northeast/southwest (75/255 degrees, Magnetic).

Feature 24 was constructed of dry-laid limestone cobbles and small boulders. Both the cobbles and small boulders are sub-angular and angular in shape. Cobbles and small boulders are piled (not stacked), no more than four levels high. Although Feature 24 exhibited the effects of disturbance, including root wedging of grasses and weeds, the feature was found to be in fair condition. Based on feature type, construction methods, and construction materials, this feature has been interpreted as a habitation feature associated with pre-and/or early post-Contact Period.

Feature Type: C-Shaped structure
Feature: 30
GPS Coordinates: E 597710 N 2356196
Function: Habitation
Age: Pre-and/or early Post-Contact Period
Condition: Fair

Description: State Site 50-80-12-5119, Feature 30 consists of a small C-shaped structure with surface feature exterior dimensions of 1.47 m long by 1.1 cm wide and surface feature interior dimensions of 70 cm long by 60 cm wide (Figure 20). Wall thickness averaged 0.30 m. Surface feature heights above ground ranged between 6 cm to 48 cm. The long axis of the feature is oriented southeast/northwest (160/340 degrees, Magnetic).

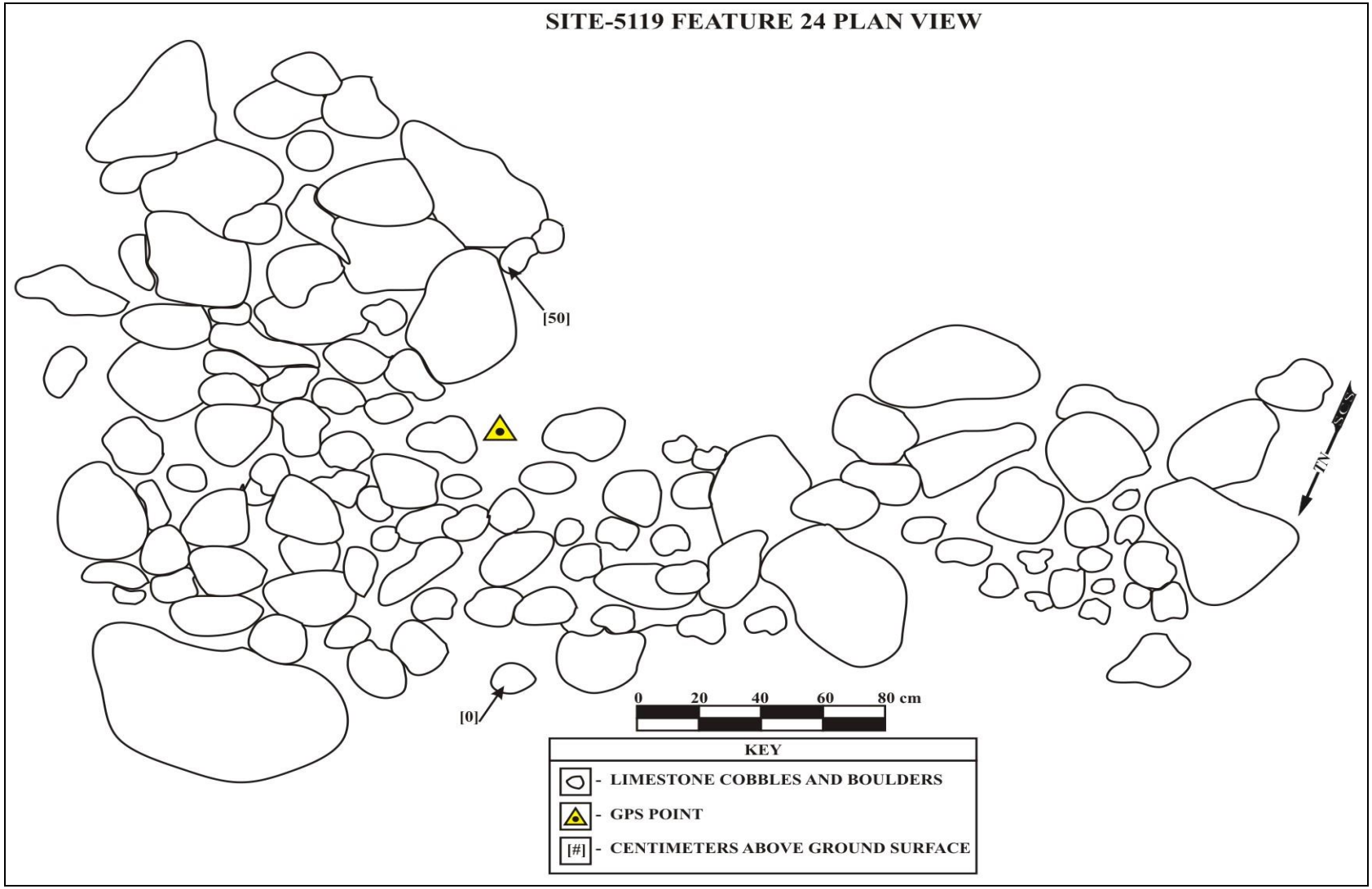

Figure 18: Plan View Drawing of State Site 50-80-12-5119, Feature 24.

Figure 19: Photographic View of State Site 50-80-12-5119, Feature 24. View to Southeast.

Figure 20: Photographic View of State Site 50-80-12-5119, Feature 30. View to Southwest.

The feature was constructed of dry-laid limestone cobbles and small boulders. Cobbles and small boulders are angular in shape and stacked two to four courses high. The opening of the enclosure faces northeast. A brass .30-caliber rifle casing and a .50-caliber ferrous metal link were found on the ground surface of the feature interior. Although Site -5119, Feature 30 exhibited the effects of disturbance, including root wedging of *kiawe* trees, the feature was found to be in fair condition. Based on feature type, construction methods, and construction materials, this feature has been interpreted as a habitation feature associated with pre-and/or early post-Contact Period.

Feature Type: Enclosure
Feature: 34
GPS Coordinates: E 597696 N 2356193
Function: Habitation
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-12-5119, Feature 34 consists of an irregularly-shaped, rectangular enclosure with rounded corners (Figures 21 and 22). The surface feature exterior dimensions measure 7.5 m long x 5.5 m wide and surface feature interior dimensions are 3 m long x 1.5 m wide. Surface feature heights above the ground surface range from 0.05 m to 0.48 m. The long axis of the feature is oriented northeast/southwest (48/228 degrees, Magnetic). Wall thickness measures 1.25 to 2.25 m. The western flank of the feature measured 2.75 m wide by an average 0.25 m high. The southern flank of the feature measured 2.50 m wide and an average 0.19 m high. The eastern feature flank measured 1.25 m wide and an average 0.30 m high.

The feature was constructed of dry-laid limestone cobbles and a few small boulders. The cobbles and small boulders are angular in shape and piled two to three courses high. Although Site -5119, Feature 34 exhibited the effects of natural disturbance, including minor root wedging, the feature was found to be in fair condition. Based on feature type, construction methods, and construction materials, this feature has been interpreted as a habitation feature associated with pre-and/or early post-Contact Period.

Feature Type: C-shaped structure
Feature: 35
GPS Coordinates: E 597702 N 2356188
Function: Habitation
Age: Pre-and/or early Post-Contact
Condition: Fair

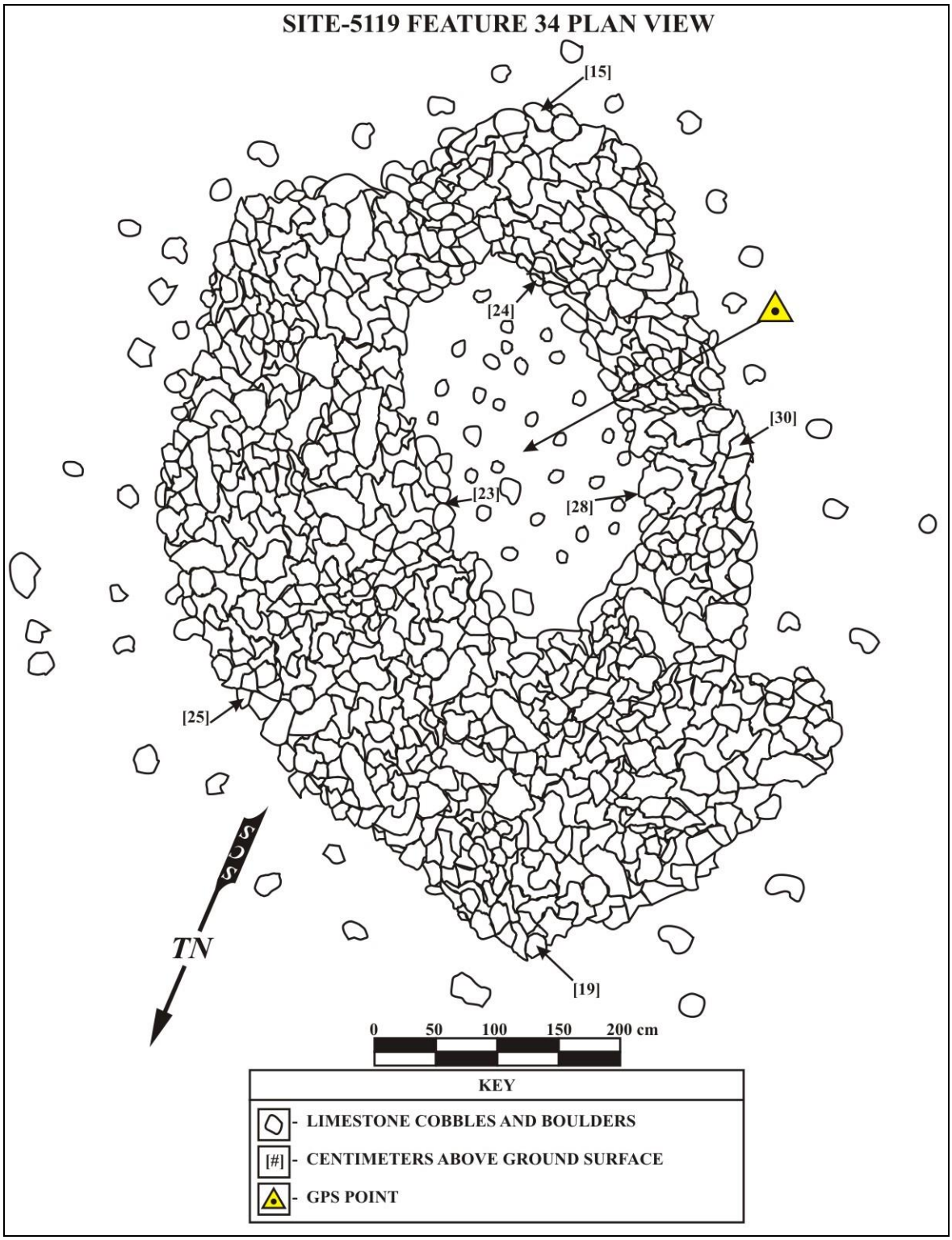

Figure 21: Plan View Drawing of State Site 50-8-12-5119, Feature 34.

Figure 22: Photographic View of State Site 50-80-12-5119, Feature 34. View to Northwest.

Description: State Site 50-80-12-5119, Feature 35 consists of a C-shaped structure (Figures 23 and 24) with surface feature exterior dimensions measuring 5.5 m long x 3.1 m wide and surface feature interior dimensions of 2.8 m long x 1.0 m wide. Surface feature heights above ground ranged from 20 cm to 40 cm. The long axis of the feature is oriented northeast/southwest (30/210 degrees, Magnetic).

Feature 35 was also constructed of dry-laid limestone cobbles and small boulders. The cobbles and small boulders are sub-rounded and sub-angular in shape and piled no more than four courses high. Small boulders outline the feature. Cobbles are located within the interior of the small boulder perimeter. The opening of the enclosure faces southeast. Although Site -5119, Feature 35 exhibited the effects of natural disturbance via minor root wedging, the feature was found to be in fair condition. Based on feature type, construction methods, and construction materials, this feature has been interpreted as a habitation feature associated with pre-and/or early post-Contact Period.

Feature: 37
GPS Coordinates: E 597693 N 2356176
Feature Type: U-shaped structure
Function: Habitation
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-12-5119, Feature 37 consists of a U-shaped structure (Figures 25 and 26) with surface feature exterior dimensions of 6.5 m long x 4.5 m wide and surface feature interior dimensions of 2.5 m long x 2.0 m wide. Surface feature heights above ground ranged between 10 cm to 43 cm. The long axis of the feature is oriented northeast/southwest (87/267 degrees, Magnetic). An upright limestone rock was used in feature architecture, the limestone slab being placed near the northern flank of the structure. The upright limestone rock measured 0.60 m long by 0.25 m wide.

The feature was constructed of locally available dry-laid limestone cobbles and small boulders. The cobbles and small boulders are sub-rounded and sub-angular in shape and piled no more than four courses high. A few of the small boulders construct the bend of the "U." The interior of the feature is fairly flat, similar to the surrounding natural landscape. The opening of the enclosure faces south/southeast. Although Site -5119, Feature 37 exhibited the effects of disturbance, including root wedging of *kiawe* trees, the feature was found to be in fair condition. Based on feature type, construction methods, and construction materials, this feature has been interpreted as a habitation feature associated with the pre-and/or early post-Contact Period.

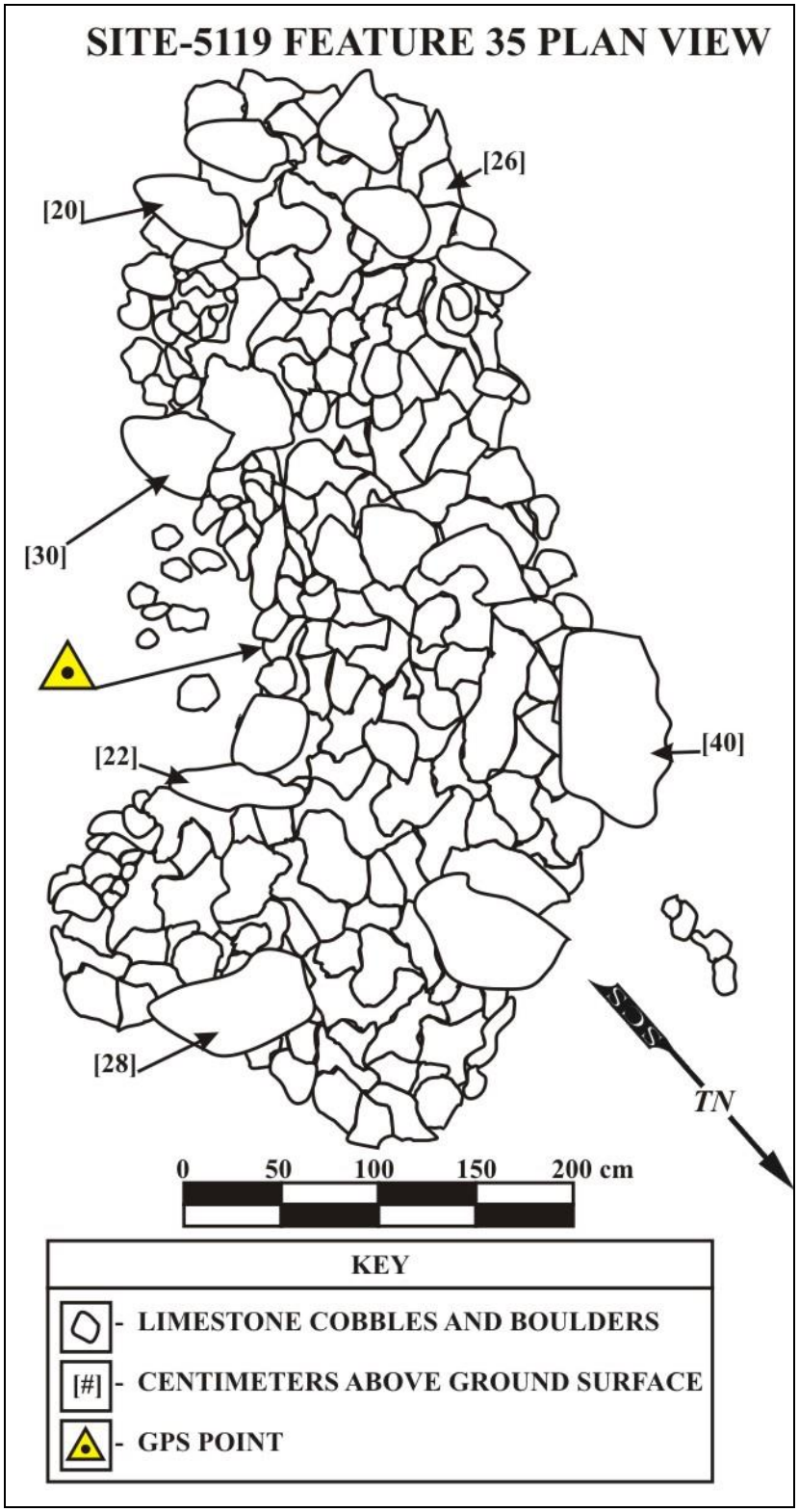

Figure 23: Plan View Drawing of State Site 50-80-12-5119, Feature 35.

Figure 24: Photographic View of State Site 50-80-12-5119, Feature 35. View to Northwest.

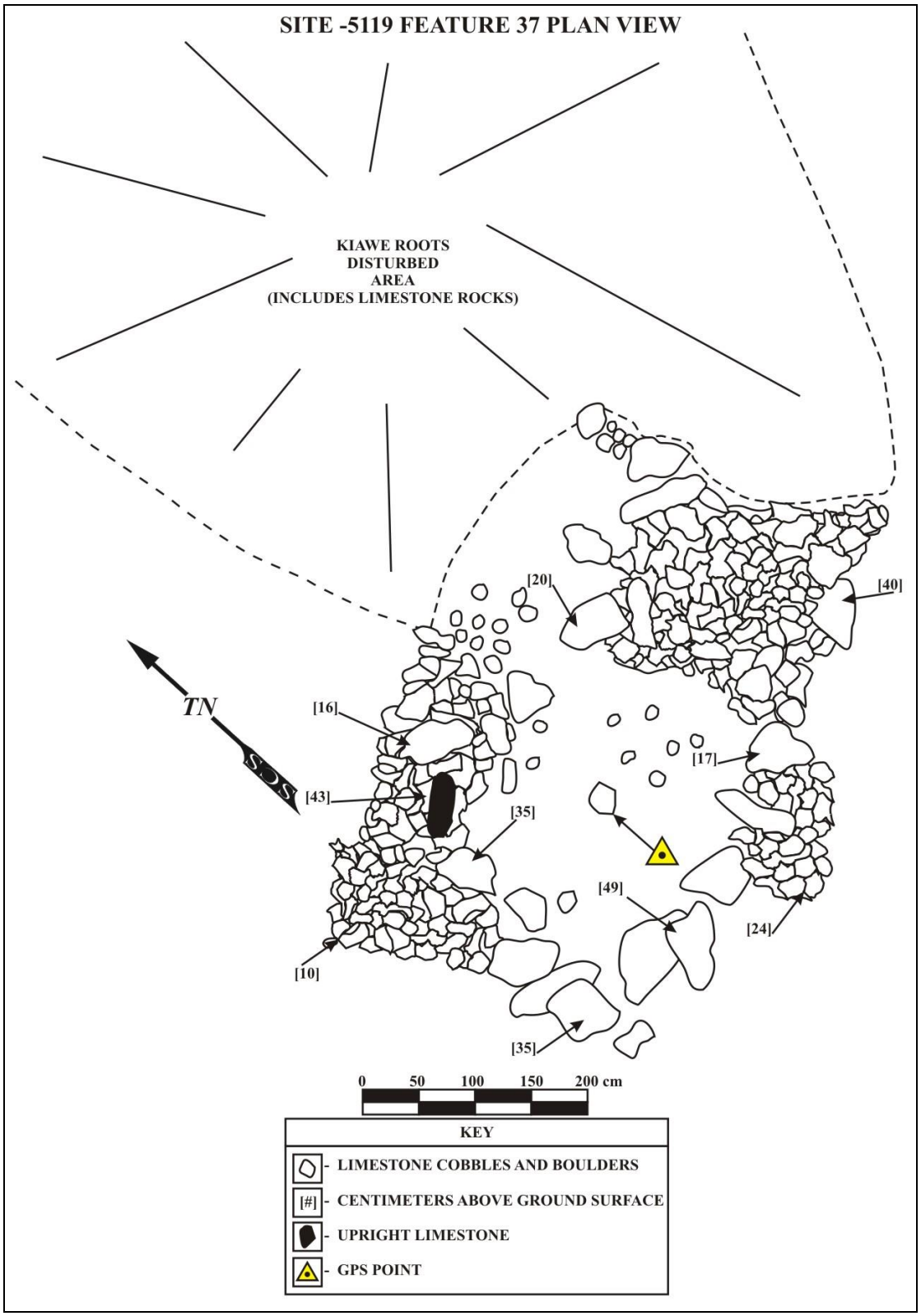

Figure 25: Plan View Drawing of Sate Site 50-80-12-5119, Feature 37.

Figure 26: Photographic View of State Site 50-80-12-5119, Feature 37. View to Northeast.

STATE SITE 50-80-12-7483 (SCS SITE TS-2)

State Site No. 50-80-12-7483 is a newly identified multi-functional complex consisting of 10 features (Figure 27). State Site 50-80-12-7483 measures 69.5 by 9.0 m and is oriented along a northeast/southwest axis with a compass bearing of 43/223 degrees (Magnetic). The current research led to the identification and documentation of six karst pits, three agricultural mounds, and one rock mound possibly containing a human burial (see Table 2). Based on feature types and functions, State Site 50-80-12-7483 was interpreted as an agriculture/refuse complex with a possible burial component and was found to be in good condition. Based on feature types, Site -7483 was interpreted as associated with the pre- and /or early post-Contact Period. State Site 50-80-12-7483 has been evaluated for significance, as outlined in Hawai‘i Administrative Rules §13-275-6, and found to be significant under Criterion d, for information content; and under Criterion e, for its importance to Native Hawaiians. As archaeological subsurface testing was not conducted, potential remains for additional cultural information to be present in subsurface contexts. Thus, a recommendation of preservation has been made for the features within State Site 50-80-12-7483.

Descriptive Data by Feature Number
Feature: 1, 2, 3, 5, 9, and 10
GPS Coordinates: E 597673 N 2356179
Feature Type: Karst Pits
Function: Agriculture/Refuse
Age: Pre-and/or early Post-Contact t Period
Condition: Good

Description: State Site 50-80-12-7483, Features 1, 2, 3, 5, 9, and 10 consist of six karst pits with no observed cultural modification. The pits average 1.49 m long (range 0.98 m-2.30 m), 0.98 to 2.30 m wide (range 0.34 m-1.93 m) and extend an average 0.51 m below the surface (range 0.28 m-0.84 m). Based on feature type, these karst pits may have been in use from the pre-and/or early post-Contact Period. No cultural materials were observed in these six pits. A representative photograph of these karst pits (Feature 1) appears in Figure 28.

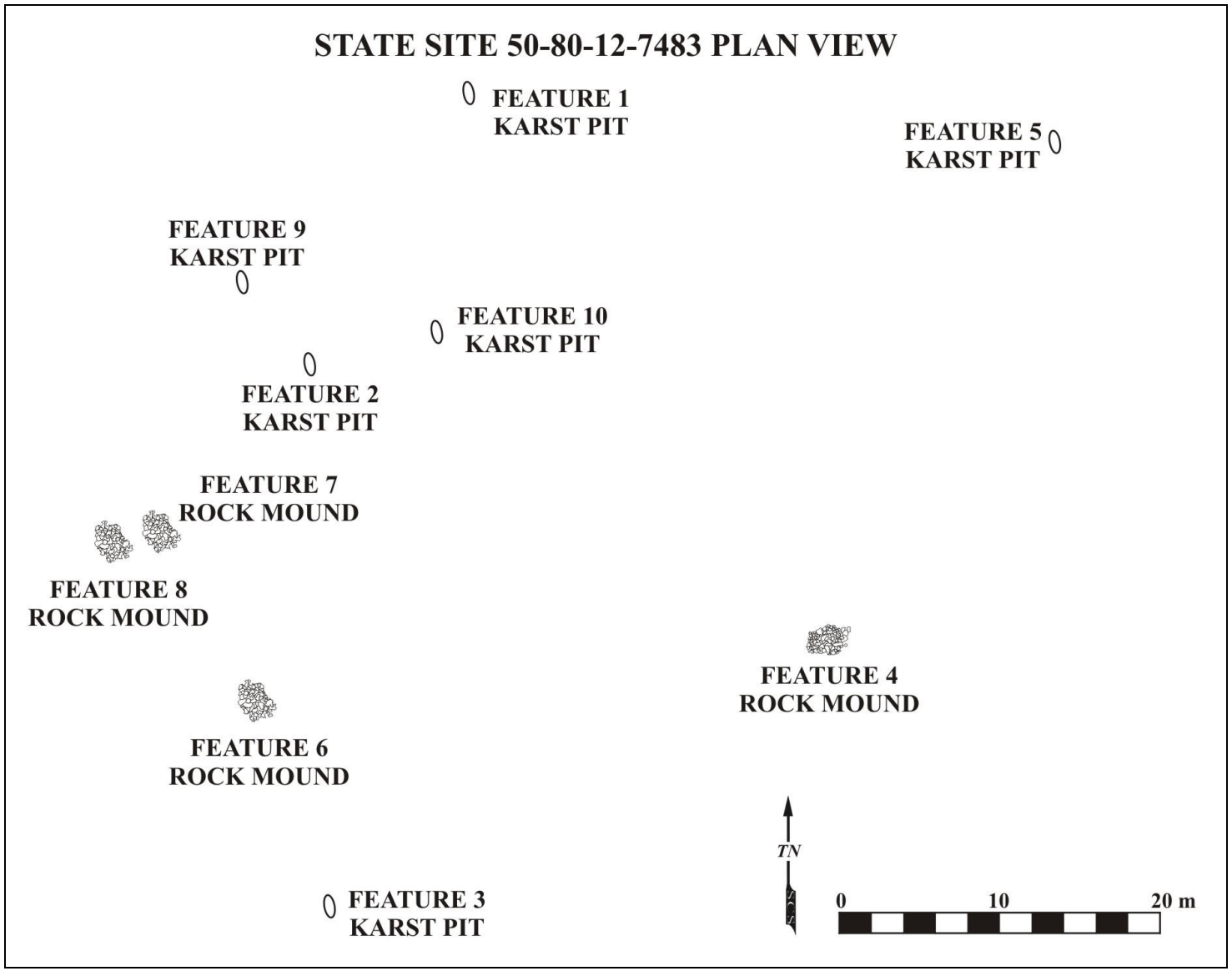

Figure 27: Plan View Drawing of State Site 50-80-12-7483.

Figure 28: Representative Photographic View of Karst Pits (*i.e.*, Feature 1) in State Site 50-80-12-7483. View to Northwest.

State Site 50-80-12-7483, Feature 1

State Site 50-80-12-7483, Feature 1 (0.84 by 1.40 by 0.34 m deep) consisted of an irregularly shaped and filled-in karst pit. Feature 1 was oriented along a southeast/northwest axis with a compass bearing of 176/356 degrees (Magnetic).. The soil, within Feature 1, is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 1 may have functioned as a refuse pit. Thus, Feature 1 was interpreted as having an agriculture/refuse function. Feature 1 was found to be in good condition.

State Site 50-80-12-7483, Feature 2

State Site 50-80-12-7483, Feature 1 (0.46 by 1.60 by 0.90 m deep) consisted of an irregularly shaped and filled-in karst pit. Feature 2 was oriented along an southeast/northwest axis with a compass bearing of 99/279 degrees (Magnetic).The soil, within Feature 2, is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 2 may have functioned as a refuse pit. Thus, Feature 2 was interpreted as having an agriculture/refuse function. Feature 2 was found to be in good condition.

State Site 50-80-12-7483, Feature 3

State Site 50-80-12-7483, Feature 3 (0.48 by 1.31 by 0.76 m deep) consisted of an irregularly shaped and filled-in karst pit. Feature 3 was oriented along a southeast/northwest axis with a compass bearing of 117/297 degrees (Magnetic). The soil, within Feature 3, is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 3 may have functioned as a refuse pit. Thus, Feature 3 was interpreted as having an agriculture/refuse function. Feature 3 was found to be in good condition.

State Site 50-80-12-7483, Feature 5

State Site 50-80-12-7483, Feature 5 (0.70 by 2.30 by 1.93 m deep) consisted of an irregularly shaped and filled-in karst pit. Feature 5 was oriented along a northeast/southwest axis with a compass bearing of 22/202 degrees (Magnetic). The soil, within Feature 5, is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 5 may have functioned as a refuse pit. Thus,

Feature 5 was interpreted as having an agriculture/refuse function. Feature 5 was found to be in good condition.

State Site 50-80-12-7483, Feature 9

State Site 50-80-12-7483, Feature 9 (0.28 by 1.39 by 1.04 m deep) consisted of an irregularly shaped and filled-in karst pit. Feature 9 was oriented along a northeast/southwest axis with a compass bearing of 41/221 degrees (Magnetic). The soil, within Feature 9, is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 9 may have functioned as a refuse pit. Thus, Feature 9 was interpreted as having an agriculture/refuse function. Feature 9 was found to be in good condition.

State Site 50-80-12-7483, Feature 10

State Site 50-80-12-7483, Feature 10 (0.31by 98 by 0.84 m deep) consisted of an irregularly shaped and filled-in karst pit. Feature 10 was oriented along a northeast/southwest axis with a compass bearing of 7/187 degrees (Magnetic). The soil, within Feature 10, is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 10 may have functioned as a refuse pit. Thus, Feature 10 was interpreted as having an agriculture/refuse function. Feature 10 was found to be in good condition.

Feature Type: Rock Mound
Feature: 4
GPS Coordinates: E 597659 N 2356148
Function: Possible Burial Mound
Age: Pre-and/or early Post-Contact
Condition: Good

Description: State Site 50-80-12-7483, Feature 4 consists of an irregular, oval-shaped limestone mound (Figures 29 and 30) with surface feature dimensions of 2.8 m long x 1.9 m with a maximum height of 48 cm above surface. The long axis of the feature is oriented northeast/southwest (75°255°, Magnetic).

The feature was constructed of dry-laid limestone cobbles and small boulders. The cobbles are sub-rounded and angular, while the boulders are sub-rounded and sub-angular. Both

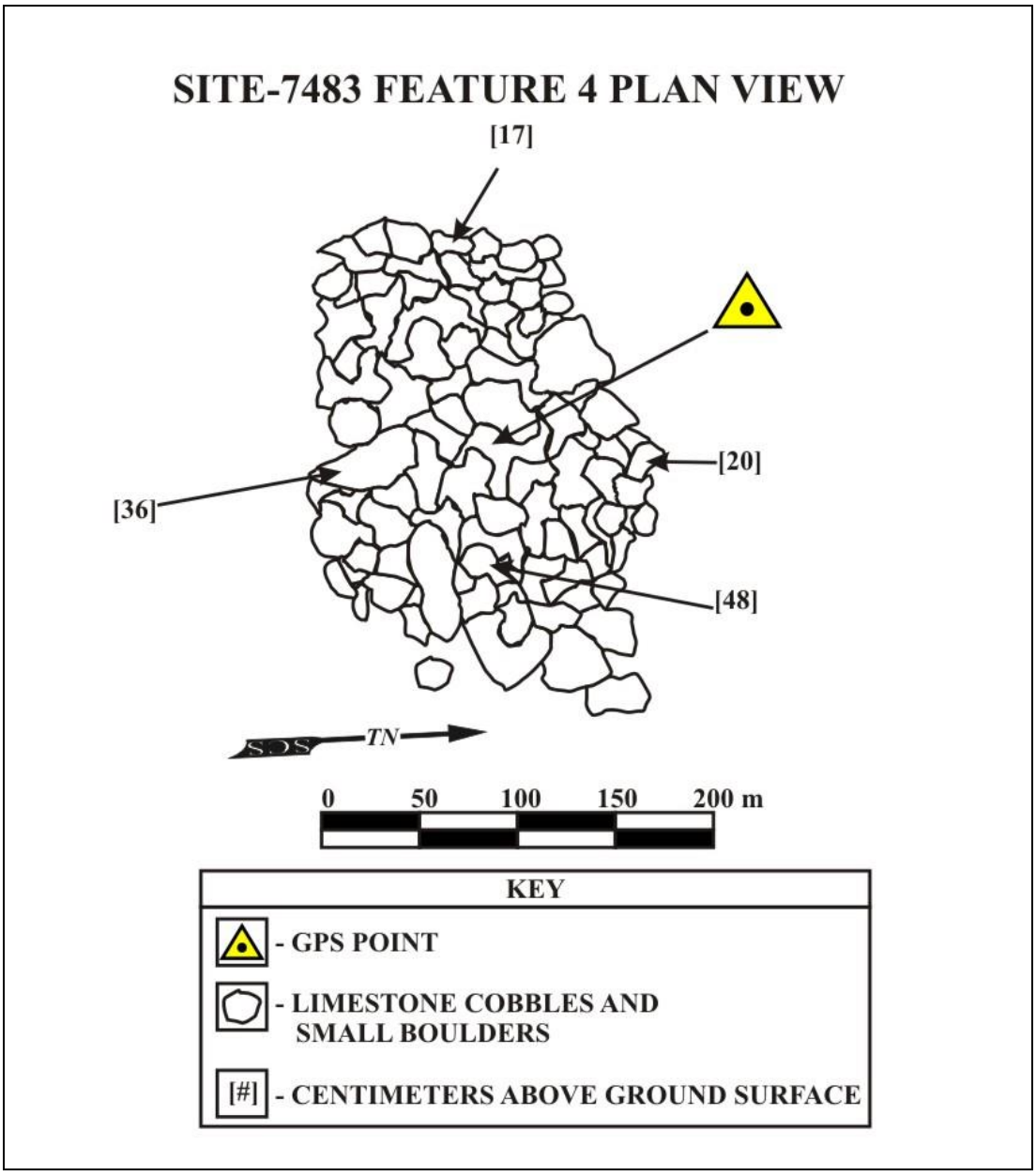

Figure 29: Plan View Drawing of State Site 50-80-12-7483, Feature 4.

Figure 30: Photographic View of State Site 50-80-12-7483, Feature 4. View to Southwest.

cobbles and boulders are piled no more than five courses high, with the cobbles and boulders being interspersed. Although Site -7483, Feature 4 exhibited collapse portions along its perimeter, the feature was found to be in good condition.

The feature type, construction methods, and construction materials (large size of cobbles and boulders), suggests Feature 4 may contain a human burial. This mound is much larger in breadth then typical agricultural mounds occurring in the area. Given the assumed temporal association of the adjacent sites and features in the area, Site -7483, Feature 4 is interpreted as associated with the pre-and/or early post-Contact Period.

Feature Type: Rock mounds
Features: 6, 7, and 8
GPS Coordinates (average): E 597627 N 2356144
Function: Agriculture
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-12-7483, Features 6, 7, and 8 consisting of three irregular-shaped rock mounds (see Table 3). On average, the mounds measure 2.89 m long by 1.34 m wide, with an average height of 1.01 m above the surface. Mound length varies from a minimum 1.72 m to 4.45 m while width varies from 1.11 m to 1.55 m. The height range of the mounds is variable, from a minimum 0.47 m to a maximum 1.98 m above the surface.

The features were constructed of dry-laid limestone cobbles and small boulders, both being sub-rounded and angular. The rocks were piled a variable two to four courses high, with the cobbles and boulders being interspersed. All of the mounds were in fair condition.

Based on feature type, construction methods, and construction materials, these three features were interpreted as agricultural mounds associated with the pre- and/or early post-Contact Period. These were not interpreted as clearing mounds but rather, locations of piled rocks that could trap moisture and allow for crops such as sweet potato to grow. Representative photographs of the mound features within Site -7483 appear in Figures 31 and 32.

STATE SITE 50-80-12-7484 (SCS SITE TS-3)

State Site 50-80-12-7484 (47.0 by 26.0 m) is a newly identified site comprised of two karst pits and one surface midden scatter (Figure 33). State Site 50-80-12-7484 is oriented along an east/west axis with a compass bearing of 90/270 degrees (Magnetic). State Site 50-80-12-

Figure 31: Photographic View of State Site 50-80-12-7483, Feature 6. View to Southwest.

Figure 32: Photographic View of State Site 50-80-12-7483, Feature 8. View to Northeast.

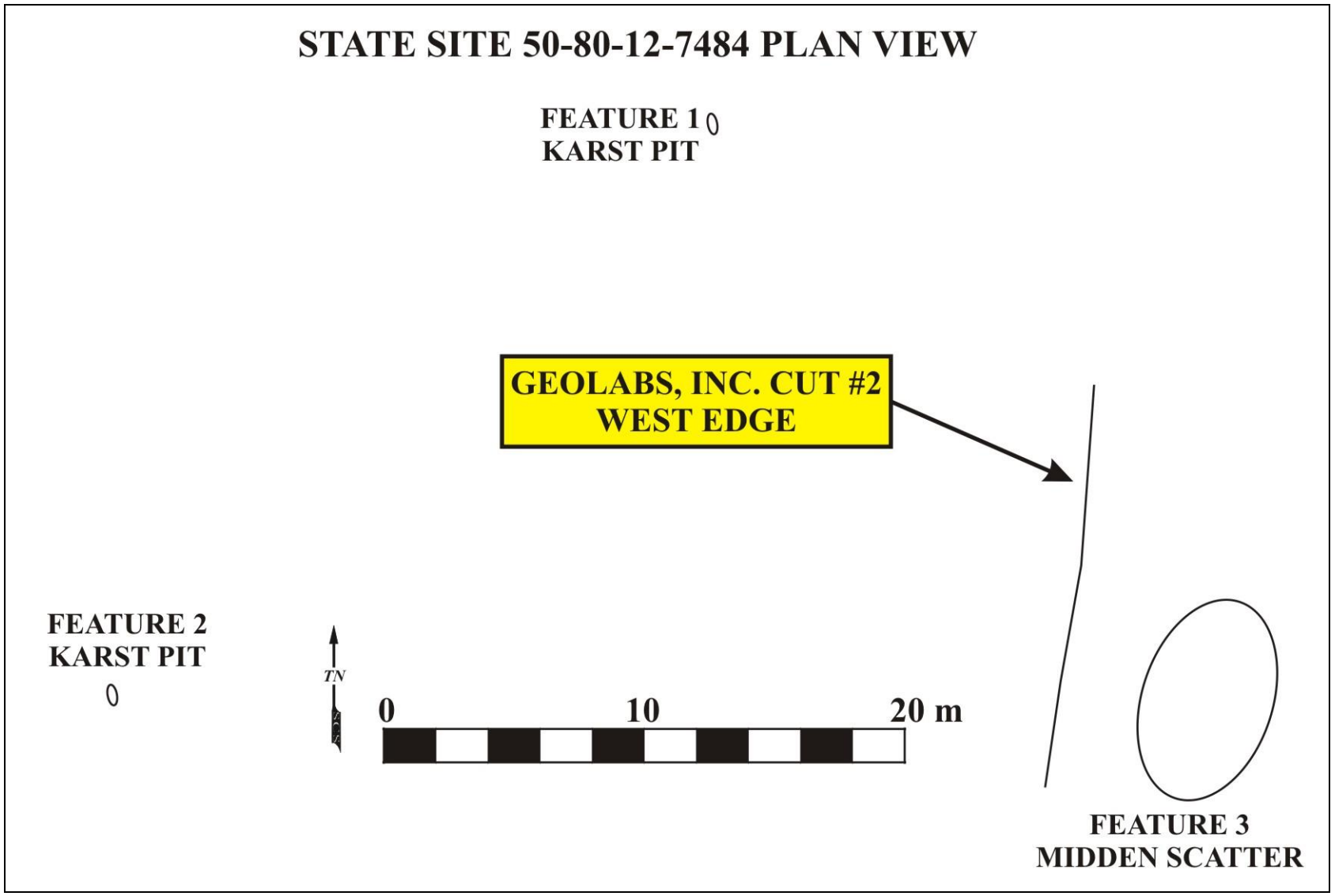

Figure 33: Plan View Drawing of State Site 50-80-12-7484.

7484 was found to be in fair condition. Feature 3 (midden scatter) of State Site 50-80-12-7484 was physically affected by the Geolabs, Inc. Cut #2 bulldozing incident (see Figure 33 and Appendix D). However, since the project area's ground surface was covered with decaying vegetation, it is difficult to say with certainty that the current Archaeological Inventory Survey crew would have found the feature without the removal of decaying vegetation. Based on feature type and construction methods, State Site 50-80-12-7484 was interpreted as an agriculture/refuse/habitation complex associated with the pre- and/or early post-Contact Period (see Table 3). State Site 50-80-12-7484 has been evaluated for significance, as outlined in Hawai'i Administrative Rules §13-275-6, and found to be significant under Criterion d, for information content. As archaeological subsurface testing was not conducted of all the features, the unexcavated features retain the potential for containing additional cultural information in subsurface contexts. Thus, a recommendation of preservation has been made for Features 1 and 2. Feature 3 was subject to subsurface testing and yielded negative findings. Thus, no further work is recommended for Feature 3.

Descriptive Data by Feature Number
Features: 1 and 2
GPS Coordinates: E 597584 N 2356173
Feature Type: Karst Pits
Function: Agriculture/Refuse
Age: Pre-and/or early Post-Contact Period
Condition: Good

Description: State Site 50-80-12-7484, Feature 1 consists of an irregularly shaped filled-in karst pit. Feature 1 measured 0.74 by 0.55 by 0.26 m deep. Feature 1 was oriented along a southeast/northwest axis with a compass bearing of 158/338 degrees (Magnetic). Feature 1 was found to be in good condition. The soil, within Feature 1, is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 1 may have functioned as a refuse pit. Thus, Feature 1 was interpreted as having an agriculture/refuse function. A photograph of Feature 3 (karst pit) is provided in Figure 34 as a representative sample of karst pits within State Site 50-80-12-7484.

Features 2 consists of an irregularly shaped and filled-in karst pit (see Figure 34). Feature 2 measured 1.60 by 1.20 by 1.25 deep. Feature 2 was oriented along a southeast/northwest axis with a compass bearing of 172/352 degrees (Magnetic). Feature 2 was found to be in fair condition. The soil, within Feature 2, is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 2 may have functioned as a refuse pit. Thus, Feature 2 was interpreted as having an agriculture/refuse function.

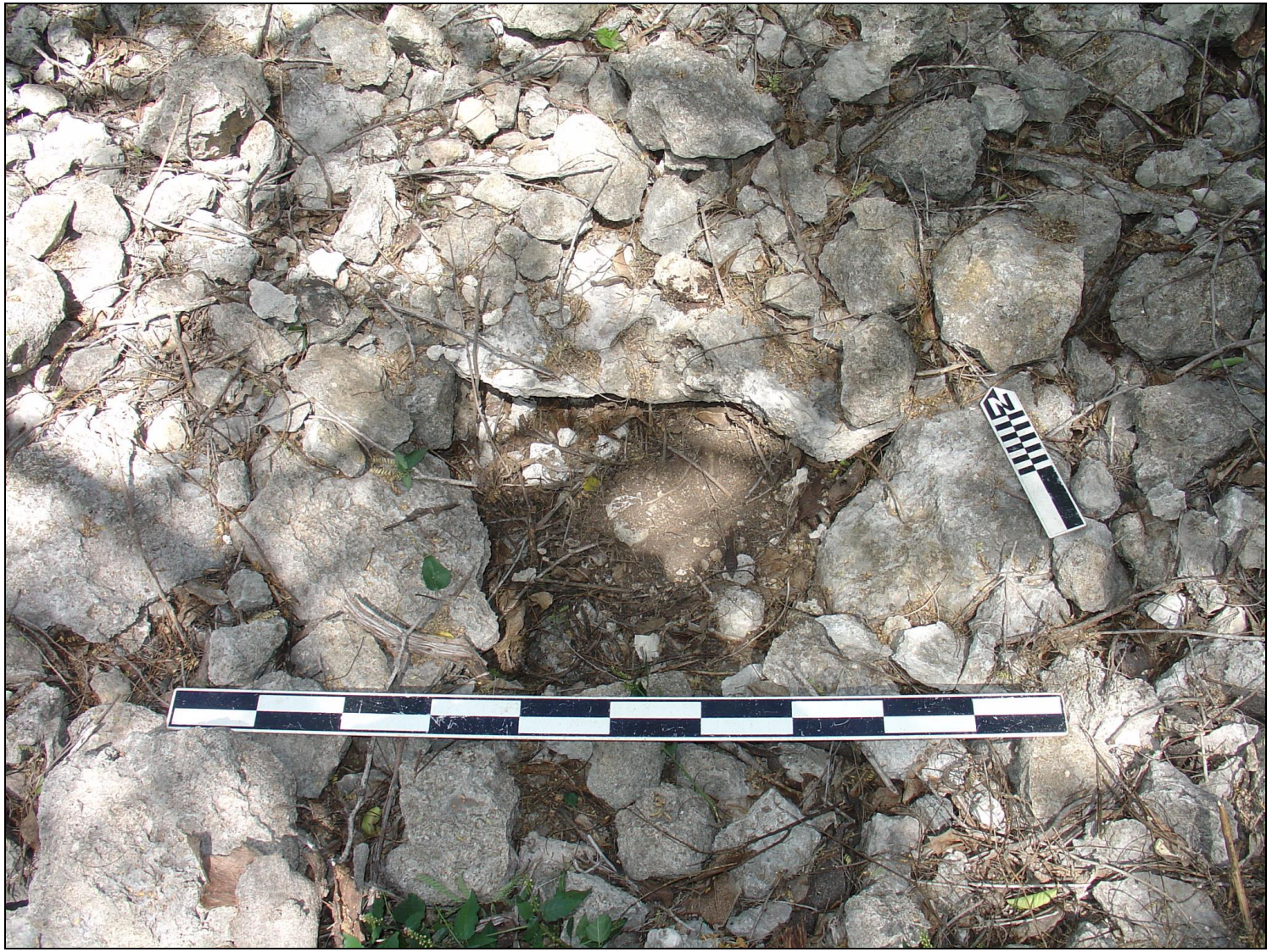

Figure 34: Representative Photographic View of Karst Pit Feature 3 in State Site 50-80-12-7484. View to Northeast.

Feature: 3
GPS Coordinates: E 5967604 N 2356154
Feature Type: Midden Scatter
Function: Habitation
Age: Pre-and/or early Post-Contact
Condition: Poor

Description: State Site 50-80-12-7484, Feature 3 consists of a surface midden scatter (Figures 35 and 36) with surface feature dimensions measuring 8.5 m long x 5 m wide. The long boundary of the feature is oriented northeast/southwest (14/194 degrees, Magnetic).

The midden scatter was identified on the ground surface within a modern (2012) Geolabs, Inc. bulldozed area designated as Cut #2 (Figure 37). Forty-two individual fragments of vertebrate and invertebrate remains were identified on the surface within the dozed cut. The traditional artifacts identified and collected from the scatter area consist of one basalt micro-adze and several volcanic glass debitage flakes.

State Site 50-80-12-7484, Feature 3 was mechanically altered and thus, is presently in poor condition. Based on feature type and the cultural materials comprising the feature, Feature 3 has been interpreted as having a habitation function and as being associated with the pre- and/or early post-Contact Period. The original provenience of the midden finds has been lost due to bulldozer disturbance of the site. Subsurface testing involved eight shovel probes (labeled SP-1 through SP-8) of which two shovel probes (SP-4, SP-7) are illustrated here as representative of the strata exposed within Site -7484, Feature 3 and are described below.

SHOVEL PROBE 4

Shovel Probe 4 (SP-4) was placed along the western portion of Site -7484, Feature 3 (see Figure 35). SP-4 measured 25 cm in diameter x 24 cm deep and exposed two stratigraphic layers (Figure 38). SP-4 did not yield cultural any material.

Layer I (0-10 cmbs) consisted of very dark grayish brown (10YR 3/2, dry) loamy slit.

Layer II (12-28 cmbs) consisted of brownish yellow (10YR 6/6, dry) silt

SHOVEL PROBE 7

Shovel Probe 7 (SP-7) was placed in the southeastern portion of Site -7484, Feature 3 (see Figure 35). SP-7 measured 25 cm in diameter by 16 cm deep and exposed two stratigraphic

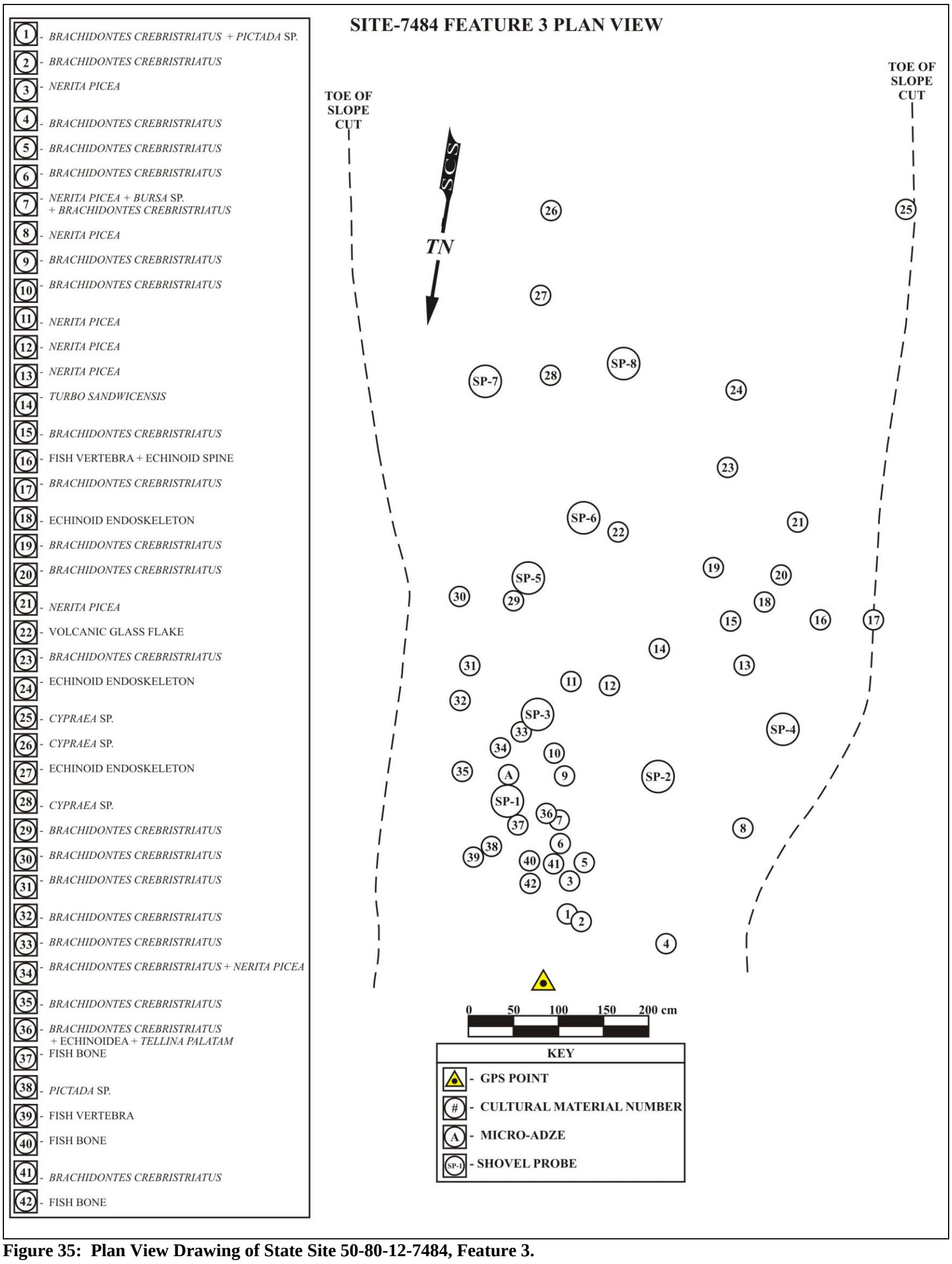

Figure 35: Plan View Drawing of State Site 50-80-12-7484, Feature 3.

Figure 36: Photographic View of State Site 50-80-12-7484, Feature 3. View to Southeast.

Figure 37: Google Earth Aerial Image of Project Area with 2012 Bulldozed Locations.

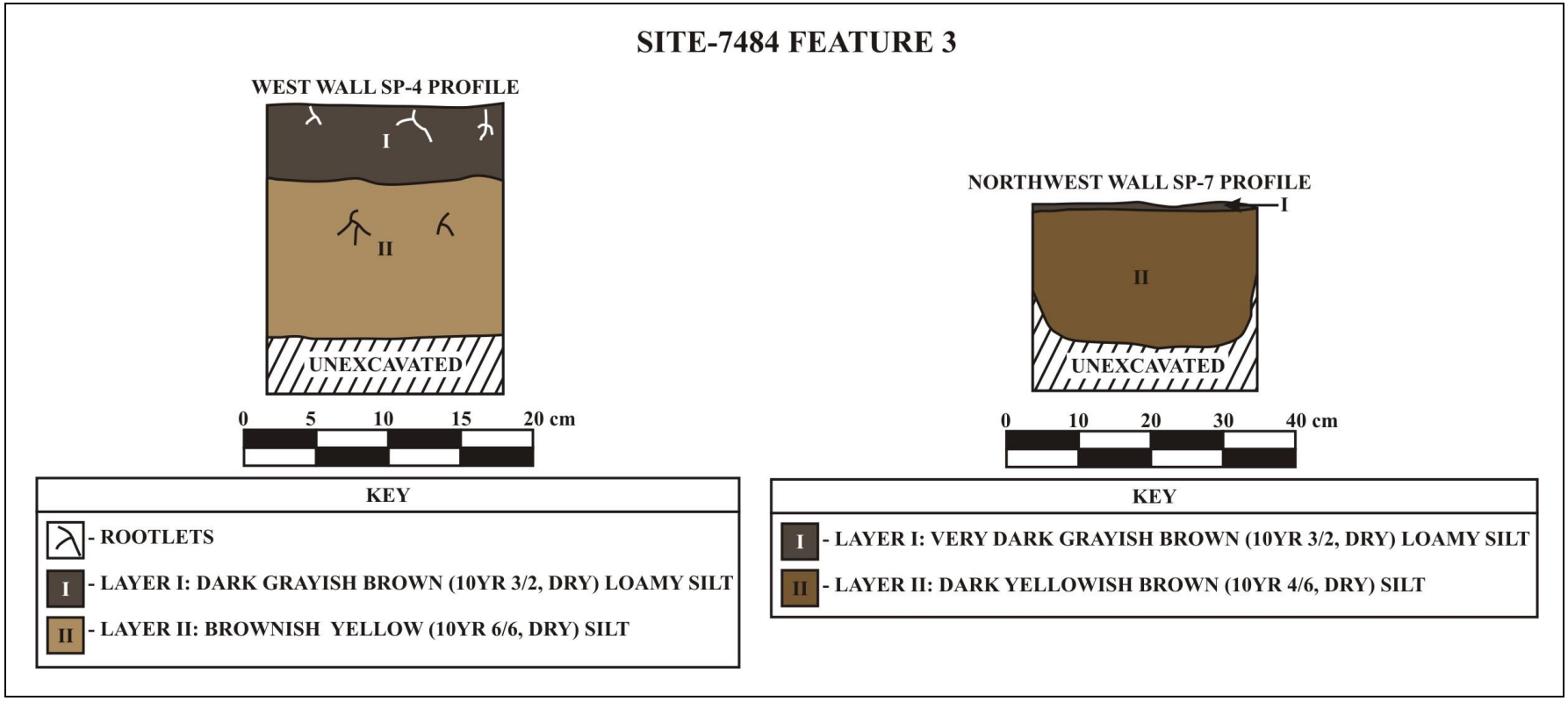

Figure 38: Stratigraphic Profiles for State Site 50-80-12-7484, Feature 3, SP-4 and SP-7.

layers (see Figure 38). The midden identified in Layer I is most likely the source deposit of the midden scatter identified on the dozed surface.

- Layer I (0-10 cmbs) consisted of very dark grayish brown (10YR 3/2, dry) loamy slit with rootlets and limestone pebbles. Layer I yielded a modest quantity of euryhaline and marine shell midden, as well as volcanic glass debitage. Terrestrial snail shells were also observed and collected.

- Layer II (10-16 cmbs) consisted of brownish yellow (10YR 6/6, dry) silt. Layer II was sterile.

STATE SITE 50-80-12-7485 (SCS SITE TS-4)

State Site 50-80-12-7485 is a newly identified site comprised of two features (Figure 39) and was found to be in good condition (see Table 2). Feature 1 consists of a rock mound and Feature 2 consists of an unmodified karst pit. State Site 50-80-12-7485 measures 21.0 by 2.0 m and is oriented along a southeast/northwest axis with compass bearing of 127/307 degrees (Magnetic). Based on feature types, construction materials and construction methods, State Site 50-80-12-7485 has been interpreted as an agriculture/refuse complex associated with the pre- and/or early post-Contact Period. State Site 50-80-12-7485 has been evaluated for significance, as outlined in Hawai‘i Administrative Rules §13-275-6, and found to be significant under Criterion d, for information content. As archaeological subsurface testing was not conducted, the potential remains for additional information to be present in subsurface contexts. Thus, a recommendation of preservation has been made for the features within State Site 50-80-12-7485.

Descriptive Data by Feature Number
Feature Type: Rock Mound
Feature: 1
GPS Coordinates: E 597479 N 2356141
Function: Agriculture
Age: Pre-and/or early Post-Contact
Condition: Good

Description: State Site 50-80-12-7485, Feature 1 consists of a rock mound (Figure 40) (see Table 3). The feature measures 6.3 m long, a variable 0.50-1.1 m wide, and 0.20-0.55 m above the surface. The rock mound was constructed of dry-laid limestone cobbles and small boulders. The cobbles are sub-rounded and angular, while the boulders are sub-rounded and sub-angular. Both cobbles and boulders are piled no more than two courses high, with the cobbles and boulders being interspersed. Although Site -7485, Feature 1 exhibited collapsed portions along its perimeter, the feature was found to be in good condition. Based on feature type, construction

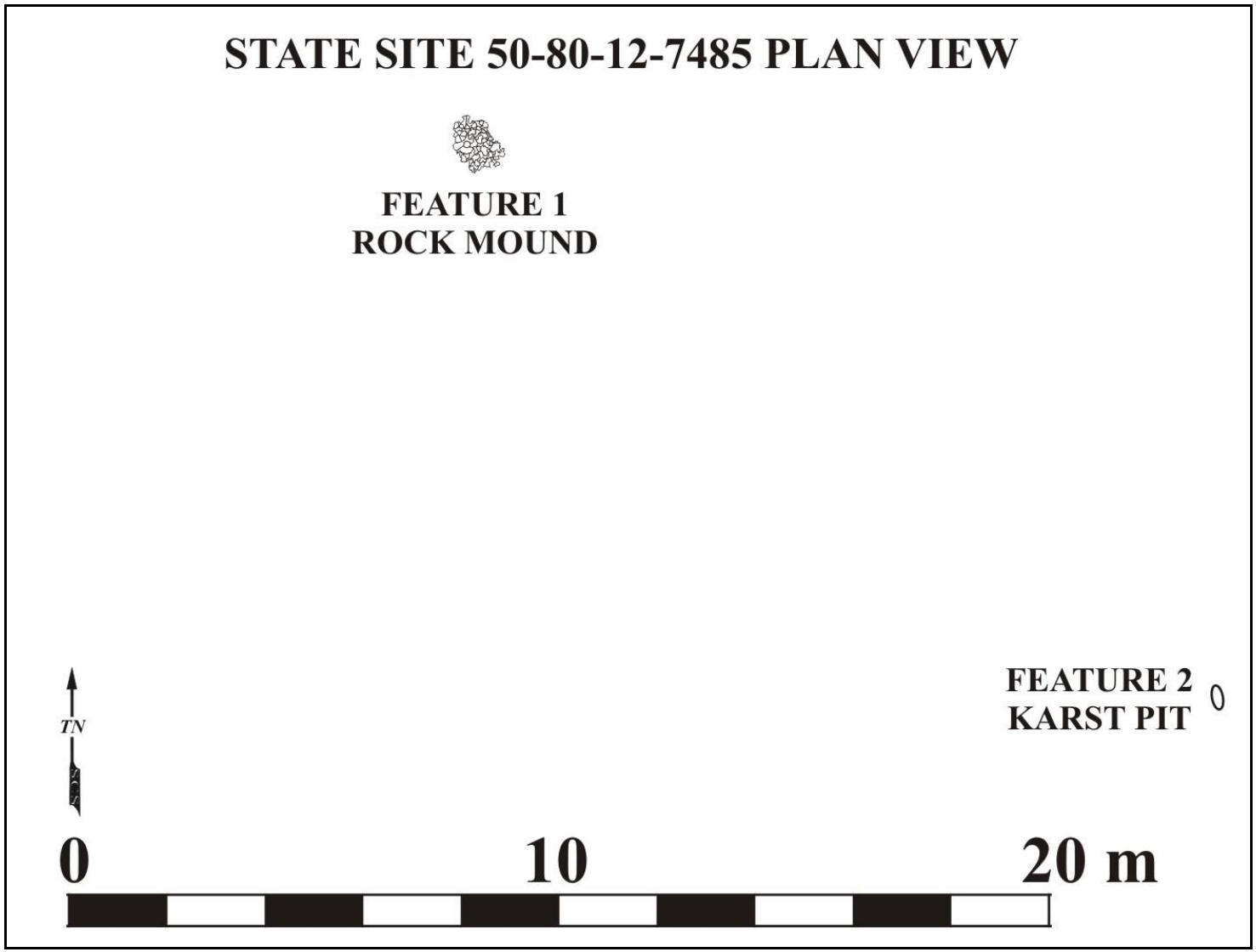

Figure 39: Plan View Drawing of State Site 50-80-12-7485

Figure 40: Photographic View of State Site 50-80-12-7485, Feature 1. View to Southwest.

methods, and construction materials, Feature 1was interpreted as an agricultural mound associated with the pre- and/or early post-Contact Period.

Feature Type: Karst Pit
Feature: 2
GPS Coordinates: E 597494 N 2356130
Function: Agriculture/Refuse
Age: Pre-and/or early Post-Contact
Condition: Fair

State Site 50-80-12-7485, Feature 2 (2.50 by 1.30 by 0.45 m deep) consisted of an irregularly shaped and filled-in karst pit (Figure 41). Feature 2 was oriented along an east /west axis with a compass bearing of 127 degrees (Magnetic). The soil within Feature 2 is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 2 may have functioned as a refuse pit. Thus, Feature 2 was interpreted as having an agriculture/refuse function. Based on feature type, Feature 2 was interpreted as associated with the pre- and /or early post-Contact Period. Feature 2 was found to be in fair condition. No cultural materials were observed on the surface within in Feature 2.

STATE SITE 50-80-12-7486 (SCS SITE TS-5)

State Site 50-80-12-7486 is a newly identified site consisting of five features: a walled karst pit, a possible burial mound, two karst pits, and a linear trail segment (Figure 42) (see Table 2). State Site 50-80-12-7486 measures 47.5 by 30.5 m and is oriented along a northeast/southwest axis with a compass bearing of 34/214 degrees (Magnetic). Based on feature types and construction methods and materials, State Site 50-80-12-7486 was interpreted as an agriculture/refuse/storage/travel/ranching complex, with a possible burial component. Based on feature type, Site -7486 was interpreted as associated with the pre- and/or early post-Contact Period. Site 50-80-12-7486 has been evaluated for significance, as outlined in Hawai‘i Administrative Rules §13-275-6, and found to be significant under Criterion d, for information content, and also significant under Criterion e due to the potential presence of a burial. State Site 50-80-12-7486 was found to be in fair condition. Given the feature types identified and that archaeological subsurface testing was not conducted of Features 2 through 5, the potential remains for the unexcavated features to contain additional cultural information in subsurface contexts. Thus, a recommendation of preservation has been made for the features within State Site 50-80-12-7486.

Figure 41: Photographic View of State Site 50-80-12-7485, Feature 2. View to Northeast.

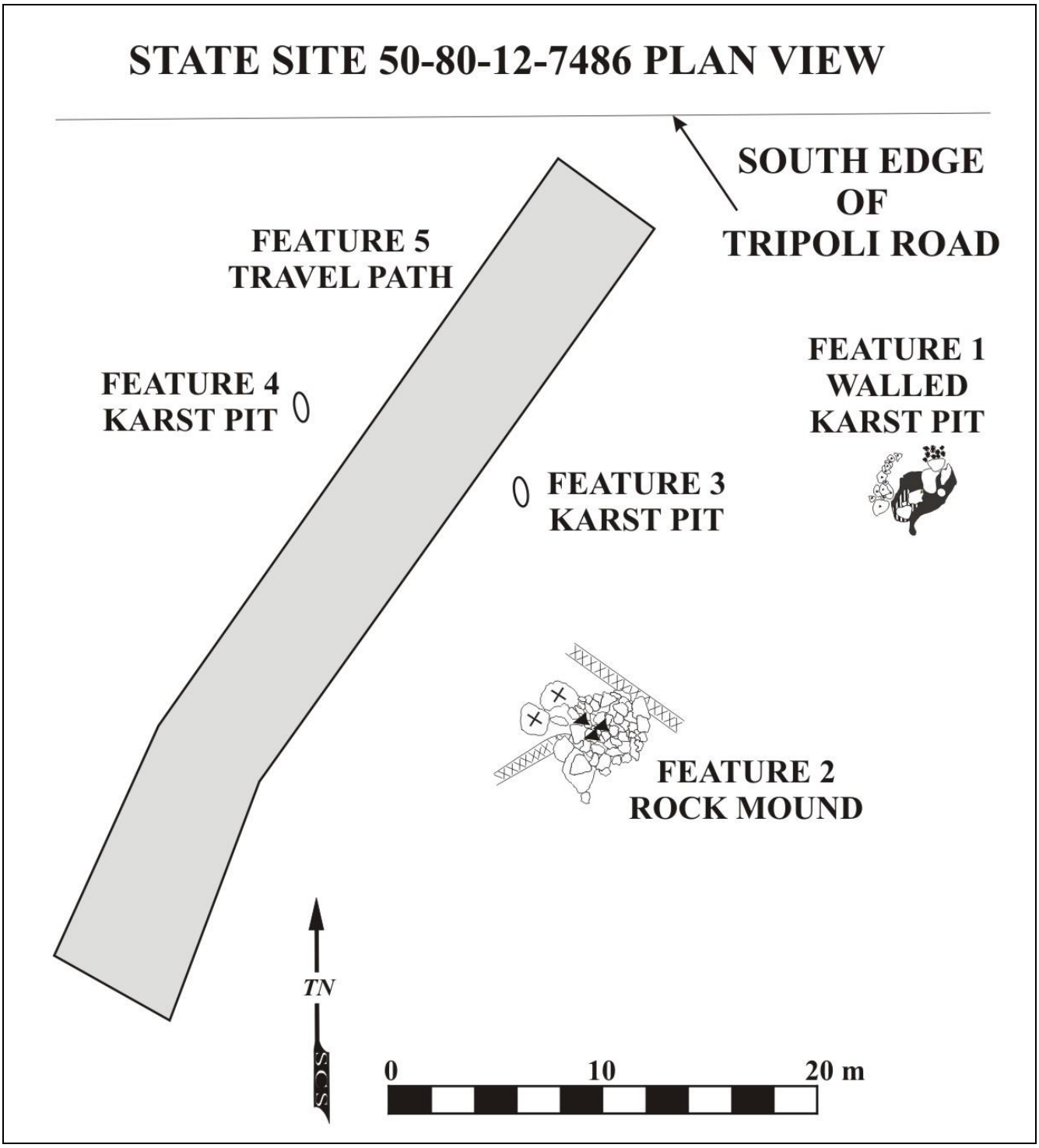

Figure 42: Plan View Drawing of State Site 50- 80-12-7486 (For map symbology, see Figures 43 and 46).

Descriptive Data by Feature Number
Feature Type: Walled Karst Pit
Feature: 1
GPS Coordinates: E 597373 N 2356123
Function: Agriculture/Refuse Area
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-12-7486, Feature 1 consists of a modified limestone karst pit (Figures 43 and 44) with surface feature exterior dimensions of 1.95 m long x 1.8 m wide and surface feature interior dimensions of 1.2 m long x 1.6 m wide. Subsurface interior dimensions (aperture below limestone surface) ranged between 46 cm to 50 cm deep. Surface feature heights measured to 30 cm above ground surface. Wall thickness measured 20 cm to 60 cm. The long axis of the feature is oriented northeast/southwest (28/208 degrees, Magnetic).

The cultural modification to the naturally occurring karst pit included a low wall of piled limestone cobbles no more than two courses high, and a partition situated in the middle. The wall was built on the west edge of the karst pit. Both wall and partition were constructed directly on a limestone outcrop. The low wall was composed of dry-laid limestone cobbles with a maximum diameter of 20 cm, while the partition included dry-laid small boulders with a maximum diameter of 64 cm. The cobbles and small boulders are angular in shape. The karst pit is filled with silty/loamy soil. The soil, within Feature 1, is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 1 may have functioned as a refuse pit. Thus, Feature 1 was interpreted as having an agriculture/refuse function.

Although State Site 50-80-12-7486, Feature 1 exhibited the effects of disturbance, including root wedging, the feature was found to be in fair condition. The karst pit was formalized by inclusion of the wall around its west aperture at the surface. Subsurface testing involved a single shovel probe (SP-9).

SHOVEL PROBE 9

- Shovel Probe 9 (SP-9) was placed along the east/southeast flank of Site -7486, Feature 1 (see Figure 43). SP-9 measured 30 cm in diameter x 30 cm deep and exposed two sterile stratigraphic layers (Figure 45). Since the feature's partition was constructed on a vertically protruding limestone outcrop, the portable limestone cobbles and small boulders placed on the partition were not present in Shovel Probe 9's stratigraphic profile No cultural materials were found in SP-9.

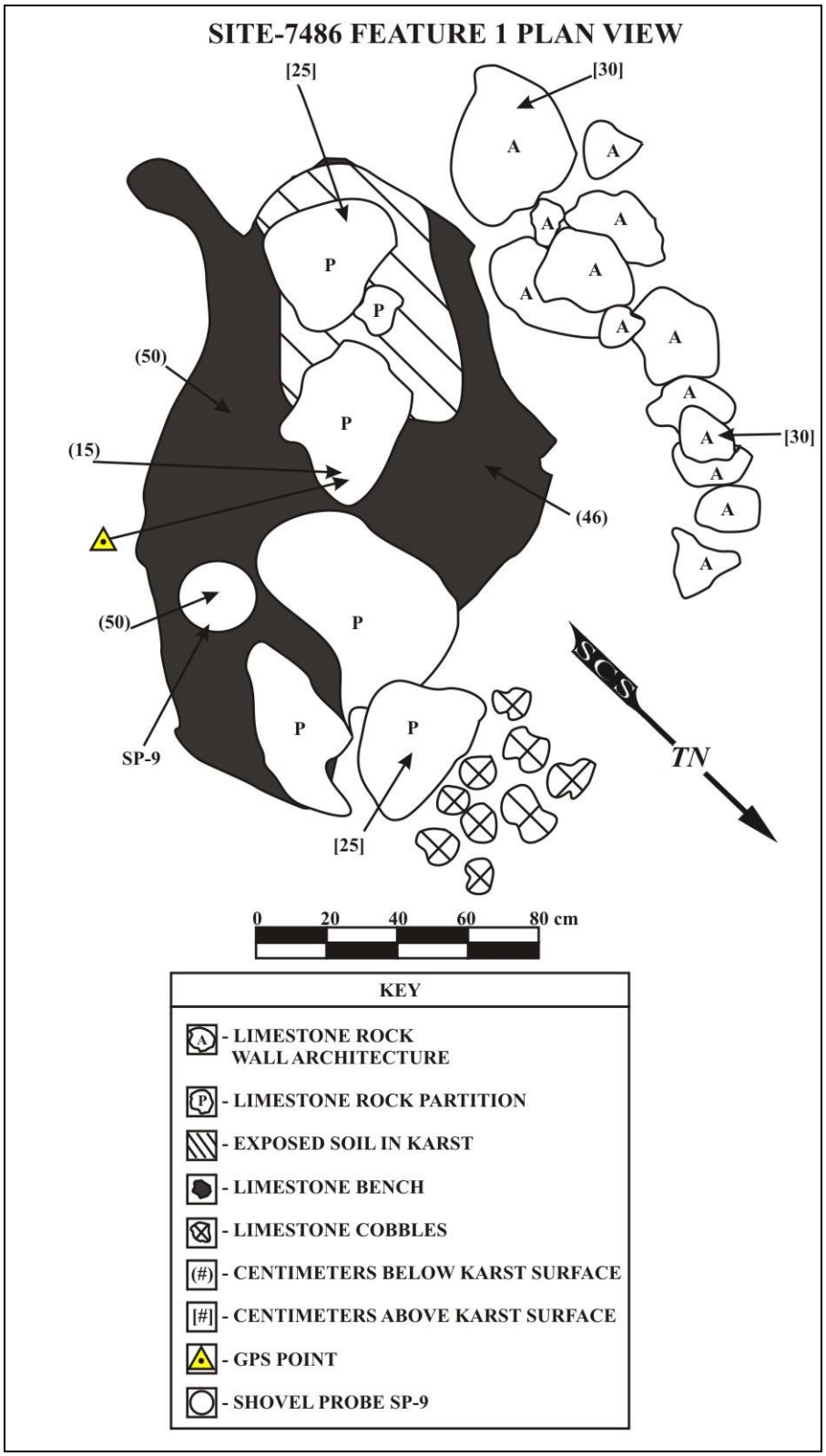

Figure 43: Plan View Drawing of State Site 50-80-12-7486, Feature 1 Interior.

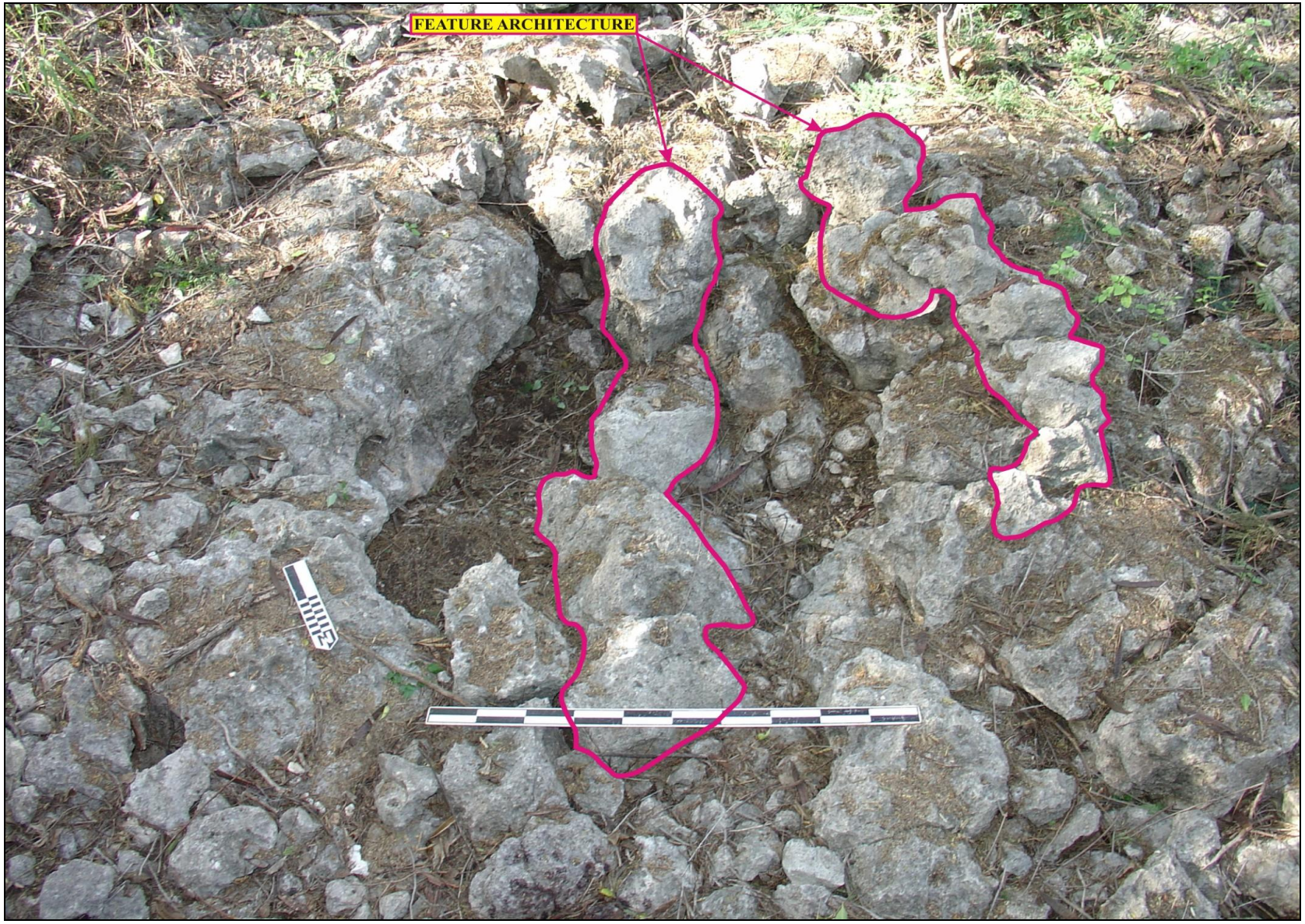

Figure 44: Photographic View of State Site 50-80-12-7486, Feature 1. View to Southwest.

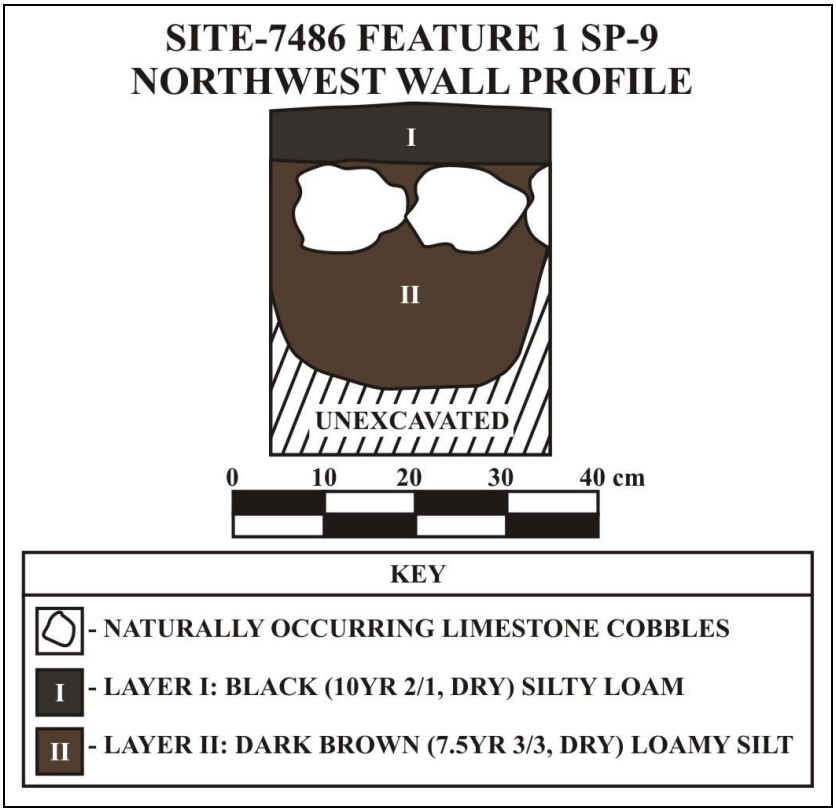

Figure 45: State Site 50-80-12-7486, Feature 1, SP-9 Profile.

- Layer I (0-6 cmbs) consisted of black (10YR 2/1, dry) semi-loose, very fine granular structured silty loam with a few rootlets.

- Layer II (6-30 cmbs) consisted of dark brown (7.5YR 3/3, dry) loose, very fine granular structured loamy silt with a few roots.

Function: Possible Burial Mound
Feature: 2
Feature Type: Rock Mound
GPS Coordinates: E 597358 N 2356112
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-12-7486, Feature 2 consists of an oval-shaped limestone mound (Figures 46 and 47) with surface feature dimensions of 2.4 m long x 1.8 m wide, and a maximum height of 70 cm above surface (see Table 3). The long axis of the feature is oriented northeast/southwest (40/220 degrees, Magnetic).

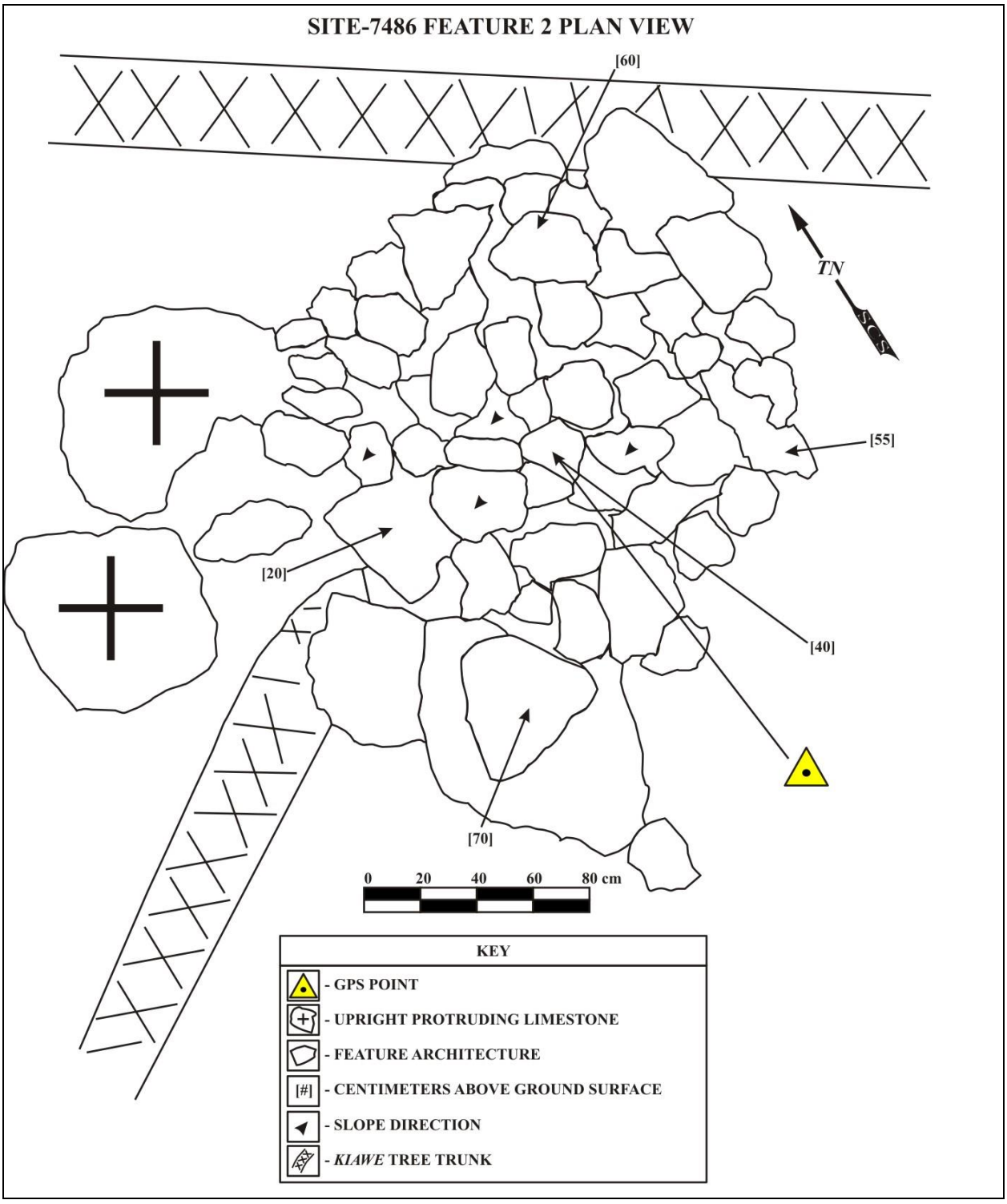

Figure 46: Plan View Drawing of State Site 50-80-12-7486, Feature 2.

Figure 47: Photographic View of State Site 50-80-12-7486, Feature 2. View to East.

The feature was constructed with dry-laid limestone cobbles and small boulders. The cobbles and small boulders are sub-rounded and angular in shape. Both the cobbles and boulders are piled no more than five courses high. The small boulders are located around the perimeter, while the cobbles are located within the interior of the feature. Several uprights were used in feature construction, extending to 0.50 m above surface and located in the north, central, and southern portions of the feature. The feature exhibited collapsed portions along the west/southwest perimeter and in the center. Although Site -7486, Feature 2 exhibited the effects of root wedging of a *kiawe* tree, the feature was found to be in fair condition. Based on feature type, construction methods, construction materials, and collapsed center, Site -7486, Feature 2 was interpreted as a possible burial feature associated with the pre- and/or early post-Contact Period. This mound is greater in breadth and is more substantial in construction than agricultural mounds in the area.

Feature Type: Karst Pit
Feature: 3
GPS Coordinates: E 597351 N 2356124
Function: Agriculture/Refuse
Age: Pre-and/or early Post-Contact Period
Condition: Fair

Description: State Site 50-80-12-7486, Features 3 (2.00 by 0.95 by 0.90 m deep) consisted of an irregularly shaped and filled-in karst pit. Feature 3 was oriented along a northeast/southwest axis with a compass bearing of 75/255 degrees (Magnetic). The fill within Feature 3 is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 3 may have functioned as a refuse pit. Thus, Feature 3 was interpreted as having an agriculture/refuse function. No cultural materials were observed on the surface of Feature 3. A photograph of Feature 3 (karst pit) is presented in Figure 48 as a representative sample of karst pits within State Site 50-80-12-7486.

Feature Type: Karst Pit
Feature: 4
GPS Coordinates: E 597346 N 2356125
Function: Agriculture/Refuse
Age: Pre-and/or early Post-Contact Period
Condition: Fair

State Site 50-80-12-7486, Features 4 (0.80 by 0.45 by 0.28 m deep) consisted of an irregularly shaped and filled-in karst pit. Feature 4 was oriented east/west

Figure 48: Photographic View of State Site 50-80-12-7486, Feature 3 Karst Pit. View to Northwest.

with a compass bearing of 90/270 degrees (Magnetic). The soil within Feature 4 is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 4 may have functioned as a refuse pit. Thus, Feature 4 was interpreted as having an agriculture/refuse function. Feature 4 was found to be in fair condition. No cultural materials were observed on the surface in Feature 4.

Feature Type: Limestone Rock Trail
Feature: 5 [previously Wickler and Tuggle (1997) Feature D of State Site 50-80-12-5120]
GPS Coordinates: E 597342 N 2356123
Function: Transportation
Age: Historic Period Ranching
Condition: Fair

Description: State Site 50-80-12-7486, Feature 5 consists of a limestone rock trail (Figure 49) covered by a collapsed linear wall with surface feature dimensions of 78.35 m long x 3 m to 5.5 m wide, and surface feature heights from 10 cm to a maximum 55 cm above ground surface. The long axis of the limestone rock trail is oriented northeast/southwest (37/217 degrees, Magnetic).

Feature 5 consists of a single course, limestone rock trail constructed of dry laid and piled limestone cobbles and small boulders. The cobbles and small boulders are sub-rounded and sub-angular in shape and are mixed together to form an undulating linear, slightly meandering surface. The limestone rock trail extends from Tripoli Road, which borders the project area to the north/northeast, and terminates 75.35 m to the southwest, near Site -7487, Feature 5 (Figures 50 and 51). No sections of the Feature 5 were breached by the Geolabs, Inc. bulldozing. Only the section of the limestone rock trail located within the project area was recorded (see Figure 50). The northern terminus of the feature is not as wide as the remainder of the limestone rock trail, possibly due to construction of Tripoli Road. The other terminus of the limestone rock trail ends at a push pile composed of concrete, indicating mechanical disturbance on that end of the limestone rock trail.

Historic cultural material observed on the surface of the feature includes clear and amber glass bottle fragments. One clear fragment has "Duraglas" embossed along the heel. This historic material may be associated with historic ranching activities or with military use of the area or date to more recent activities.

Although State Site 50-80-12-7486, Feature 5 exhibited the effects of modern disturbance and root wedging by *koa* trees, the feature was found to be in fair condition. Based on

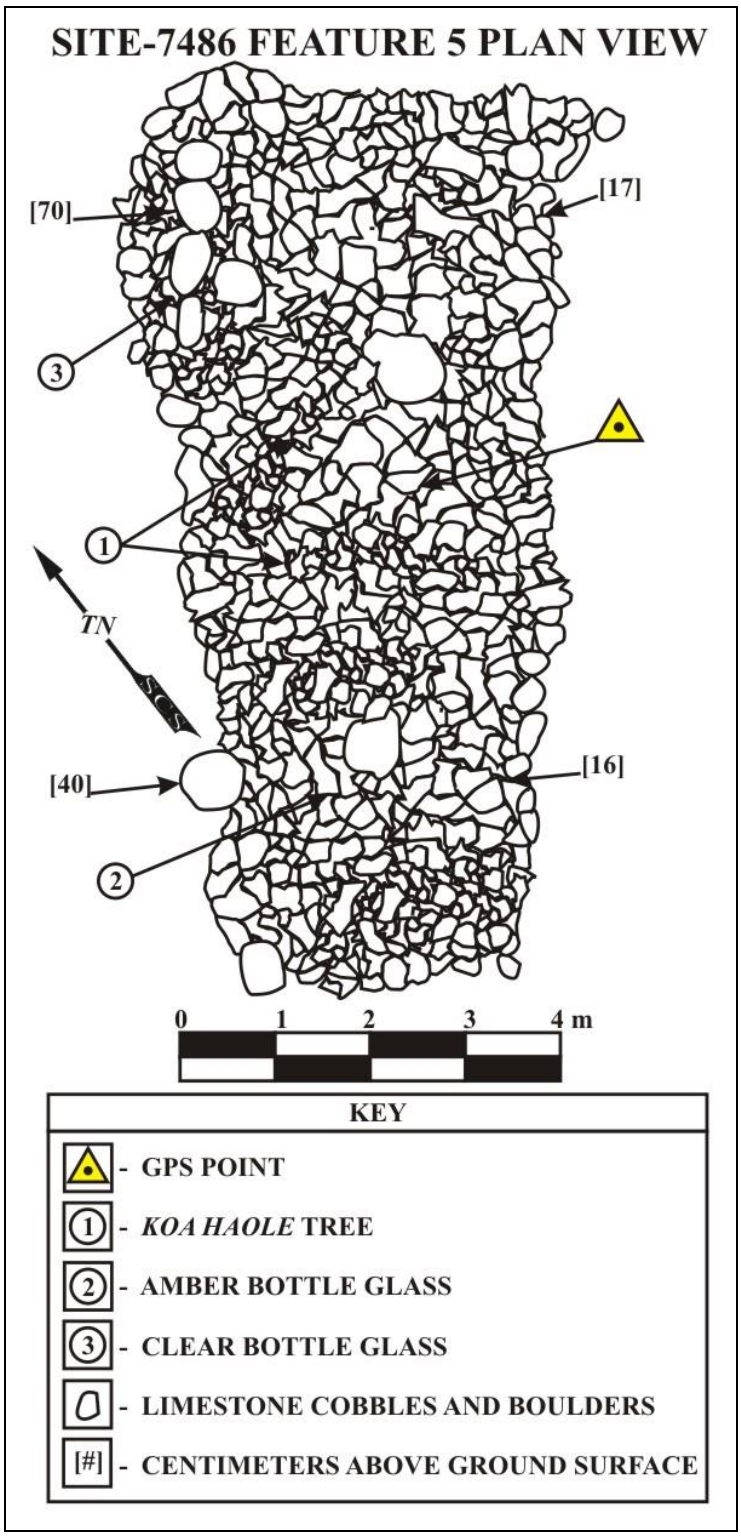

Figure 49: Plan View Drawing of State Site 50-80-12-7486, Feature 5, near Northern Terminus.

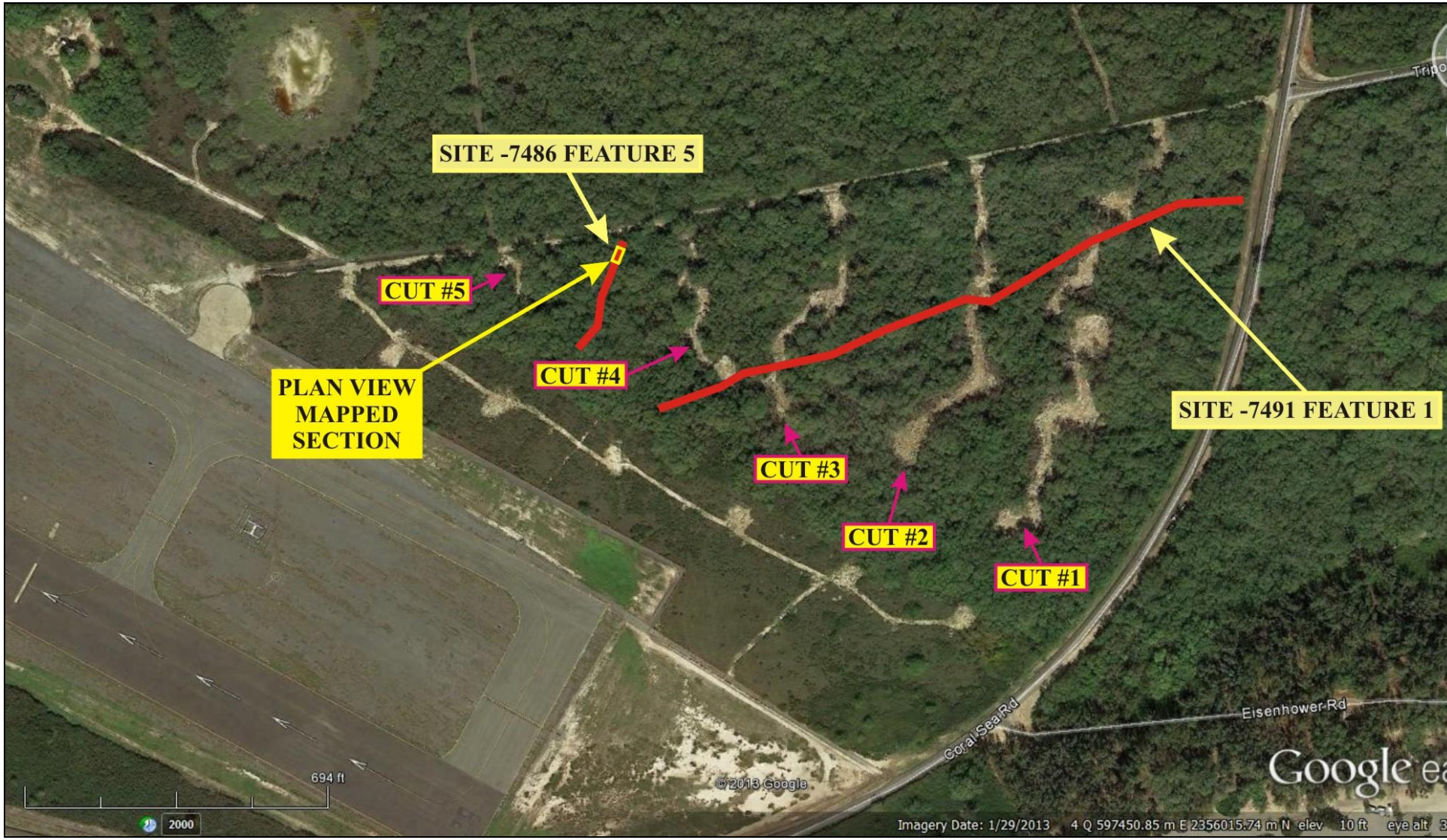

Figure 50: 2013 Google Earth Aerial Image of State Site 50-80-12-7486, Feature 5, State Site 50-80-12-7491, Feature 1 and Geolabs, Inc. Bulldozer Cuts #1 through #5.

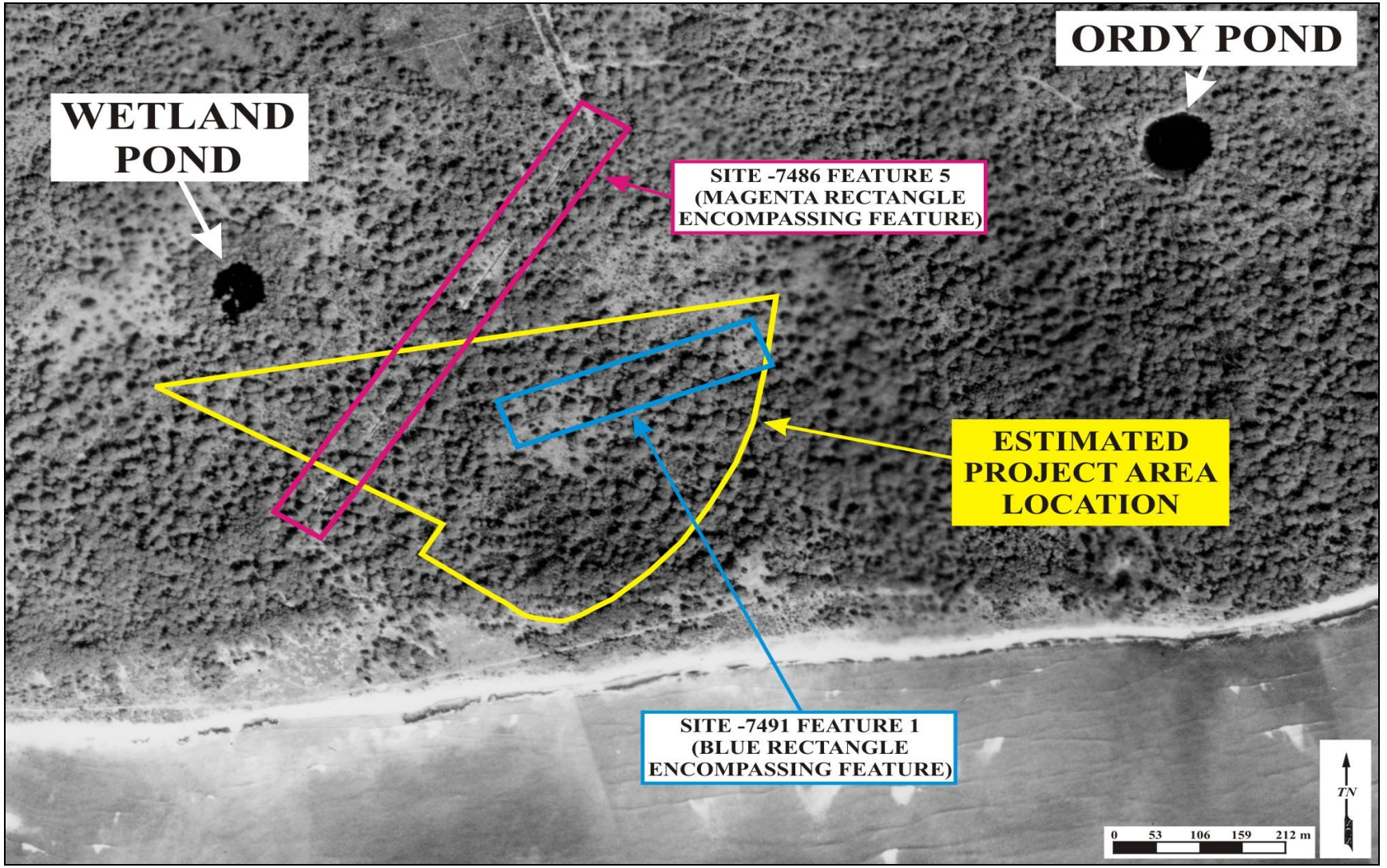

Figure 51: 1928 Aerial Photograph Showing Locations of State Site 50-80-12-7486 Feature 5 and State Site 50-80-12-7491, Feature 1.

feature type, construction methods, construction materials, a 1928 aerial photograph, and a 1927 USGS (Barbers Point) quadrangle map, Feature 5 was interpreted as a limestone rock trail covered by a collapsed limestone rock wall associated with Historic Period ranching activities (Figure 52). It should be noted that Figure 52 indicates another limestone rock trail (*i.e.*, State Site 50-80-12-7491) located immediately adjacent and west of Feature 5.

STATE SITE 50-80-12-7487 (SCS SITE TS-6)

State Site 50-80-12-7487 is a newly established multi-functional site consisting of 12 features: six karst pits, three modern aircraft crash features, a concrete building foundation, an L-shaped boundary wall, and a platform and rock wall complex (Figure 53) (see Table 2). Following the literature review of the Tuggle and Tomonari-Tuggle (1994) Phase I work and Wickler and Tuggle (1997) Phase II work, the current Archaeological Inventory Survey found that three of the 12 features, Feature 2A (single-wheeled aircraft landing gear), Feature 2B (two-wheeled aircraft landing gear), and Feature 2C (portion of an aircraft wing), now all part of State Site 50-80-12-7487, were previously identified within the Tuggle and Tomonari-Tuggle (1994) Phase I Inventory Area E6-c and recorded within the horizontal boundaries of State Site 50-80-12-5120 during the Wickler and Tuggle (1997) Phase II work. Also following the literature review of the Tuggle and Tomonari-Tuggle (1994) Phase I work and Wickler and Tuggle (1997) Phase II work, the current Archaeological Inventory Survey could not confirm that Feature 4 (L-shaped limestone rock wall) and Feature 5 (rectangular-shaped limestone platform and wall) of State Site 50-80-12-7487, were initially identified during the Tuggle and Tomonari-Tuggle (1994) Phase I work and recorded during the Wickler and Tuggle (1997) Phase II work based on comparisons of the current Archaeological Inventory Survey and the Wickler and Tuggle (1997) Phase II work of State Site 50-80-12-5120 site plan view map showing feature location, feature horizontal shape, and feature horizontal long axis orientation. It is possible that Features 4 and 5 of State Site 50-80-12-7487 are what was recorded during Wickler and Tuggle (1997) as State Site 50-80-12-5120 Feature A and Feature C, respectively. The remaining seven features (Features 1A through 1F and 3) of State Site 50-80-12-7487 are newly identified features.

State Site 50-80-12-7487 measures 65.0 by 59.0 m and is oriented along an east/west axis with a compass bearing of 90/270 degrees (Magnetic). State Site 50-80-12-7487 was found to be in good condition. Based on feature types and construction methods, State Site 50-80-12-7487 was interpreted as an agriculture/refuse storage/military/boundary complex with a possible burial component.

Based on feature types, State Site 50-80-12-7487 was interpreted as associated with the pre-and/or early post-Contact Period through the Historic Period. State Site 50-80-12-7487 has been evaluated for significance, as outlined in Hawai‘i Administrative Rules §13-275-6, and found to be significant under Criterion d, for information content. As archaeological subsurface testing was not conducted for all the features, the unexcavated features retain the potential for yielding additional cultural information in subsurface contexts. Thus, a recommendation of data recovery, preservation, and no further work has been made for the features within State Site 50-80-12-7487.

Descriptive Data by Feature Number
Feature Type: Karst Pit
Feature: 1A through 1F
GPS Coordinates: E 597317 N 2356113
Function: Agriculture/Refuse/Storage/Undetermined
Age: Pre-and/or early Post-Contact Period
Condition: Good

Description: State Site 50-80-12-7487, Feature 1A consists of an irregularly shaped and filled-in karst pit. Feature 1A measures 1.10 by 0.56 by 0.37 m deep and is oriented along a north/south axis with a compass bearing of 000/180 degrees (Magnetic). The soil within Feature 1A is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 4 may have functioned as a refuse pit. Thus, Feature 1A was interpreted as having an agriculture/refuse function. Feature 1A was found to be in fair condition. No cultural materials were observed on the surface in Feature 1A. A recommendation of preservation has been made for Feature 1A.

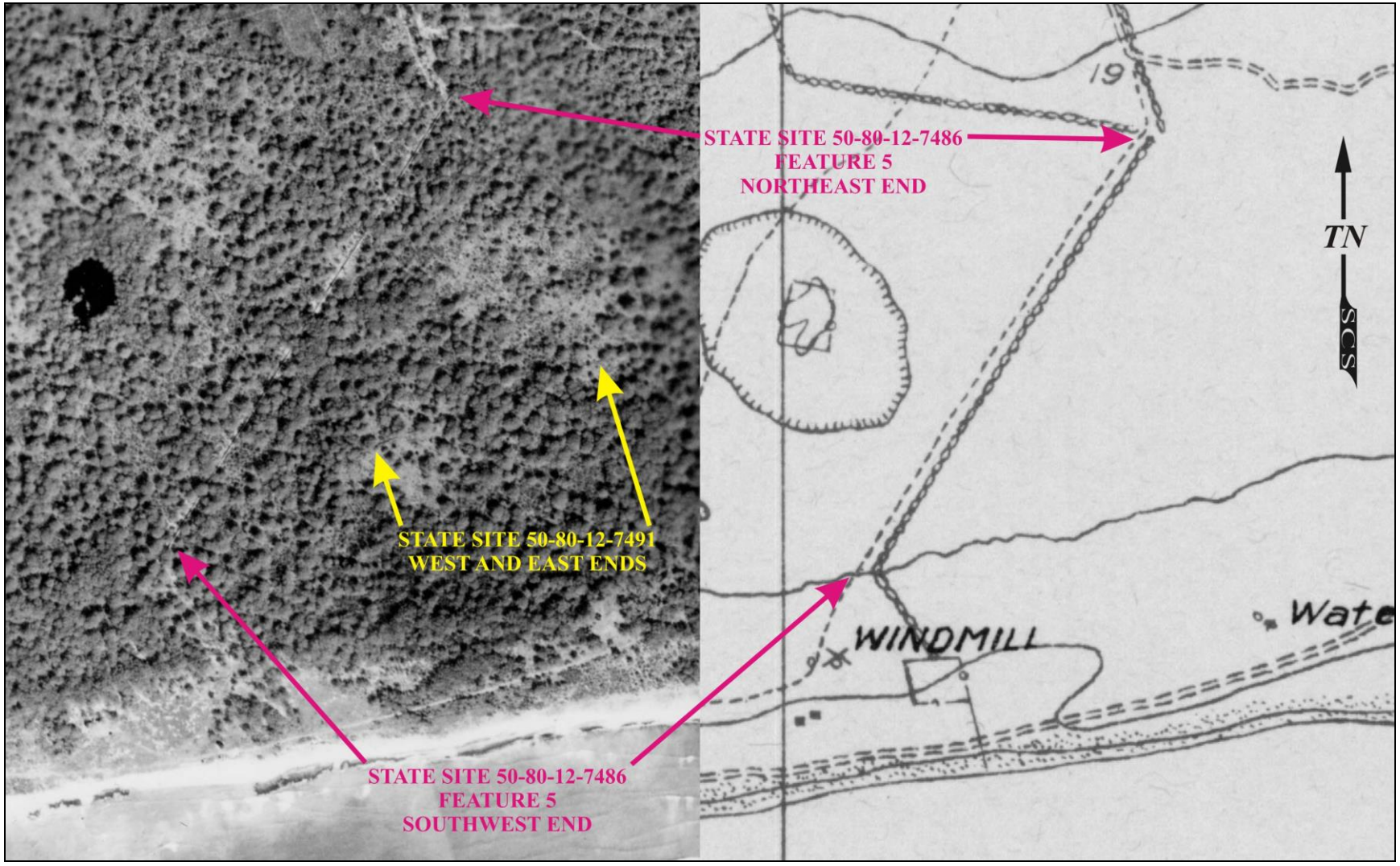

Figure 52: 1928 Aerial Photo Joined with USGS Quadrangle (Barbers Point, 1927) Map Showing Location of State Site 50-80-12-7486 Feature 5 and State Site 50-80-12-7491, Feature 1. Note trail (dashed line) parallel to State Site 50-80-12-7486, Feature 5.

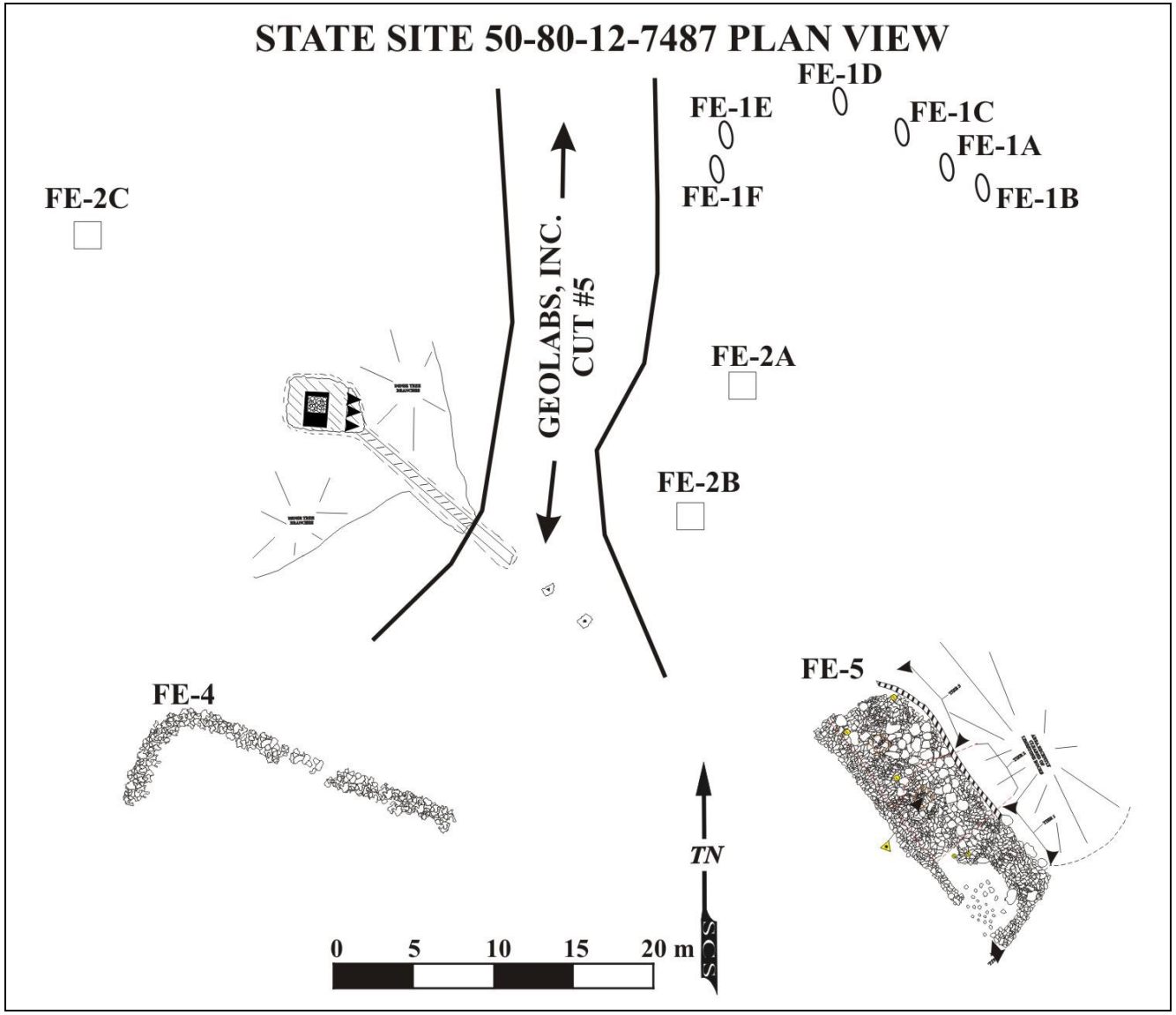

Figure 53: Plan View Drawing of State Site 50-80-12-7487.

State Site 50-80-12-7487, Feature 1B consists of an irregularly shaped filled-in karst pit. Feature 1B measures 1.26 by 0.80 by 0.57 m deep and is oriented along a southeast/northwest axis with a compass bearing of 135/315 degrees (Magnetic). The soil within Feature 1B is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 1B may have functioned as a refuse pit. Thus, Feature 1B was interpreted as having an agriculture/refuse function. Feature 1B was found to be in fair condition. No cultural materials were observed on the surface in Feature 1B. A recommendation of preservation has been made for Feature 1B.

State Site 50-80-12-7487, Feature 1C consists of an irregularly shaped filled-in. Feature 1C measures 0.55 by 0.35 by 0.60 m deep and is oriented along a south/north axis with a compass bearing of 000/180 degrees (Magnetic). The soil within Feature 1C is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 4 may have functioned as a refuse pit. Thus, Feature 1C was interpreted as having an agriculture/refuse function. Feature 1C was found to be in fair condition. No cultural materials were observed on the surface in Feature 1C. A recommendation of preservation has been made for Feature 1C.

State Site 50-80-12-7487, Feature 1D consists of an irregularly shaped filled-in karst pit. Feature 1D measures 1.10 by 0.35 by 0.45 m deep and is oriented along a northeast/southwest axis with a compass bearing of 70/250 degrees (Magnetic). The soil within Feature 1D is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 1D may have functioned as a refuse pit. Thus, Feature 1D was interpreted as having an agriculture/refuse function. Feature 1D was found to be in fair condition. No cultural materials were observed on the surface in Feature 1D. A recommendation of preservation has been made for Feature 1D.

State Site 50-80-12-7487, Feature 1E consists of an irregularly shaped and unmodified karst pit with no observed cultural modification. Feature 1E measures 0.55 by 0.27 by 1.05 m deep and is oriented along a northeast/southwest axis with a compass bearing of 55/235 degrees (Magnetic). Feature 1E was interpreted as a having a storage or refuse function as the karst pit contains a cavity in which items (*i.e.,* gourds containing water) may have been placed for storage. However, previous archaeological studies conducted in the vicinity identified similar

features which were found to contain food midden refuse suggesting Feature 1E may have functioned as a refuse pit.

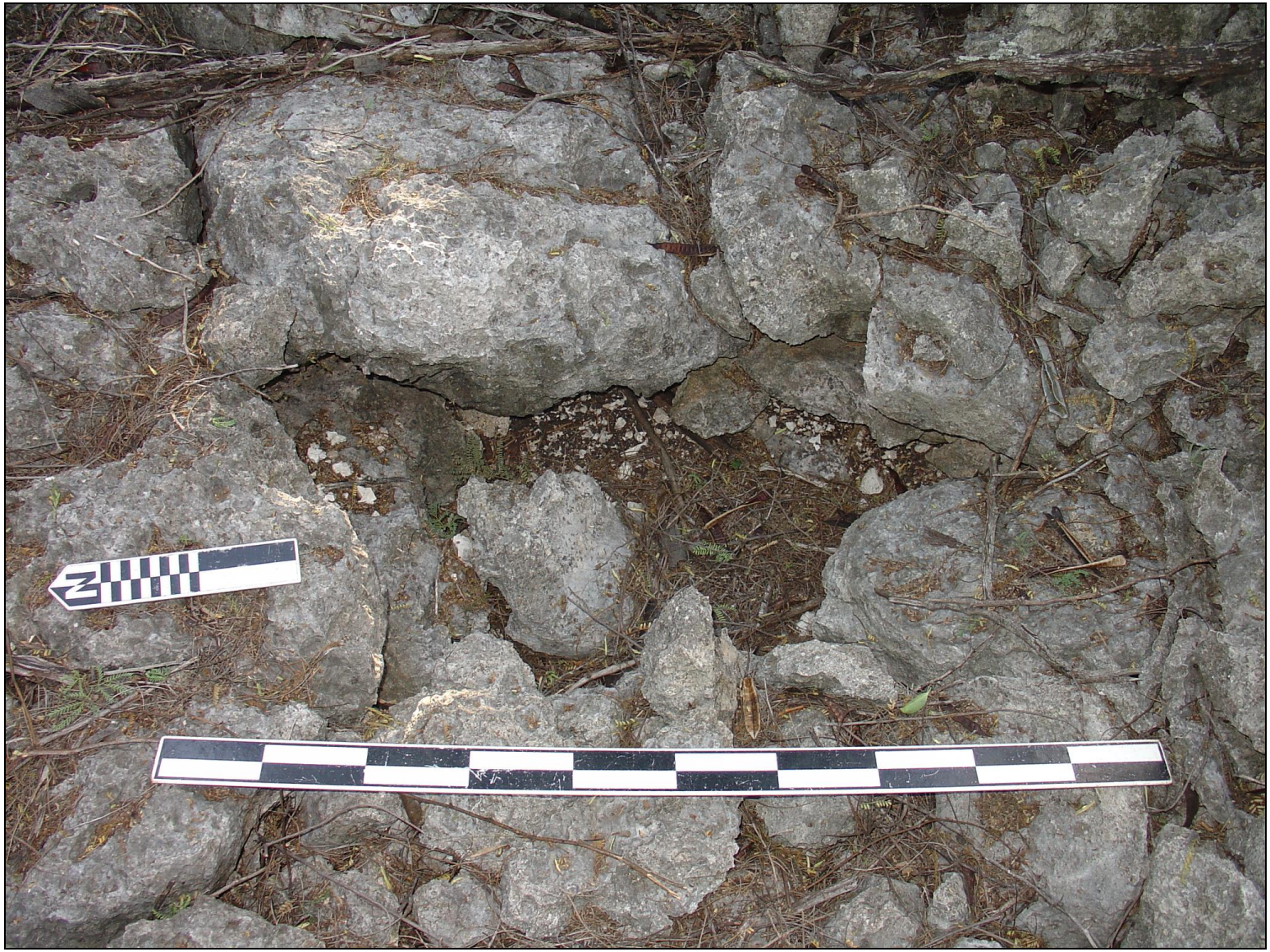

Figure 54: Representative Photographic View of Karst Pit Feature 1F of State Site 50-80-12-7487. View to Southeast.

Feature 1E was found to be in fair condition. No cultural materials were observed on the surface in Feature 1E. A recommendation of preservation has been made for Feature 1E.

State Site 50-80-12-7487, Feature 1F consists of an irregularly shaped and filled-in karst pit with no observed cultural modification. Feature 1F measures 0.76 by 0.40 by 0.46 m deep and is oriented along a southeast/northwest axis with a compass bearing of 15/195 degrees (Magnetic). The soil within Feature 1F is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 1F may have functioned as a refuse pit. Thus, Feature 1F was interpreted as having an agriculture/refuse function. Feature 1F was found to be in fair condition. No cultural materials were observed on the surface in Feature 1F. A recommendation of preservation has been made for Feature 1F.

Feature Type: Aircraft Crash Site
Feature: 2A, 2B, and 2C [previously known in Wickler and Tuggle (1997) as Feature E of State Site 50-80-12-5120]
GPS Coordinates: E 597304 N 2356100
Function: Military Aircraft
Age: Modern
C**ondition:** Fair

Description: State Site 50-80-12-7487, Features 2A through 2C consist of components of a modern aircraft crash site. Dimensions were taken for each component of the wreckage. Feature 2A consists of a single-wheeled aircraft landing gear, measuring 1.9 m long x 63 cm wide (Figure 55). Feature 2B consists of a two-wheeled aircraft landing gear, measuring 2.08 m long x 35 cm wide (Figure 56). Feature 2C consists of an aircraft wing, measuring 2.05 m x 70 cm wide (Figure 57). Features 2A through 2C are in fair condition. State Site 50-80-12-7487, Features 2A through 2C are pieces of a McDonnell Douglas Phantom II F-4J, construction number c/n153830, radio name WD-38, unit number VMFA-212, identification number 12/3830. After a training flight, this Phantom F-4J of the USMC attempted to land in Kāne`ohe Bay but due to extreme weather conditions, communications broke off. The pilot retreated to the south coast but crashed landed when attempting to land at the former NAS Barbers Point (`Ewa Field). The crew (pilot, Lieutenant Edwin David Hughes, 25; and Lieutenant Phillip Samuel Skaff, 28) were tragically killed in this accident on December 17, 1971. A recommendation of data recovery has been made for Features 2A, 2B, and 2C.

Figure 55: Photographic View of State Site 50-80-12-7487, Feature 2A. View to Northeast.

Figure 56: Photographic View of State Site 50-80-12-7487, Feature 2B. View to Southeast.

Figure 57: Photographic View of State Site 50-80-12-7487, Feature 2C. View to Southeast.

Feature Type: Concrete Foundation and Strip
Feature: 3
GPS Coordinates: E 597283 N 2356099
Function: Military Building
Age: Historic
Condition: Fair

Description: State Site 50-80-12-7487, Feature 3 consists of a poured concrete foundation and poured walk (Figures 58 and 59). Surface feature exterior dimensions of the concrete foundation measured 4.1 m long x 2.1 m wide. Surface feature interior dimensions measured 1.36 m long x 1.03 m wide. Surface feature exterior dimensions of the exposed portion of the concrete walk measured 4 m long x 60 cm wide. Surface feature heights above ground for both the concrete foundation and walk measured from 1 cm to a maximum of 17 cm. The long axis of the foundation is oriented southeast/northwest (147/327 degrees, Magnetic).

It remains unknown whether Feature 3 was built in place or was constructed as a preform and transported to the area. Material utilized in the construction includes concrete containing angular basalt gravel and the use of ferrous metal bolts in some areas. In plan view, Feature 3 is a rectangular-shaped concrete foundation with a rectangular pit and a linear rectangular- shaped concrete strip which extends to the northwest/southeast. This feature consists of two tiers. The lowest tier is comprised of the concrete strip and an undulated concrete surface which surrounds the second tier. The upper tier is comprised of a smooth concrete surface, which surrounds a rectangular pit, now filled with limestone pebbles, cobbles, and concrete fragments. Metal bolts are located along the south and north surfaces of the upper tier (concrete foundation), which suggest that this tier may have once had vertical walls. Modern bulldozing (Cut #5) conducted in 2012 fractured two sections of the concrete strip. Historic artifacts observed on the surface of the site include ferrous metal and aluminum fragments from Site -7487, Feature 2 (aircraft crash locus), which are scattered around Feature 3.

Although Site -7487, Feature 3 was subject to mechanical alteration, the feature was found to be in fair condition. Based on feature type, construction methods, and construction materials, this feature is interpreted to be a former building associated with Historic-era military use of the area. A recommendation of no further work has been made for Feature 3.

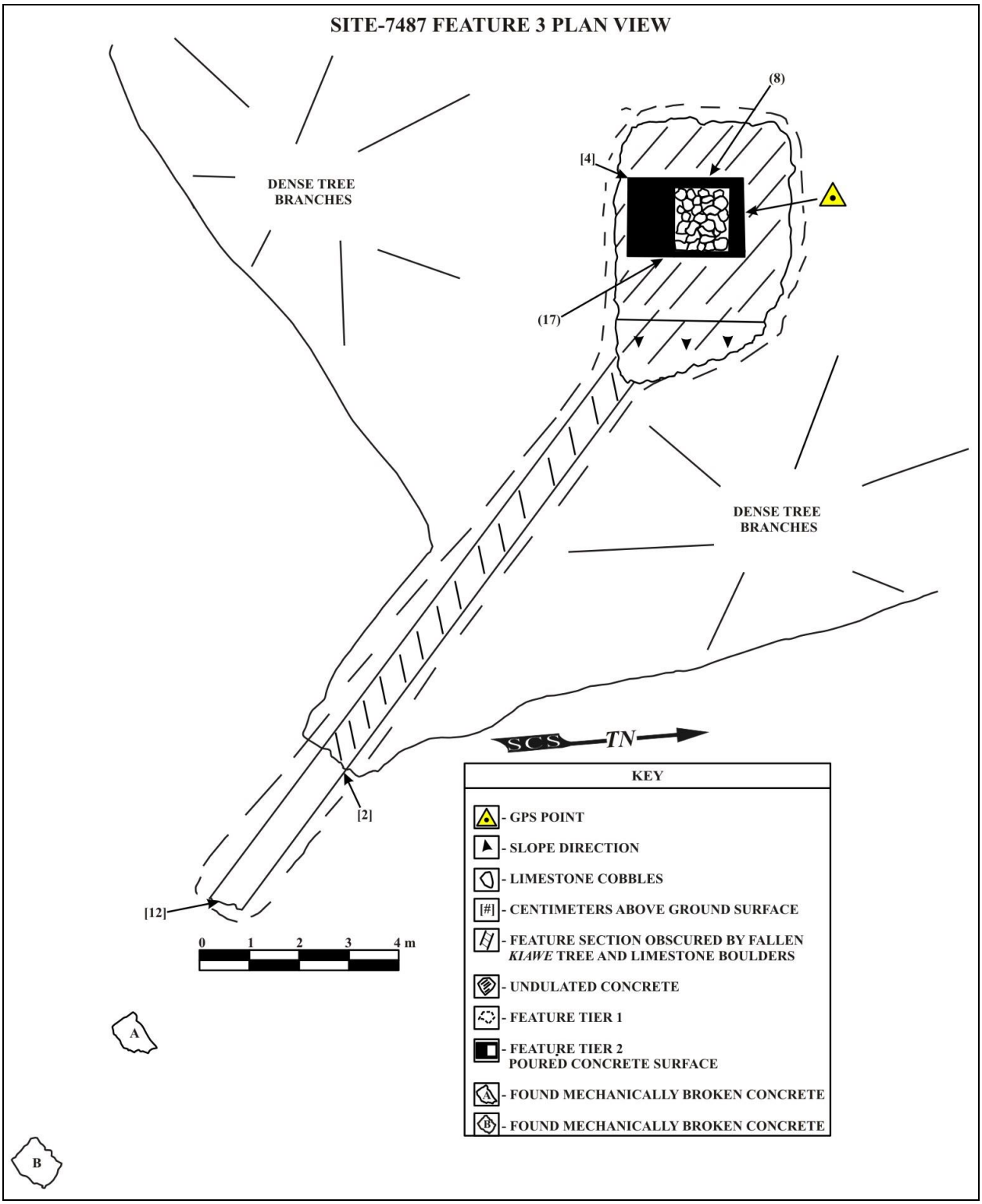

Figure 58: Plan View Drawing of State Site 50-80-12-7487, Feature 3.

Figure 59: Photographic View of State Site 50-80-12-7487, Feature 3, Poured Concrete Walk Section. View to Northwest.

Feature Type: L-shaped Rock Wall
Feature: 4 [possibly Wickler and Tuggle (1997) Feature A of State Site 50-80-12-5120]
GPS Coordinates: E 597266 N 2356075
Function: Boundary
Age: Pre-and/or early Post-Contact
Condition: Good

Description: State Site 50-80-12-7487, Feature 4 consists of an L-shaped limestone rock wall with a slight bend (Figure 60) and measuring 25.8 m long. Surface feature heights above ground measured to a maximum 50 cm. Wall thickness measured 50 cm to 86 cm. The long axis of the feature is oriented southeast/northwest (103/283 degrees, Magnetic).

Feature 4 was constructed of dry stacked limestone cobbles and small boulders up to four courses high. The cobbles and small boulders are angular, sub-angular, and sub-rounded in shape. The elbow of the feature is curved rather than a sharp 90 degree turn. Portions of the feature appear to have a cobble fill core/center with larger cobbles and small boulders between the smaller cobbles. The southern end of the short wall segment has structurally degraded and due to this condition, a bottom course of larger sized boulders is visible. The east end of the longer segment was structurally compromised by a combination of *kiawe* trees and machine (possibly a bulldozer) impact from the south, which pushed the wall down a slight degree. The portion of the feature that appeared to have been structurally compromised was surrounded by 2-foot tall grass and small diameter *koa haole* trees. Both types of vegetation suggested that the mechanical disturbance to the feature occurred prior to the Geolabs, Inc. (2012) bulldozing incident but not so long ago as the diameter of the *koa haole* trees was small [approximately 2 inches (~5 cm)]. Also supporting the likelihood that the Geolabs bulldozing incident did not cause disturbance to the feature is the fact that the Geolabs bulldozer path is located approximately 30.0 m to the northeast of the feature.

Although Site -7487, Feature 4 exhibited the effects of disturbance, including root wedging by a *kiawe* tree, and mechanical alteration, the feature was found to be in fair condition. Based on feature type, construction methods, and construction materials, this feature has been interpreted as a boundary wall associated with the pre- and/or-post Contact Period. A recommendation of preservation has been made for Feature 4.

Figure 60: Photographic View of State Site 50-80-12-7487, Feature 4. View to Northeast.

Feature Type: Platform and Rock Wall
Feature: 5 [possibly Wickler and Tuggle (1997) Feature C of State Site 50-80-12-5120]
GPS Coordinates: E 597316 N 2356074
Function: Historic Foundation
Age: Historic
C**ondition:** Fair

Description: State Site 50-80-12-7487, Feature 5 consists of a rectangular-shaped limestone platform and two walls (Figures 61 and 62) with surface feature exterior dimensions of 18.8 m long by 5.8 m wide. Surface feature heights above ground measured a maximum of 80 cm. Wall thickness measured 60 cm to 80 cm. The long axis of the feature is oriented southeast/northwest (132/312 degrees, Magnetic).

The feature was constructed of dry-laid limestone pebbles, cobbles, and small boulders. The limestone platform consists of three tiers. Tier three, the highest tier, consists mostly of small boulders and pebbles, which may suggest the feature was a dump pile. Tier two consists of a few small boulders on the northeast half, with the remainder of the tier composed of cobbles. Tier one, the lowest tier, consists of a few small boulders and cobbles but is half the width of tiers two and three.

Abutting the southwest and southeast side of the three tiered platform is a limestone wall, one of two walls in the feature. The limestone wall consists of dry-stacking of cobbles and small boulders to a maximum of seven courses high. Construction of the wall appears to be core-filled, with larger cobbles and small boulders on the outer flank. This wall may have connected with a smaller wall located at the southeast end of the feature, although currently there is what appears to be a breach on the southwest side between the two walls. The walls were likely built around the same time. The smaller limestone wall is composed of dry-stacking of cobbles and small boulders, no more than four courses high. This wall appears core-filled in some areas. Observed cultural material included ferrous metal fragments, clear glass bottles, clear and amber glass bottle sherds, a large unidentified metal object, a glass bottle sherd dated between 1940 and 1954, a rubber ball, and fiberglass strands scattered on the feature's surface. Subsurface testing of Site -7487, Feature 5 involved two test units (TU-1 and TU-2) which exposed buried deposits containing historic materials. Based on construction methods and materials and associated artifacts, State Site 50-80-12-7487, Feature 5 is interpreted as an Historic foundation.

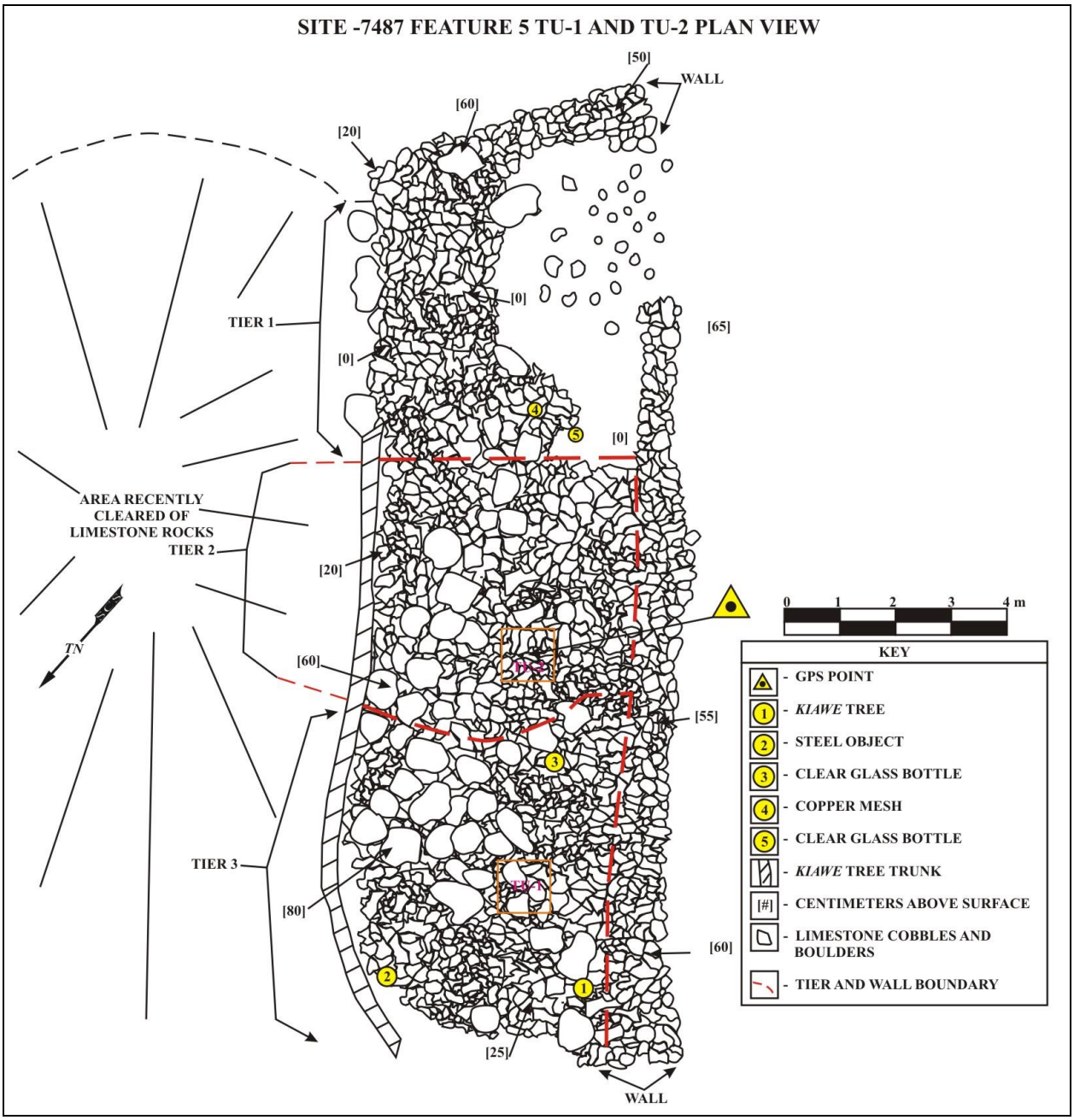

Figure 61: Plan View Drawing of State Site 50-80-12-7487, Feature 5.

Figure 62: Photographic View of State Site 50-80-12-7487, Feature 5. View to Northwest.

Although Site -7487, Feature 5 exhibited the effects of root wedging by a *kiawe* tree and mechanical alteration, the feature was found to be in fair condition. Feature construction revealed that the longer wall was constructed prior to the abutting tiers of the platform. A recommendation of preservation has been made for Feature 5.

TEST UNIT 1

Test unit 1 (TU-1) was placed in the center of tier three of Site -7487, Feature 5 (see Figure 61. Test unit 1 (TU-1) measured 1 m long x 1 m wide. TU-1 exposed two stratigraphic layers (Figure 63). Historic-era cultural materials were recovered from both layers. The base of tier 3 architecture was identified in Layer II at 55 cmbs.

- Layer I (0-30 cmbs) consisted of limestone cobbles and pebbles (tier three of architecture) with decomposing vegetation. Layer I yielded copper wire, ferrous nails, glass sherds, and metal bottle caps. Layer I also contained several rat bones.

- Layer II (30-66 cmbs) consisted of dark brown (10YR 3/3, dry) silty loam with decomposing vegetation. Feature architecture extended into Layer II. Layer II yielded ferrous nails, glass sherds, and metal bottle caps. Layer II began at ground surface and terminated when depth reached limestone outcrop.

TEST UNIT 2

Test unit 2 (TU-2) was placed in the center of tier two of Site -7487, Feature 5 (see Figure 61). TU-2 measured 1 m long x 1 m wide. TU-2 exposed three stratigraphic layers (Figure 64). Historic-era cultural materials were recovered from all three layers. The base of tier 2 architecture was identified in Layer I at 18 cmbs.

- Layer I (0-20 cmbs) consisted of limestone cobbles (tier two of architecture) and yielded glass sherds and several fragments of ferrous metal.

- Layer II (20-28 cmbs) consisted of very dark brown (10YR 2/2, dry) silty loam with decomposing vegetation and limestone cobbles and pebbles. Layer II contained bottle glass sherds and ferrous metal. Layer II was interpreted as a natural stratum as the base boundary of the stratum was diffuse.

- Layer III (28-35 cmbs) consisted of dark brown (7.5YR 3/2, dry) semi-loose, very fine granular structured loam/sandy/silt with a few roots. Layer III contained basalt gravel and bottle glass fragments. Layer III terminated upon limestone outcropping. Layer III was also interpreted to be a natural stratum.

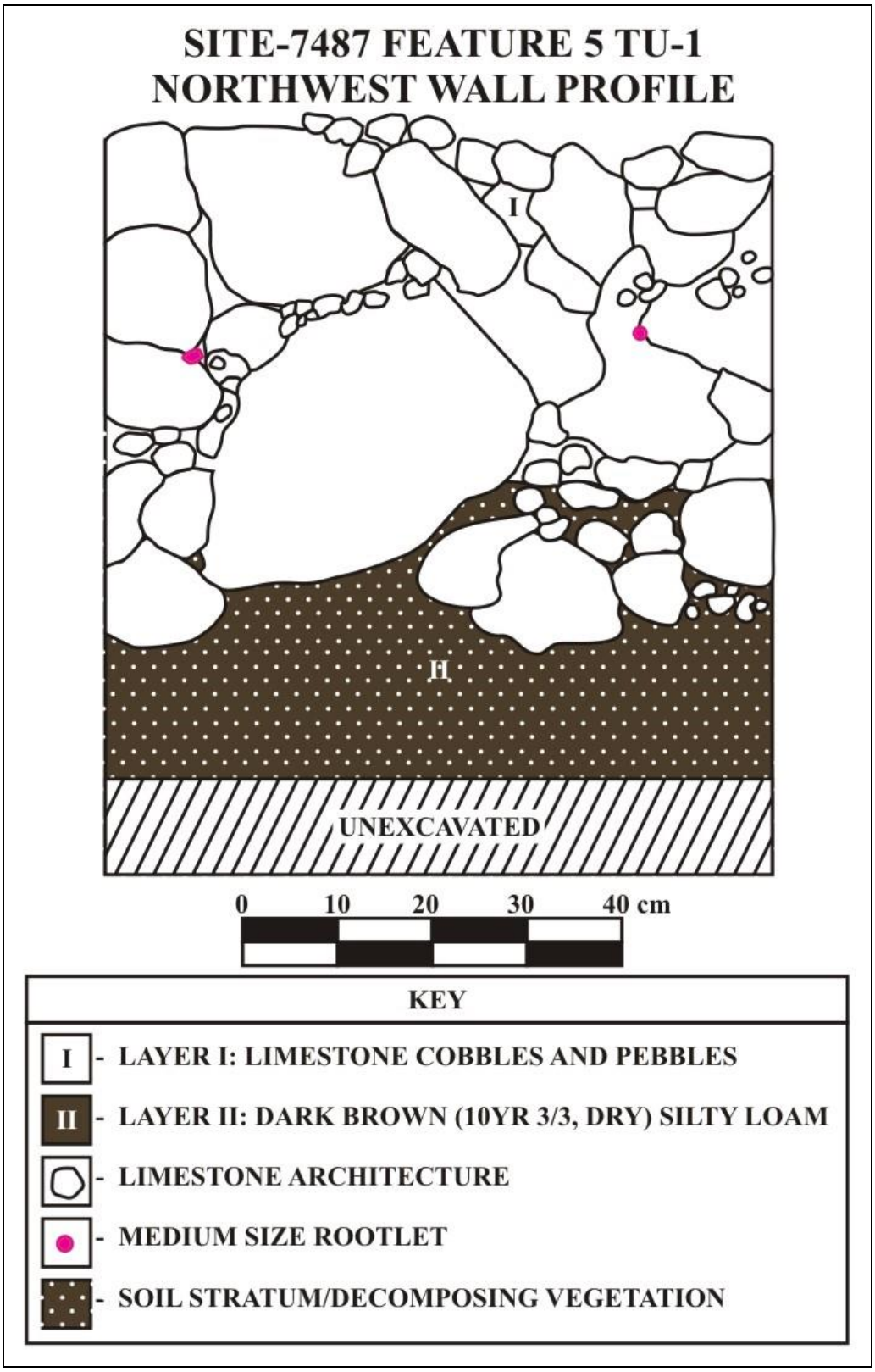

Figure 63: State Site 50-80-12-7487, Feature 5, TU-1 Profile.

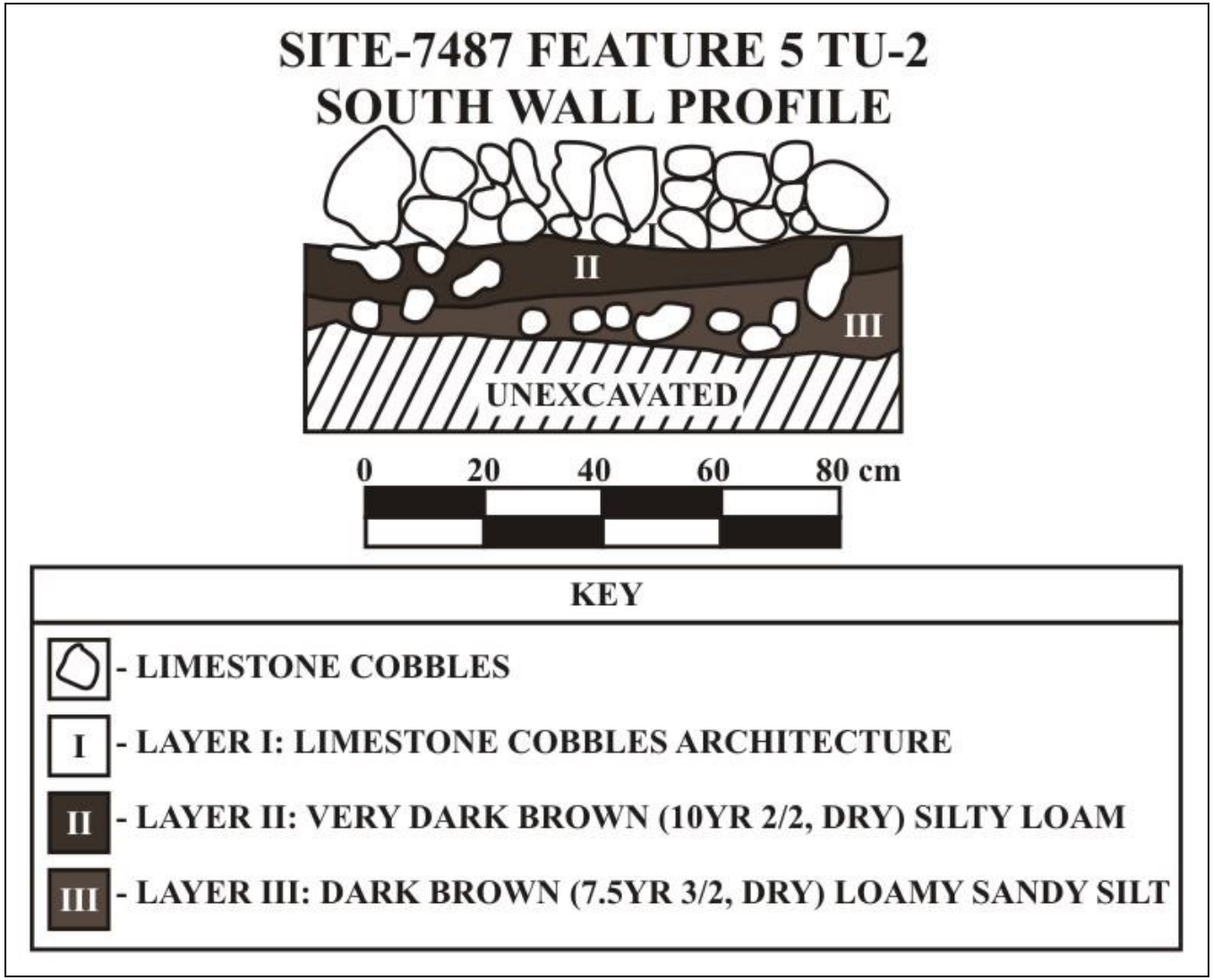

Figure 64: State Site 50-80-12-7487, Feature 5, TU-2 Profile.

STATE SITE 50-80-12-7488 (SCS SITE TS-7)

State Site 50-80-12-7488 is a newly identified site consisting of one karst pit (see Table 2). State Site 50-80-12-7488 measures 2.0 by 0.50 m and is oriented along a north/south axis with a compass bearing of 000/180 degrees (Magnetic). State Site 50-80-12-7488 was found to be in fair condition. Based on feature type, State Site 50-80-12-7488 was interpreted as an agriculture/refuse site associated with the pre- and/or early post-Contact Period. State Site 50-80-12-7488 has been evaluated for significance, as outlined in Hawai‘i Administrative Rules §13-275-6, and found to be significant under Criterion d, for information content, and was in fair condition. As archaeological subsurface testing was not conducted, the potential remains for additional cultural information to be present in subsurface contexts. Thus, a recommendation of preservation has been made for the features within State Site 50-80-12-7488.

Descriptive Data by Feature Number
Feature Type: Karst Pit
Feature: 1
Function: Agriculture/Refuse
GPS Coordinates: E 597244 N 2356112
Age: Pre-and/or early Post-Contact Period
Condition: Fair

Description: State Site 50-80-12 -7488 consists of an irregularly shaped and filled-in karst pit (Figure 65). The pit measured 1.00 m long, 0.40 m wide, and a maximum 0.86 m deep, and is oriented along a north/south axis with a compass bearing of 000/180 degrees (Magnetic). The soil within Feature 1 is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 1 may have functioned as a refuse pit. Thus, Feature 1 was interpreted as having an agriculture/refuse function. Feature 1 was found to be in fair condition. No cultural materials were observed on the surface within the pit.

STATE SITE 50-80-12-7489 (SCS SITE TS-8)

State Site 50-80-12-7489 is a newly identified site consisting of two karst pits (Figure 66) (see Table 2). State Site 50-80-12-7489 measures 21.0 m by 2.5 m and is oriented along a northeast/southwest axis with a compass bearing of 24/204 degrees. State Site 50-8-12-7489 was found to be in fair condition. Based on feature type, State Site 50-80-12-7489 was interpreted as an agriculture/refuse site associated dating to the pre- and/or early post-Contact Period. Site 50-80-12-7489 has been evaluated for significance, as outlined in Hawai‘i Administrative Rules §13-275-6, and found to be significant under Criterion d, for information content.

Figure 65: Photographic View of State Site 50-80-12-7488. View to Northwest.

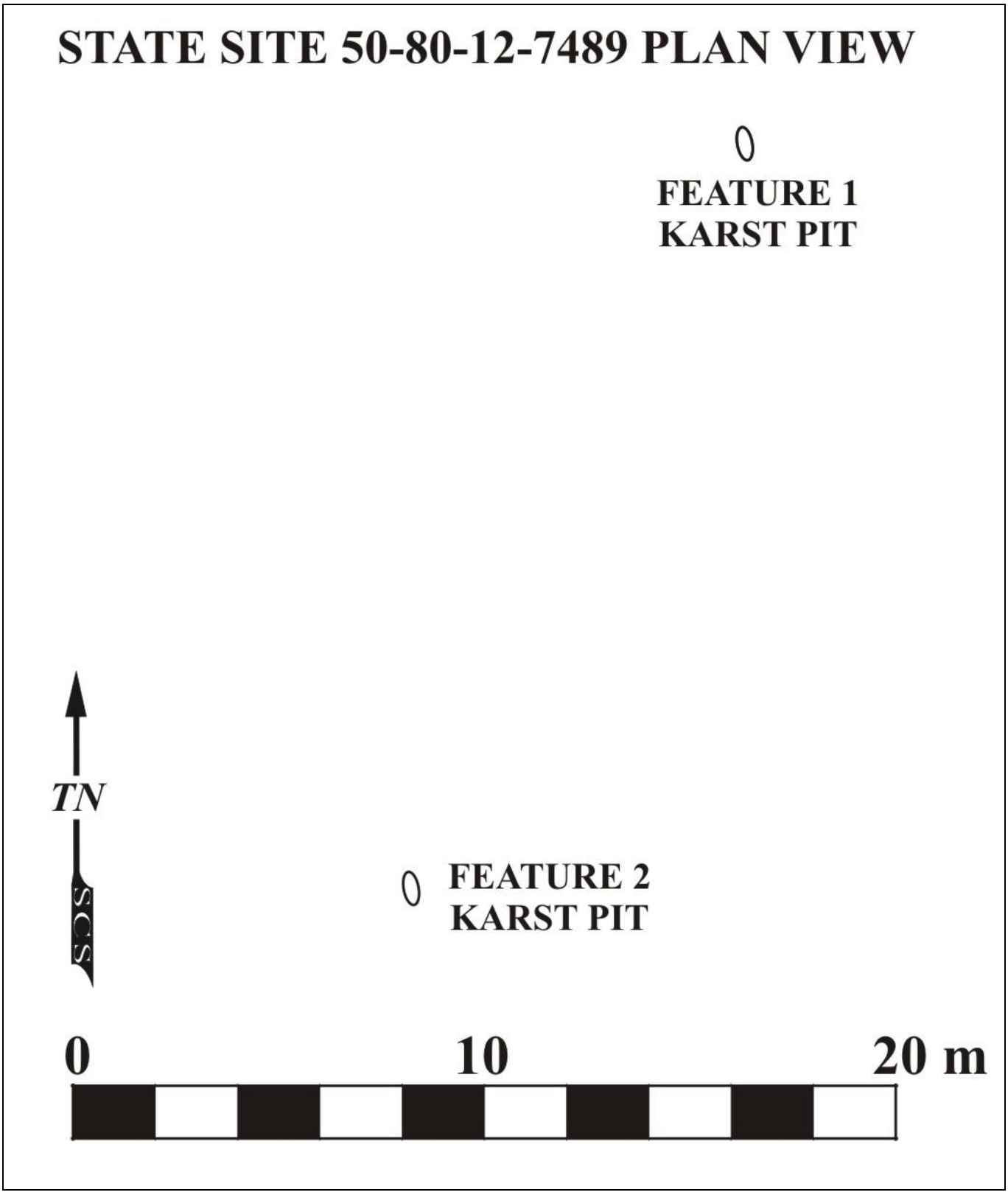

Figure 66: Plan View Drawing of State Site 50-80-12-7489.

As archaeological subsurface testing was not conducted, the potential remains for additional information to be present in subsurface contexts. Thus, a recommendation of preservation has been made for the features within State Site 50-80-12-7489.

Descriptive Data by Feature Number
Feature Type: Karst Pit
Features: 1 and 2
GPS Coordinates: E 597451 N 2356113
Function: Agriculture/Refuse
Age: Pre-and/or early Post-Contact Period
Condition: Good

Description: State Site 50-80-12-7489, Feature 1 consists of an irregularly shaped and filed-in karst pit. Feature 1 measures 1.26 by 0.82 by 0.65 m deep and is oriented along a southeast/northwest axis with a compass bearing of 167/347 degrees (Magnetic). The soil within Feature 1 is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 1 may have functioned as a refuse pit. Thus, Feature 1 was interpreted as having an agriculture/refuse function. Feature 1 was found to be in fair condition. No cultural materials were observed in Feature 1. A representative photograph of Features 1 and 2 is presented in Figure 67.

State Site 50-80-12-7489, Feature 2 consists of an irregularly shaped filled-in karst pit with no observed cultural modification (see Figure 67). Feature 2 measures 1.25 by 0.63 by 0.59 m deep and is oriented along a north/south axis with a compass bearing of 000/180 degrees (Magnetic). The soil within Feature 2 is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 2 may have functioned as a refuse pit. Thus, Feature 2 was interpreted as having an agriculture/refuse function. Feature 2 was found to be in fair condition. No cultural materials were observed in Feature 2.

STATE SITE 50-80-12-7490 (SCS SITE TS-9)

State Site 50-80-12-7490 is a newly identified site consisting of one walled pit and two karst pits (Figure 68) (see Table 2). State Site 50-80-12-7490 measures 30.0 by 4.0 m and was oriented along a southeast/northwest axis with a compass bearing of 65/245 degrees. State Site 50-80-12-7490 was found to be in fair condition. Based on feature type and construction methods and materials, State Site 50-80-12-7490 was interpreted as a multi-functional complex

Figure 67: Representative Photographic Karst Pit Feature Type for State Site 50-80-12-7489. View to Southwest.

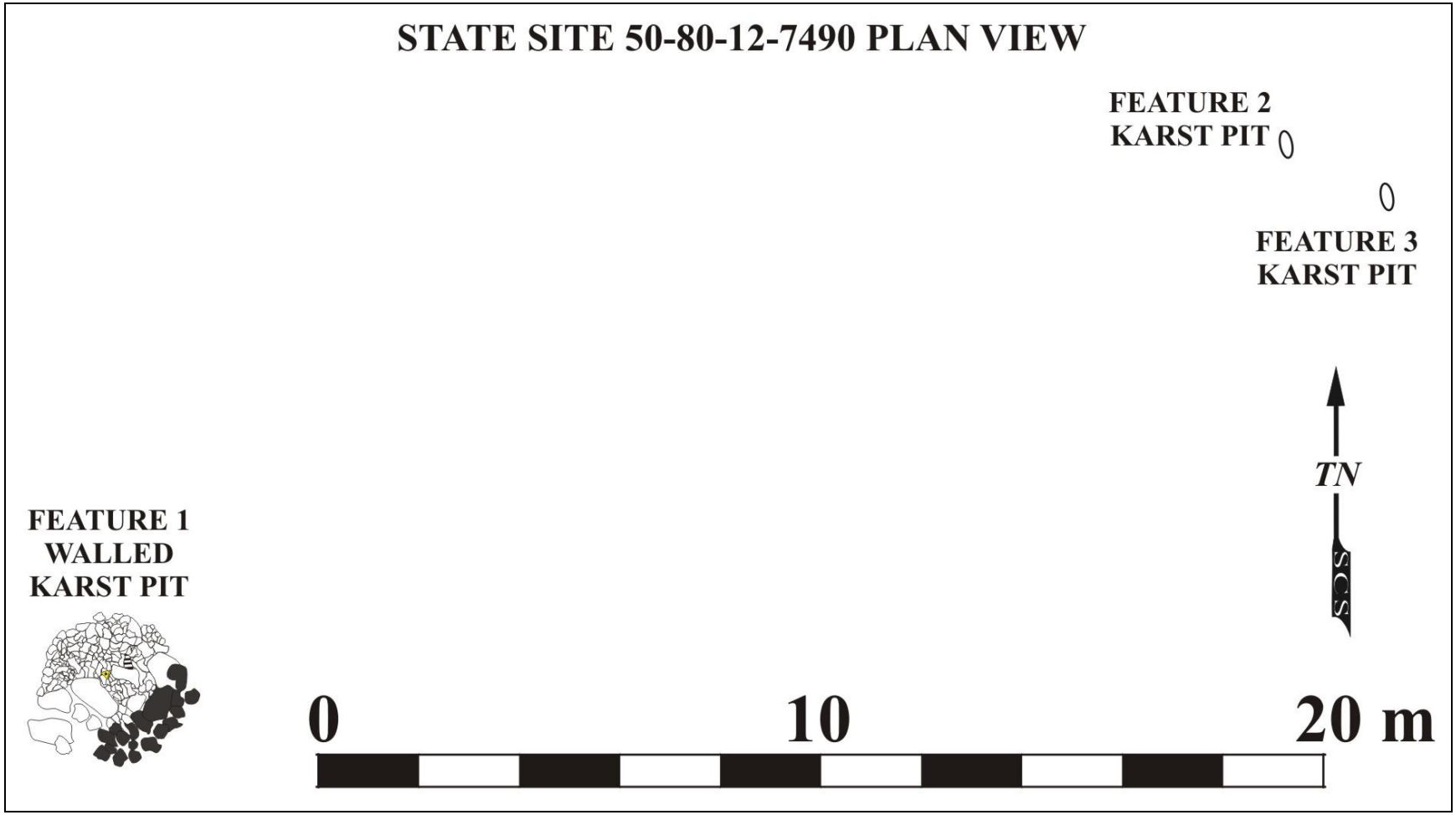

Figure 68: Plan View Drawing of State Site 50-80-12-7490

with an agriculture/refuse component associated with the pre- and/or post-Contact Period. State Site 50-80-12-7490 has been evaluated for significance, as outlined in Hawai‘i Administrative Rules §13-275-6, and found to be significant under Criterion d, for information content. As archaeological subsurface testing was not conducted, the features retain the potential for containing additional information in subsurface contexts. Thus, a recommendation of preservation has been made for the features within State Site 50-80-12-7490.

Descriptive Data by Feature Number
Feature Type: Walled Karst Pit
Feature: 1
GPS Coordinates: E 597580 N 2356117
Function: Agriculture/Refuse
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-12-7490, Feature 1 consists of a modified limestone pit (Figures 69 and 70) with surface feature exterior dimensions of 2.8 m long by 2.4 m wide and surface feature interior dimensions of 2.5 m long by 2.0 m wide. Subsurface interior dimensions (pit below limestone surface) measured a maximum 50 cm deep. Surface feature heights above ground ranged between 43 cm to 55 cm. Wall thickness measured 80 cm. The long axis of the feature is oriented northeast/southwest (15/195 degrees, Magnetic) axis.

The feature's cultural modification included a low wall constructed of angular piled limestone cobbles and small boulders, no more than three courses high. The wall was built on the south edge of the karst pit and surrounds a little less than half of the pit opening. The dry-laid wall was constructed above limestone outcropping. The cobbles and small boulders are angular, sub-angular, and sub-rounded in shape. The interior of the pit is filled-in with limestone cobbles and small boulders.

Although Site -7490, Feature 1 exhibited the effects of disturbance, including modest wedging of non-native vines, the feature was found to be in fair condition. The soil, within Feature 1, is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 1 may have functioned as a refuse pit. Thus, Feature 1 was interpreted as having an agriculture/refuse function.

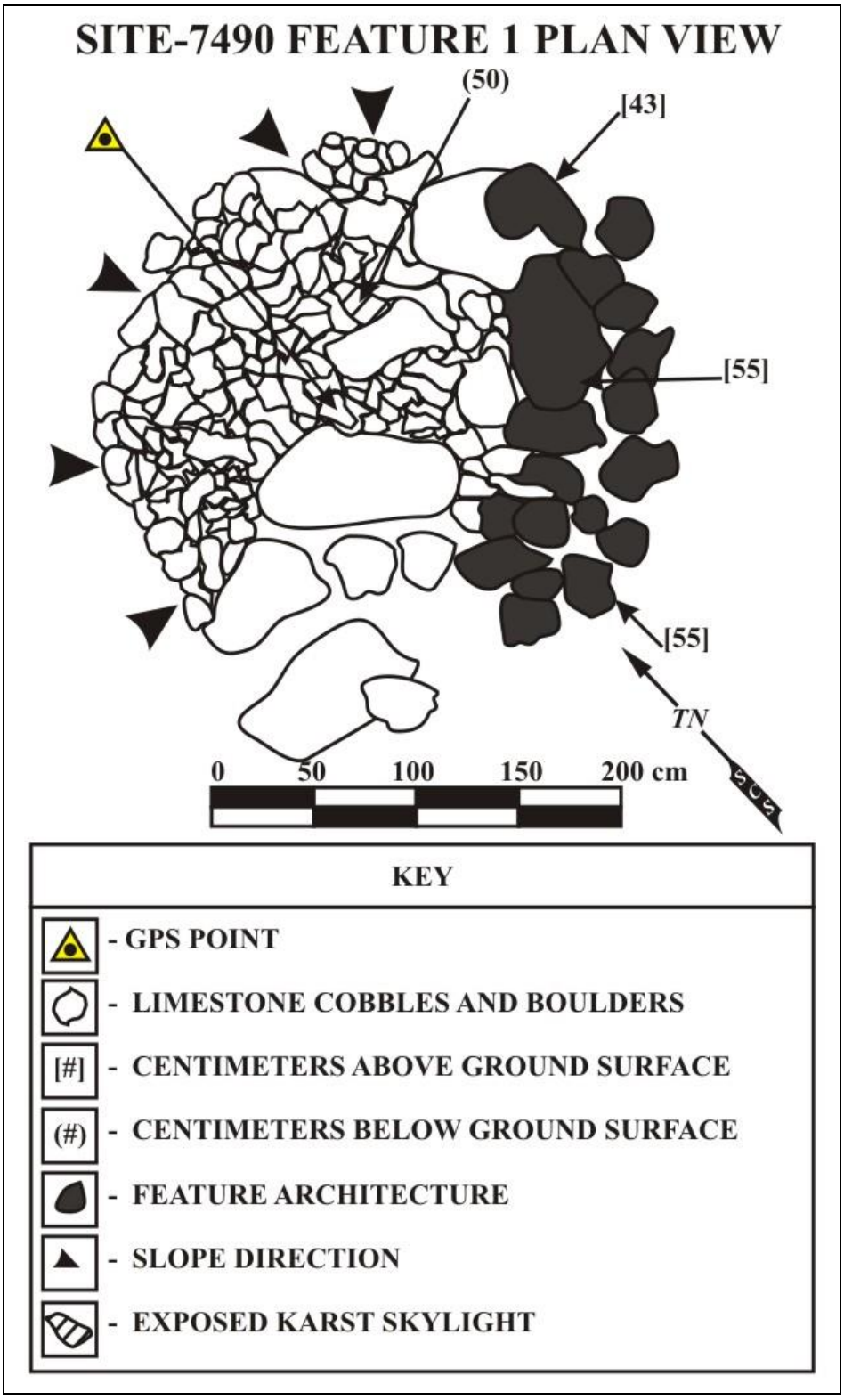

Figure 69: Plan View Drawing of State Site 50-80-12-7490, Feature 1.

Figure 70: Photographic View of State Site 50-80-12-7490, Feature 1. View to Northeast.

Feature Type: Karst Pit
Features: 2 and 3
GPS Coordinates: E 597603 N 2356120
Function: Agriculture/Refuse
Age: Pre-and/or early Post-Contact Period
Condition: Good

Description: State Site 50-80-12-7489, Feature 2 consists of an irregularly-shaped and filled-in karst pit with no observed cultural modification. Feature 2 measures 1.02 by 0.80 by 0.42 m deep and is oriented along a southeast/northwest axis with a compass bearing of 156/336 degrees (Magnetic). The soil within Feature 2 is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 2 may have functioned as a refuse pit. Thus, Feature 2 was interpreted as having an agriculture/refuse function. Feature 2 was found to be in good condition. No cultural materials were observed on the surface in Feature 2 (Figure 71).

State Site 50-80-12-7489, Feature 3 consists of an irregularly-shaped and filled-in karst pit with no observed cultural modification (see Figure 71). Feature 3 measures 0.76 by 0.72 by 0.47m deep and is oriented along a northeast/southwest axis with a compass bearing of 22/202 degrees (Magnetic). The soil within Feature 3 is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 3 may have functioned as a refuse pit. Thus, Feature 3 was interpreted as having an agriculture/refuse function. Feature 3 was found to be in fair condition. No cultural materials were observed on the surface in Feature 3.

STATE SITE 50-80-12-7491 (SCS SITE TS-10)

State Site 50-80-12-7491 is newly identified and consists of a limestone rock trail covered by a collapsed limestone wall (see Table 2). State Site 50-80-12-7491 measures 445.0 by 2.8 m and is oriented along a northeast/southwest axis with a compass bearing of 75/255 degrees (Magnetic). State Site 50-80-12-7491 was found to be in fair condition. Based on feature type, construction methods, and construction materials, Site -7491 was interpreted as a limestone rock trail covered by a wall associated with Historic Period ranching activities. No other archaeological features were found to be in association with the trail. State Site 50-80-12-7491 has been evaluated for significance, as outlined in Hawai‘i Administrative Rules §13-275-6, and found to be significant

Figure 71: Representative Photographic Karst Pit Feature Type for State Site 50-80-12-7490, Features 2 and 3. View to Southeast.

under Criterion d for information content. As archaeological subsurface testing was not conducted, the feature retains potential for containing additional information in subsurface contexts. Thus, a recommendation of preservation has been made for State Site 50-80-12-7491.

Feature/Site Type: Limestone Rock Trail
GPS Coordinates: E 597790 N 2356171
Function: Ranching
Age: Historic Period
Condition: Fair

Description: State Site 50-80-12-7491 consists of a limestone rock trail covered by a collapsed free-standing low wall constructed of limestone boulders and cobbles (Figure 72; see Figures 50 through 52). The surface feature dimensions are 445 m long by 2.8 m to 4.7 m wide, with surface feature heights between 10 cm to 55 cm above the surface. The long axis of the feature is oriented northeast/southwest (75/255 degrees, Magnetic).

The feature consists of dry-laid limestone cobbles and some small boulders to up to four courses high. The cobbles and small boulders are sub-rounded and sub-angular in shape. The terminal ends of the limestone rock trail are of original construction, but portions along its length were mechanically breached in 2012 by Geolabs, Inc. (bulldozer Cut #1 through Cut #4) (see Figure 50) The integrity and direction of the limestone rock trail was found to be largely intact, exclusive of these breaches. The limestone rock trail extends from Coral Sea Road, which borders the project area to the east/southeast, to the southwest, terminating near Site -5120, Feature 8.

Although State Site 50-80-12-7491 exhibits the effects of disturbance, including root wedging of *kiawe* trees and the aforementioned breaches, it was found to be in fair condition. Based on feature type, construction methods, and construction materials, Site -7491 was interpreted as a limestone rock trail associated with Historic Period ranching activities (see Figures 51 and 52). It should be noted that only the section of the wall located within the project area were recorded.

Figure 72: Photographic View of State Site 50-80-12-7491. View to Southwest.

STATE SITE 50-80-12-7492 (SCS SITE TS-11)

State Site 50-80-12-7492 is a newly identified site consisting of 45 surface features: one karst; two enclosures; one T-shaped structure; one reverse L-shaped structure; two U-shaped structures; two J-shaped structures (2-reverse, 1-regular); five C-shaped structures; and 31 rock mounds (Figure 73) (see Table 2). State Site 50-80-12-7492 measures 74.0 by 52.0 m and was oriented along a southeast/northwest axis with a compass bearing of 107/287 degrees (Magnetic). Based on feature types, construction methods, and construction materials, State Site 50-80-12-7492 was interpreted as a habitation/agriculture complex associated with the pre- and/or post-Contact Period. State Site 50-80-12-7492 was found to be in fair condition. Site 50-80-12-7492 has been evaluated for significance, as outlined in Hawai‘i Administrative Rules §13-275-6, and found to be significant under Criterion d, for information content. As archaeological subsurface testing was not conducted for all of the features, the unexcavated features retain the potential for containing additional cultural information in subsurface contexts. Thus, a recommendation of preservation has been made for State Site 50-80-12-7492.

Descriptive Data by Feature Number

Feature Type: C-Shape structure
Feature: 1
Function: Habitation
GPS Coordinates: E 597767 N 2356120
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-12-7492, Feature 1 consists of a C-shape structure (Figures 74 and 75) with surface feature exterior dimensions of 4.2 m long x 2.8 m wide and surface feature interior dimensions of 1.6 m long x 1.5 m wide. The wall varies in width ranging from 0.8 m to 1.4 m. Surface feature heights above ground range between 5 cm to 45 cm. The long axis of the feature was oriented northeast/southwest (68/248 degrees, Magnetic).

The feature was constructed of dry-laid limestone cobbles and small boulders which are sub-rounded, sub-angular, and sometimes tubular in shape. The cobbles and small boulders are piled no more than three courses high. The opening of the enclosure faces to the northwest. Although Site -7492, Feature 1 exhibited the effects of root wedging of a *kiawe* tree, it was found to be in fair condition. Based on feature type, construction methods, and construction materials, this feature has been interpreted as a habitation feature associated with the pre- and/or post-Contact Period. Subsurface testing involved a single test unit (TU-3).

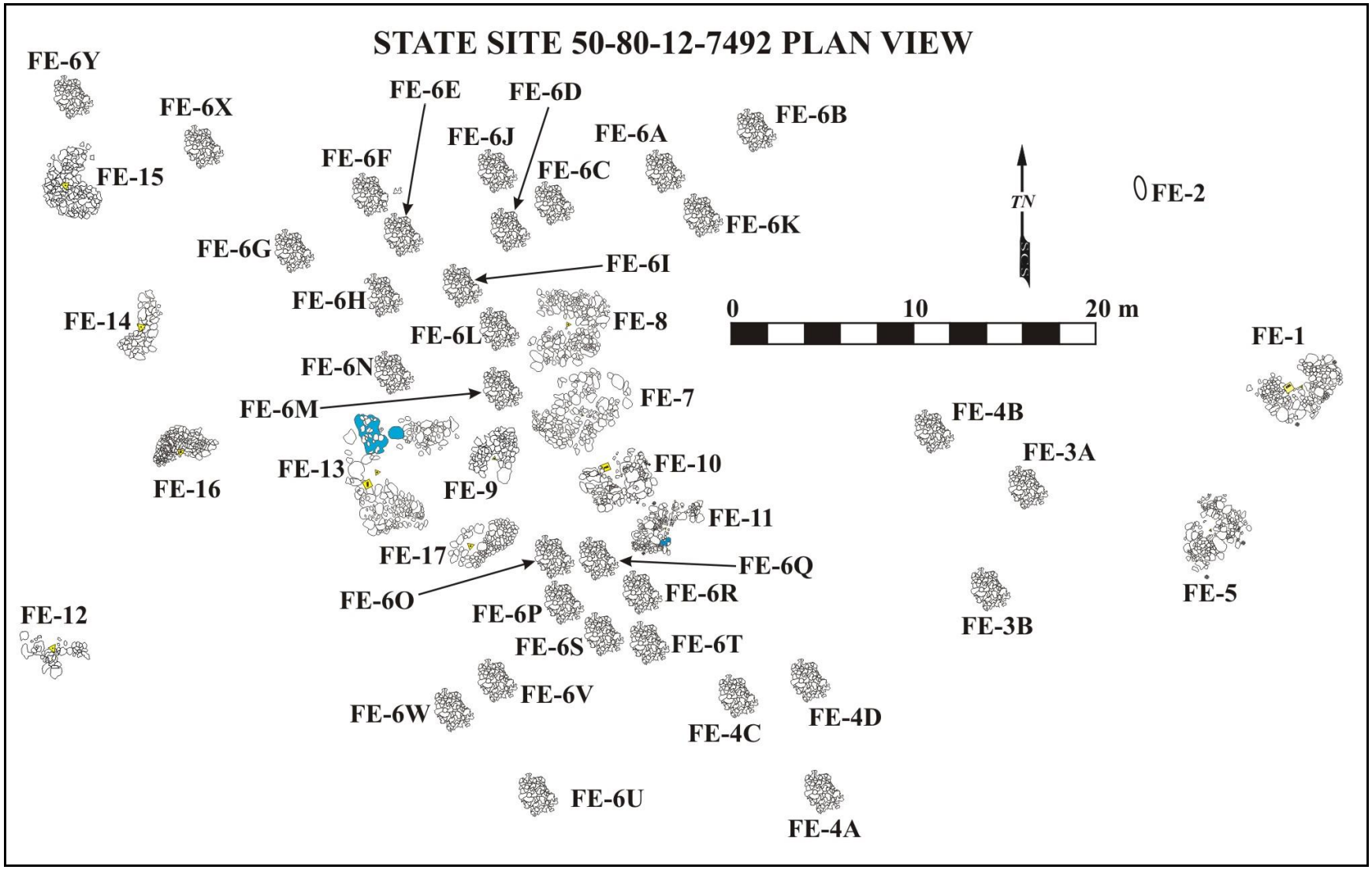

Figure 73: Plan View Drawing State Site 50-80-12-7492.

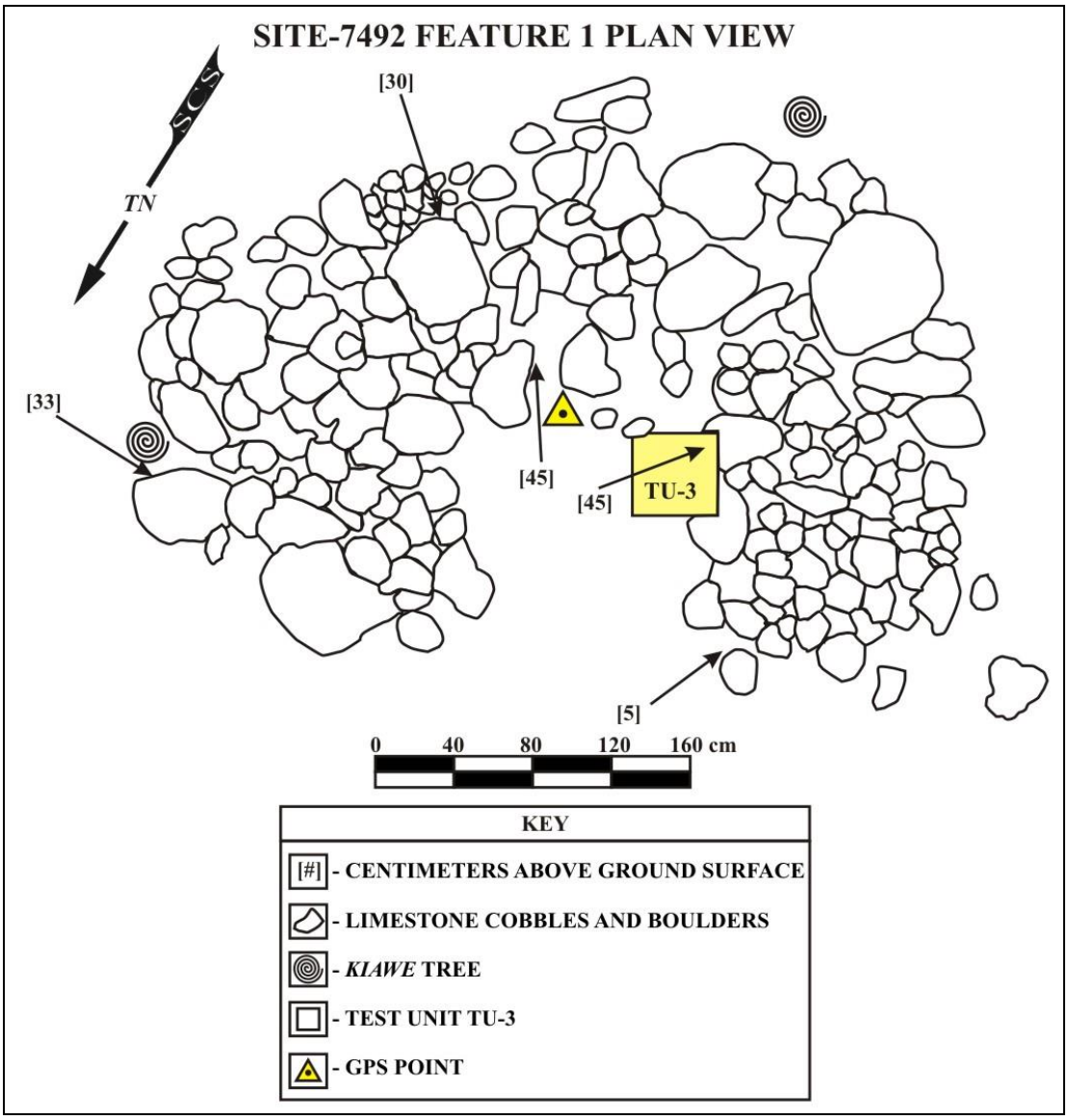

Figure 74: Plan View Drawing of State Site 50-80-12-7492, Feature 1.

TEST UNIT 3

Test unit 3 (TU-3) was placed within the western, interior portion of Site -7492, Feature 1. Approximately 1/4 of the test unit penetrated the west leg of Feature 1 (see Figure 74). Test unit 3 measured 40 cm long x 40 cm wide, with its west wall oriented southeast/northwest (140/320 degrees, Magnetic). Test unit 3 exposed three stratigraphic layers (Figure 76). Layers II and III were sterile. The base of Site -7492, Feature 1 was identified at 11 cmbs within Layer II.

Figure 75: Photographic View of State Site 50-80-12-7492, Feature 1. View to Southeast.

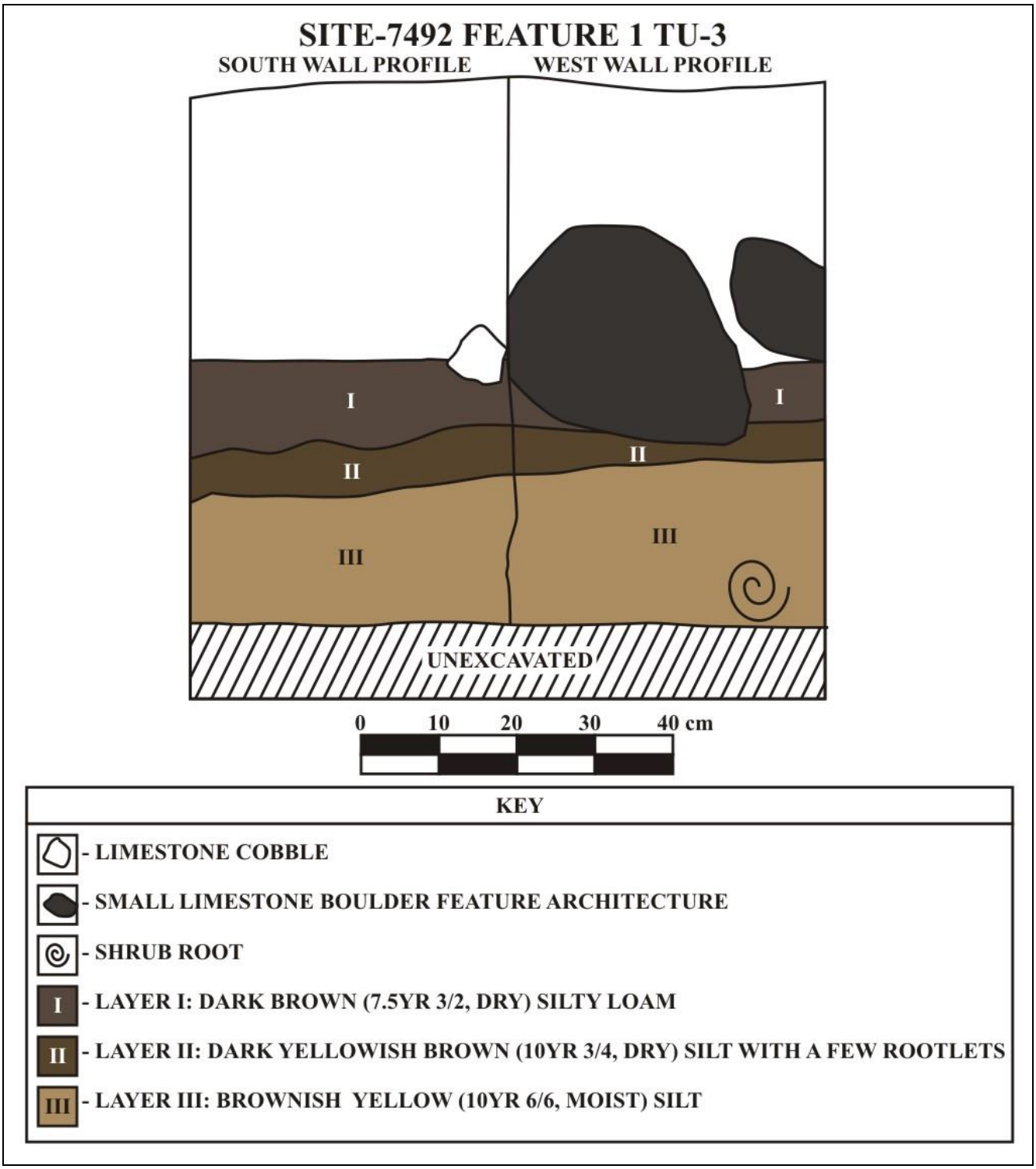

Figure 76: State Site 50-80-12-7492, Feature 1, TU-3 Profile.

- Layer I (0-12 cmbs) consisted of very dark brown (7.5YR 3/2, dry) semi-loose silty loam with a few roots and decomposing vegetation on the ground surface. A single piece of *Cypraea* sp. shell was identified but could not be definitively interpreted as cultural, since *Cypraea* sp. shells were found throughout the project area with no cultural context and also embedded in the karstic landscape.

- Layer II (12-17 cmbs) consisted of dark yellowish brown (10YR 3/4, dry) semi-loose silt with a few rootlets. The architecture of Feature 1 terminates in Layer II. The boundary between Layer I and Layer II is diffused, suggesting Layer II is a natural stratum.

- Layer III (17-23 cmbs) consisted of brownish yellow (10YR 6/6, moist) semi-loose silt with larger shrub roots and a few angular limestone pebbles. The boundary between Layer II and Layer III is diffuse, suggesting Layer III is a natural stratum.

Feature Type: Karst Pit
Feature: 2
GPS Coordinates: E 597759 N 2356131
Function: Storage/Refuse
Age: Pre-and/or early Post-Contact Period
Condition: Good

Description: State Site 50-80-12-7492, Feature 2 consists of a single karst pit (Figure 77). The pit is approximately 0.65 m long x 0.40 m wide and extends to 2.05 m below the ground surface. Based on feature type and the absence of soil fill, the function of Feature 2 was interpreted as a possible storage or possible refuse pit which may have seen use from Pre-and/or early Post-Contact Period. No cultural materials were observed in this pit.

Feature Type: Rock mounds
Features: 3A and 3B
GPS Coordinates (average): E 597752 N 2356155
Function: Agriculture
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-12-7492, Features 3A and 3B consist of two irregular-shaped rock mounds (see Table 3). The features were constructed of dry-laid limestone cobbles and small boulders, both being sub-rounded and angular. The rocks were piled a variable two to four courses high, with the cobbles and boulders being interspersed. Both mounds were in fair condition.

Figure 77: Photographic View of State Site 50-80-12-7492, Feature 2. View to Southeast.

Based on feature type, construction methods, and construction materials, these two features were interpreted as agricultural mounds associated with the pre-and/or early post-Contact Period. These were not interpreted as clearing mounds but rather, locations of piled rocks that could trap moisture and allow for crops such as sweet potato to grow. A representative photograph of the Features 3A and 3B is presented in Figure 78.

Feature Type: Rock mounds
Features: 4A, 4B, 4C, and 4D
GPS Coordinates (average): E 597740 N 2356098
Function: Agriculture
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-12-7492, Features 4A, 4B, 4C, and 4D consists of four irregular-shaped rock mounds (see Table 3). The mounds measure approximately 1.9 m to 3.55 m long by 1.2 m to 2.45 wide and between 0.42 m to 0.63 m above ground surface. A representative photograph of the Features 4B, 4C, and 4D is presented in Figure 79.

The features were constructed of dry-laid limestone cobbles and small boulders, both being sub-rounded and angular. The rocks were piled a variable two to four courses high, with the cobbles and boulders being interspersed. All four mounds were in fair condition.

Based on feature type, construction methods, and construction materials, these four features were interpreted as agricultural mounds associated with the pre- or early-post Contact Period. These were not interpreted as clearing mounds but rather, locations of piled rocks that could trap moisture and allow for crops such as sweet potato to grow.

Feature Type: C-Shaped structure
Feature: 5
GPS Coordinates: E 597762 N 2356112
Function: Habitation
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-12-7492, Feature 5 consists of a C-shaped structure (Figure 80) with surface feature exterior dimensions of 4.4 m long by 3.8 m wide and surface feature interior dimensions of 1.6 m long by 1.2 m wide. Feature 5's wall widths range from 0.6 m to 1.4 m.

Figure 78: Representative Photographic View of Rock Mound Feature Types at State Site 50-80-12-7492, Features 3A and 3B. View to Southwest.

Figure 79: Representative Photographic View of Rock Mound Feature Types at State Site 50-80-12-7492, Features 4A through 4D. View to Northwest.

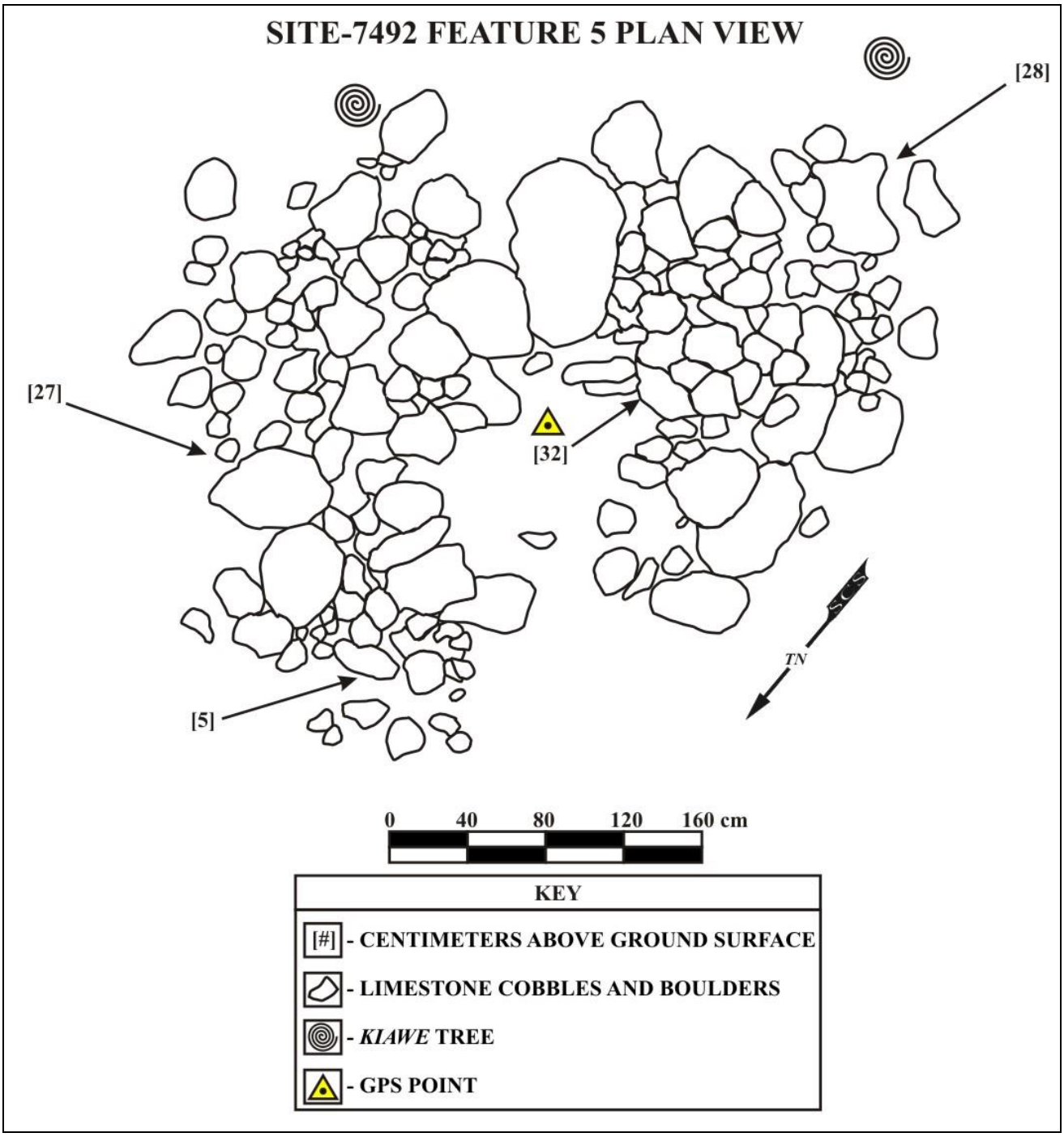

Figure 80: Plan View Drawing of State Site 50-80-12-7492, Feature 5.

Surface feature heights above ground surface ranged between 12 cm to 30 cm. The long axis of the feature was oriented northeast/southwest (62/242 degrees, Magnetic).

The feature was constructed of dry-laid limestone cobbles and small boulders. The cobbles and small boulders are angular and sub-angular in shape and piled no more than three courses high. The opening of the C-shaped structure faces the northwest. Although Site -7492, Feature 5 exhibited the effects of root wedging by *Haole Koa* trees, the feature was found to be in fair condition. Based on feature type, construction methods, and construction materials, this feature has been interpreted as a habitation feature associated with the pre- and/or post-Contact Period.

Feature Type: Rock mounds
Features: 6A through 6Y
GPS Coordinates (average): E 597732 N 2356131
Function: Agriculture
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-12-7492, Features 6A through 6Y consist of 25 irregular-shaped rock mounds (see Table 3). The mounds measure approximately 1.06 m to 3.8 m long by 0.94 m to 2.9 wide and between 0.3 m to 0.76 m above ground surface. A representative photographic View of State Site 50-80-12-7492, Features 6A through 6Y is presented in Figure 81.

The features were constructed of dry-laid limestone cobbles and small boulders, both being sub-rounded and angular. The rocks were piled a variable two to four courses high, with the cobbles and boulders being interspersed. All 25 mounds were in fair condition.

Based on feature type, construction methods, and construction materials, these 25 features were interpreted as agricultural mounds associated with the pre- and/or post-Contact Period. These were not interpreted as clearing mounds but rather, locations of piled rocks that could trap moisture and allow for crops such as sweet potato to grow.

Figure 81: Representative Photographic View of Rock Mound Feature Types at State Site 50-80-12-7492, Features 6A through 6Y. View to Northwest.

Feature Type: Enclosure
Feature: 7
GPS Coordinates: E 597725 N 2356118
Function: Habitation
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-12-7492, Feature 7 consists of a rectangular-shaped enclosure (Figures 82 and 83) with surface feature exterior dimensions of 5.5 m long by 4 m wide and surface feature interior dimensions of 3.2 m long by 1.2 m wide. Feature 7's wall widths range from 0.6 m to 1.8 m. Surface feature heights above ground surface ranged between 10 cm to 48 cm. The long axis of the feature was oriented northeast/southwest (55/235 degrees, Magnetic).

The feature was constructed of dry-laid limestone cobbles and boulders partially laid onto exposed soil areas and partially onto small areas of vertically protrusions of the limestone karstic landscape. Note: the locations of the vertically protruding limestone outcrops cannot be seen in the Site -7492, Feature 7 plan view drawing since the limestone cobbles and boulders visually obscure the horizontal extents of the limestone outcrops. The cobbles and small boulders are angular, while a few larger small boulders are angular and sub-rounded in shape. The cobbles and small boulders were piled no more than four courses high. Although Site -7492, Feature 7 exhibited the effects of minor vegetation overgrowth, the feature was found to be in fair condition. Based on feature type, construction methods, and construction materials, this feature has been interpreted as a habitation feature associated with the pre- and/or post-Contact Period.

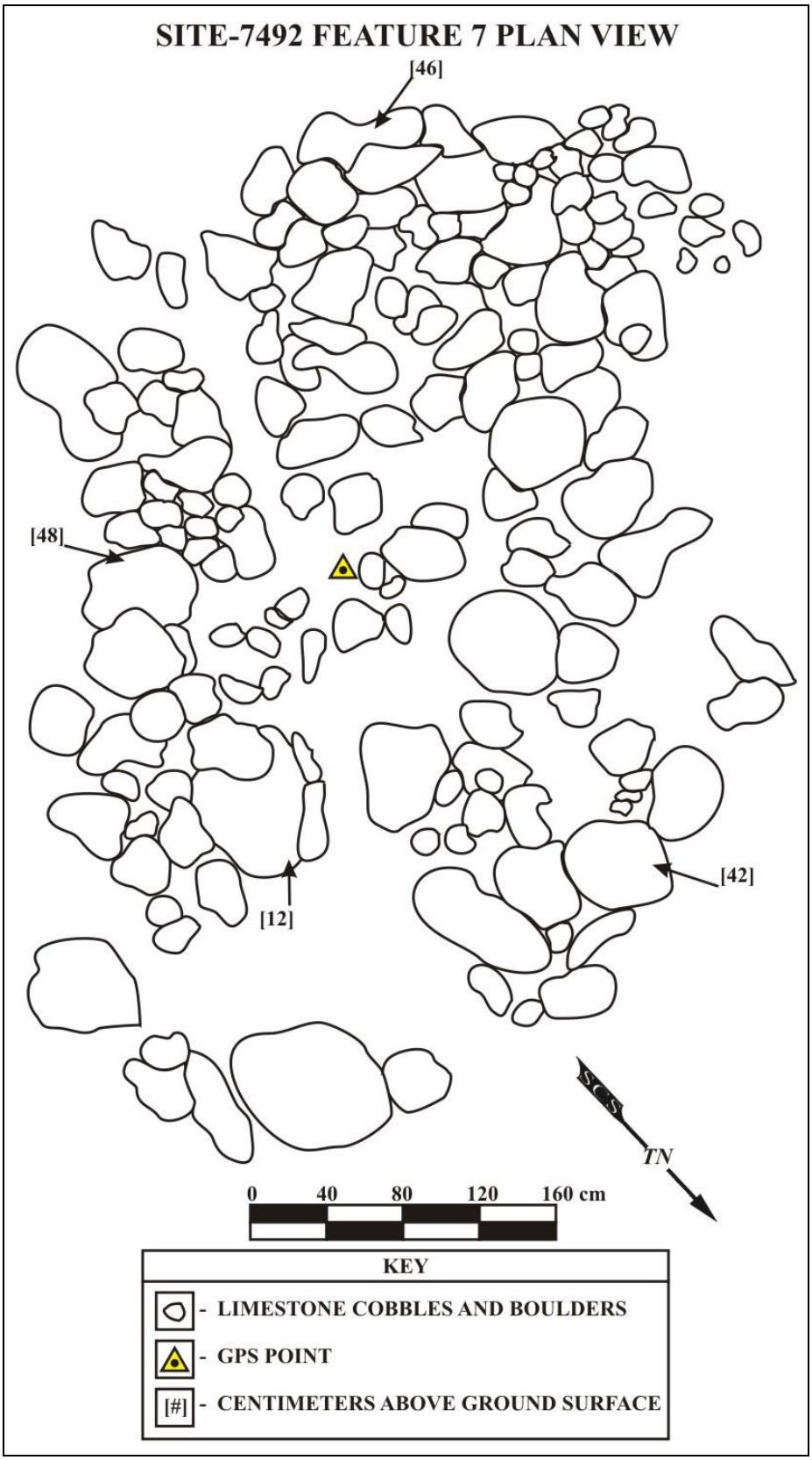

Figure 82: Plan View Drawing of State Site 50-80-12-7492, Feature 7.

Figure 83: Photographic View of State Site 50-80-12-7492, Feature 7. View to Northeast.

Feature Type: C-Shaped structure
Feature: 8
GPS Coordinates: E 597723 N 2356121
Function: Habitation
Age: Pre-and/or early Post-Contact
C**ondition:** Fair

Description: State Site 50-80-12-7492, Feature 8 consists of a C-shaped structure (Figure 84) with surface feature exterior dimensions of 4 m long x 4.4 m wide and surface feature interior dimensions of 2 m long x 1 m wide. Feature 8's wall widths range from 1.4 m to 1.8 m. Surface feature heights above ground surface range between 8 cm to 44 cm. The long axis of the feature is oriented northeast/southwest (77/257 degrees, Magnetic).

The feature was constructed of dry-laid limestone cobbles and small boulders. The cobbles and small boulders are sub-rounded and sub-angular and piled no more than three courses high. The opening of the enclosure faces to the southwest. Although Site -7492, Feature 8 exhibited the effects of root wedging of *haole koa* trees, the feature was found to be in fair condition. Based on feature type, construction methods, and construction materials, this C-shaped structure has been interpreted as a habitation feature associated with the pre- and/or post-Contact Period. Subsurface testing involved a single test unit (TU-4).

TEST UNIT 4

Test unit 4 (TU-4) was placed within the southeastern, interior portion of Site -7492, Feature 8. A portion of the test unit penetrates the southeast leg of Feature 8 (see Figure 84). TU-4) measured 50 cm long x 50 cm wide, with the northwest wall oriented northeast/southwest (54/234 degrees, Magnetic). TU-4 exposed three natural stratigraphic layers (Figure 85). Based on the exposed TU-4 northwest wall stratigraphic profile, the architecture of Site -7492, Feature 8 sits atop the upper surface of Layer I. No cultural materials were identified in Layers I through III.

- Layer I (0-10 cmbs) consisted of very dark brown (7.5YR 3/2, dry) semi-loose silty loam. Feature 8 architecture is situated on the surface of Layer I.

- Layer II (10-16 cmbs) consisted of dark yellowish brown (10YR 3/4, dry) semi-loose silt. The boundary between Layer I and Layer II is diffuse.

- Layer III (16-21 cmbs) consists of brownish yellow (10YR 6/6, moist) semi-loose silt. Several terrestrial snails were observed in Layer III. The boundary between Layer II and Layer III is diffuse.

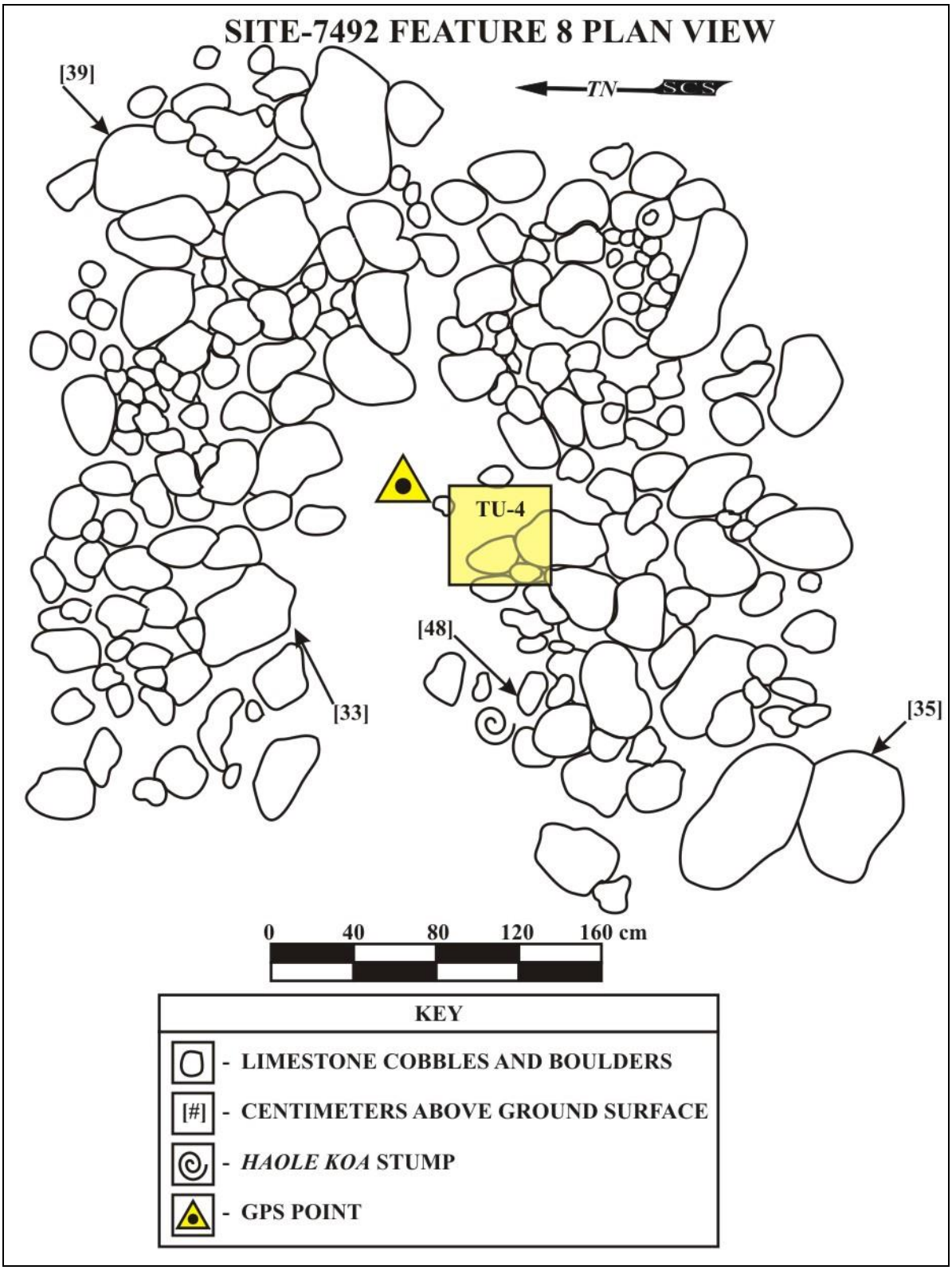

Figure 84: Plan View Drawing of State Site 50-80-12-7492, Feature 8.

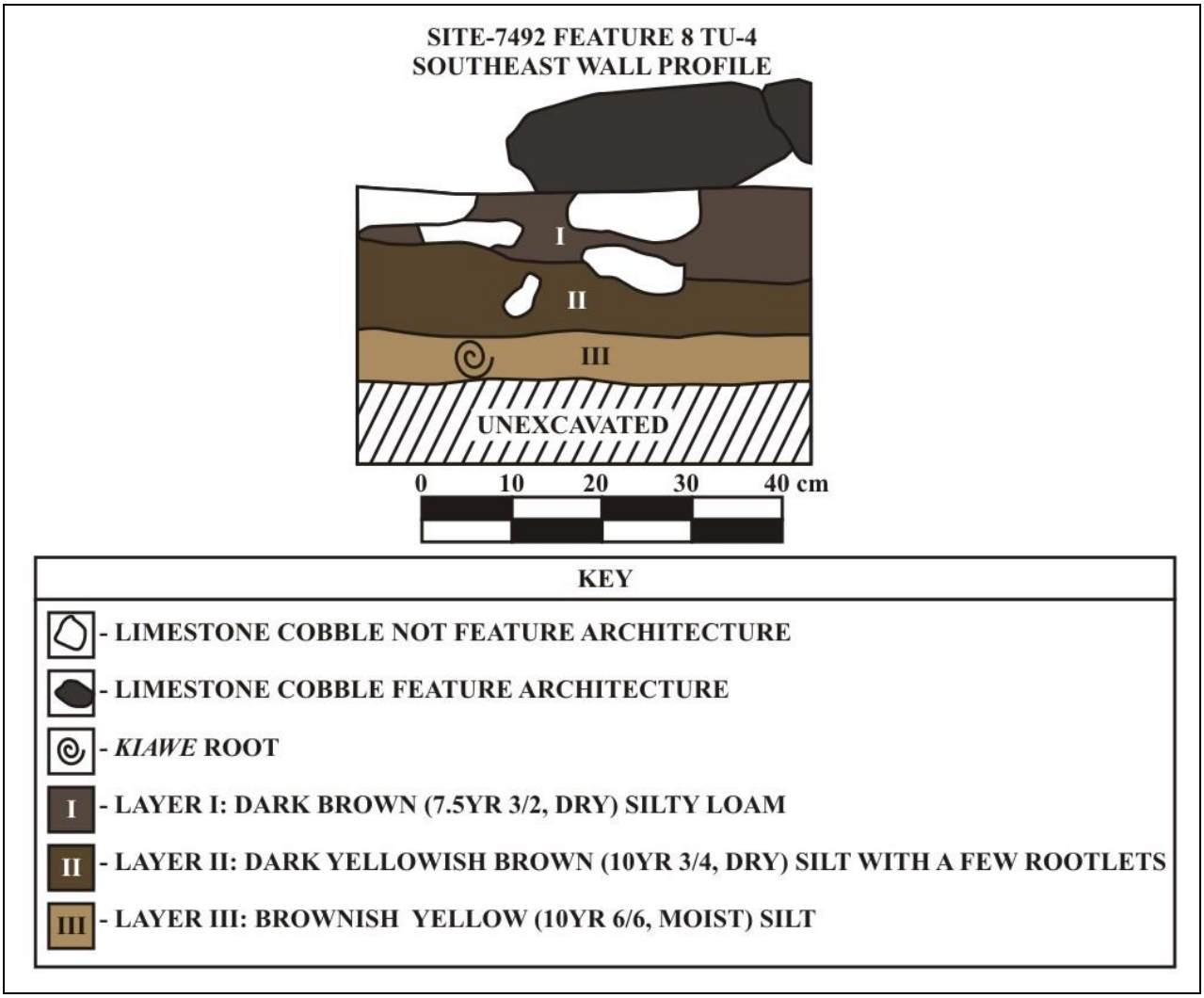

Figure 85: State Site 50-80-12-7492, Feature 8, TU-4 Profile.

Feature Type: U-Shaped structure
Feature: 9
GPS Coordinates: E 597722 N 2356116
Function: Habitation
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-12-7492, Feature 9 consists of a U-shaped structure (Figure 86) with surface feature exterior dimensions of 3.2 m long by 2.9 m wide and surface feature interior dimensions of 1.3 m long by 85 cm wide. Feature 9's wall widths range from 0.75 m to 1.75 m. Surface feature heights above ground ranged between 25 cm to 40 cm. The long axis of the feature was oriented northeast/southwest (11/191 degrees, Magnetic).

The feature was constructed of dry-laid limestone cobbles and small boulders partially laid onto exposed soil areas and partially onto small areas of vertically protrusions of the limestone karstic landscape. Note: the locations of the vertically protruding limestone outcrops cannot be seen in the Site -7492, Feature 9 plan view drawing since the limestone cobbles and boulders visually obscure the horizontal extents of the limestone outcrops. The cobbles and small boulders are angular in shape and piled no more than four courses high. The opening of the enclosure faces to the south. Although Site -7492, Feature 9 exhibited the effects of modest vegetation intrusion, the feature was found to be in fair condition. Based on feature type, construction methods, and construction materials, this feature has been interpreted as a habitation feature associated with the pre- and/or post-Contact Period.

Feature Type: U-Shaped structure
Feature: 10
GPS Coordinates: E 597726 N 2356114
Function: Habitation
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-12-7492, Feature 10 consists of a U-shaped structure (Figures 87 and 88) with surface feature exterior dimensions of 4 m long x 2.8 m wide and surface feature interior dimensions of 1.3 m long by 1.1 m wide. Feature 10's wall widths range from 1.0 m to 1.7 m. Surface feature heights above ground surface ranged between 10 cm to 54 cm. The long axis of the feature was oriented northeast/southwest (60/240 degrees, Magnetic).

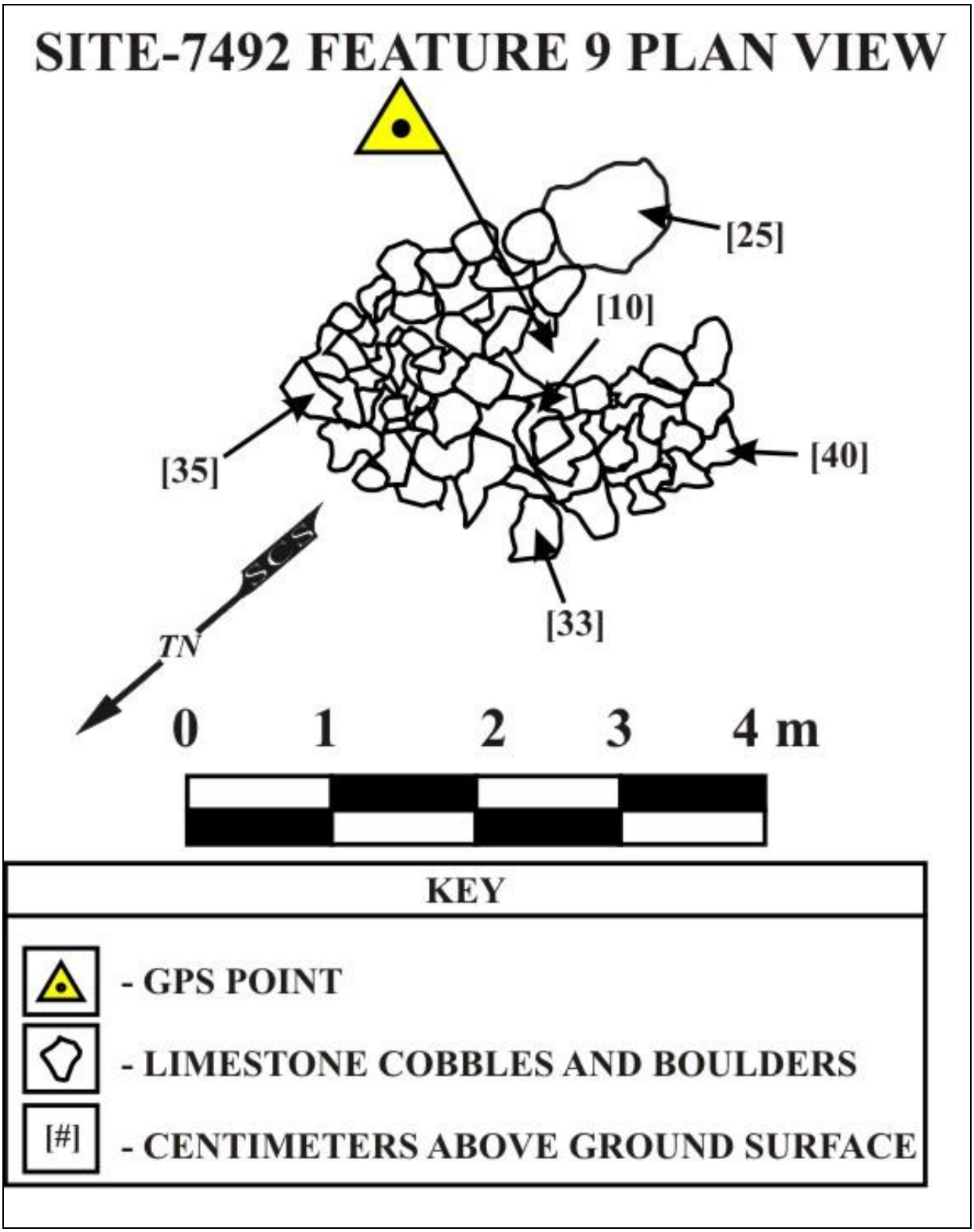

Figure 86: Plan View Drawing of State Site 50-80-12-7492, Feature 9.

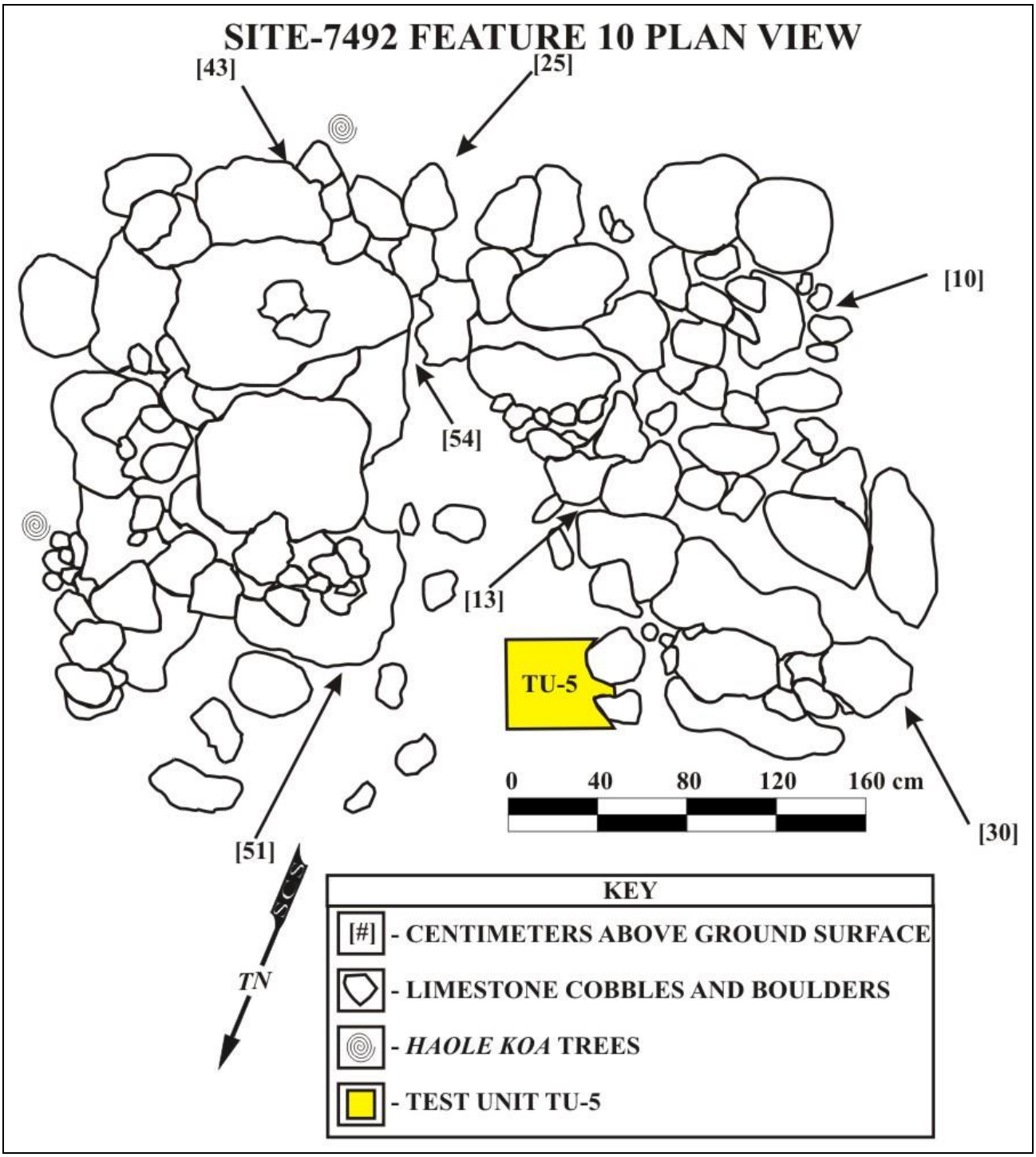

Figure 87: Plan View Drawing of State Site 50-80-12-7492, Feature 10.

Figure 88: Photographic View of State Site 50-80-12-7492, Feature 10. View to Southeast.

The feature was constructed of dry-laid limestone cobbles and small boulders partially laid onto exposed soil areas and partially onto small areas of vertically protrusions of the limestone karstic landscape. Note: the locations of the vertically protruding limestone outcrops cannot be seen in the Site -7492, Feature 10 plan view drawing since the limestone cobbles and boulders visually obscure the horizontal extents of the limestone outcrops. The cobbles and small boulders are angular and sub-angular in shape and piled no more than three courses high. The opening of the enclosure faces to the northwest. Although Site -7492, Feature 10 exhibited the effects of natural vegetation intrusion, the feature was found to be in fair condition. Based on feature type, construction methods, and construction materials, this feature has been interpreted as a habitation feature associated with the pre- and/or post-Contact Period. Subsurface testing involved one test unit (TU-5).

TEST UNIT 5

Test unit 5 (TU-5) was placed within the southwest, interior portion of Site -7492, Feature 10 (see Figure 87). TU-5 measured 50 cm long x 50 cm wide, with its southwest wall oriented southeast/northwest (167/347 degrees, Magnetic). Test unit 5 (TU-5) exposed three stratigraphic layers, all sterile (Figure 89).

- Layer I (0-8 cmbs) consisted of very dark brown (7.5YR 3/2, dry) semi-loose silty loam with decomposing vegetation and rootlets. The architecture of Feature 10 terminates at 4 cmbs within Layer I. The lower boundary of Layer I is diffuse.

- Layer II (8-13 cmbs) consisted of dark yellow (10YR 3/4, dry) semi-loose silt with rootlets and limestone cobbles. *Cypraea* sp. shells were found but could not be definitively interpreted as cultural, since *Cypraea* sp. shells are found throughout the project area, sometimes embedded in the karstic landscape.

- Layer III (13-18 cmbs) consisted of brownish yellow (10YR 6/6, moist) semi-loose silt with larger roots and limestone cobbles. The boundary between Layer II and Layer III is diffuse.

Feature Type: Reverse J-Shaped structure
Feature: 11
GPS Coordinates: E 597726 N 2356113
Function: Habitation
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-12-7492, Feature 11 is a reverse J-shaped structure (Figures 90 and 91) with surface feature exterior horizontal dimensions of 5.8 m long by 3.2 m wide and interior horizontal dimensions of 0.9 m long by 0.8 m wide. Feature 11's wall widths range from

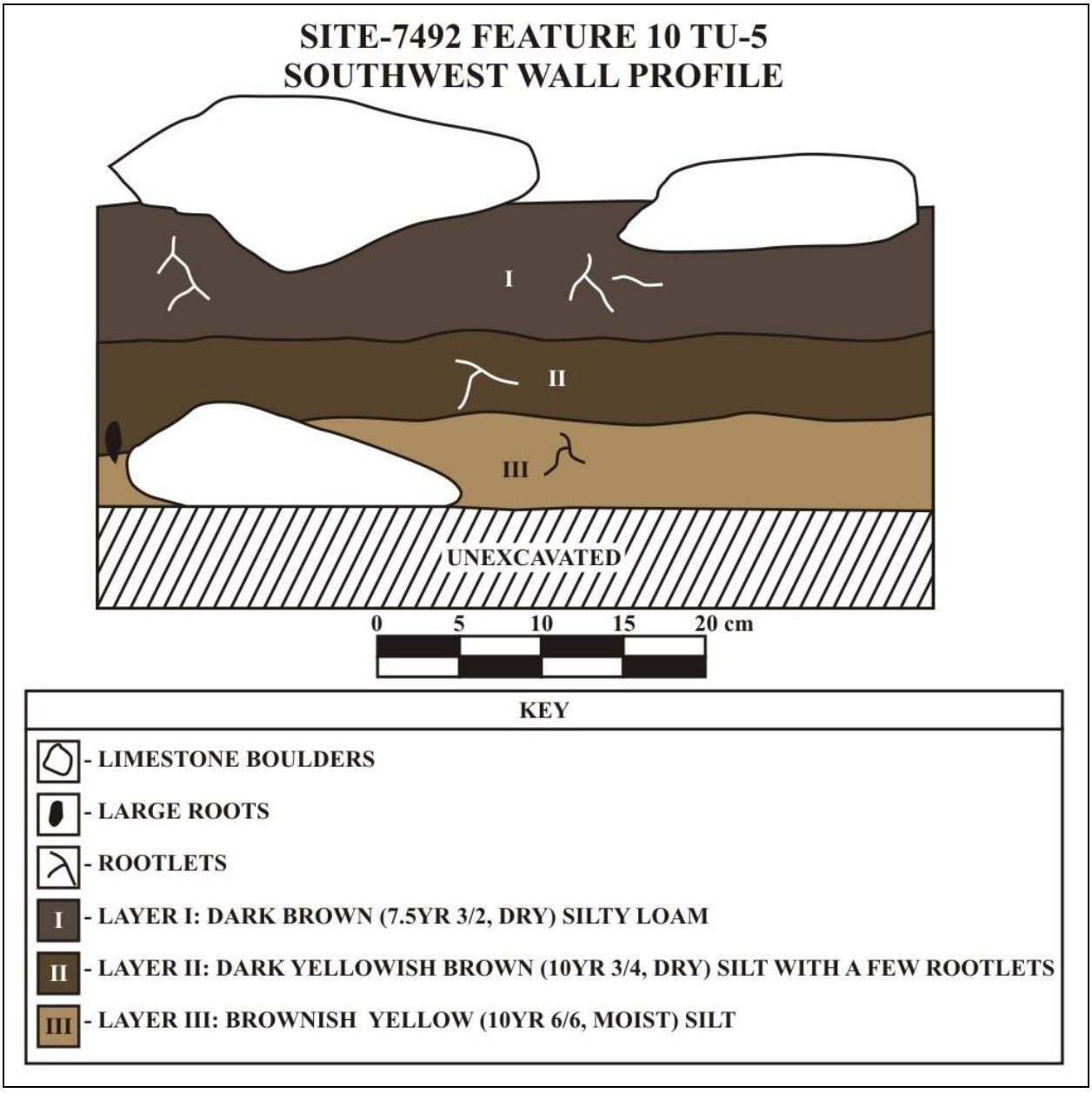

Figure 89: State Site 50-80-12-7492, Feature 10, TU-5 Profile.

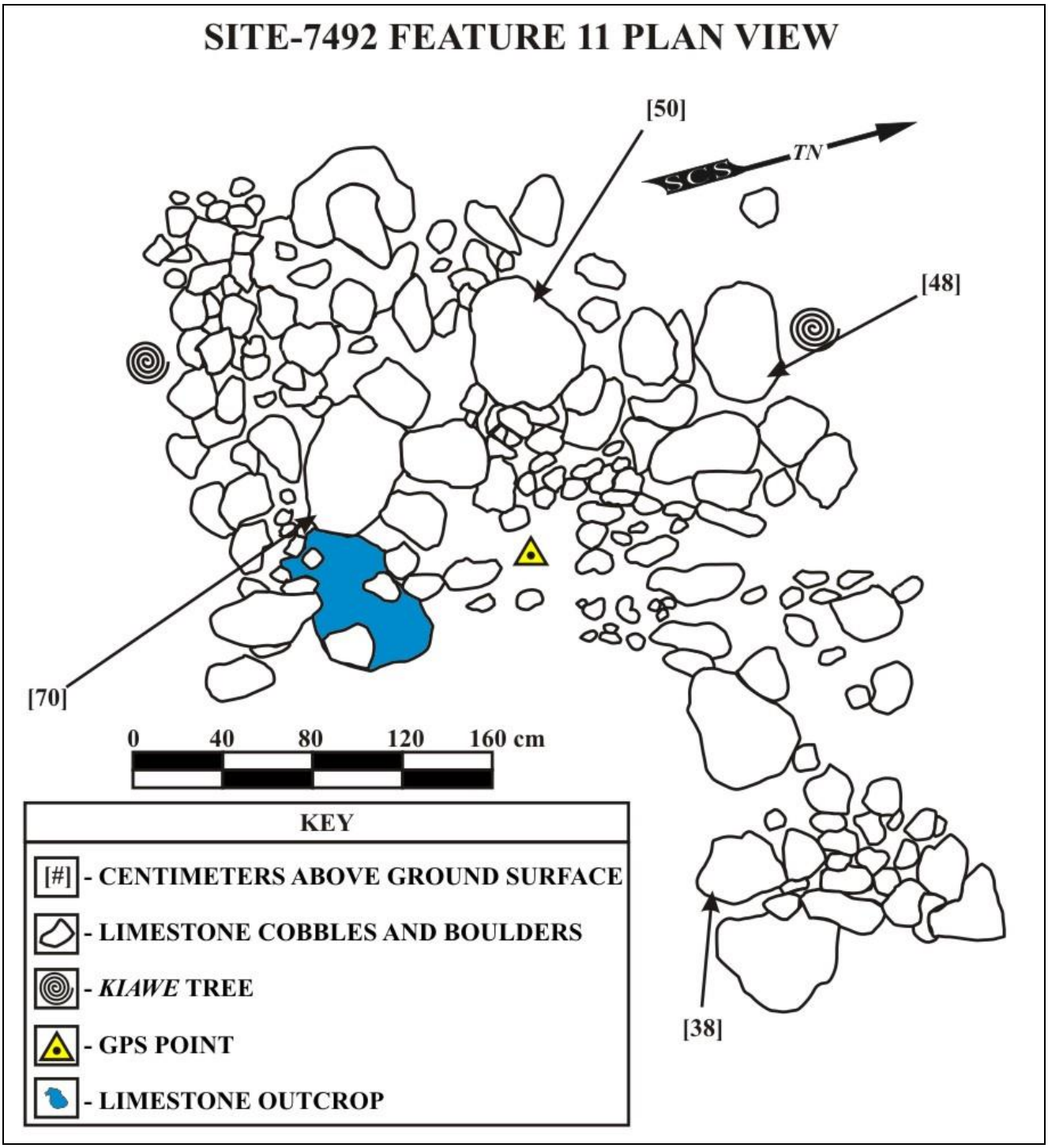

Figure 90: Plan View Drawing of State Site 50-80-12-7492, Feature 11.

Figure 91: Photographic View of State Site 50-80-12-7492, Feature 11. View to West.

1.0 m to 1.2 m. Surface feature heights above ground surface ranged between 38 cm to 70 cm. The long axis of the feature is oriented east/west (90/270 degrees, Magnetic).

The feature was constructed of dry-laid limestone cobbles and small boulders and incorporates limestone outcropping in some portions of the architecture. The most noticeable portion of the limestone outcropping exists at the shorter tip of the J-shaped structure. The cobbles are sub-angular and sub-rounded, while the small boulders are sub-rounded and angular in shape. The cobbles and small boulders are piled no more than five courses high. Some of these limestone cobbles and small boulders were also piled onto to small areas of vertically protruding limestone outcrops. Although Site -7492, Feature 11 exhibited the effects of modest vegetation intrusion, the feature was found to be in fair condition. Based on feature type, construction methods, and construction materials, this feature has been interpreted to be a habitation feature associated with the pre-and/or early post-Contact Period.

Feature Type: T-Shaped walled structure
Feature: 12
GPS Coordinates: E 597697 N 2356105
Function: Habitation
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-0-12-7492, Feature 12 consists of a T-shaped structure (Figure 92) with overall surface horizontal feature exterior dimensions of approximately 4.0 m long by 2.2 m wide. The east-west segment of the T-shaped structure is approximately 4.0 m long by 1.0 m wide. The north-south segment of the T-shaped structure is approximately 1.2 m long by 1.0 m wide. Surface feature heights above ground ranged between 20 cm to 40 cm. The long axis of the feature is oriented northeast/southwest (81/261 degrees, Magnetic).

The feature was constructed of dry-laid limestone cobbles and small boulders and incorporated limestone outcropping at the intersection of the east-west and north-south segments of the feature architecture. The cobbles are angular, sub-angular, and sub-rounded, while the small boulders are sub-rounded and angular in shape. A few of the limestone cobbles were piled onto the vertically protruding limestone outcrop. The cobbles and small boulders are piled no more than 3 courses high. The feature contains an anthropogenic, two-holed limestone cobble sitting atop the "T" intersection. According to Kapolei Hawaiian Civic Club member Mr. Shad Kane, whom accompanied SCS archaeologists during the current Archaeological Inventory Survey, the anthropogenic two-holed limestone cobble is a female stone, also called a wahine

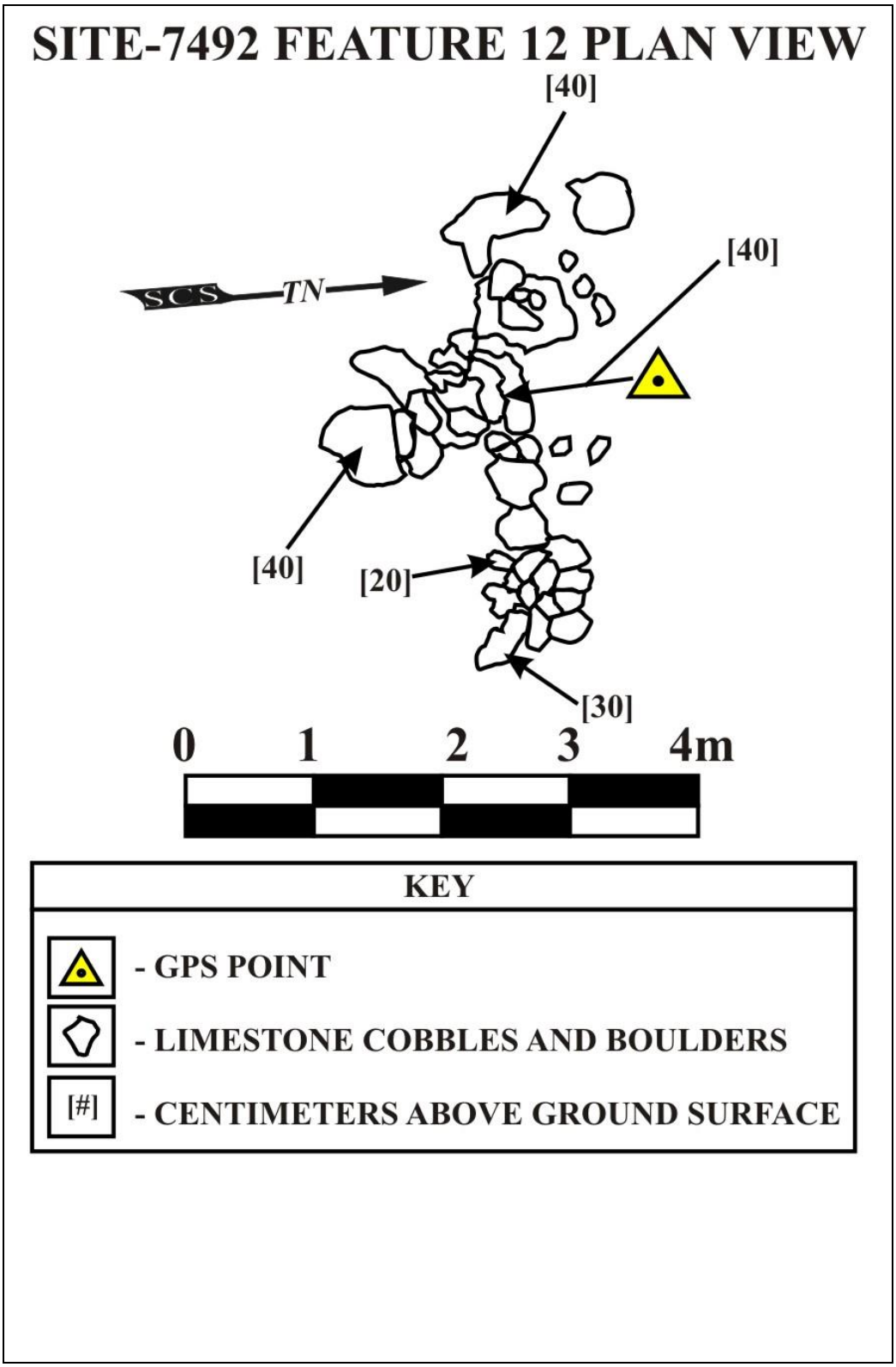

Figure 92: Plan View Drawing of State Site 50-80-12-7492, Feature 12.

stone. The placement of the wahine stone atop Feature 12 suggested that there was some sort of female connection to Feature 12. Although Site -7492, Feature 12 exhibited the effects of disturbance, including wedging of non-native vines, the feature was found to be in fair condition. Based on feature type, construction methods, and construction materials, this feature has been interpreted to be a habitation feature associated with the pre- and/or post-Contact Period.

Feature Type: Reverse J-Shaped structure
Feature 13
GPS Coordinates: E 597716 N 2356115
Function: Habitation
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-12-7492, Feature 13 consists of a reverse J-shaped structure (Figure 93) with surface feature exterior horizontal dimensions of 6.4 m long by 6.0 m wide and interior horizontal dimensions of 3.6 m long by 3.2 m wide. The feature's interior ground surface was relatively level and covered with decomposing vegetation. Feature 13's wall widths range from 0.8 m to 2.8 m. Surface feature heights above ground surface ranged between 20 cm to 45 cm. The long axis of the feature is oriented northeast/southwest (70/250 degrees, Magnetic).

The feature was constructed of dry-laid limestone cobbles and small boulders and incorporates limestone outcrops in some areas of the architecture. The vertically protruding limestone outcrops are visible near the bend of the J-shaped structure. Some of the limestone cobbles were placed on the limestone outcrops. The cobbles are sub-angular and angular, while the small boulders are sub-rounded, sub-angular, and angular in shape. The cobbles and small boulders are piled no more than four courses high. The opening of the reverse J-shaped structure faces to the northeast. Although Site -7492, Feature 13 exhibited the effects of vegetation intrusion, the feature was found to be in fair condition. Based on feature type, construction methods, and construction materials, this feature has been interpreted to be a habitation feature associated with the pre- and/or post-Contact Period. Subsurface testing involved a single test unit (TU-6).

TEST UNIT 6

Test unit 6 (TU-6) was placed within the southern, interior portion of Site -7492, Feature 13 (see Figure 93). TU-6 measured 50 cm long x 50 cm wide, with its south wall oriented southeast/northwest (110/290 degrees, Magnetic). TU-6 exposed of three stratigraphic layers, all which were sterile (Figure 94).

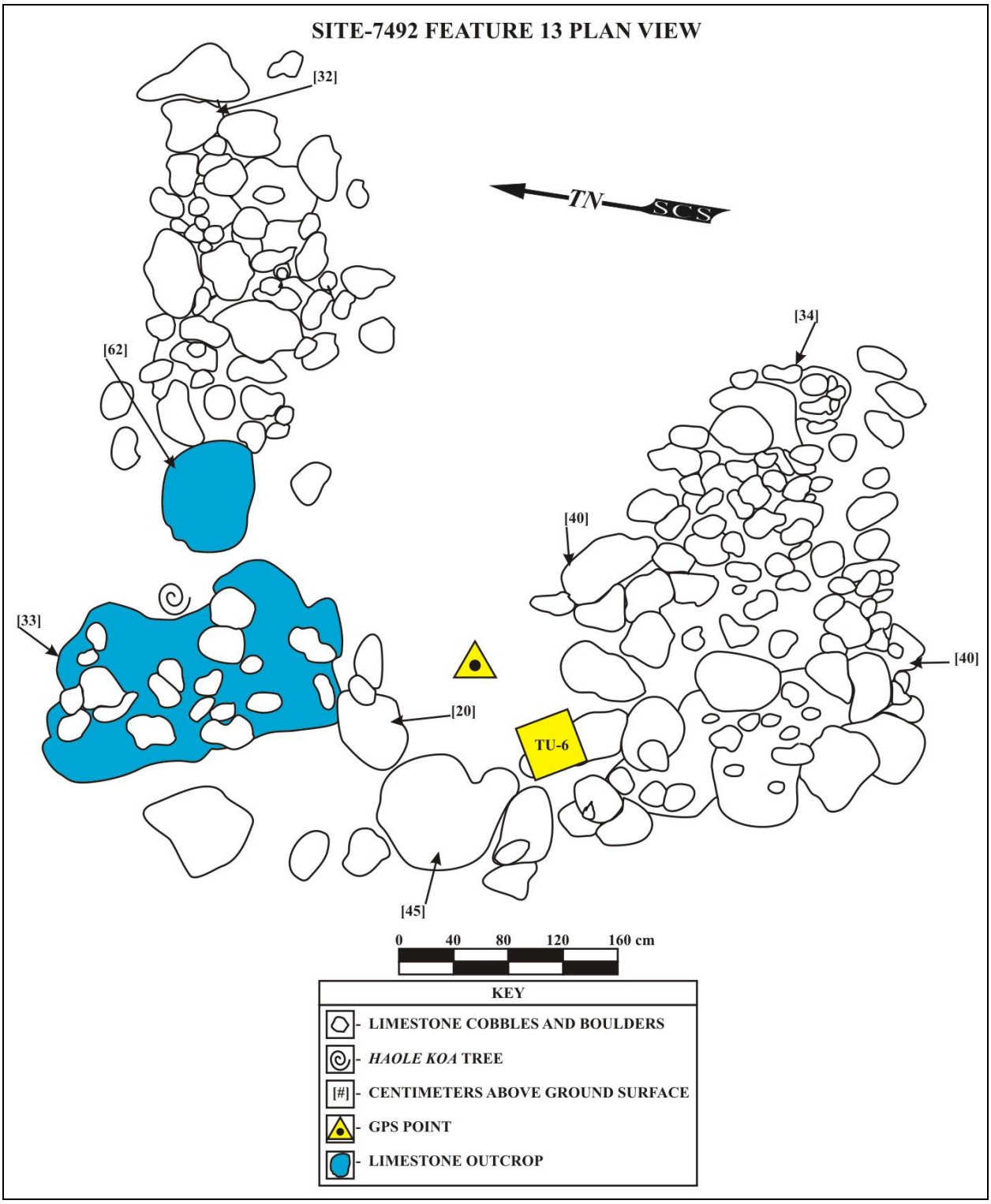

Figure 93: Plan View Drawing of State Site 50-80-12-7492, Feature 13.

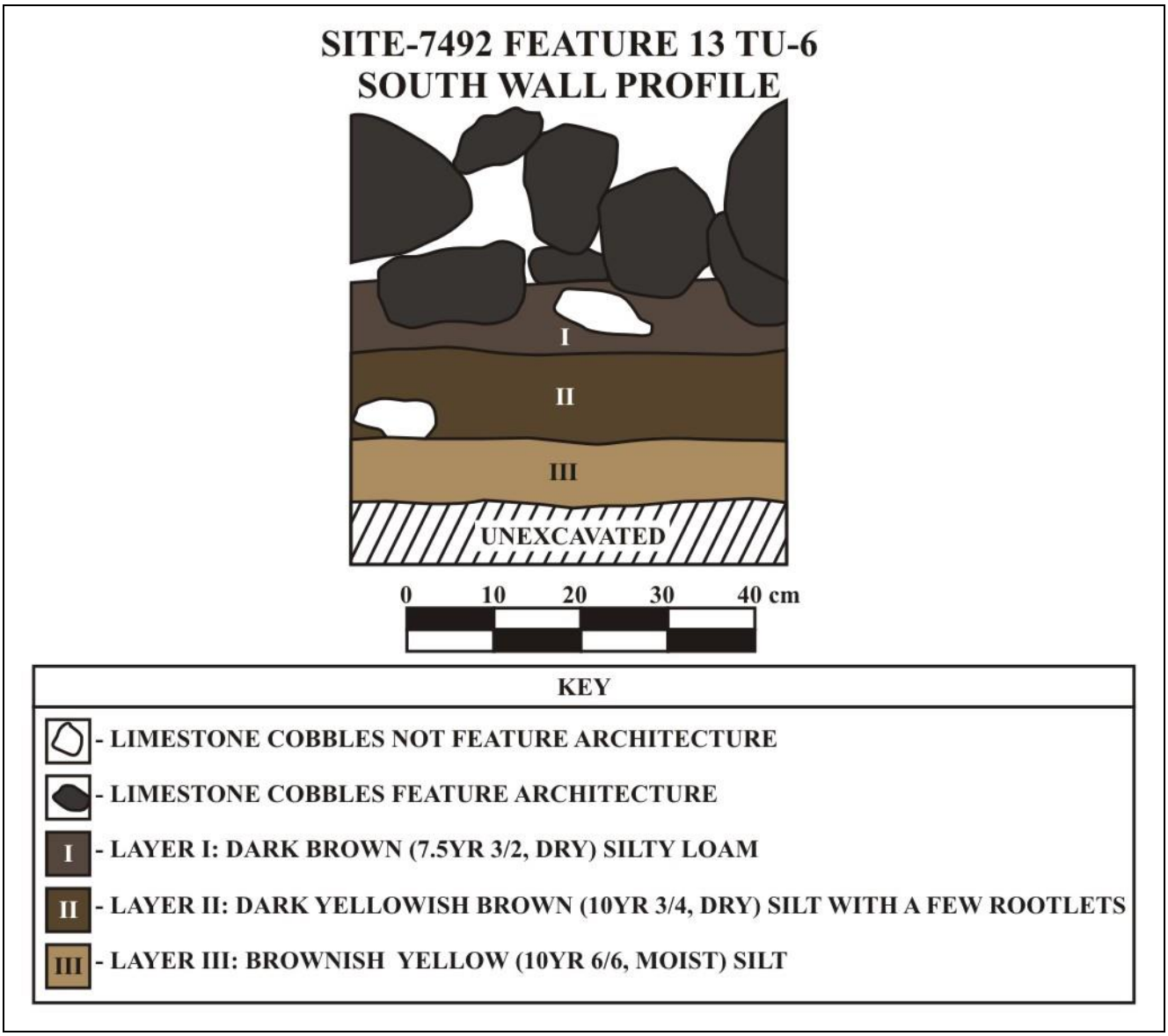

Figure 94: State Site 50-80-12-7492, Feature 13, TU-6 Profile.

- Layer I (0-8 cmbs) consisted of very dark brown (7.5YR 3/2, dry) semi-loose silty loam with a few rootlets, cobbles, and boulders. Feature 13 architecture terminates at 6 cmbs in Layer I. The lower boundary of Layer I is diffuse.

- Layer II (8-18 cmbs) consisted of dark yellowish brown (10YR 3/4, dry) semi-loose silt with roots, cobbles, boulders. Several pieces of marine shell identified as *Turbo sandwicensis* and *Cypraea* sp. were collected from Layer II but appear to be naturally occurring. The boundary between Layer I and Layer II is diffuse.

- Layer III (18-25 cmbs) consisted of brownish yellow (10YR 6/6, moist) semi-loose silt with roots. The boundary between Layer II and Layer III is diffuse.

Feature Type: L-Shaped structure
Feature: 14
GPS Coordinates: E 597702 N 2356123
Function: Habitation
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-12-7492, Feature 14 consists of an L-shaped structure (Figure 95) with surface feature exterior horizontal dimensions of 4.0 m long x 2.1 m wide and interior horizontal dimensions of 3.0 m long x 0.8 m wide. The feature's interior ground surface was relatively level and covered with decomposing vegetation. Feature 14's wall widths range from 1.0 m to 1.4 m. Feature heights above ground surface ranged between 28 cm to 41 cm. The long axis of the feature is oriented southeast/northwest (179/359 degrees, Magnetic).

The feature was constructed of dry-laid limestone cobbles and small boulders. The cobbles are sub-rounded, sub-angular, and angular, while the small boulders are sub-rounded and angular in shape. The cobbles and small boulders are piled up to four courses high. The opening of the feature faces to the west. Several small boulders surround the outer perimeter of the feature. Although Site -7492, Feature 14 exhibited the effects of slight disturbance, including tree branch wedging from a *kiawe* tree, it was found to be in fair condition. Based on feature type, construction methods, and construction materials, this L-shaped structure has been interpreted to be associated a habitation feature with the pre- and /or post-Contact Period.

Feature Type: C-shaped structure
Feature: 15
GPS Coordinates: E 597698 N 2356133
Function: Habitation
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-12-7492, Feature 15 consists of a C-shaped structure (Figure 96) with surface feature exterior horizontal dimensions of 4.0 m long x 3.0 m wide and interior horizontal dimensions of 2.5 m long x 1.0 m wide. The feature's interior ground surface is relatively level and covered with decomposing vegetation. Feature heights above ground surface range between 15 cm to 38 cm. The long axis of the feature is oriented southeast/northwest (154/334 degrees, Magnetic).

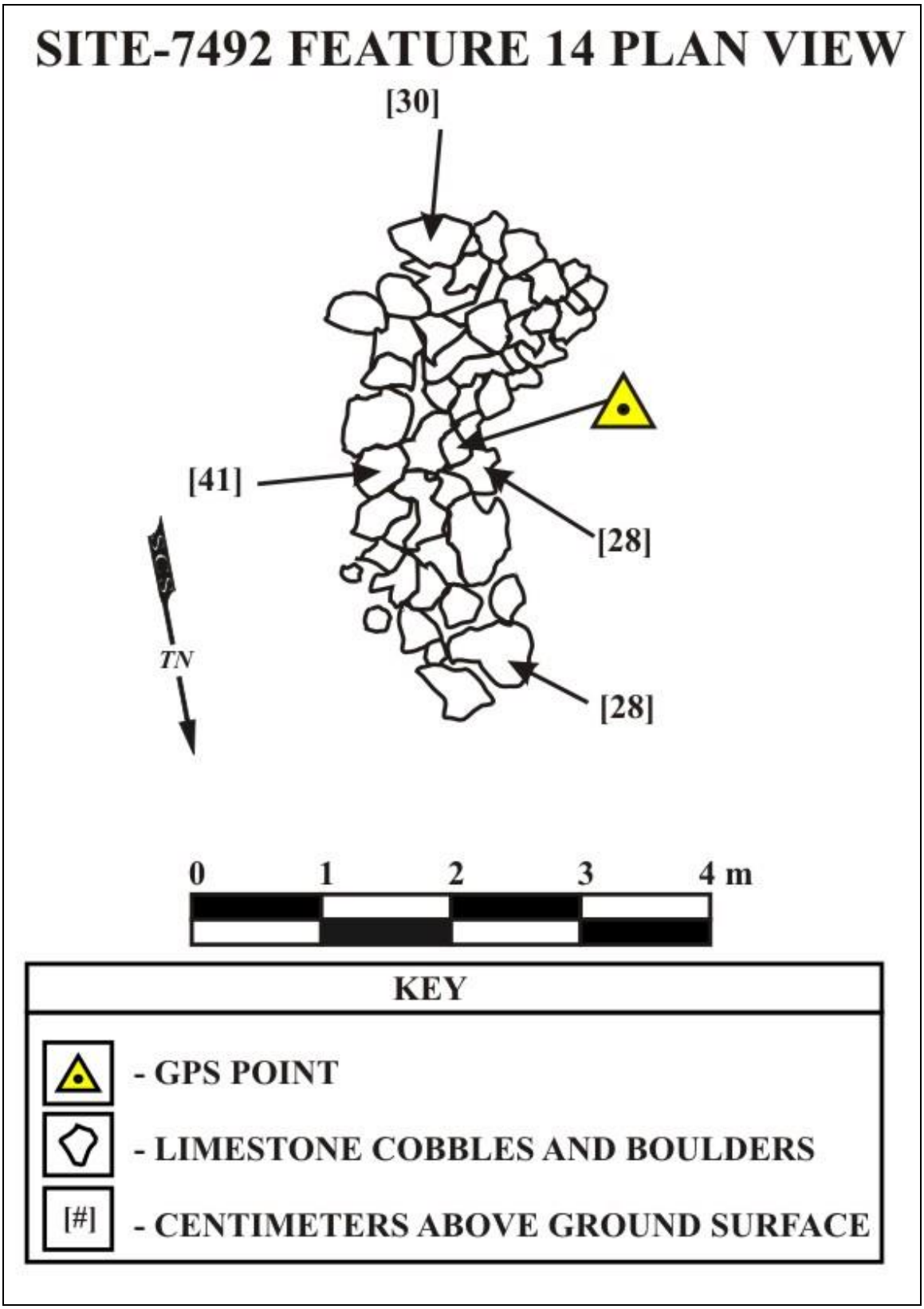

Figure 95: Plan View Drawing of State Site 50-80-12-7492, Feature 14.

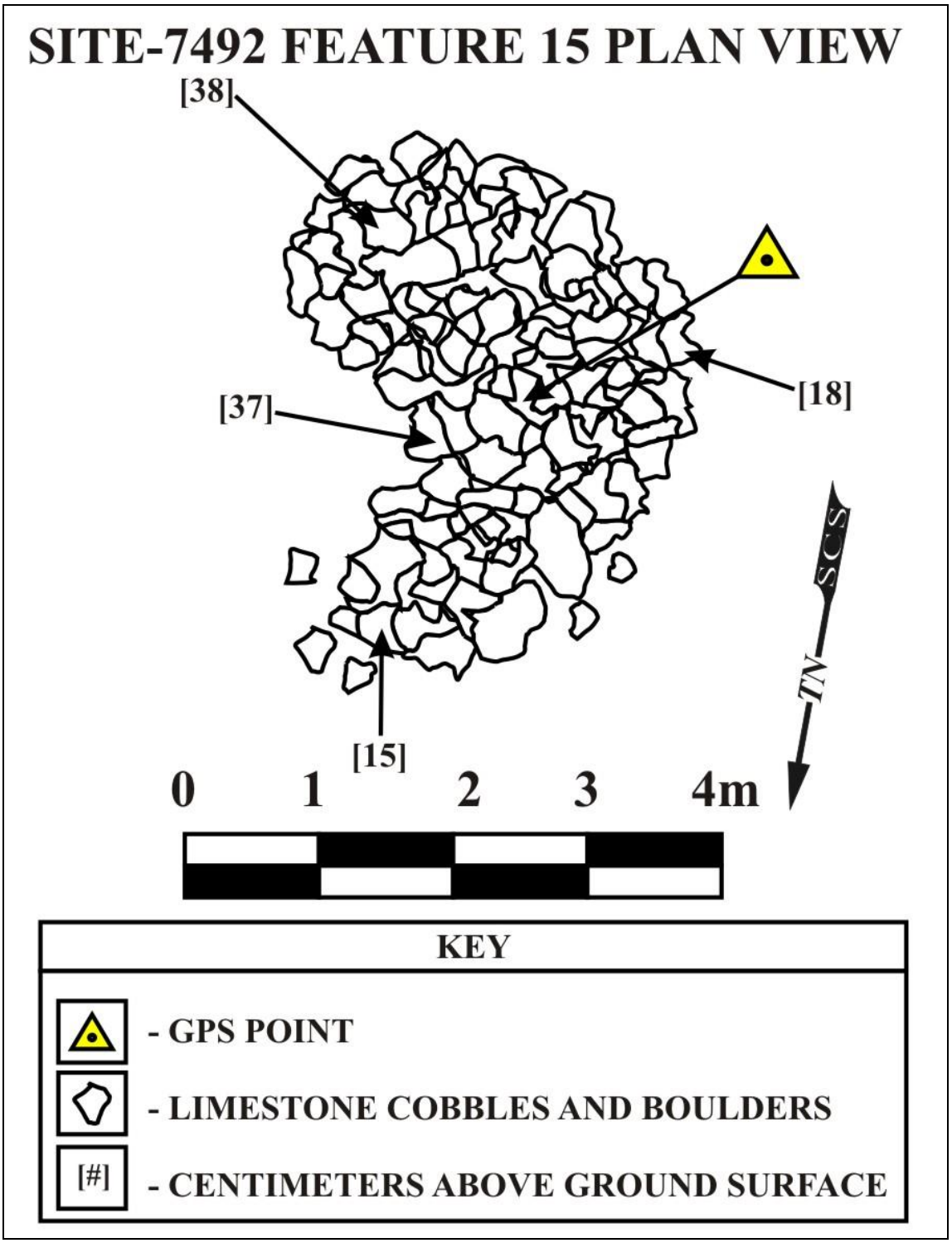

Figure 96: Plan View Drawing of State Site 50-80-12-7492, Feature 15.

The feature was constructed of dry-laid limestone cobbles and small boulders. The cobbles and small boulders are angular and sub-angular in shape and piled up to three courses high. The opening of the C-shaped structure faces to the northeast. Larger cobbles and small boulders surround the perimeter of the feature. Although Site -7492, Feature 15 exhibited the effects of natural vegetation disturbance, it was found to be in fair condition. Based on feature type, construction methods, and construction materials, this C-shaped structure has been interpreted to be a habitation feature associated with the pre- and/or post-Contact Period.

Feature Type: C-Shaped structure
Feature: 16
GPS Coordinates: E 597704 N 2356116
Function: Habitation
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-12-7492, Feature 16 consists of a C-shaped structure (Figure 97) with surface feature exterior horizontal dimensions of 4.8 m long x 3.0 m wide and interior horizontal dimensions of 2.2 m long x 0.8 m wide. The feature's interior ground surface was relatively level and covered with decomposing vegetation. Feature 16's wall widths range from 1.5 m to 2.5 m. Feature heights above ground surface ranged between 17 cm to 36 cm. The long axis of the feature is oriented northeast/southwest (70/250 degrees, Magnetic).

The feature was composed of dry-laid limestone cobbles and small boulders. The cobbles and small boulders are angular and sub-angular in shape and piled up to three courses high. The opening of the enclosure faces to the southeast. Larger cobbles and small boulders form the perimeter of the feature, while the smaller cobbles were placed within the feature's interior. Although Site -7492, Feature 16 exhibited the effects of natural vegetation intrusion, it was found to be in fair condition. Based on feature type, construction methods, and construction materials, this C-shaped structure has been interpreted to be a habitation feature associated with the pre- and/or post-Contact Period.

Feature Type: Enclosure
Feature: 17
GPS Coordinates: E 597722 N 2356112
Function: Habitation
Age: Pre-and/or early Post-Contact
Condition: Fair

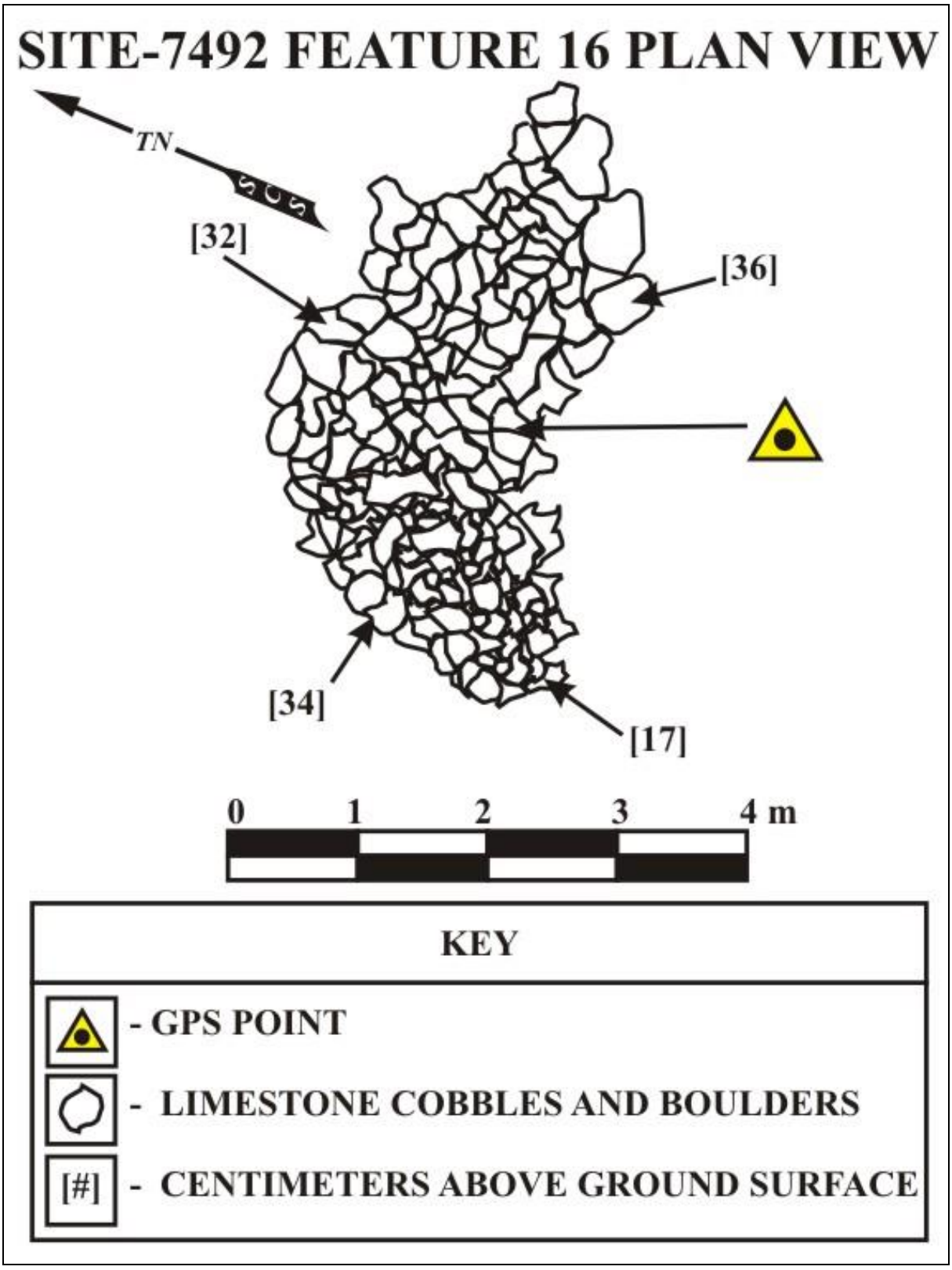

Figure 97: Plan View Drawing of State Site 50-80-12-7492, Feature 16.

Description: State Site 50-80-12-7492, Feature 17 consists of an enclosure (Figure 98) with surface feature exterior horizontal dimensions of 5.6 m long by 3.0 m wide and surface feature interior horizontal dimensions of 1.6 m long by 1.0 m wide. Feature 17's wall widths range from 0.7 m to 2.6 m. The feature's interior ground surface was relatively level and covered with decomposing vegetation. Feature heights above ground surface ranged between 25 cm to 46 cm. The long axis of the feature is oriented northeast/southwest (35/215 degrees, Magnetic).

The feature was constructed of dry-laid limestone cobbles and small boulders and incorporates segments of natural limestone outcropping in some areas of architecture. The cobbles and small boulders are angular and sub-angular in shape and piled up to four courses high. Although Site -7492, Feature 17 exhibited the effects of minor disturbance, including root wedging of a *haole koa* tree and non-native vines, the feature was found to be in fair condition. Based on feature type, construction methods, and construction materials, this enclosure has been interpreted to be a habitation feature associated with the pre- and/or post-Contact Period.

STATE SITE 50-80-12-7493 (SCS SITE TS-12)
Feature/Site Type: Karst Pit
Feature: 1
Function: Storage/Refuse
GPS Coordinates: E 597697 N 2356105
Age: Pre-and/or early Post-Contact Period
Condition: Good

Description: State Site 50-80-12-7493 consists of a newly identified single karst pit with no observed cultural modification (Figure 99). The pit is approximately 0.50 m long by 0.40 m wide and extends to 0.60 m below the ground surface (see Table 2). State Site 50-80-12-7493 was oriented along a northeast/southwest axis with a compass bearing of 50/230 degrees (Magnetic). Based on feature type and the absence of soil fill, State Site 50-80-12-7493 was interpreted as a storage/refuse feature associated with the pre- and/or post-Contact Period. State Site 50-80-12-7493 was found to be in good condition. No cultural materials were observed in this pit. Site 50-80-12-7493 has been evaluated for significance, as outlined in Hawai'i Administrative Rules §13-275-6, and found to be significant under Criterion d, for information content. As archaeological subsurface testing was not conducted, the potential remains for additional cultural information to be present in subsurface contexts. Thus, a recommendation of preservation has been made for State Site 50-80-12-7493.

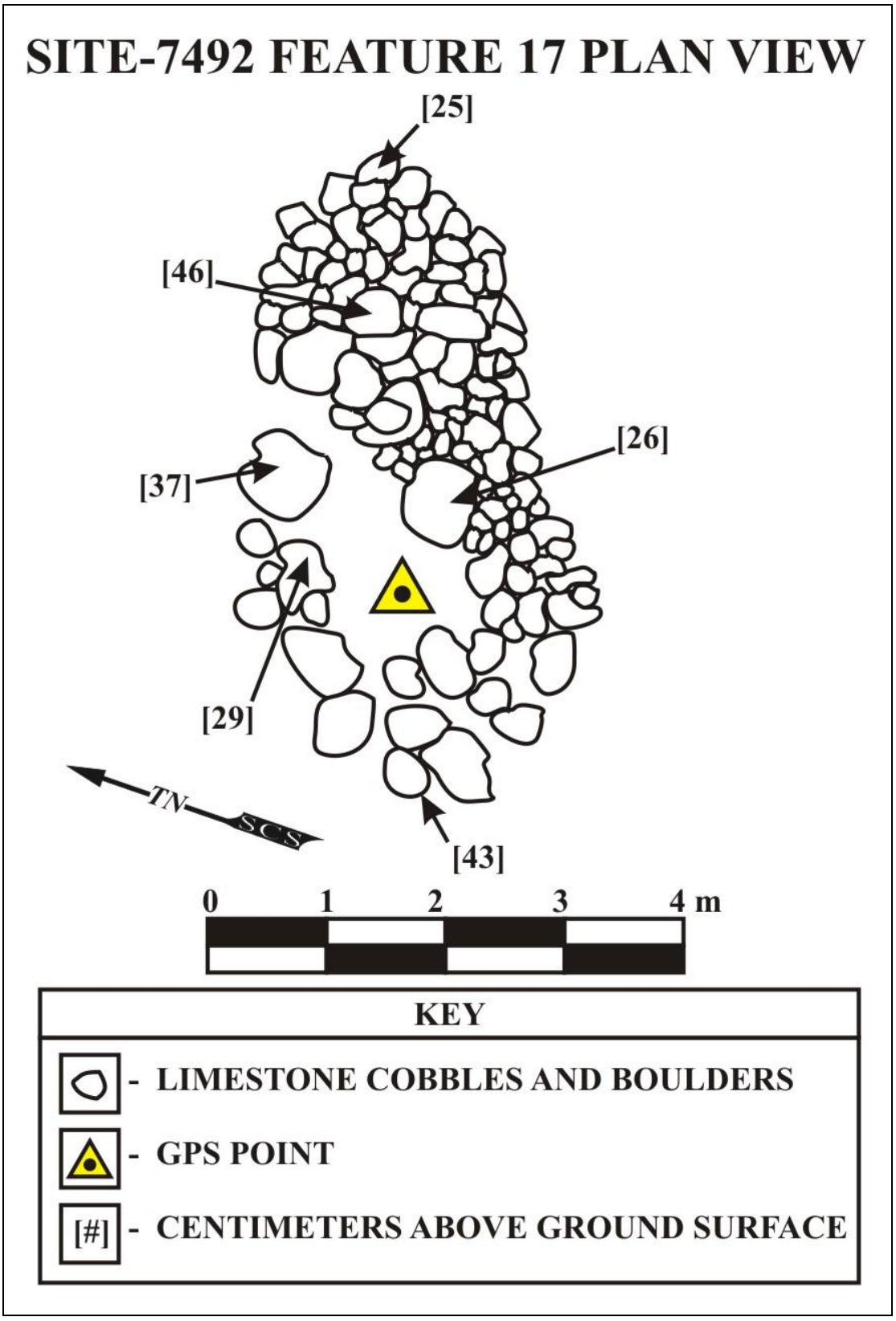

Figure 98: Plan View Drawing of State Site 50-80-12-7492, Feature 17.

Figure 99: Photographic View of State Site 50-80-12-7493, Feature 1. View to Southeast.

STATE SITE 50-80-12-7494 (SCS SITE TS-13)
Feature/Site Type: Walled Karst Pit
Feature: 1
GPS Coordinates: E 597627 N 2356092
Function: Agricultural
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-12-7494 consists of a newly identified site comprised of a modified limestone pit (Figures 100 and 101) (see Table 2). The surface feature exterior dimensions of State Site 50-80-12-7494, Feature 1 are 3.0 m long by 2.0 m wide and surface feature interior dimensions of 1.6 m long x 1.2 m wide. Subsurface interior dimensions (karst pit below limestone surface) measured a maximum 50 cm deep. Surface feature heights above ground range between 35 cm to 36 cm. The long axis of the feature is oriented northeast/southwest (32/212 degrees, Magnetic).

The feature's cultural modification includes a low wall consisting of dry-laid and piled limestone cobbles and small boulders, up to two courses high. The wall was constructed on a natural limestone outcropping located at the southwestern edge of the karst and surrounds over half of the pit opening. The cobbles and small boulders are angular and sub-angular in shape. The pit opening is partially filled with sediment and possibly displaced limestone cobbles.

Although the feature was found to be in fair condition, the low wall of Site -7494, Feature 1 exhibited the effects of minor natural disturbance, including root wedging of *haole koa* trees, as well as a *haole koa* tree growing inside the karst. Based on feature type, construction methods, and construction materials, this walled-pit has been interpreted as an agricultural and/or storage feature associated with the pre- and/or post-Contact Period. Subsurface testing involved a single shovel probe (SP-10).

State Site 50-80-12-7494 was found to be in fair condition. Site 50-80-12-7494 has been evaluated for significance, as outlined in Hawai‘i Administrative Rules §13-275-6, and found to be significant under Criterion d, for information content. Based on the findings of the excavation (see Appendix C), the potential may remain for additional cultural information to be contained within the feature. Thus, a recommendation of preservation has been made for State Site 50-80-12-7494.

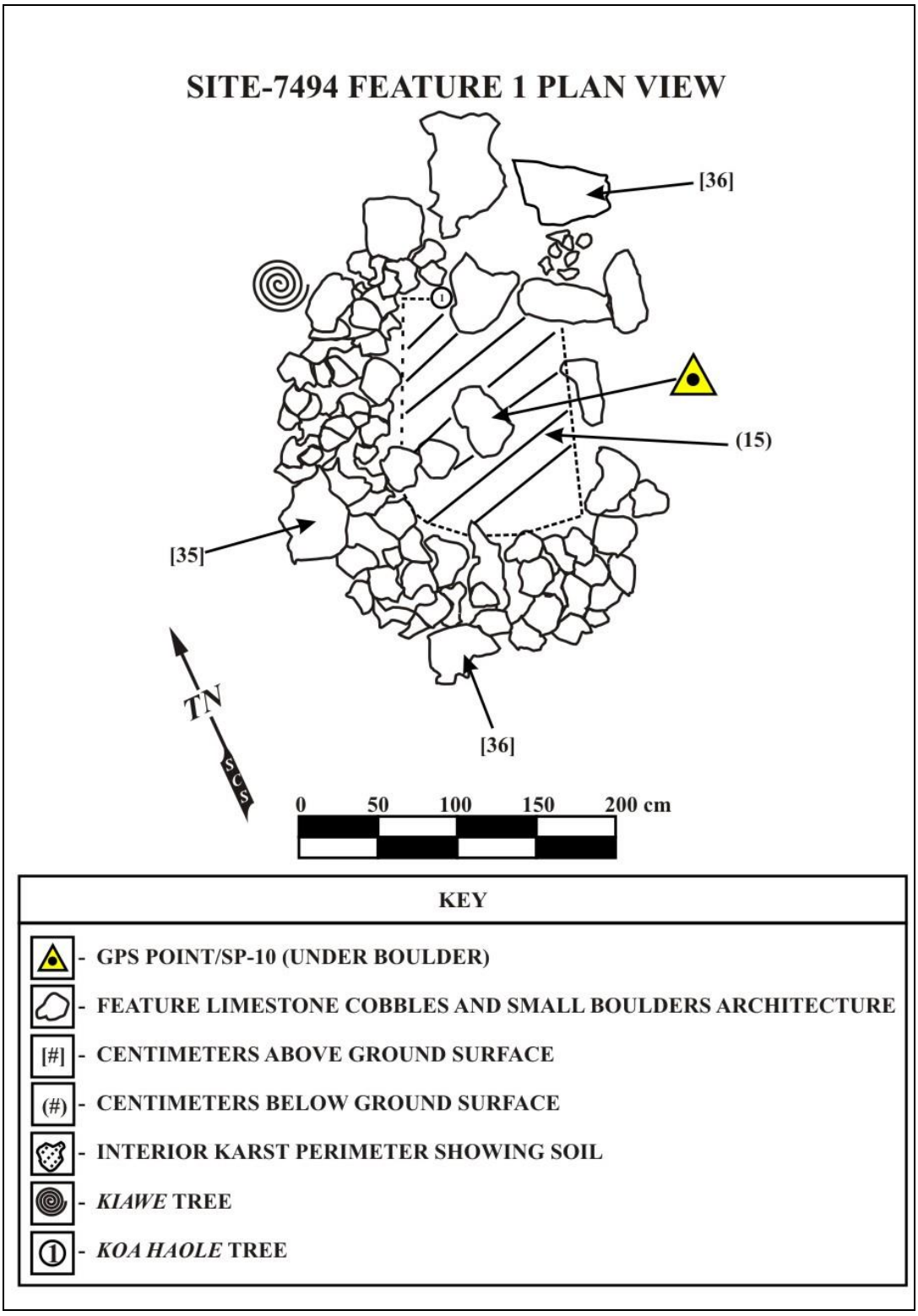

Figure 100: Plan View Drawing of State Site 50-80-12-7494, Feature 1.

Figure 101: Photographic View of State Site 50-80-12-7494, Feature 1. View to Southwest.

SHOVEL PROBE 10

Shovel Probe 10 (SP-10) was placed in the center of Site -7494, Feature 1 (see Figure 100). SP-10 measured 30 cm in diameter x 27 cm deep and exposed three stratigraphic layers (Figure 102). Subsurface testing of -7494, Feature 1 resulted in the collection of a charcoal sample. The charcoal sample (internally designated as SCS-676) was collected from Layer I (0-17 cmbs) and was submitted for radiocarbon dating. Calibrated using OxCal version 3.5, the sample yielded a conventional age of 220 ± 30 B.P. (A.D.1730-1810). As such, Site -7494, Feature 1, Layer I has been interpreted as a late pre-Contact to early post-Contact cultural layer based on the presence of charcoal, the radiocarbon date of the sampled charcoal, and the fact that the charcoal is located within the culturally modified karst.

- Layer I (0-17 cmbs) consisted of very dark brown (10YR 2/2, dry) semi-loose, silty loam interpreted as top soil with decomposing vegetation and limestone cobbles. One limestone boulder was situated on the ground surface, above Layer I. Layer I yielded modest charcoal flecking.

- Layer II (17-22 cmbs) consisted of dark yellowish brown (10YR 3/1, dry) silt with small rootlets. This stratum was sterile.

- Layer III (22-30 cmbs) consisted of brown (10YR 5/3, dry) slightly compacted silt with medium size rootlets. Layer III was sterile.

STATE SITE 50-80-12-5120 (SCS SITE TS-14)

As previously stated in the **PREVIOUS ARCHAEOLOGY** section of the current Archaeological Inventory Survey report, the subject project area [TMK (1) 9-1-013:070] was part of the Naval Air Station Barbers Point Archaeological Survey conducted by the Bernice Pauahi Bishop Museum and the Pacific Division of the Naval Facilities Engineering Command in 1984 and in 1985 by Haun (1991). Tax Map Key (1) 9-1-013:070 (*i.e.,* the current project area) was delineated during the survey as Area E6 and surveyed at medium intensity. While Haun (1991) reported finding multiple historic properties within the Naval Air Station Barbers Point perimeter, he did not find any historic properties within the perimeter of TMK (1) 9-1-013:070. In 1994, International Archaeological Research Institute, Inc. (IARII) conducted a Reconnaissance Survey and a Phase I Inventory Survey of the entire NAS Barbers Point property (Tuggle and Tomonari-Tuggle 1994). The 1994 Phase I Inventory Survey (*ibid*) employed the Haun (1991) survey areas (A through E, Area E6 included), with four new survey areas (F through I) (see Figure 5; Tuggle and Tomonari-Tuggle 1997: Fig 20). Thirty-five sites, including a burial site, were newly identified (State Sites 50-80-12-5119 through -5130), boundaries were

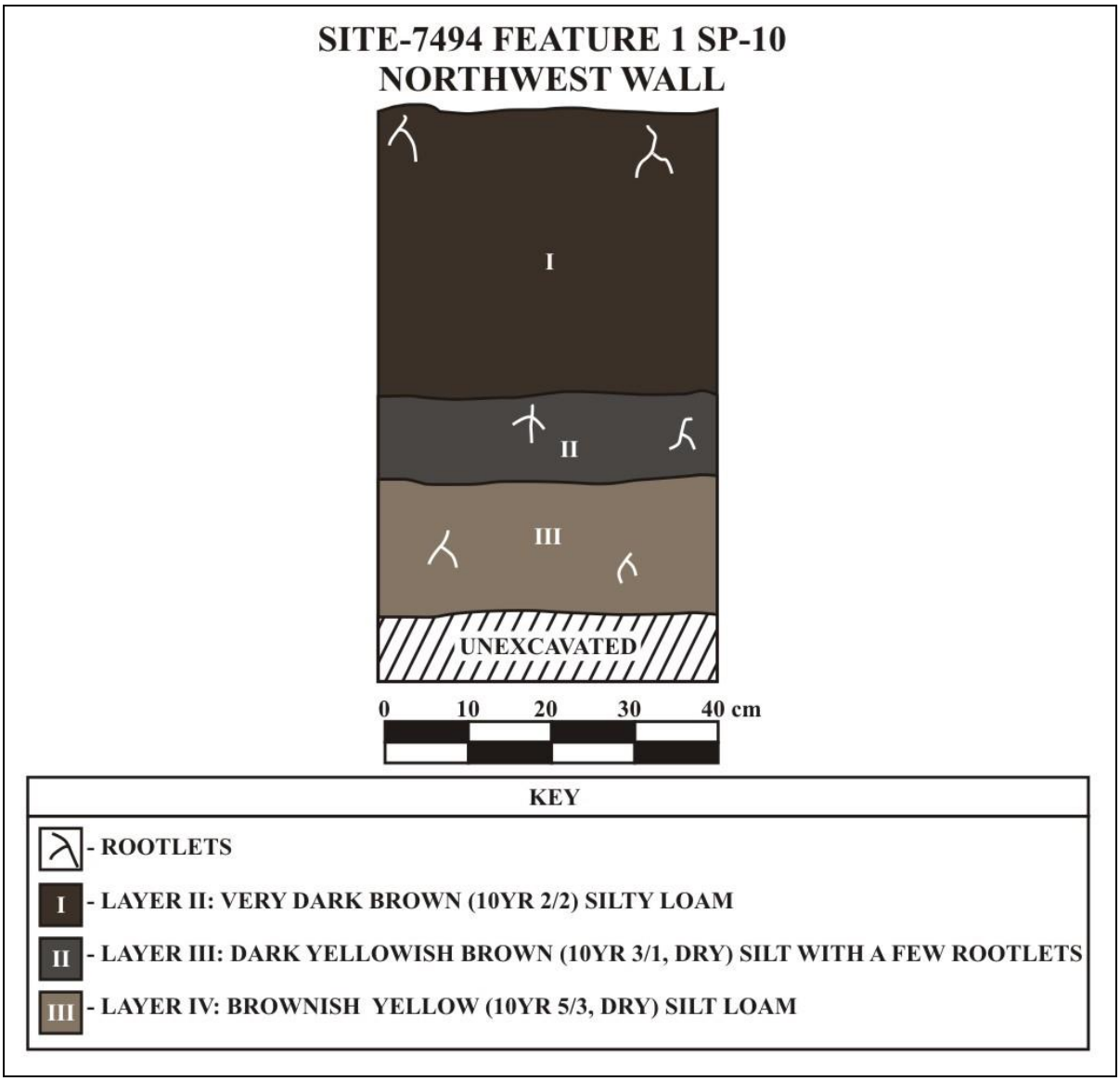

Figure 102: State Site 50-80-12-7494, Feature 1, SP-10 Profile.

modified for eight previously recorded sites, several areas were selected for subsurface investigation, and locations were clarified for two sites (State Sites -1727 and -4548 through -4567). During the 1994 project, what would eventually become Site -5120 was found in an area designated by Tuggle and Tomonari-Tuggle (1994) as Area E6c with a smaller horizontal area designated as Historic Site Resource Area (HSRA) 30 Within HSRA 30, three groups of historic properties were found and subsequently designated by Tuggle and Tomonari-Tuggle (1994) as NL-13 (a military complex containing various surface structures), NL-52 (multiple stone walls "forming a military rest area"), and NL-53 (an airplane crash area). During the Phase II work, Wickler and Tuggle (1997) assigned letter designations to the features, and NL-13, NL-52, and NL-53 were combined into one archaeological historic property and assigned as State Site 50-80-12-5120 which was re-identified during the current SCS Archaeological Inventory Survey.

Most of the State Site 50-80-12-5120 documentation was completed by International Archaeological Research Institute, Inc., which consisted of detailed mapping of features (Wicker and Tuggle 1997). According to Wicker and Tuggle (1997), State Site 50-80-12-5120 consists of ten features:

- Feature A: a stone enclosure,
- Feature B: a small concrete slab,
- Feature C: a limestone cobble platform,
- Feature D: a long narrow paved structure,
- Feature E: fragments of a jet aircraft,
- Feature F: a sentry post,
- Feature G: a coral packed road,
- Feature H: a single gun position,
- Feature I: a portable concrete pillbox, and
- Feature J: a three-unit gun position.

According to Wicker and Tuggle (1997), Feature D, a long narrow paved structure, may be a remnant of a sisal wall; however the original function of this feature was found to be undetermined. No archaeological excavation was conducted at State Site 50-80-12-5120. Of the ten archaeological surface features that Wicker and Tuggle (1997) recorded during their Phase II work on Site -5120, only seven features (Features A, B, E, F, H, I, and J) were re-located during the current Archaeological Inventory Survey. Wicker and Tuggle (1997) Site -5120 Features C, D, and G could not be re-located due to non-matching comparisons (*i.e.,* feature location, feature horizontal shape, and feature horizontal long axis orientation) between the current Archaeological Inventory Survey work and the Wickler and Tuggle (1997) site plan view map. It is suspected that Feature G, a coral packed road recorded by Wickler and Tuggle (1997), was

destroyed or covered by either previous bulldozing (non-Geolabs, Inc. work) or vegetation growth.

Only one feature that was originally designated under State Site 50-80-12-5120 has been given a new feature number and re-allocated to a new state site. During the current Archaeological Inventory Survey State Site 50-80-12-5120, Feature E (plane wreck), was initially designated as SCS Site TS-6 Features 2A through 2C (two different landing gears with wheels and a wing fragment) and because SCS interpreted Site -5120, Feature E as a separate site, Feature E will be discussed under what is now State Site 50-80-12-7487, Feature 2A (single-wheeled aircraft wing landing gear), 2B (two-wheeled aircraft nose landing gear), and 2C (aircraft wing section).

State Site 50-80-12-5120 consists of 9 features (seven previously identified and two previously unidentified) and measures 81.0 by 41.0 m and was oriented along a southeast/northwest axis with compass bearing of 142/322 degrees (Magnetic) (Figure 103). Based on feature type, Site -5120 was interpreted as an agriculture/refuse/military/boundary complex associated with the pre- and/or post-Contact Period through the Historic Military Period. Overall, Site 5120 was found to be in fair condition. Site 50-80-12-5120 has been evaluated for significance, as outlined in Hawai‘i Administrative Rules §13-275-6, and found to be significant under Criterion d, for information content. Based on the findings of the excavation (see Appendix C), the potential remains for additional cultural information to be present within subsurface contexts. Thus, a recommendation of preservation and no further work has been made for the features within State Site 50-80-12-5120.

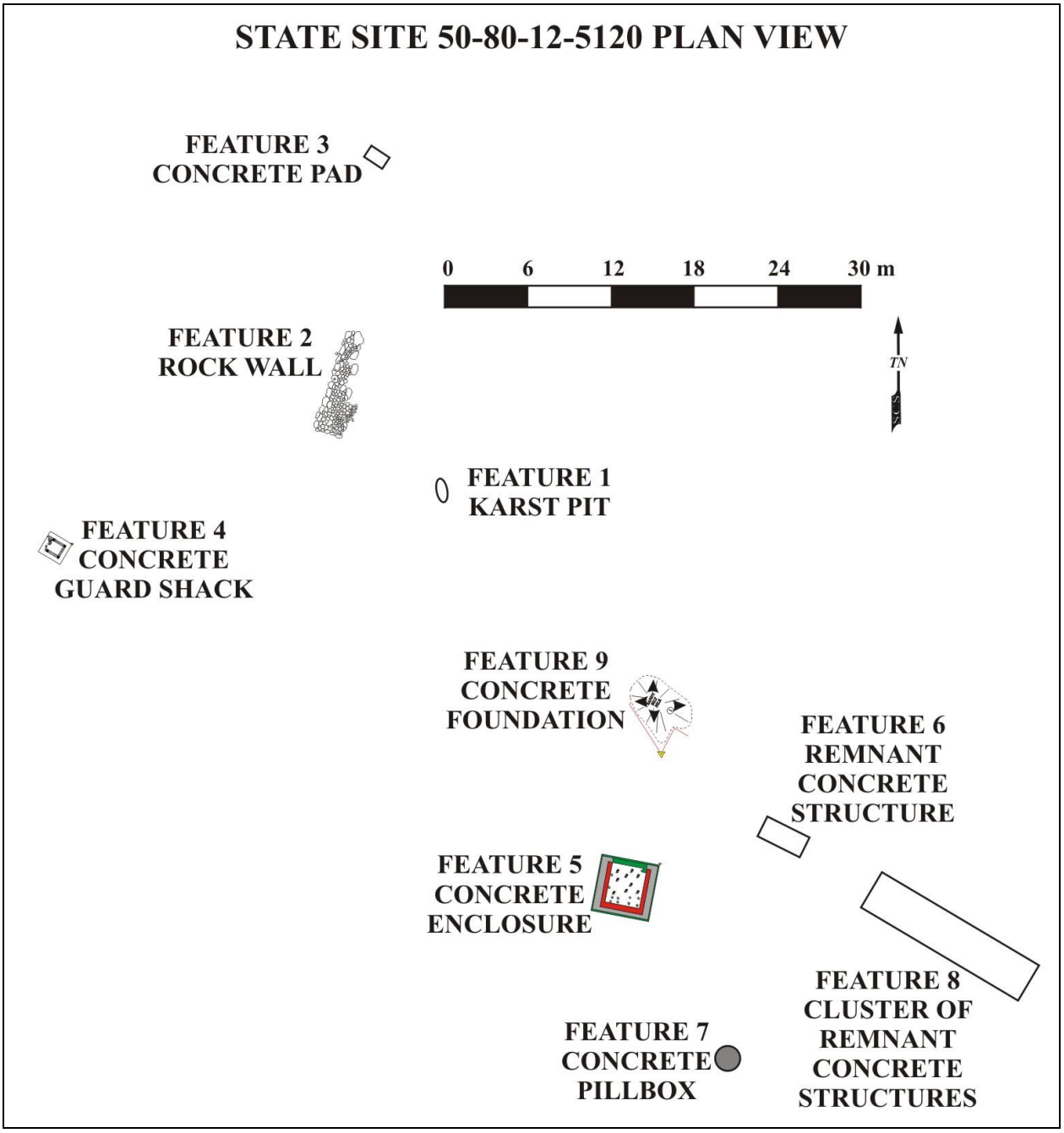

Figure 103: Plan View Drawing of State Site 50-80-12-5120.

Descriptive Data by Feature Number
Feature Type: Karst Pit
Feature: 1 (feature previously not documented)
GPS Coordinates: E 597337 N 2356044
Function: Agricultural
Age: Pre-and/or early Post-Contact Period
Condition: Good

Description: State Site 50-80-12-5120, Feature 1 consists of a newly identified single karst pit with no observed cultural modification (Figure 104). Feature 1 was found to be in good condition. The pit is approximately 1.65 m long by 1.25 m wide and extends to 0.40 m below the ground surface. Based on feature type, the karst pit was interpreted as an agricultural feature associated with the pre-and/or early post-Contact Period. At present, no cultural materials were observed in this pit. A recommendation of preservation has been made for Feature 1.

Feature Type: Rock Wall
Feature: 2 [possibly IARII Feature A]
GPS Coordinates: E 597328 N 2356052
Function: Habitation
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-2-5120, Feature 2 consists of a linear limestone rock wall (Figure 105), with surface feature dimensions of 7.2 m long x 2.32 m wide. Surface feature heights above ground ranged between 14 cm to 60 cm. Wall thickness measured 85 cm to 2.0 m. The long axis of the feature is oriented northeast/southwest (10/190 degrees, Magnetic).

The wall was constructed of dry-laid limestone cobbles and small boulders some of which were laid onto vertical protrusions of limestone outcropping in some portions of the architecture. The feature has pilings of cobbles, up to three courses high, and stacking of small boulders, no more than three courses high. The cobbles are sub-rounded and angular, while the small boulders are sub-rounded and sub-angular. This feature was constructed with multiple small boulders outlining the west edge of the feature. Cobbles and a few small boulders outline the east side of the feature. The location of the small limestone boulders that line the west side of the feature and that the most of the limestone cobbles are located on the east side of that line of small boulders suggest that the wall was likely core-filled.

Figure 104: Photographic View of State Site 50-80-12-5120, Feature 1. View to Southeast.

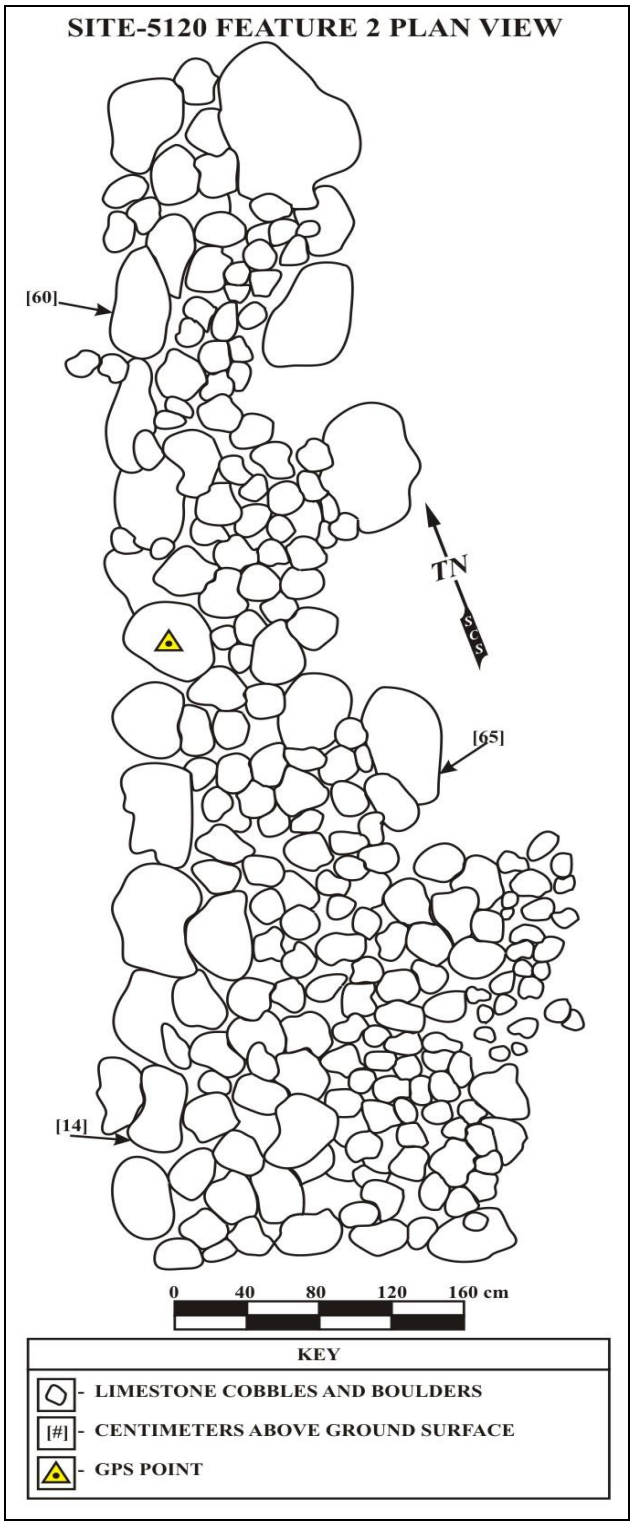

Figure 105: Plan View Drawing of State Site 50-80-12-5120, Feature 2.

The north and south sides of the feature appear to have sustained both mechanically disturbance and some natural disturbance, the later caused by *kiawe* tree roots. The mechanical disturbance of the feature is interpreted as having occurred prior to the recent mechanical disturbance caused by Geolabs, Inc. (2012) as the vegetation immediately surrounding the feature wall is intact.

Although State Site 50-80-12-5120, Feature 2 exhibited the effects of minor disturbance, including root wedging of a *kiawe* tree on the south end, the feature was found to be in fair condition. Based on feature type, feature total horizontal size, construction methods, and construction materials, this wall has been interpreted as a habitation feature associated with the pre- and/or early post-Contact Period. During the study of Site -5120, Feature A was interpreted by Wickler and Tuggle (1997) as a stone enclosure. However, based on the above criteria, the current Archaeological Inventory Survey could not confirm that the feature is an enclosure wall. A recommendation of preservation has been made for Feature 2.

Feature Type: Concrete Pad
Feature: 3 (IARII Feature B)
GPS Coordinates: E 597333 N 2356068
Function: Possible Military Pet Burial (2013 AIS re-interpretation)
Age: Historic (A.D. 1945)
Condition: Fair

Description: State Site 50-80-12-5120, Feature 3 is a rectangular concrete pad (Figure 106) with surface feature exterior horizontal dimensions of 1.48 m long by 1.17 m wide and surface feature interior horizontal dimensions of 56 cm long by 36 cm wide. Surface feature heights above ground surface measured 6 cm to 12 cm. The long axis of the feature is oriented northwest/southeast (110/290 degrees, Magnetic).

Feature 3 was most likely built in place but is small enough to have been transported via vehicle (*e.g.*, on the flat bed of an industrial size truck). Material utilized in the surface features construction includes concrete with sub-angular basalt gravel.

Figure 106: Photographic View of State Site 50-80-12-5120, Feature 3. View to Northeast.

In plan view, Feature 3 is rectangular, with an interior small rectangular open area that had a thin, approximate 2 mm thick ferrous metal rectangular cover. The metal cover was found buried just below ground surface adjacent to the feature. The surface of the feature is sloped inward toward the small rectangular opening and contains four areas with impressions. The first reads: CoL. "COBB", the second is a right hand impression, the third says "MARCH 27 1945" and "SGT. JONES" under the date, and the fourth says "L.Z."

Feature 3 is in fair condition. Based on feature type, construction methods, construction materials, and inscriptions on the feature surface, this concrete pad has been interpreted to be associated with Historic military occupation of the area during World War II. During the Phase II study, Site -5120, Feature B was interpreted by Wickler and Tuggle (1997) as the base of a field shower. The current Archaeological Inventory Survey interpretation reassessed the feature's function based on the feature's relatively small size, inscriptions on the surface of the feature, and nearby metal lid concluded that the concrete pad is possibly a military pet burial interred on March 27, 1945. "CoL. COBB" or "SGT. JONES" may be either the pet's name or the owner of the pet. Based on the two military ranks ("CoL." and "SGT.") inscribed onto the surface of the feature, it is likely that whomever utilized or constructed the feature was either associated with the United States Army or the United States Marine Corps. However, because the location of the feature is on a United States Navy Installation, it is likely the feature was associated with the United States Marine Corps since Marines during World War II were the likely defenders of United States Naval Installations. A recommendation of no further work has been made for Feature 3.

Feature Type: Guard Shack
Feature: 4 (IARII Feature F)
GPS Coordinates: E 597310 N 2356040
Function: Military Defense
Age: Historic (ca. 1940s-1960s)
Condition: Good

Description: State Site 50-80-12-5120, Feature 4 consists of a concrete guard shack (Figure 107). Feature exterior surface dimensions measure 3.5 m long by 3.25 m wide and surface feature interior dimensions measure 3 cm long x 1.5 cm wide. Surface feature exterior heights above ground surface measure 1.85 m to 1.88 m, while surface feature interior heights above ground surface measure 91 cm to 1.03 m. Wall thickness is 30 cm. The long axis of the feature is oriented southeast/northwest (115/295 degrees, Magnetic).

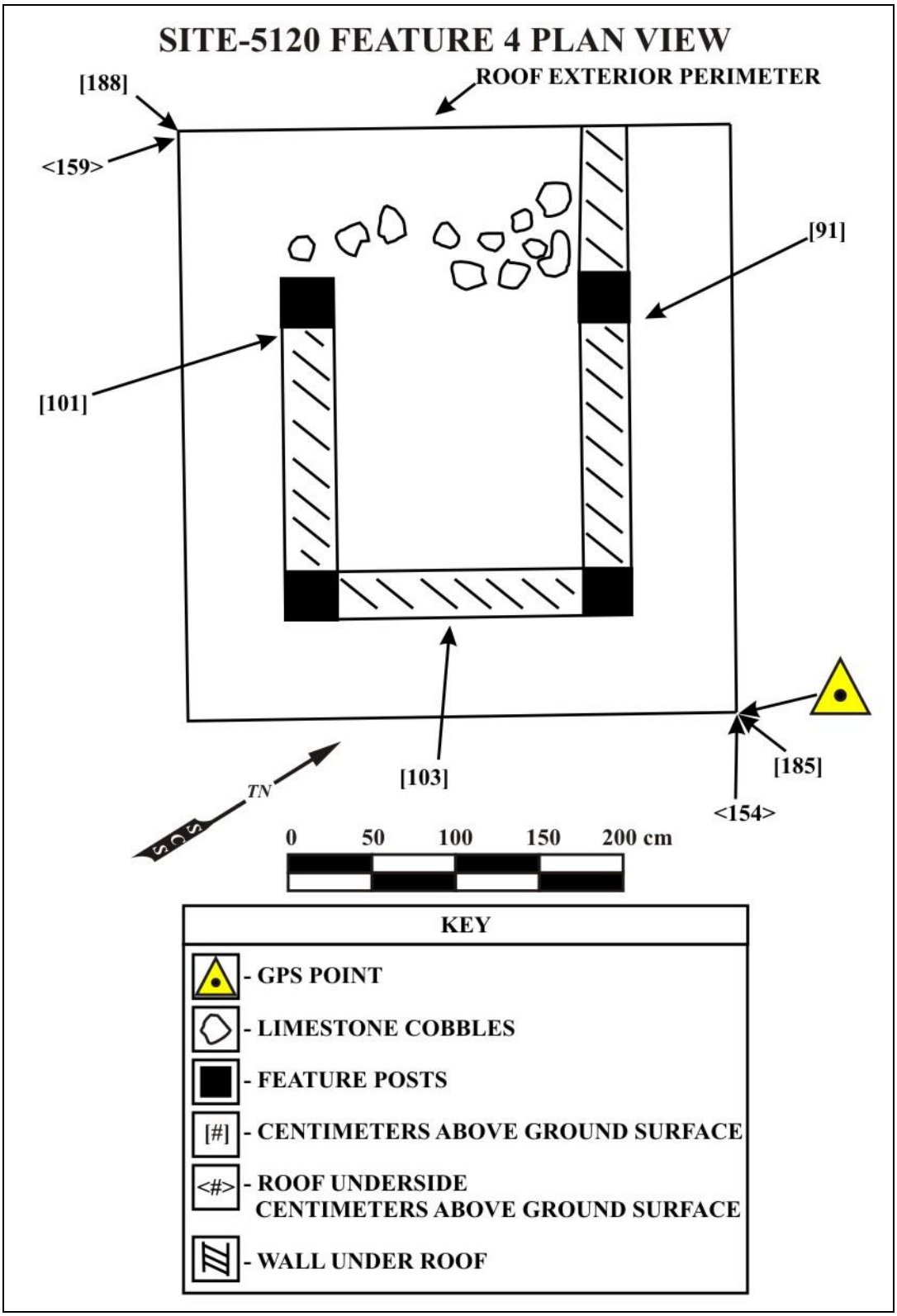

Figure 107: Plan View Drawing of State Site 50-80-12-5120, Feature 4.

Feature 4 was most likely built in place given its horizontal and vertical dimensions. Material utilized in the feature's construction includes concrete with angular basalt gravel, ferrous metal rebar, and ferrous metal wire. The rebar and wire were utilized for structural integrity. In plan view, Feature 4 is rectangular, with a concrete roof measuring 30 cm in thickness. This feature has three walls measuring 30 cm in thickness. The feature also has four vertical square pillars that support the roof. The opening of the structure is on the west/northwest side. Each of the three walls has an open viewing area. The north viewing area measures 60 cm high by 1.52 m wide. The east viewing area is 60 cm high by 1.48 m wide, and the south viewing area measures 60 cm high by 1.52 m wide. Observed Historic-era cultural material include a broken, portable ferrous metal bullhorn located on the feature's east wall.

Although State Site 50-80-12-5120, Feature 4 exhibited structural damage to its corners, the feature was found to be in good condition. Based on feature type, construction methods, and construction materials, this guard shack has been interpreted to be associated with Historic military occupation of the area and to have functioned as a defense post. A recommendation of no further work has been made for Feature 4.

Feature Type: Concrete Enclosure
Feature: 5 (IARII Feature H)
GPS Coordinates: E 597353 N 2356017
Function: Remnant building
Age: Historic (ca. 1940s)
Condition: Fair

Description: State Site 50-80-12-5120, Feature 5 consists of a concrete enclosure (Figure 108) with surface feature exterior dimensions of 4.6 m to 4.7 m long by 4.6 m to 4.7 m wide. Surface feature interior dimensions measure 2.75 m to 4.0 m long by 2.75 m to 4.0 wide. Surface feature exterior heights measure 38 cm to 1.43 m. Surface feature interior heights measure 1.30 m to 1.36 m. Wall thicknesses measure 30 cm to 45 cm. The long axis of the feature is oriented southeast/northwest (115/295 degrees, Magnetic).

Feature 5 was most likely built in place given its large horizontal and vertical dimensions. It rests on the ground surface and the material utilized in construction includes concrete with angular basalt gravel and ferrous metal rebar. In plan view, Feature 5 is square and is comprised of three walls facing south, east, and west. This feature also has two concrete tiers. Tier one (base) is slightly larger with overall horizontal dimensions of 4.56 m long x 4.48 m wide. Tier two, the upper portion of the feature, has overall horizontal dimensions of 4.4 m long x 4.32 m

wide and has top edges (interior and exterior) that are beveled. The feature's eastern interior wall has a shelf, while the west and south walls do not.

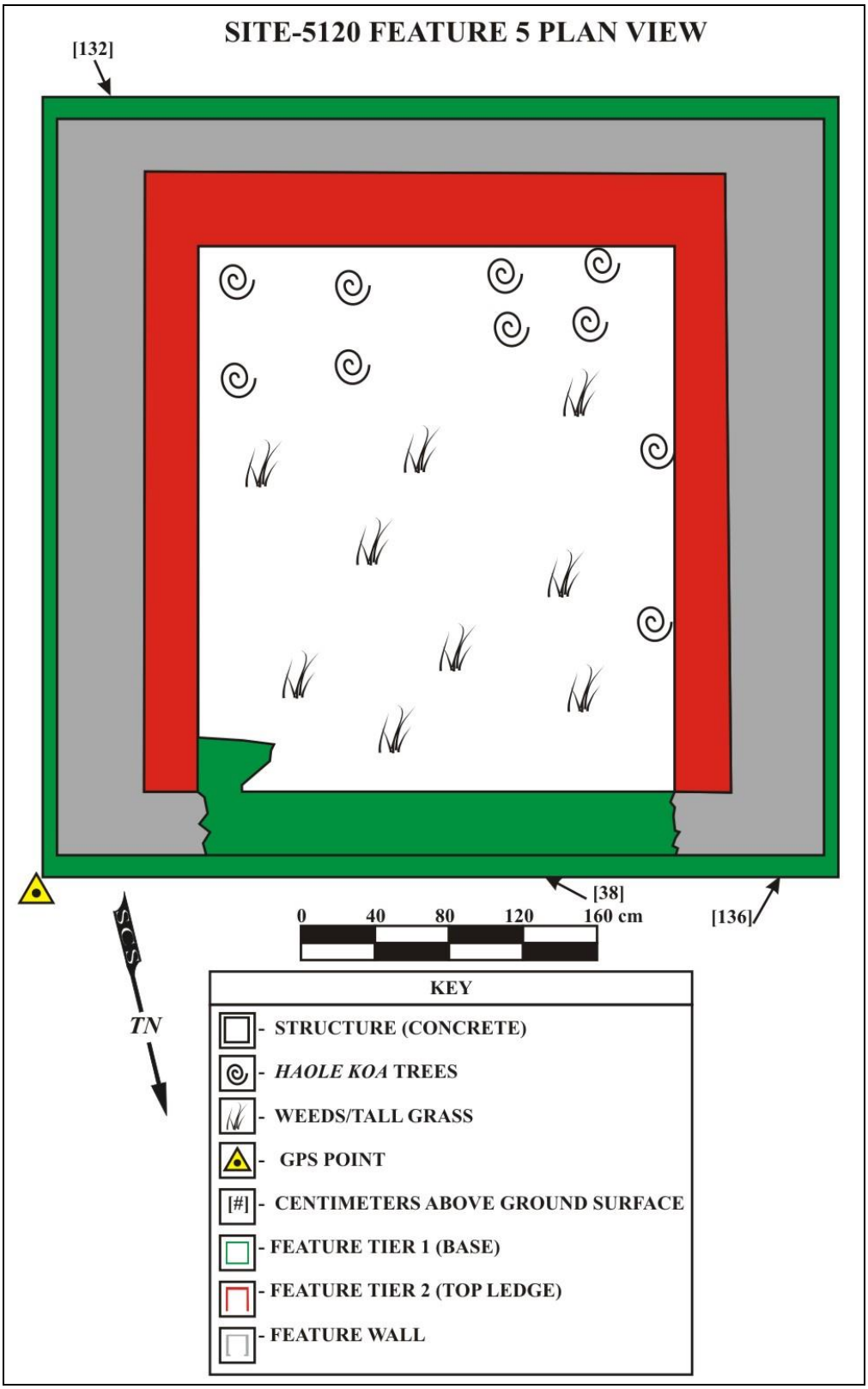

Figure 108: Plan View Drawing of State Site 50--80-12-5120, Feature 5.

The northern, interior wall may previously have had a shelf but there is nothing there now. Observed Historic-era cultural material includes two ferrous metal barrels located due south of the feature.

Feature 5 was found to be in fair condition. Based on feature type, construction methods, and construction materials, this concrete enclosure has been interpreted to be associated with Historic military occupation of the area. During the Phase II study, Site -5120, Feature H was interpreted by Wickler and Tuggle (1997) as a single gun position. Based on the current study, State Site 50-80-12-5120, Feature H, is a remnant building likely used as a single gun position. A recommendation of no further work has been made for Feature 5.

Feature Type: Remnant Concrete Structures
Feature: 6 (Portion of IARII Feature J)
GPS Coordinates: E 597363 N 2356019
Function: Military building foundations
Age: Historic
Condition: Poor

Description: State Site 50-80-12-5120, Feature 6 consists of two displaced sections of a damaged concrete structure (Figure 109). Horizontal dimensions of the overall surface feature area measure approximately 3.25 m long by 1.5 m wide. Wall thickness of both displaced sections measured 14 cm to 31 cm. The long axis of Feature 6 is oriented northwest/southeast (southeast/northwest (110/290 degrees, Magnetic).

Material utilized in the feature's construction includes concrete with angular basalt gravel and ferrous metal rebar. In plan view, Feature 6 is rectangular and consists of two displaced concrete structural remnants, similar to Site -5120, Feature J recorded by Wickler and Tuggle's (1997) Feature J. Both remnant components of Feature 6 have two tiers like Site -5120, Feature H (concrete enclosure), and one has two 3-ring ferrous metal climbing rungs.

State Site 50-80-12-5120, Feature 6 exhibited heavy structural damage most likely due to mechanical displacement. Feature 6 was found to be in poor condition. Based on feature type, construction methods, and construction materials, these foundation remnants have been interpreted to be associated with former Historic military occupation of the area. A recommendation of no further work has been made for Feature 6.

Figure 109: Photographic View of State Site 50-80-12-5120, Feature 6. View to Southeast.

Feature Type: Concrete Pillbox
Feature: 7 (IARII Feature I)
GPS Coordinates: E 597358 N 2356003
Function: Guard Post
Age: Historic
Condition: Good

Description: State Site 50-80-12-5120, Feature 7 consists of a concrete pillbox (Figure 110). Surface feature diameter measures 1.6 m. The exterior of the feature opening measures 82 cm wide x 44 cm high. The interior of the feature measures 47 cm wide by 27 cm high. Wall thickness measures 15 cm to 27 cm.

Materials utilized in feature construction include concrete with angular basalt gravel and ferrous metal rebar. In plan view, Feature 7 is circular, with a dome top and cylindrical body. On the dome top are three ferrous metal rebar, each bent into a U-shape and anchored/embedded into the concrete. The presence of these rebar suggests the feature was designed to be portable. The feature has a single opening, which faces southwest. The vertical sides of the opening are beveled outward and over the left side of the opening is a 4 cm thick steel plate that can be moved into a vertical or near horizontal position. On the back of the steel plate is a hook that may have latched onto a second steel plate, which is missing. Close to the opening, in the interior of the feature, is a vertical threaded metal bolt onto which a machine gun may have been secured. This feature is a good example of a WWII-era portable defensive structure.

Feature 7 is in good condition. Based on feature type, construction methods, and construction materials, this feature has been interpreted to be associated with former Historic military occupation of the area. A recommendation of no further work has been made for Feature 7.

Figure 110: Photographic View of State Site 50-80-12-5120, Feature 7. View to Northeast.

Feature Type: Cluster of Remnant Concrete Structures
Feature: 8 (portion of IARII Feature J)
GPS Coordinates: E 597374 N 2356012
Function: Military structural remnants
Age: Historic (ca.1940)
Condition: Poor

Description: State Site 50-80-12-5120, Feature 8 consists of four pieces of at least one concrete structure (Figure 111). Overall surface feature dimensions measure 13 m long by 3.0 m wide. Wall thickness measures 14 cm to 31 cm. The long axis of the site is oriented southeast/northwest (116/296 degrees, Magnetic). Materials utilized in feature construction include concrete with angular basalt gravel and ferrous metal rebar. In plan view, Feature 8 is rectangular. Pieced together, at least three of the components would make a structure similar to Site -5120, Feature 5 (IARII Feature H), while the fourth component is an angular U-shape remnant that does not correlate in size and shape with any of the features in the project area. Each of the four feature components has two tiers similar to Site -5120, Feature 5.

State Site 50-80-12-5120, Feature 8 exhibited heavy structural damage most likely due to displacement and root wedging of *haole koa* trees. Feature 8 was found to be in poor condition. Based on feature type, construction methods, and construction materials, these structural remnants have been interpreted to be associated with former Historic military occupation of the area. A recommendation of no further work has been made for Feature 8.

Feature Type: Concrete Foundation
Feature: 9 (feature newly documented)
GPS Coordinates: E 597353 N 2356025
Function: Military structure
Age: Historic
Condition: Fair to poor

Description: State Site 50-80-12-5120, Feature 9 consists of a concrete foundation (Figure 112), with feature exterior horizontal dimensions measuring 3.82 m long by 1.55 m wide. Surface feature heights measure up to 7 cm above ground surface. The long axis of the feature is oriented southeast/northwest (124/304 degrees, Magnetic). Feature 9 was most likely built in place. Material utilized in feature construction includes concrete with angular basalt gravel. In plan view, Feature 9 is a poured concrete slab of unknown original shape, with at least two corners.

Figure 111: Photographic View of State Site 50-80-12-5120, Feature 8. View to East.

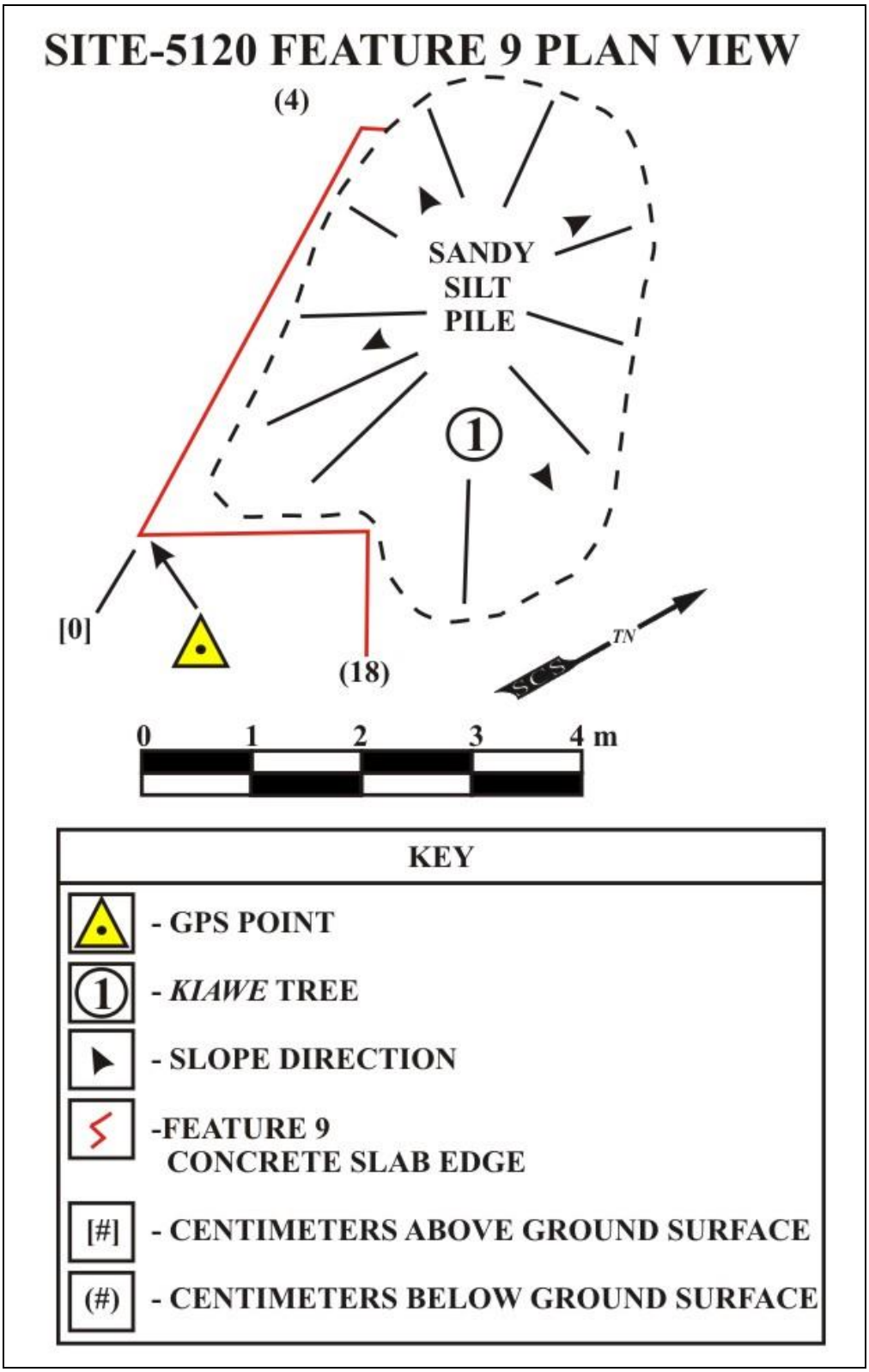

Figure 112: Plan View Drawing of State Site 50-80-12-5120, Feature 9.

Although Site -5120, Feature 9 is located under a mound of silty/loamy/sandy soil with grasses and weeds growing above it, the feature was found to be in fair condition. Based on feature type, construction methods, and construction materials, this feature has been interpreted to be associated with former Historic military occupation of the area. The recordation of State Site 50-80-12-5120 during the Wickler and Tuggle (1997) Phase II work did not observe this feature. A recommendation of no further work has been made for Feature 9.

STATE SITE 50-80-12-7496 (SCS SITE TS-15)

State Site 50-80-12-7496 is a newly identified site comprised of two surface archaeological features (Figure 113 (see Table 2). State Site 50-80-12-7496 measures 16.0 by 10.5 m and is oriented along a southeast/northwest axis with a compass bearing of 120/300 degrees, (Magnetic). The current research led to the documentation of one platform and a platform partially covered by a push pile limestone cobble and boulder mound. Site 50-80-12-7496 was found to be in fair condition. Based on feature type, construction methods, and construction materials, Site -7496 as been interpreted as a habitation/agriculture/storage complex associated with the pre- and/or post-Contact Period.

State Site 50-80-12-7496 has been evaluated for significance, as outlined in Hawai‘i Administrative Rules §13-275-6, and found to be significant under Criterion d, for information content. Based on the findings of the excavation (see Appendix C), the potential may remain for additional cultural information to be present within subsurface contexts. Thus, a recommendation of preservation has been made for the features within State Site 50-80-12-7496.

Descriptive Data by Feature Number

Feature Type: Platform
Feature: 1
GPS Coordinates: E 597404 N 2356009
Function: Habitation
Age: Pre- and/or Post Contact
Condition: Fair

Description: State Site 50-80-12-7496, Feature 1 consists of a five-sided limestone platform (Figures 114 and 115) with overall surface feature dimensions of 4.6 m long by 4.5 m wide. None of the feature's side lengths are of equal length: the south side of the feature is 4.5 m long, the east side is 1.7 m long, the northeast side is 3.0 m long, the north side is 2.0 m long, and the west side is 3.5 m long. Surface feature heights above ground surface measured 9 cm to 56 cm.

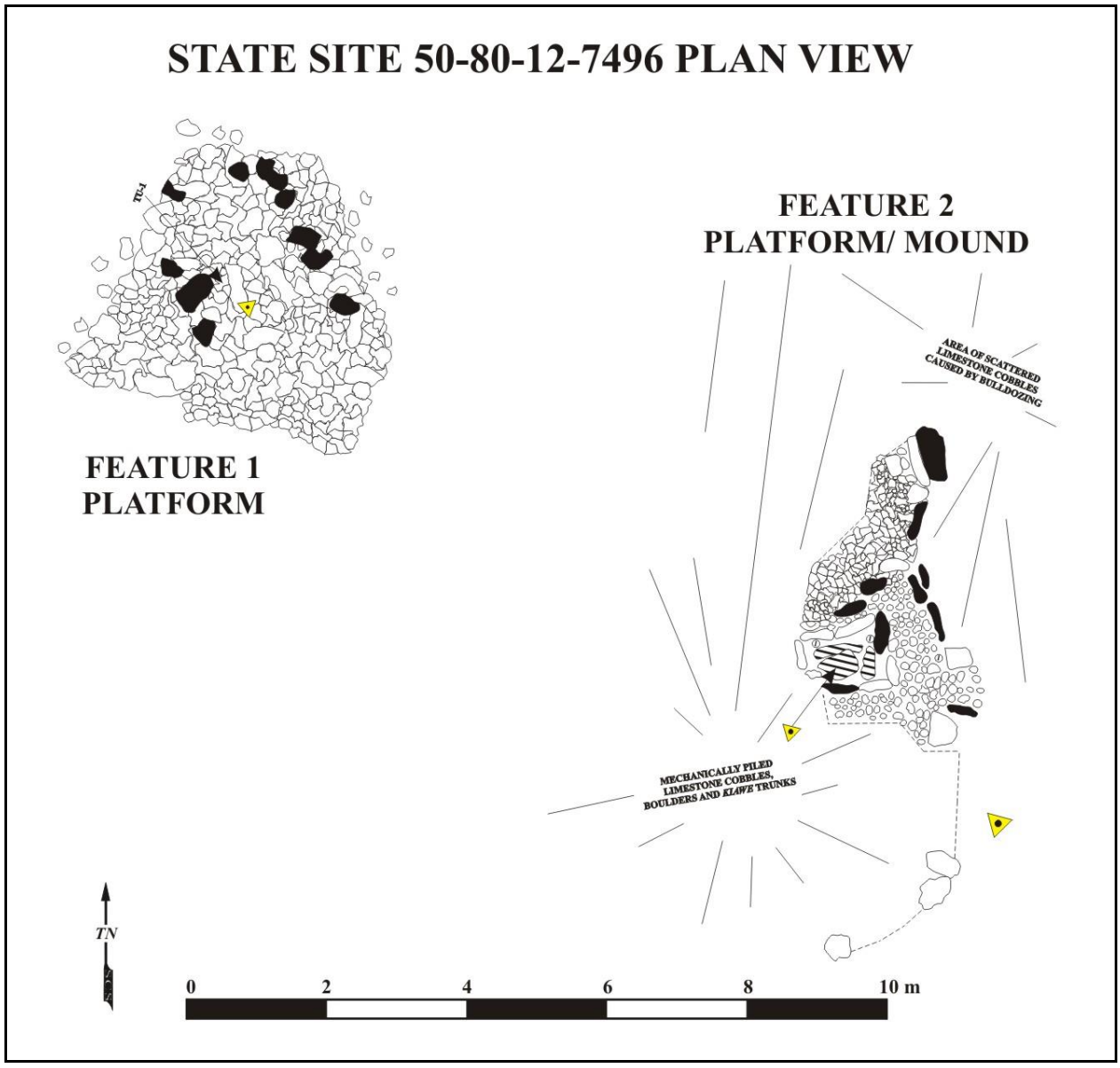

Figure 113: Plan View Drawing of State Site 50-80-112-7496.

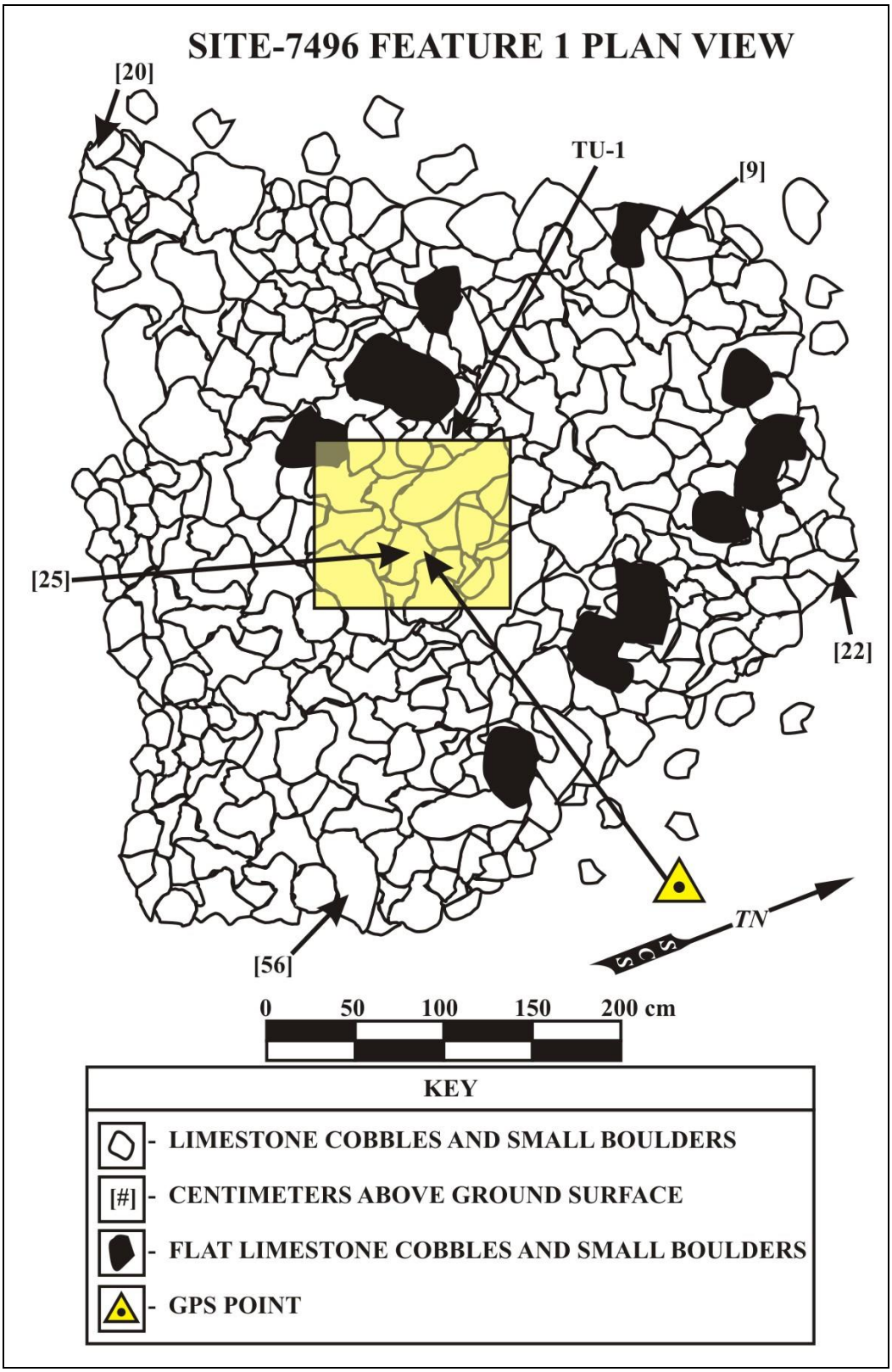

Figure 114: Plan View Drawing of State Site 50-80-12-7496, Feature 1

Figure 115: Photographic View of State Site 50-80-12-7496, Feature 1. View to Northeast.

The long axis of the feature is oriented southeast/northwest (95/275 degrees, Magnetic).

The feature was constructed of dry-laid limestone cobbles and small boulders, up to three courses high. The cobbles are angular, sub-angular, sub-rounded, and tubular. The small boulders are angular, sub-rounded, and tubular. A fair amount of flat and tubular cobbles and small boulders were laid horizontally. There is evidence of past (pre-2012) bulldozing near the southeast side of the feature which did not affect the feature's structural integrity.

State Site 50-80-12-7496, Feature 1 was not affected by root wedging or mechanical alteration and was found to be in fair condition. Based on feature type, construction methods, construction materials, this feature has been interpreted to be a habitation feature associated with the pre- and/or post-Contact Period. Subsurface testing of Feature 1 involved a single test unit (TU-7) described below.

TEST UNIT 7

Test Unit 7 was placed on the central, interior portion of Site -7496, Feature 1 (see Figure 114). TU-7 measured 50 cm long by 50 cm wide, with its south and north walls oriented northeast/southwest (80/260 degrees, Magnetic). TU-7 revealed four stratigraphic layers (Figure 116). Testing resulted in the identification of Traditional-Hawaiian cultural material within Layers II and III. The cultural material in Layer II suggests a second occupation may have occurred after construction of the feature as midden was observed near the top of Layer II. The stratigraphic profile of TU-7's east wall indicated that the limestone cobble and small boulder architecture of Site -7496, Feature 1 was constructed during the deposition of Layer II. Traditional cultural material within Layer III suggests a first occupation may have occurred before the architecture had been constructed as midden was observed under the architectural limestone cobbles.

- Layer I consists of Feature 1 architecture. The feature was constructed of cobbles and small boulders.

- Layer II (0-10 cmbs) consists of very dark brown (7.5YR 3/2, dry) semi-loose, silty loam with decomposing vegetation. Feature architecture terminates in Layer II. Traditional Hawaiian cultural material (marine invertebrate was found to be) were identified near ground surface within Layer II, suggests a second occupational layer. Within Layer II limestone cobbles and small boulders were utilized to construct the Feature 1 architecture. Rodent was found to be interpreted as *Rattus*/ *Mus* sp. were also observed and collected in Layer II.

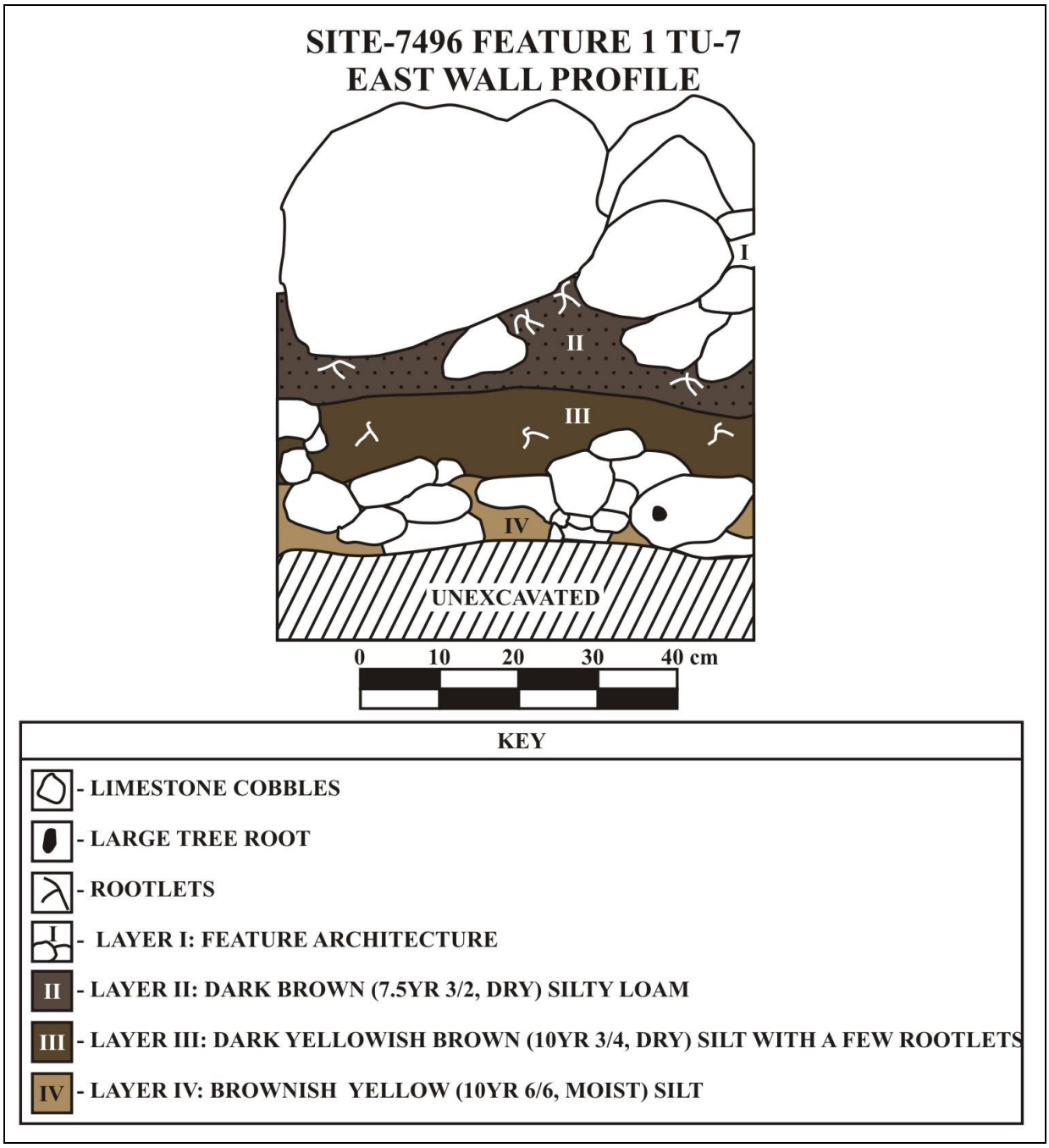

Figure 116: State Site 50-80-12-7496, Feature 1, TU-7 Profile.

- Layer III (10-17 cmbs) consists of dark yellowish brown (10YR 3/4, dry) semi-loose silt with rootlets. Traditional Hawaiian cultural material (marine invertebrate was found to be) were identified within Layer III suggests an initial occupational layer prior to the construction of the Feature 1 limestone cobble and small boulder architecture found in Layer II. No feature architecture was present in Layer III. Rodent was found to be interpreted as *Rattus*/ *Mus* sp. were also observed and collected in Layer II.

- Layer IV (17-36 cmbs) consisted of brown yellow (10YR 6/6, moist) semi-loose, very fine silt with medium size roots and limestone cobbles. Limestone cobbles makes up the majority of Layer IV. Layer IV was did not contain cultural material or feature architecture.

Feature Type: Platform/Mound
Feature: 2
GPS Coordinates: E 597412 N 2356004
Function: Agriculture/Storage
Age: Pre-and/or early Post-Contact
Condition: Fair to Poor

Description: State Site 50-80-12-7496, Feature 2 consists of a limestone cobble and small boulder platform (Figure 117) mostly encompassed by a Historic push pile of limestone cobbles and boulders (small through large). Overall feature exterior dimensions (Historic push pile included) measure 11.6 m long by 7.7 m wide. Exterior heights above ground surface measure between 23 cm to 42 cm with regards to the platform portion of the feature. Interior heights above ground surface measure between 30 cm to 1.7 m with regards to the push pile portion located on the feature. The long axis of the Historic push pile portion of the feature is oriented northeast/southwest (10/190 degrees, Magnetic). The platform portion of the feature measures approximately 4.75 m long x 2.5 m wide with a long axis oriented southeast/northwest (158/338 degrees, Magnetic). The surface of the platform is undulated.

The feature was constructed of dry-laid cobbles and small boulders. The cobbles and small boulders are angular, sub-angular, and flat/tubular in shape. The flat/tubular cobbles and small boulders form an eastern perimeter that encompasses a limestone cobble interior to the immediate west. Within the cobble interior is a small area which measures 1.2 m long by 0.8 m wide, and is encompassed by eight upright limestone slabs. Three limestone slabs located within the enclosed area appear to have been covering the small area but are now collapsed. The feature is the only one of its type in the project area. Site -7496, Feature 1 is located 7.0 m to the northwest. Collected Historic-era artifacts included one ferrous metal flare gun located 3.0 m to the east of the feature.

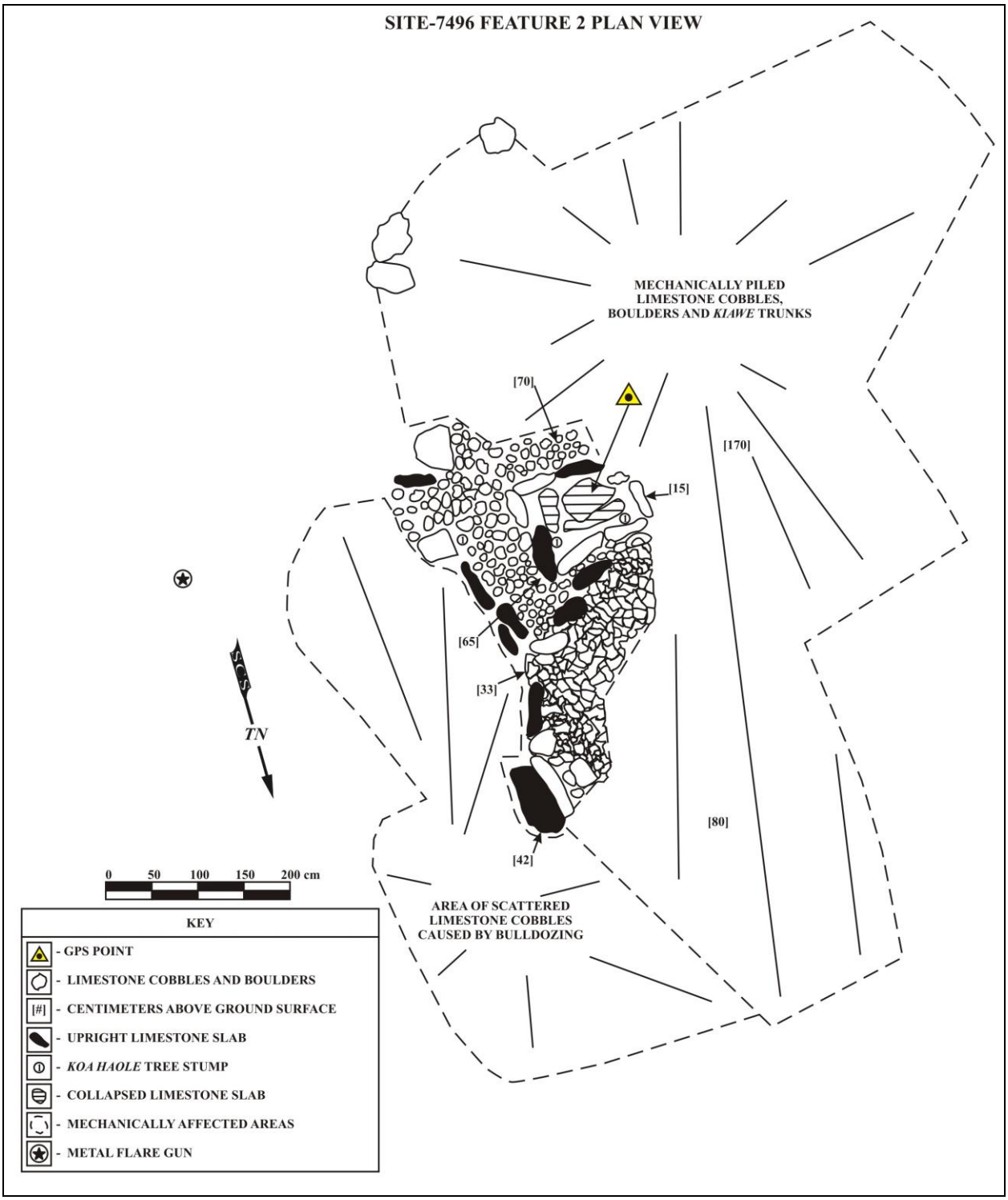

Figure 117: Plan View Drawing of State Site 50-80-12-7496, Feature 2.

The limestone rock mound composed of cobbles and boulders (small through large size) that are sub-rounded and angular in shape is situated atop the limestone cobble and small boulder platform. Historic-period (military occupation) bulldozing of area appears to have pushed limestone cobbles and boulders into the south and west sides of the feature. The rock mound and platform create a multi-sided shape with an estimated piled course count of no more than eight courses high.

State Site50-80-12 -7496, Feature 2 exhibited the effects mechanical alteration and was found to be in fair to poor condition. Based on feature type, construction methods, construction materials, this feature has been interpreted as an agriculture/storage feature associated with the pre- and/or post-Contact Period.

STATE SITE 50-80-12-7497 (SCS SITE TS-16)
Feature Type: Rock Mound
Feature: 1
GPS Coordinates: E 597634 N 2356062
Function: Agriculture
Age: Pre-and/or early Post-Contact
Condition: Fair

Description: State Site 50-80-12-7497 consists of a newly identified site comprised of a single irregular-shaped rock mound (Figure 118) (see Table 3). The mound measures approximately 3.05 m long by 1.93 m wide with a maximum above ground surface height of 0.5 m. State Site 50-80-12-7497 is oriented along a north/south axis with a compass bearing of 000/180 degrees (Magnetic).

The feature was constructed of dry-laid limestone cobbles and small boulders, both being sub-rounded and angular. The rocks were piled a variable two to four courses high, with the cobbles and boulders being interspersed. The mound was in fair condition.

Based on feature type, construction methods, and construction materials, the feature was interpreted as an agricultural mound associated with the pre- and/or early post-Contact Period. This mound was not interpreted as a clearing mound but rather, a location of piled rocks that could trap moisture and allow for crops such as sweet potato to grow.

State Site 50-80-12-7497 has been evaluated for significance, as outlined in Hawai‘i Administrative Rules §13-275-6, and found to be significant under Criterion d, for information content. As archaeological subsurface testing was not conducted, the features retain the potential

Figure 118: Photographic View of State Site 50-80-12-7497. View to Southwest

for containing additional information in subsurface contexts.. Thus, a recommendation of preservation has been made for the features within State Site 50-80-12-7497.

STATE SITE 50-80-12-7498 (SCS SITE TS-17)

State Site 50-80-12-7498 is a newly identified site comprised of three limestone karst pits (Figure 119) (see Table 2). Based on feature type, Site -7498 was interpreted as an agriculture/refuse/storage complex and associated with the pre- and/or early post-Contact Period. State Site 50-80-12-7498 measures 47.0 by 5.0 m and is oriented along a northeast/southwest axis with a compass bearing of 70/250 degrees (Magnetic). State Site 50-80-12-7498 was found to be in fair condition.

State Site 50-80-12-7498 has been evaluated for significance, as outlined in Hawai‘i Administrative Rules §13-275-6, and found to be significant under Criterion d, for information content. As archaeological subsurface testing was not conducted, the potential remains for additional cultural information to be present in subsurface contexts. Thus, a recommendation of preservation has been made for Site -7498.

Descriptive Data by Feature Number
Feature Type: Karst Pit
Feature: 1
GPS Coordinates: E 597722 N 2356064
Function: Agriculture/Refuse
Age: Pre-and/or early Post-Contact Period
Condition: Good

Description: State Site 50-80-12-7498, Feature 1 consists of a single karst pit with no observed cultural modification (Figure 120). The pit measures approximately 0.41 m long by 0.20 m wide and extends to 1.04 m below the ground surface. Based on feature type and presence of soil within the karst pit interior that is relatively close to the surface of the karst pit, Feature 1 was interpreted to be an agriculture/refuse feature associated with the pre-and/or early post-Contact Period. At present, no cultural materials were observed in this pit.

Feature Type: Karst Pit
Features: 2A and 2B
GPS Coordinates: E 597748 N 2356071
Function: Undetermined
Age: Pre-and/or early Post-Contact Period
Condition: Good

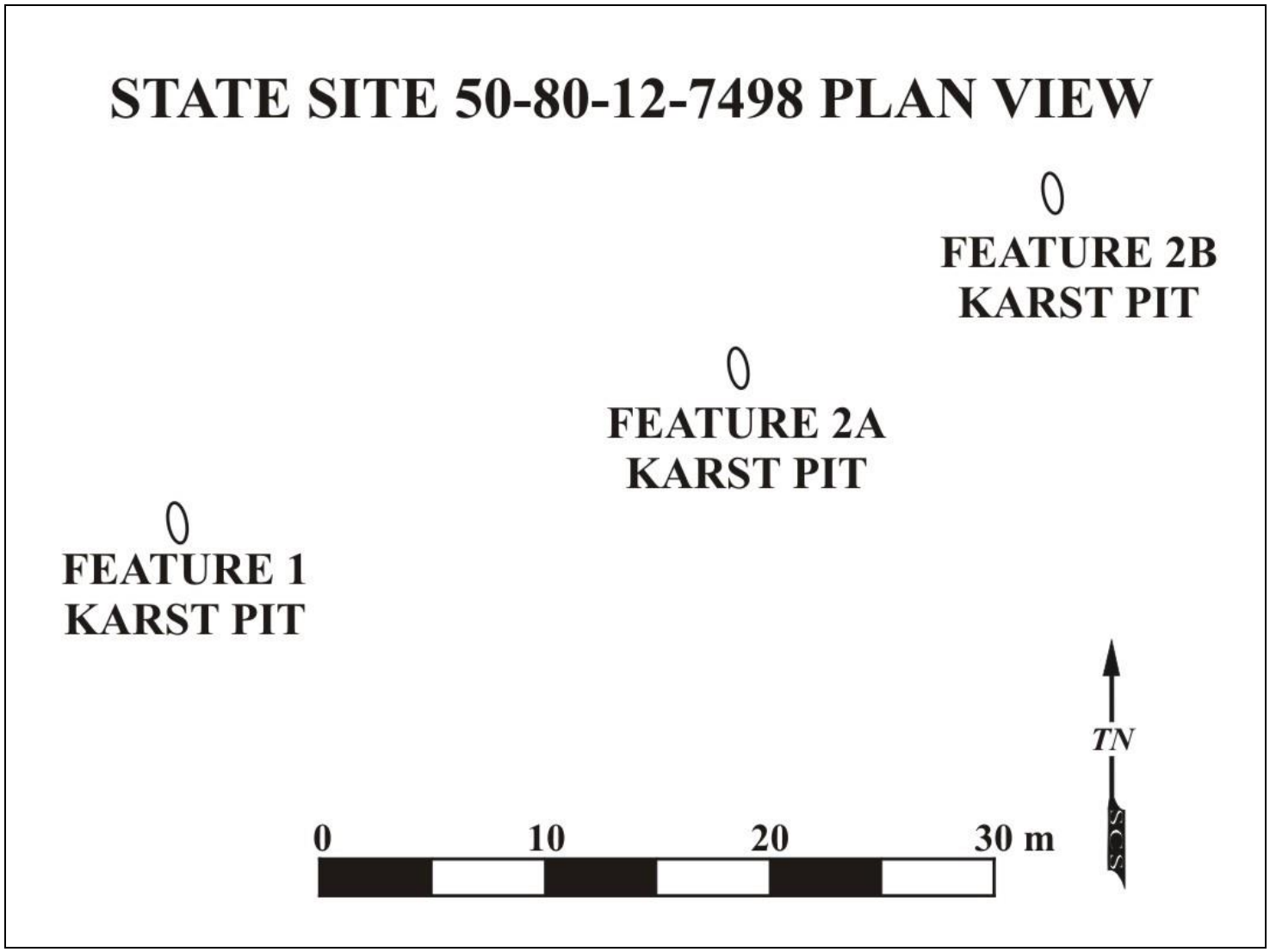

Figure 119: Plan View Drawing of State Site 50-80-12-7498.

Figure 120: Photographic View of State Site 50-80-12-7498, Feature 1. View to Northeast.

Description: State Site 50-80-12-7498, Features 2A and 2B consist of two karst pits with no observed cultural modification. The pits are approximately 1.03 m to 1.80 m long by 0.80 m to 1.55 m wide and extend to 0.34 m to 0.43 m below the ground surface. These pits may have been used during the pre-and/or early post-Contact Period. No cultural materials were observed on the surface within these pits.

State Site 50-80-12-7498, Feature 2A consists of a single karst pit measuring 1.03 by 0.80 by 0.43 m deep (Figure 121). Feature 2A is oriented along a northeast/southwest axis (35/215 degrees, Magnetic). Feature 2A was found to be in fair condition. The presence of a soil deposit or a cavity within Feature 2A could not be discerned, as limestone pebbles and cobbles obscured the view of the interior of the karst pit. If soil is present close to surface of the karst pit, an agricultural function would be suggested. If a cavity is present within Feature 2A, the feature may have functioned as a storage pit. In addition, previous archaeological work in the vicinity identified karst pits containing food midden refuse. As Feature 2A was not excavated, the function of the feature remains undetermined.

State Site 50-80-12-7498, Feature 2B consists of a single filled-in karst pit measuring 1.80 by 1.35 by 0.34 m deep (Figure 122). Feature 2B is oriented along a southeast/northwest axis (130/310 degrees, Magnetic). Feature 2A was found to be in fair condition. The soil within Feature 2B is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 2B may have functioned as a refuse pit. Thus, Feature 2B was interpreted as having an agriculture/refuse function.

STATE SITE 50-80-12-7499 (SCS SITE TS-18)

State Site 50-80-12-7499 is a newly identified site consisting of one walled limestone karst pit, and two unmodified limestone karst pits (Figure 123) (see Table 2). The two unmodified limestone karst pits have vertical cavities that have the potential to contain archaeological cultural material. State Site 50-80-12-7499 measures 28.5 by 10.5 m and is oriented along a northeast/southwest axis with a compass bearing of 32/212 degrees (Magnetic). State Site 50-80-12-7499 was found to be in fair condition. Based on feature type, construction methods, and construction materials, Site -7499 was interpreted as an agriculture/refuse/storage complex associated with the pre- and/or early post-Contact Period.

Figure 121: Photographic View of State Site 50-80-12-7498, Feature 2A. View to Southwest.

Figure 122: Photographic View of State Site 50-80-12-7498, Feature 2B. View to Northwest.

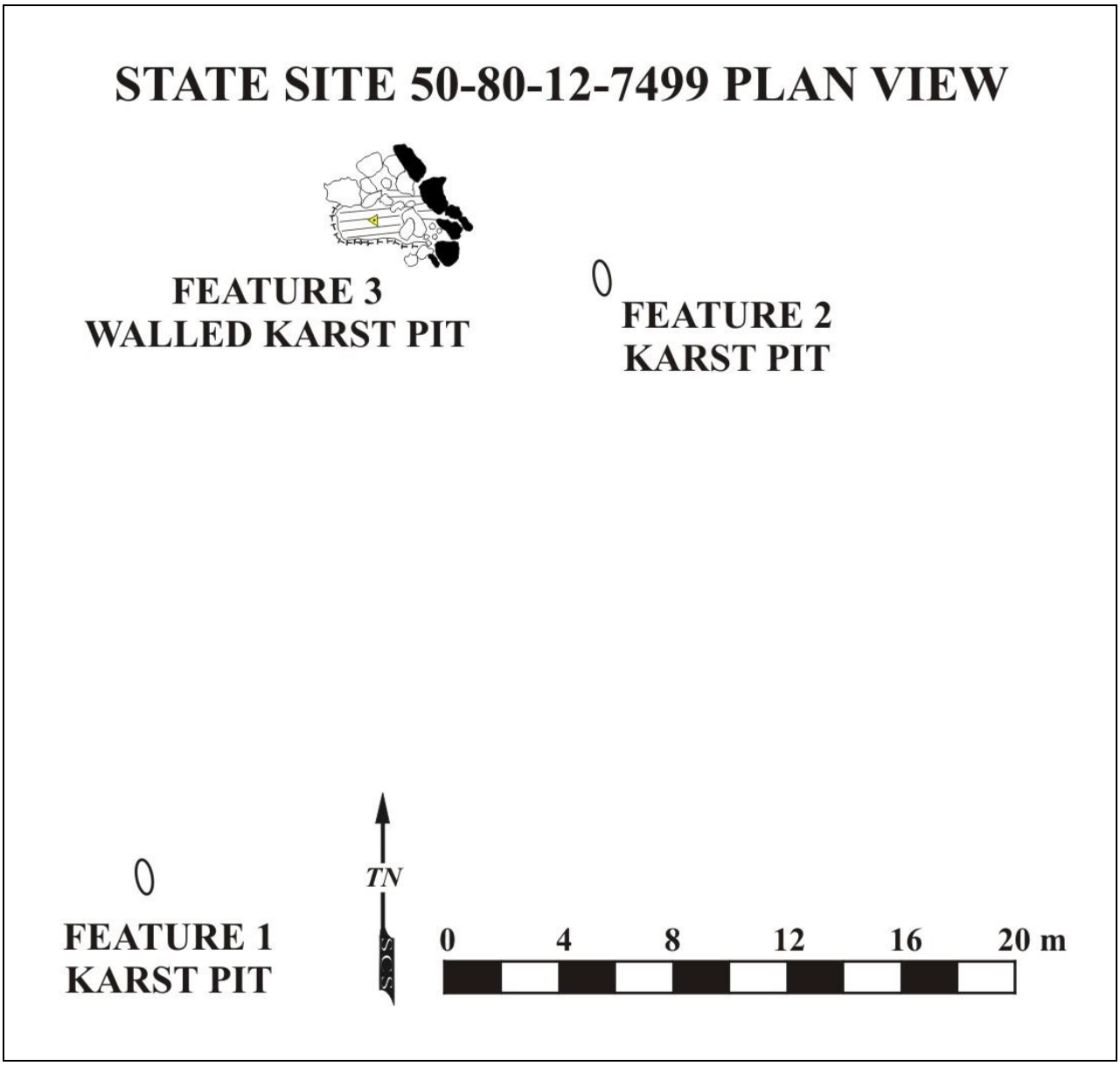

Figure 123: Plan View Drawing of State Site 50-80-12-7499.

State Site 50-80-12-7499 has been evaluated for significance, as outlined in Hawai‘i Administrative Rules §13-275-6, and found to be significant under Criterion d, for information content. As archaeological subsurface testing was not conducted, the potential remains for additional cultural information to be present in subsurface contexts. Thus, a recommendation of preservation has been made for Site -7499.

Descriptive Data by Feature Number
Feature Type: Karst Pit
GPS Coordinates: E 597742 N 2356018
Function: Refuse/Storage
Age: Pre-and/or early Post-Contact Period
Condition: Good

Description: State Site 50-80-12-7499, Feature 1 consists of a single karst pit with no observed cultural modification. The pit is approximately 0.75 m long by 0.41 m wide and extends to 0.50 m deep and is oriented along a northeast/southwest axis (65/245 degrees, Magnetic). Feature 1 was found to be in good condition. Feature 1 was interpreted as a having a storage or refuse function as the karst pit contains a cavity in which items (*e.g..*, gourds containing water) may have been stored. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 1 may have functioned as a refuse pit. Based on feature type, Feature 1 was interpreted as associated with the pre- and/or early post-Contact Period. No cultural materials were observed on the surface in Feature 1. A photograph of Site -7499 is presented in Figure 124.

Feature Type: Karst Pit
Feature: 2
GPS Coordinates: E 597759 N 2356039
Function: Refuse/Storage
Age: Pre-and/or early Post-Contact Period
Condition: Good

Description: State Site 50-80-12-7499, Feature 2 consists of a single karst pit. The pit is approximately 0.40 m long by 0.27 m wide and extends to 0.54 m deep and is oriented along a northeast/southwest axis (60/240 degrees Magnetic). Feature 2 was found to be in good condition. Feature 2 was interpreted as a having a storage or refuse function as the karst pit contains a cavity in which items (*i.e.*, gourds containing water) may be stored. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 2 may have functioned as a refuse pit. Based on feature type, Feature 2 was interpreted as associated with the pre- and/or early post-Contact Period. No cultural materials were observed on the surface in Feature 2.

Figure 124: Representative Photograph of Karts Pit Feature Types at State Site 50-80-12-7499, Features 1 and 2. View to Northwest.

Feature Type: Walled Karst Pit
Feature: 3
GPS Coordinates: E 597751 N 2356041
Function: Agriculture/Refuse
Age: Pre-and/or early Post-Contact Period
Condition: Fair

Description: State Site 50-80-12-7499, Feature 3 consists of a modified limestone karst pit (Figure 125), with feature exterior dimensions measuring 5 m long by 4.3 m wide and interior dimensions of 3.5 m long by 1.5 m wide. Subsurface interior dimensions (pit below limestone surface) measured a maximum 50 cm deep. Surface feature heights above ground ranged between 30 cm to 35 cm. Maximum wall thickness measured 1.0 m. The long axis of the feature is oriented along a southeast/northwest axis (139/319 degrees, Magnetic).

The feature was constructed of dry-laid limestone sub-rounded and sub-angular cobbles and small boulders. Cultural modification consists of a low wall, piled with limestone cobbles and small boulders, up to two courses high. The wall was built on the northeastern edge of the pit atop a natural limestone outcropping, encompasses a small portion of the pit opening. The pit itself is filled to ground surface with silty/loamy soil and limestone cobbles.

State Site 50-80-12-7499, Feature 3 is in fair condition. Feature 3 contains soil which is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Feature 3 may have functioned as a refuse pit. Thus, Feature 3 was interpreted as having an agriculture/refuse function. Based on feature type, construction methods, and construction materials, Feature 3 has been interpreted to be associated with the pre- and/or early post-Contact Period.

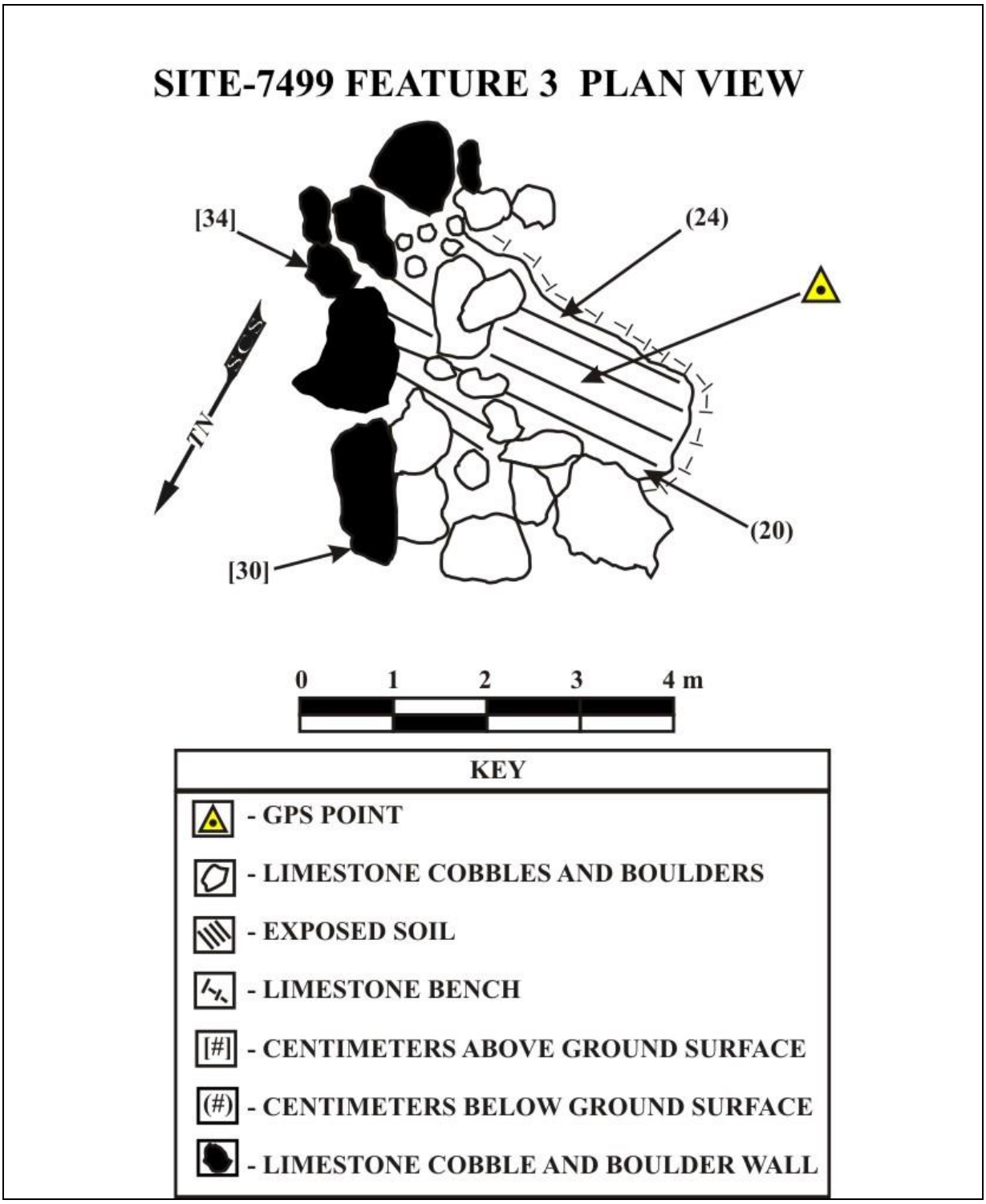

Figure 125: Plan View Drawing of State Site 5080-12-7499, Feature 3.

STATE SITE 50-80-12-7500 (SCS SITE TS-19)
Site/Feature Type: Karst Pit
GPS Coordinates: E 597673 N 2356030
Function: Agriculture/Refuse
Age: Pre-and/or early Post-Contact Period
Condition: Good

Description: State Site 50-80-12-7500, Feature 1 is a newly identified site consisting of a single soil filled karst pit (Figure 126) (see Table 2). The pit is approximately 0.35 m long by 0.30 m wide and is oriented along a northeast/southwest axis (28/208 degrees, Magnetic). The soil extends up to 45 cm below the surface of the karst pit, suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse, suggesting Site -7500 may have functioned as a refuse pit. Thus, Site -7500 was interpreted as having an agriculture/refuse function. Based on feature type, construction methods, and construction materials, Site -7500 was interpreted as an agriculture/refuse karst pit associated with the pre- and/or early post-Contact Period.

State Site 50-80-12-7500 has been evaluated for significance, as outlined in Hawai‘i Administrative Rules §13-275-6, and found to be significant under Criterion d, for information content. As archaeological subsurface testing was not conducted, potential exists for additional information to be present in subsurface contexts. Thus, a recommendation of preservation has been made for Site -7500.

STATE SITE 50-80-12-7501 (SCS SITE TS-20)
Site/Feature Type: Rock Mound
GPS Coordinates: E 597527 N 2356021
Function: Possible Military Bulldozer Push Pile
Age: Historic
Condition: Fair

Description: State Site 50-80-12-7501 is a newly identified site consisting of an irregular-shaped rock mound (Figure 127) (see Table 3). The mound measures approximately 3.5 m long by 2.1 m wide and 0.40 m above ground surface. State Site 50-80-12-7501 is oriented along a northeast/southwest axis (38/218 degrees, Magnetic). The feature was constructed of dry-laid limestone sub-round and sub-angular cobbles and small boulders. The rocks were piled from two to four courses high, with the cobbles and boulders being interspersed. The mound was in fair condition.

Figure 126: Photographic View of State Site 50-80-12-7500. View to Southeast.

Figure 127: Photographic View of State Site 50-80-12-7501. View to Northeast.

Based on feature type, construction methods, and construction materials, the feature was interpreted as an Military bulldozer push pile given the fact that surrounding the feature was land that displayed relatively no vertically protruding outcrops of limestone. State Site 50-80-12-7501 has been evaluated for significance, as outlined in Hawai‘i Administrative Rules §13-275-6, and found to be significant under Criterion d, for information content. Archaeological subsurface testing was not conducted, at State Site 50-80-12-7501. A recommendation of data recovery has been made for State Site 50-80-12-7501.

STATE SITE 50-80-12-7502 (SCS SITE TS-21)
Site/Feature Type: Rock Mound
GPS Coordinates: E 597590 N 2355962
Function: Agriculture
Age: pre- and/or early post-Contact Period
Condition: Fair

Description: State Site 50-80-12-7502 is a newly identified site consisting of an irregular-shaped rock mound (Figure 128) (see Table 3). The mound measures approximately 1.0 m long by 1.0 m wide and 0.50 m above ground surface. State Site 50-80-12-7502 is oriented along a southeast/northwest axis (140/320 degrees, Magnetic).

The feature was constructed of dry-laid limestone cobbles and small boulders, both being sub-rounded and angular. The rocks were piled a variable two to four courses high, with the cobbles and boulders being interspersed. The mound was in fair condition. Based on feature type, construction methods, and construction materials, the feature was interpreted as an as agricultural mound associated with the pre- and/or early post-Contact Period. This feature was not interpreted as a clearing mound but rather, a location of piled rocks that could trap moisture and allow for crops such as sweet potato to grow.

State Site 50-80-12-7502 has been evaluated for significance, as outlined in Hawai‘i Administrative Rules §13-275-6, and found to be significant under Criterion d, for information content. As archaeological subsurface testing was not conducted of all the features, the potential remains for additional cultural information to be present in subsurface contexts. At the request of Mr. Shad Kane (`Ewa Moku representative for the Oahu Island Burial Council) `Ahahui Siwila Hawai`i o Kapolei, Site -7502 is recommended for Archaeological Data Recovery.

Figure 128: Photographic View of State Site 50-80-12-7502. View to Northeast.

STATE SITE 50-80-12-7503 (SCS SITE TS-22)
Site/Feature Type: C-Shaped structure
GPS Coordinates: E 597642 N 2355960
Function: Habitation
Age: Pre-and/or early Post-Contact Period
Condition: Fair

Description: State Site 50-80-12-7503, Feature 1 is a newly identified site consisting of a C-shaped structure (Figure 129) with feature exterior dimensions measuring 6 m long by 5.6 m wide and feature interior dimensions of 4.2 m long by 1.7 m wide. Surface feature heights above ground ranged between 13 cm to 46 cm. The long axis of the feature was oriented southeast/northwest (126/306 degrees Magnetic).

The feature was constructed of dry-laid limestone cobbles and small boulders. The cobbles and small boulders were sub-rounded and sub-angular and piled up to four courses high. The opening of the enclosure faces southwest. Although Site -7503, Feature 1 exhibited the effects of weathering, including root wedging of Haole Koa trees, the feature was found to be in fair condition. Based on feature type, construction methods, and construction materials, this feature has been interpreted to be a habitation feature associated with the pre- and/or post-Contact Period. State Site 50-80-12-7503 has been evaluated for significance, as outlined in Hawai‘i Administrative Rules §13-275-6, and found to be significant under Criterion d, for information content. As archaeological subsurface testing was not conducted, the potential remains for additional cultural information to be present in subsurface contexts. Thus, a recommendation of preservation has been made for Site -7503.

STATE SITE 50-80-12-7504 (SCS SITE TS-23)

State Site 50-80-12-7504 is a newly identified site consisting one karst pit and a rock mound (Figure 130). State Site 50-80-12-7504 measures 16.0 by 2.0 m and is oriented along a northeast/southwest axis (37/217 degrees, Magnetic). Based on feature type, construction methods, and construction materials, Site -7504 has been interpreted to be as an agriculture/refuse site associated with the pre- and/or post-Contact Period. State Site 50-80-12-7504 has been evaluated for significance, as outlined in Hawai‘i Administrative Rules §13-275-6, and found to be significant under Criterion d, for information content. As archaeological subsurface testing was not conducted, the potential remains for additional cultural information to be present in subsurface contexts. Thus, a recommendation of preservation has been made for Site -7504.

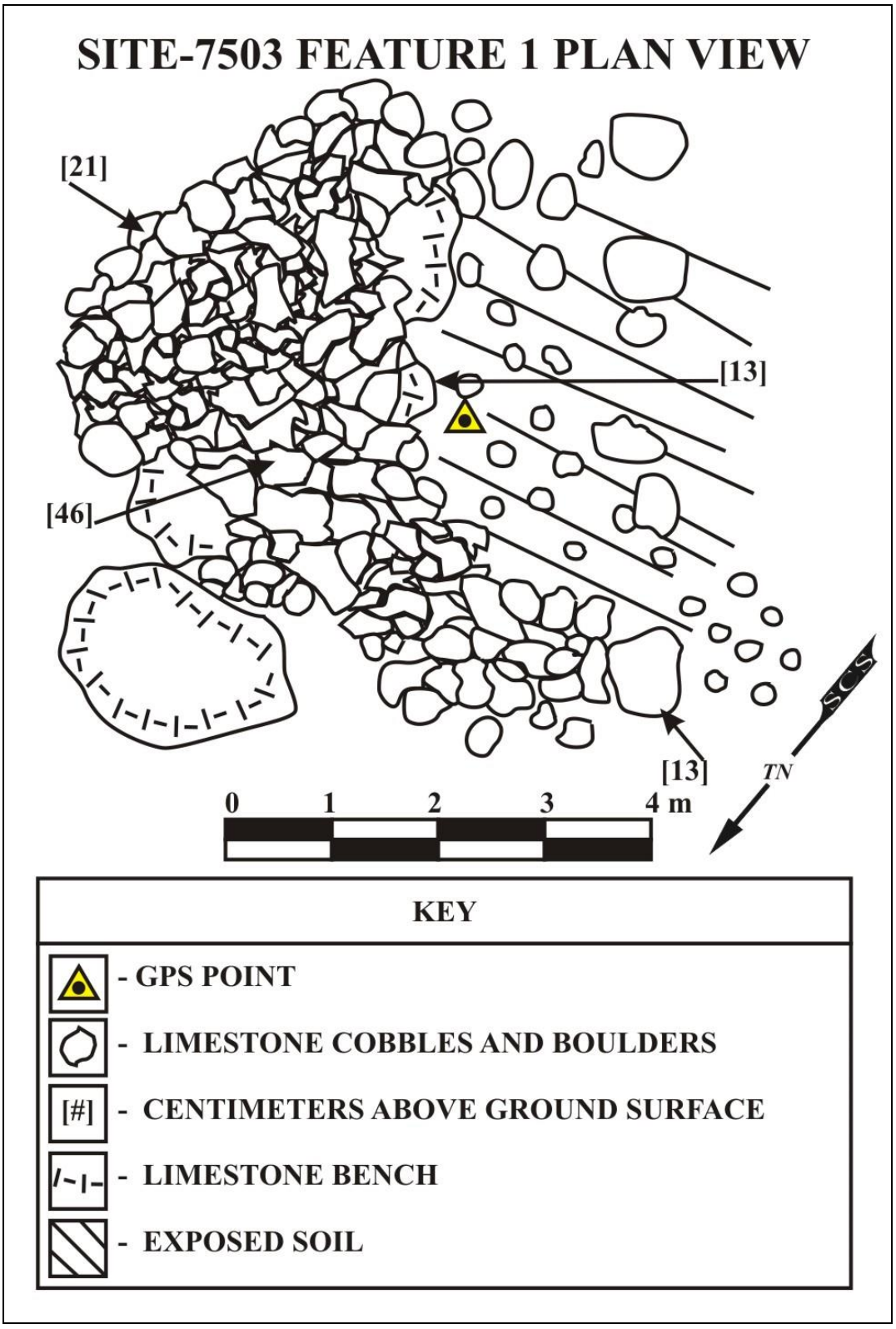

Figure 129: Plan View Drawing of State Site 50-80-12-7503, Feature 1.

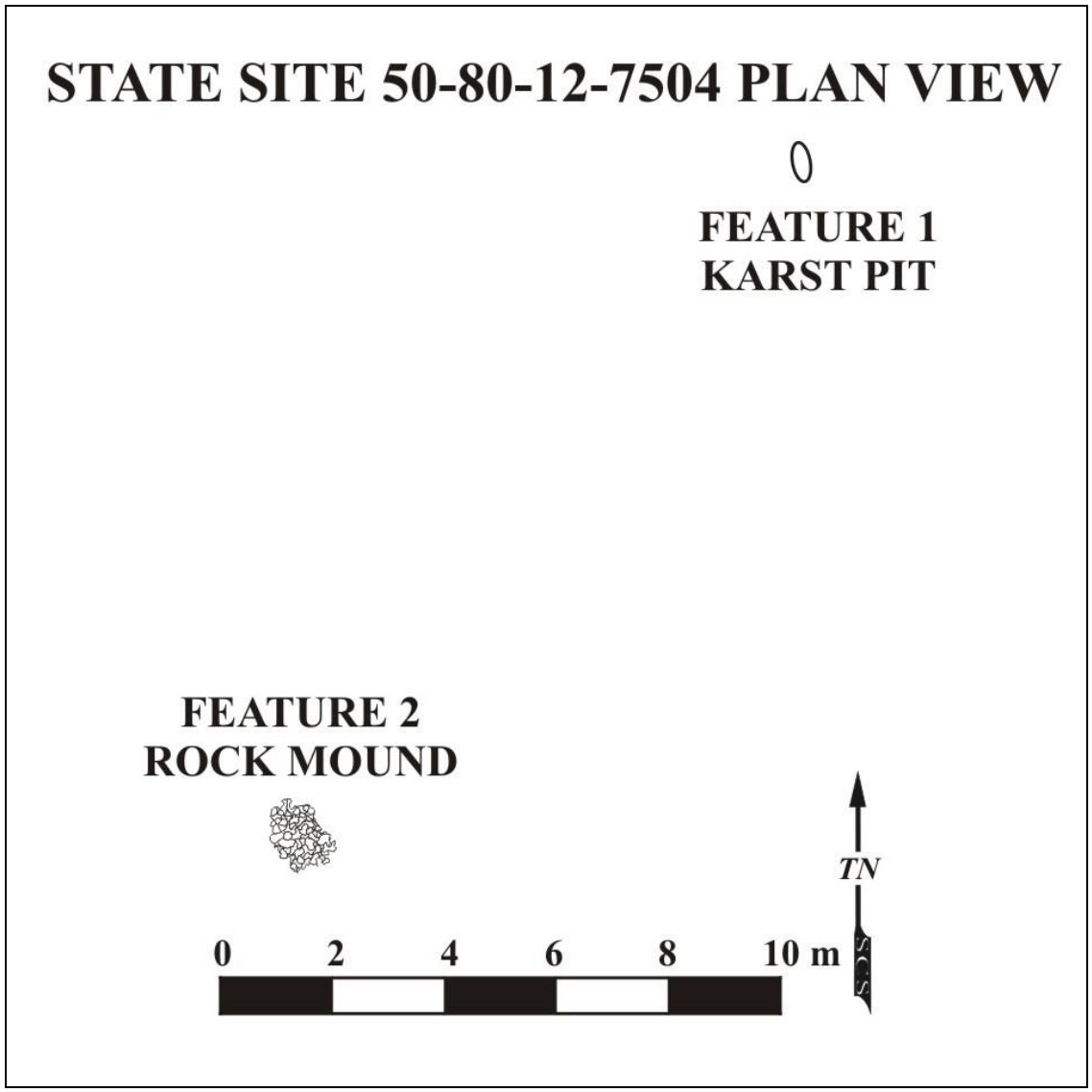

Figure 130: Plan View Drawing of State Site 50-80-12-7504.

Figure 131: Photographic View of State Site 50-80-12-7504, Feature 1. View to Southwest.

Descriptive Data by Feature Number
Feature Type: Karst Pit
GPS Coordinates: E 597668 N 2355917
Function: Agriculture/Refuse
Age: Pre-and/or early Post-Contact Period
Condition: Good

Description: State Site 50-80-12-7504, Feature 1 consists of a single karst pit (Figure 131). The karst pit measures approximately 1.30 m long by 1.10 m wide and extends to 0.25 m below the ground surface. State Site 50-80-12-7504, Feature 1 is oriented along a north/south axis (345/165 degrees, Magnetic). The soil, within Site -7504, is relatively close to the surface of the karst pit suggesting an agricultural function. However, previous archaeological studies conducted in the vicinity identified similar features which were found to contain food midden refuse suggesting Site -7504 may have functioned as a refuse pit. Thus, Site -7504 was interpreted as having an agriculture/refuse function. Based on feature type, construction methods, and construction materials, Site -7504 was interpreted as an agriculture/refuse feature associated with the pre- and/or early post-Contact Period. No cultural materials were observed on the surface in this pit.

Feature: 2
Site Type: Linear Rock mound
GPS Coordinates: E 597659 N 2355905
Function: Agriculture
Age: Pre-and/or early Post-Contact Period
Condition: Fair

Description: State Site 50-80-12-7504, Feature 2 consists of an irregular-shaped rock mound (Figure 132). The mound measures approximately 3.15 m long by 2.9 m wide and 0.65 m above ground surface. State Site 50-80-12-7504, Feature 2 was oriented along a northeast/southwest axis (60/240 degrees, Magnetic).The feature was constructed of dry-laid limestone cobbles and small boulders, both being sub-rounded and angular. The rocks were piled a variable two to four courses high, with the cobbles and boulders being interspersed. The mound was in fair condition. Based on feature type, construction methods, and construction materials, the feature was interpreted as an as agricultural mound associated with the pre- and/or early post-Contact Period. This feature was not interpreted as a clearing mound but rather, a location of piled rocks that could trap moisture and allow for crops such as sweet potato to grow. No cultural materials were observed.

Figure 132: Photographic View of State Site 50-80-12-7504, Feature 2. View to Southeast.

DISCUSSION AND CONCLUSIONS

Twenty-one historic properties (State Site 50-80-12-5119 through 50-80-12-7504, non-concurrent number sequence), comprised of 146 features were newly identified during the project. Two previously identified sites (State Site 50-80-12-5119 and State Site 50-80-12-5120) were re-located. Of the 146 features found within TMK: (1) 9-1-013:070 a total of eight features recorded by Wickler and Tuggle (1997) were re-located. Of the remaining 138 features nine features could not be confirmed as having been recorded by Wickler and Tuggle (1997) based on the current Archaeological Inventory Survey results and the site descriptions of Wickler and Tuggle (1997). The remaining 129 features are newly recorded. Based on feature type, construction methods, and construction materials, State Site -5119, -7483 through -7485, -7487 (Features 1 and 4), -7488 through -7494, -5120 (Features 1 and 2), -7496 through -7499, -7502 through -7504 were interpreted to be associated with the pre- and/or post-Contact Period. State Site 50-80-12-7501 (Feature 1), State Site 50-80-12-7487 (Features 3 and 5), State Site 50-80-12-5120 (Features 3 though 9) were interpreted to be associated with United States Military occupation of the area during Historic Periods. Two features within the project area (State Sites 50-80-12-7486, Feature 5, and 50-80-12-7491) were interpreted as trails associated with the pre- and/or post-Contact Period, with use possibly as extending into the Historic Ranching Period.

TRADITIONAL SITE TYPES

The majority of the features recorded represent pre- and/or early post-Contact occupation of the area. These features include rock mounds, various small enclosures and structures such as C-shapes and L-shapes, modified pits (karst), unmodified pits, platforms, and small coastal trails (Figures 133 through 138). The pre- and/or early post-Contact sites were all composed of limestone, a locally available resource. Together, these represent a full suite of features often associated with a basic residential complex (Cordy 1981; Haun 1991). Site features, in the form of rock mounds, platforms, modified pits, enclosures, C-shapes, L-shapes, and U-shapes in the area suggest components of a pre- and/or early Post-Contact local habitation and cultivation economy.

The documented habitation features are typically small, and represented by C-shapes, U-shapes, and remnant walls of various shapes. Only minimal counts of artifacts and midden were recovered during this project. This pattern intimates limited feature occupational duration but could be simply be a function of sampling (small sample size of excavated features). The mounds are less ambiguous, with the current research being in agreement with former interpretations that these mounds represent agricultural features (see Davis 1996). Sweet potato.

Figure 133: Google Earth Image (2014) Showing Distribution of Traditional-type Habitation Sites within the Project Area.

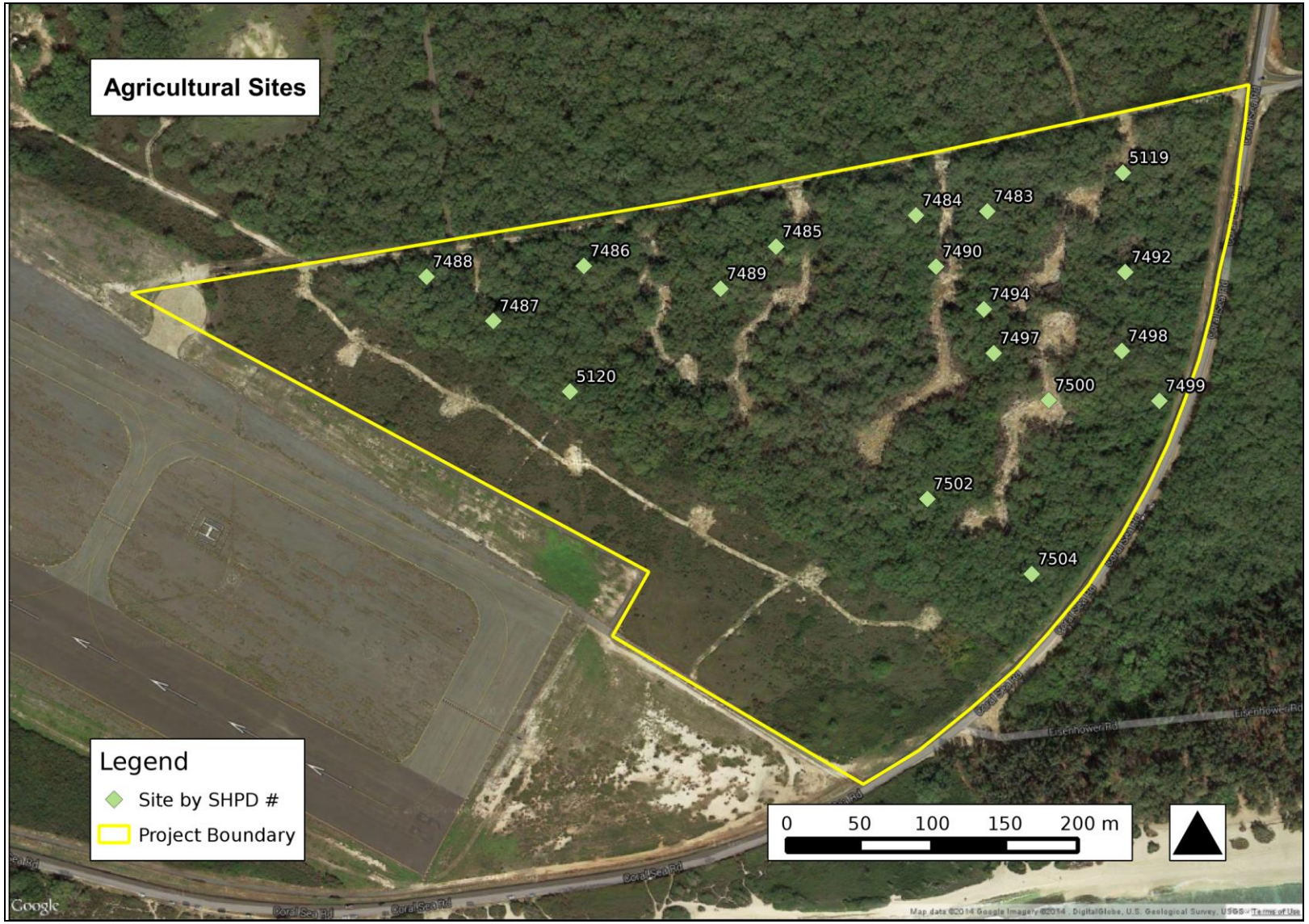

Figure 134: Google Earth Image (2014) Showing Distribution of Traditional-Type Agricultural Sites within the Project Area.

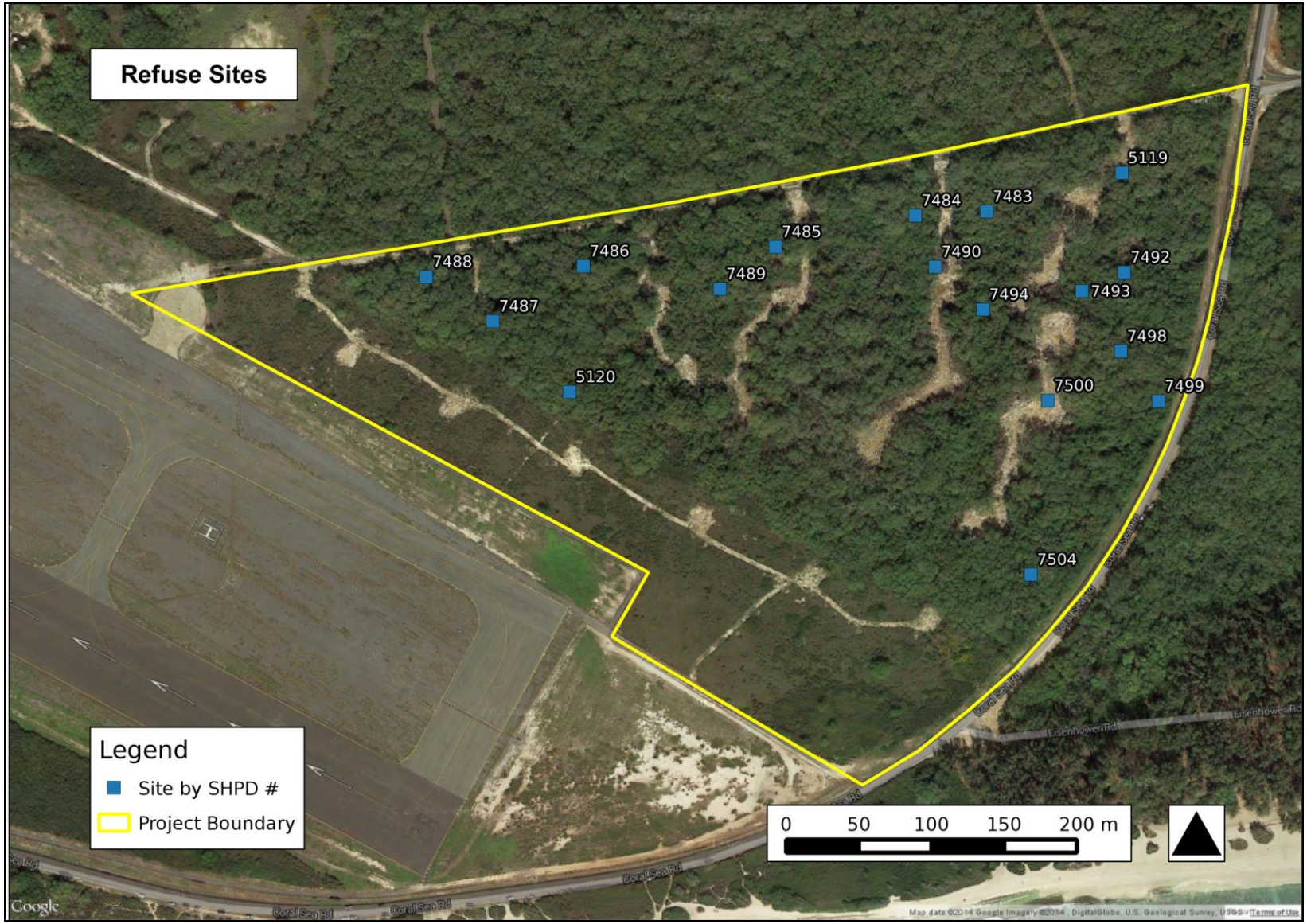

Figure 135: Google Earth Image (2014) Showing Distribution of Traditional-Type Refuse Sites within the Project Area.

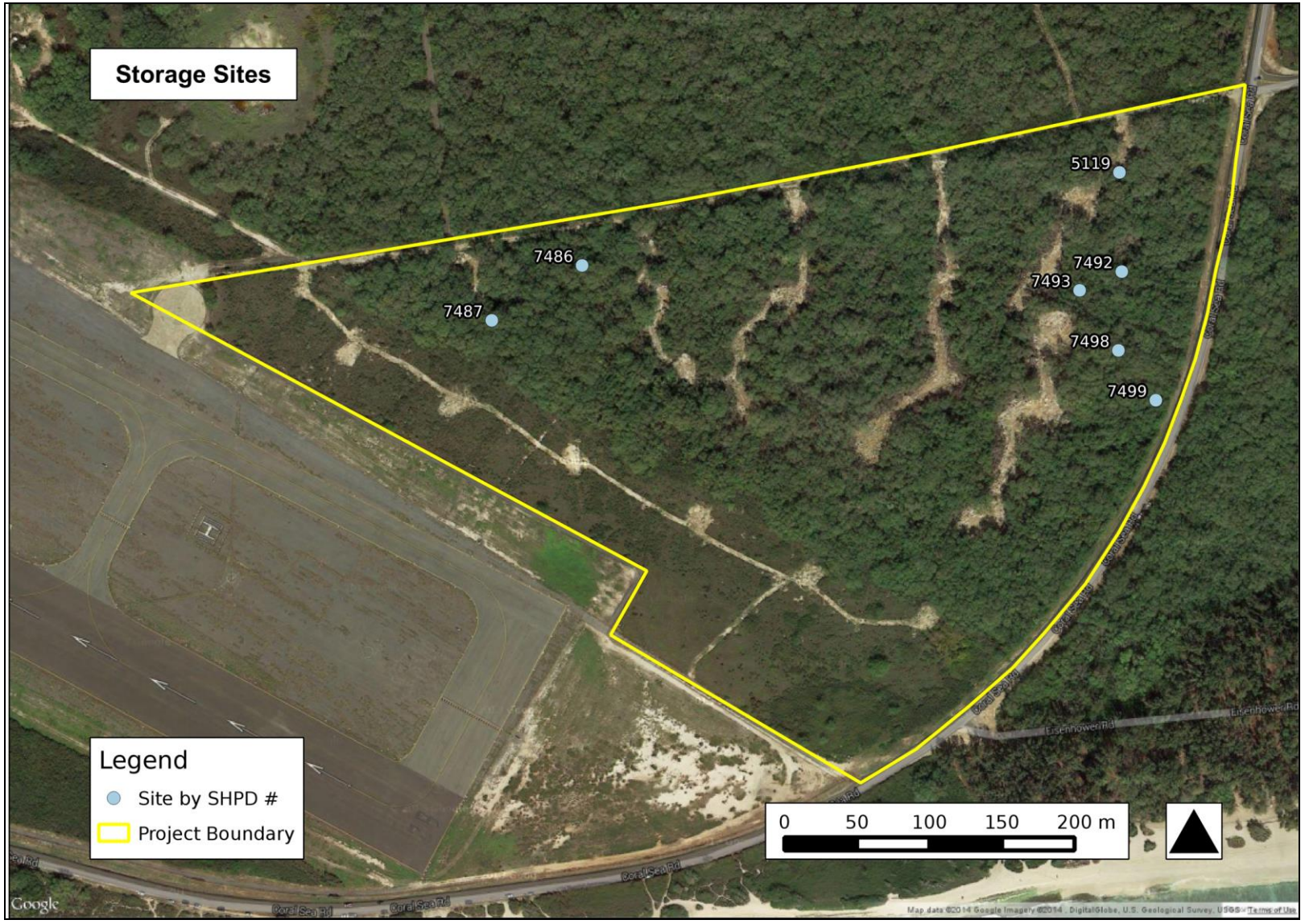

Figure 136: Google Earth Image (2014) Showing Distribution of Traditional-Type Storage Sites within the Project Area.

Figure 137: Google Earth Image (2014) Showing Distribution of Traditional-Type Boundary Sites within the Project Area.

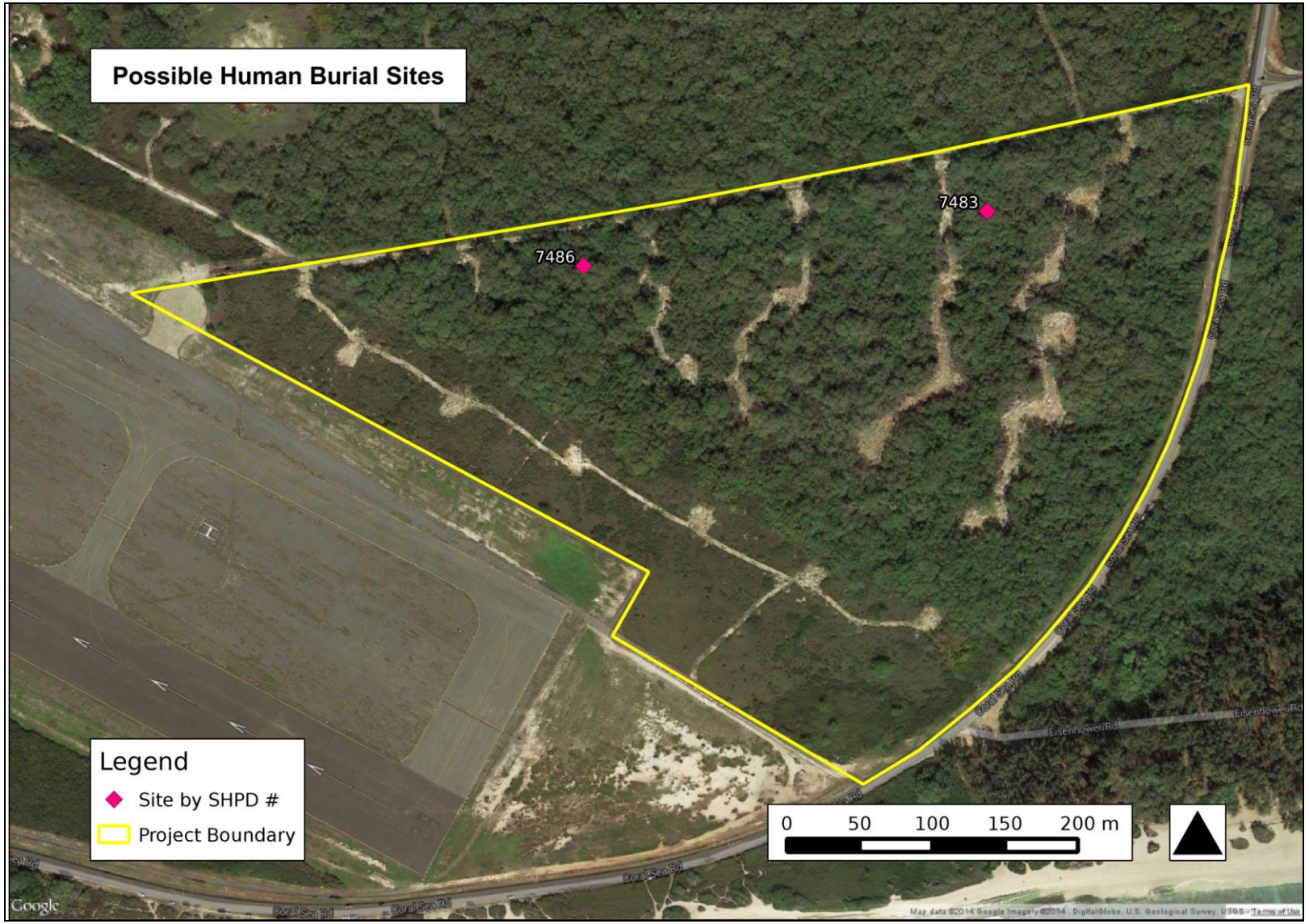

Figure 138: Google Earth Image (2014) Showing Distribution of Possible Traditional-Type Burial Sites within the Project Area.

cultivation may be the primary function of most mounds, but these features take on many forms and sizes such that they could also represent cairns or boundary markers. Several of the mounds are thought to be possible burial locations. The mounds are variable in size, morphology, construction technique, and the presence/absence of cultural resources

RANCHING SITES

Two features indentified during the current survey (State Site 50-80-12-7486, Feature 5, and State Site 50-80-12-7491) were interpreted as pre- and/or post-Contact coastal trails (Figure 139). However, archival research produced a 1928 aerial coastal photo and a 1927 USGS Quadrangle (Barber's Point) Map (see Figures 51 and 52) depicting State Site 50-80-12-7486, Feature 5 in an historic context. Trails are also known to exist outside of the project area as shown by the 1825 C.R. Malden map (Figure 140). As Figure 52 indicates a wall immediately adjacent and east of State Site 50-80-12-7486, Feature 5, it is possible that State Site 50-80-12-7486, Feature 5 is also associated with Historic Period ranching activities. Based on feature type, it is possible that State Site 50-80-12-7491 is also associated with Historic Period ranching activities. It should be noted, that although there was no supporting archaeological evidence, that the cobble-filled karst pits may have been filled-in during the Historic Ranching Period in an effort to prevent the cattle from stumbling or falling into the pits.

Supporting evidence of Historic Period ranching activities in Hono`uli`uli Ahupua`a were provided by McElroy (2013), Dye and Jourdane (2006) and archival research. According to McElroy (2013:23), following the death of Ha`alele`a (Kekau`onohi's widow), his second wife "...deeded the land to her sister's husband, John H. Coney." Coney had owned the land from 1875 to 1877 (Dye and Jourdane 2006:4). In 1877, James Campbell, purchased from Coney 43,640 acres of land in Hono`uli`uli Ahupua`a for $95,000.00 (Haun 1991:160 in McElroy 2013: 23). During the early years of his ownership, Campbell retained approximately 10,000 acres as a cattle ranch, but also leased portions of land for rice cultivation, fishing rights to Pearl Harbor, as well as a lime quarry. By the 1920s, the Hono`uli1uli Ranch was leasing 20,000 acres of land in Hono`uli`uli Ahupua`a (Dye and Jourdane 2006:4). \

MILITARY SITES

Several features recorded represent Historic WWII U.S. military occupation of the project area (Figure 141). These features include concrete structures (State Site -5120 Features 4, 5, and 7), remnant structures (State Site -5120 Features 6 and 8), and foundations/pads (State Sites -7487 Feature 3 and State Site -5120 Features 3 and 9). State Site 50-80-12-7501 is a limestone rock mound interpreted as a historic, mechanically-created bulldozer push pile, likely

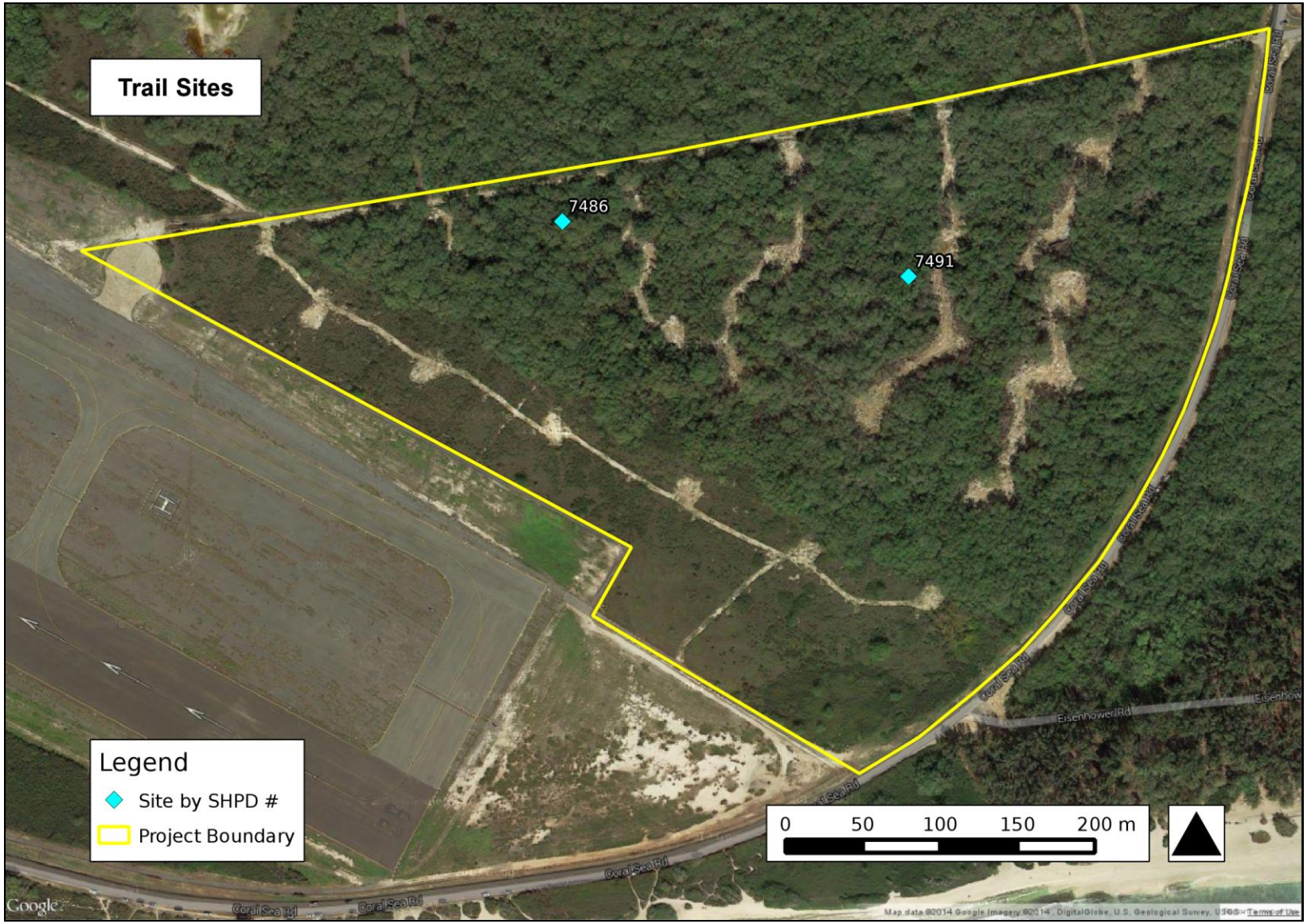

Figure 139: Google Earth Image (2014) Showing Distribution of Traditional-Type Trail Sites within the Project Area.

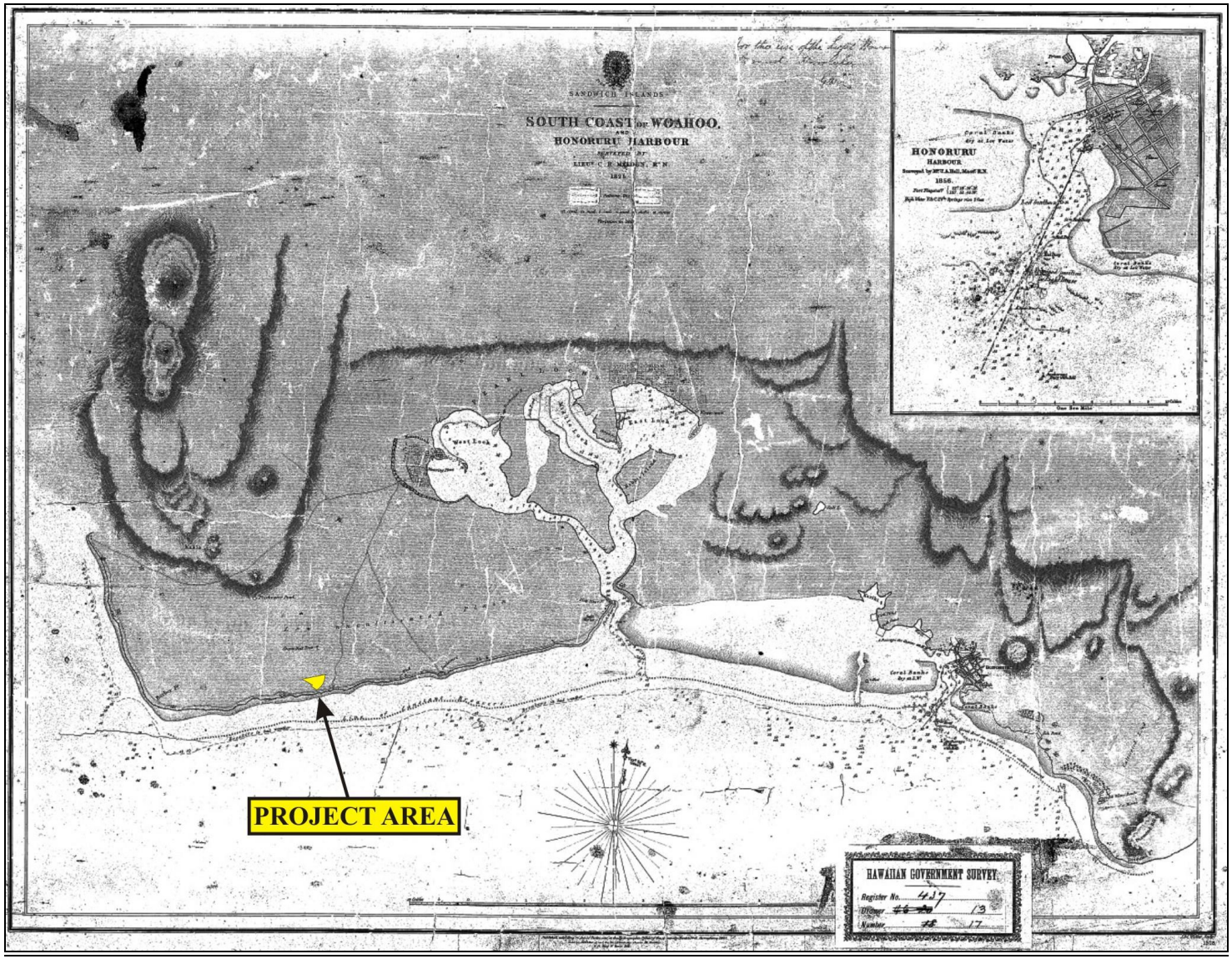

Figure 140: 1825 Malden Map of the `Ewa Plain showing Project Area and Trails outside Project Area.

Figure 141: Google Earth Image (2014) Showing Distribution of Historic Military Sites within the Project Area.

related to U.S. military operations in the project area. As stated earlier, with the onset of World War II, construction at the NAS Barbers Point accelerated. The Naval Air Station's operational capacity was increased to handle four aircraft carrier groups and a mix of both permanent and temporary buildings were quickly constructed. State Site 50-80-12-5120, Features 4 through 8 may represent the remnants of an anti-aircraft complex. This complex was damaged by bulldozing during the expansion of the runway clear zone, at some point prior to 1997, and is now under mowed grass (Wicker and Tuggle 1997).

SITE FUNCTION

The evidence for architectural variability and feature density supports an interpretation of a temporary, Traditional Hawaiian (pre- and/or early post-Contact) occupation area, as was also the interpretation for the 1984 and 1985 study (Haun 1991) which was conduced in the vicinity of the subject project area. While the sites are thought to primarily represent temporary habitation locales, the duration, intensity, and re-occupation of the subject project area may need refinement (*i.e.*, Data Recovery). Although the majority of the pits (karst) recorded during the subject project have no surface cultural modifications, they have potential to contain valuable cultural and paleo-environmental deposits and were recorded with such future expectations. Two rock mounds, Sites -7486 Feature 2 and Site -7483 Feature 4, suggest possible burials, and are recommended for Preservation.

CHRONOLOGY

Three sites (Site -7484 Feature 3, Site -7494 Feature 1, and Site -7496 Feature 1) yielded artifacts and/or ecofacts. Midden samples collected from Site -7484, Feature 3 within subsurface contexts are associated with the midden scatter identified on the ground surface. As Site -7484, Feature 3 was mechanically altered by modern bulldozing, original provenience is unknown, although it is likely within the general area of the find. The charcoal sample (SCSRC676) collected from Site -7494, Feature 1, Layer I (0-17 cmbs) was submitted for radiocarbon dating and resulted in a conventional age of 220 $\pm$ 30 B.P. (A.D.1730-1810) (Appendix C; Note: the sample was not submitted for wood taxa identification). Site -7494, Feature 1, Layer I has been interpreted as a late pre-Contact and/or early post-Contact cultural layer. Midden samples collected from Site -7496, Feature 1 suggests a continuous occupation of the area, both before and after construction of Feature 1 (Layers I through III). In Layer II (0-10 cmbs), midden continues to be present above the base of Feature 1 architecture. In Layer III (10-17 cmbs), the midden occurs prior to the construction of Feature 1, being observed below the limestone cobble architecture.

Overall, chronology has been one issue at the center of many debates revolving around the timing of initial settlement of the `Ewa Plain and the terminus of settlement following

Contact. Conservative researchers intimate that the `Ewa Plain was not settled prior to A.D. 900-1100, with most settlement occurring from A.D. 1400-1800 (see Tuggle and Tomonari-Tuggle 1997), within the proposed time frame of most sites documented during the current study. The single radiocarbon date from the current project suggests at least one site dates to late pre- and/or early Post-Contact times. Later occupation likely dates to the 1930s with the build up of batteries to support Pearl Harbor, or after 1945, when hundreds of military buildings were constructed in the area, as well as landing strips, bunkers, and additional gun placement locations.

ARTIFACTS AND ECOFACTS

In general, soils were indeed generally shallow, with a two soil strata generally found to be overlying natural limestone bedrock. The shallow soil mantle did not yield much in the way of artifacts or ecofacts. Vertebrate and invertebrate was found to be and several artifacts were identified in minimal quantities during the project. Laboratory analysis indicates that all collected cultural materials were associated with either pre- and/or Post-Contact occupation or Historic military occupation (c. 1940s-1960s) of the area. The paucity of collected artifacts and ecofacts may suggest short-term habitation occurring in the area, rather than long-term habitation which normally produces a variety and higher quantity of cultural materials. The lack of artifacts and ecofacts may also reflect the limited amount of testing conducted within the project area.

LANDSCAPE MODIFICATION

As noted above, the project area has been subject to historic (military) and modern (Geolabs, Inc. (2012) incident included) mechanical disturbances, including at least two instances of bulldozing and one airplane crash. The construction of Naval Air Station Barbers Point between 1940 and 1945 resulted in substantial landscape modifications throughout the area (see Tuggle and Tomonari-Tuggle 1997). Additional modern modifications in 2012 when Geolabs, Inc. mechanical bulldozing five horizontal multi-angular and curvilinear cuts across the project area (see Figure 26).

PREVIOUS SITE DESIGNATIONS AND CURRENT PROJECT SITE DESIGNATIONS

The subject project area was initially surveyed in 1984 and 1985 (Haun 1991). The project area was designated as area E6 and no sites were reported. Two sites (State Sites -5119 and -5120) were recorded on the parcel in 1994. State Site -5119 was identified during an Archaeological Inventory Survey, Phase II in 1996 (Wickler and Tuggle 1997). State Site -5119 was identified as an agricultural complex consisting of seven features. During the current project, this site was relocated and described as containing thirty-seven features, including rock mounds, C -shaped structures, and unmodified pits. However, since Tuggle and Tomonari-Tuggle (1994;

Task 1b) Wickler and Tuggle (1997; Part II: Phase II) did not provide plan view maps showing State Site 50-80-12-5119's feature spatial relationships, the current Archaeological Inventory Survey could not confirm which features were previously recorded.

State Site 50-80-12-5120 was identified in an area designated E6c during a Phase I Archaeological Inventory Survey in 1994 (Tuggle and Tomonari-Tuggle 1997; Wicker and Tuggle 1997). According to the Wickler and Tuggle (1997) Phase II work, State Site 50-80-12-5120 was identified as a large stone wall (Feature A), a small concrete slab (Feature B), a limestone cobble platform (Feature C), a long narrow paved structure (Feature D), remnants of a jet aircraft crash (Feature E), anti-aircraft complexes (Features F, H and J), a coral packed road (Feature G), and a portable concrete pillbox (Feature I). Feature B of State Site -5120 (small concrete slab) represents the current State Site -5120, Feature 3 (concrete pad). Feature D of State Site -5120 (long narrow paved structure) may represent the current State Site -7486, Feature 5 (coastal trail). According to Wicker and Tuggle (1997), this feature may be a remnant of a sisal wall; however the original function of this feature was found to be undetermined. Feature E of State Site -5120 (was found to be of a jet aircraft) represents the current State Site -7487, Feature 2 A through 2C (Aircraft Crash Site). Features F, H and J (was found to be of anti-aircraft complexes) represents the current State Site -5120, Feature 4 (guard shack), Feature 5 (Concrete Enclosure), possibly Feature 6 (remnant concrete structure), and Feature 8 (cluster of remnant concrete structures). Feature I of State Site -5120 (portable concrete pillbox) represents the current State Site -5120, Feature 7 (pillbox).

Of the ten archaeological surface features that Wicker and Tuggle (1997) recorded during their Phase II work on Site -5120, only seven features (Features A, B, E, F, H, I, and J) were re-located during the current Archaeological Inventory Survey. Wicker and Tuggle (1997) Site -5120 Features C, D, and G could not be re-located due to non-matching comparisons *(i.e.*, feature location, feature horizontal shape, and feature horizontal long axis orientation) between the current Archaeological Inventory Survey work and the Wickler and Tuggle (1997) site plan view map. It is suspected that Feature G, a coral packed road recorded by Wickler and Tuggle (1997), was destroyed or covered by either previous bulldozing (*i.e.*, non-Geolabs, Inc. work) or vegetation growth.

Overall, a variety of site types were documented during the study. The majority of the features recorded represent pre- and/or Post-Contact occupation of the area. These features include rock mounds, various small enclosures and structures, modified pits (karst), unmodified pits (karst), platforms, and small coastal trails. Historic era sites from the 1940s-1960s were also recorded. The site population for the project area has expanded significantly due to this project,

and additional recommended mitigation of these sites will allow for a greater understanding of these sites than even reflected in this manuscript.

SIGNIFICANCE ASSESSMENTS AND RECOMMENDATIONS

Twenty-one historic properties comprised of 146 features were newly identified during the project. Two previously identified sites were re-located (State Sites 50-80-12-5119 and 50-80-12-5120). The sites are designated as follows: State Sites 50-8-12-5119, -5120, -7483 through -7494, and -7496 through -7504. These sites have been evaluated for significance, as outlined in Hawai‘i Administrative Rules §13-275-6 (Table 1). To be assessed as significant a site must be characterized by one or more of the following five criteria:

> Criterion a: Site is associated with events that have made a significant contribution to the broad patterns of our history.
>
> Criterion b: Site is associated with the lives of persons significant to our past.
>
> Criterion c: Site is an excellent site type; embodies distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual construction.
>
> Criterion d: Site has yielded or has the potential to yield information important in prehistory or history.
>
> Criterion e: Site has cultural significance to an ethnic group; examples include religious structures, burials, major traditional trails, and traditional cultural places.

All sites have been assessed as significant under Criterion d, with State Sites 50-80-12-7483 ,Feature 4, and State Site 50-80-12-7486, Feature 2, also being assessed as Significant under Criterion e due to the possible presence of a human burial. Most pre- and/or post-Contact period sites documented during this study are recommended for Preservation. These include State Site 50-80-12-7486, Feature 5 and State Site 50-80-12-7491, Feature 1, both coastal trail segments.

Structural features within three archaeological sites are recommended for Data Recovery to facilitate the installation of the proposed solar panel farm surface structures and associated subsurface utilities. The features recommended for Data Recovery are State Site 50-80-12-7487, Features 2A through 2C (airplane crash location), State Site 50-80-12-7501 (possible military bulldozer push pile), and State Site 50-80-12-7502, Feature 21 (agricultural rock mound).

State Site 50-80-12-7487, Features 2A through 2C are recommended for Data Recovery because the Pacific Aviation Museum has expressed great interest in documenting the site, collecting all the materials, and potentially displaying them in the museum.

State Sites 50-80-12-7501 and 50-80-12-7502 are recommended for Data Recovery to facilitate the placement of solar panel farm structures. With the exception of these rock mounds all of the other Traditional Hawaiian agricultural mounds are recommended for Preservation. No further work is recommended for the remaining sites/features (see Table 2), which primarily entail military-era sites.

Sufficient information has been obtained, during the current AIS, for State Site 50-80-12-7487, Feature 3, and State Site 50-80-12-5120, Features 3 through 9. Thus, no further archaeological work is recommended for State Site 50-80-12-7487, Feature 3, and State Site 50-80-12-5120, Features 3 through 9.

Upon acceptance of this Archaeological Inventory Survey report, several archaeological documents shall be created to mitigate the various effects on historic properties found within TMK: (1) 9-1-013:070. First, a Preservation Plan shall be written to discuss interim and long-term preservation of the historic properties designated for preservation State Site 50-80-12-7487, Features 1A through 1F; Feature 4, and Feature 5; State Site 50-80-12-5120, Features 1 and 2. Second, a Burial Treatment Plan shall be written for State Site 50-80-12-7483,Feature 4, and State Site 50-80-12-7486, Feature 2, which contain possible human burials and will be preserved. Third, a Data Recovery Plan will be prepared for State Site 50-80-12-7487, Features 2A-2C, State Site 50-80-12-7501, Feature 1, and State Site 50-80-12-7502, Feature 21. Both Kalaeloa Heritage Park (KHP) and `Ahahui Siwila o Hawai`i o Kapolei Hawaiian Civic Club (ASHOK) organizations have expressed they would like to see Data Recovery for State Site 50-80-12-7501 (Feature 1; bulldozer push pile rock mound), and State Site 50-80-12-7502 (Feature 1; agricultural rock mound) conducted in the form of manual deconstruction and screening of sub-architectural matrices (*i.e.,* soil) for evidence of cultural material. Portable feature architecture (*i.e.,* the limestone cobbles and small boulders) of both rock mounds would be transported for culturally appropriate use elsewhere within the project area. Finally, Archaeological Monitoring with regards to ground disturbance (*e.g.,* soil borings, vegetation clearance, grubbing, perimeter fencing, landscaping, and mechanical excavation) within the project area [TMK: (1) 9-1-013:070] is recommended due to potential to expose undocumented subsurface historic properties (*e.g.,* human burials and archaeological cultural material in karst pits) and to ensure

that preserved archaeological sites will not be physically affected. The Archaeological Monitoring Plan will indicate on-site archaeological monitoring of all ground-disturbing activities related to construction of the proposed solar farm project.

The proposed solar project has been planned to actively avoid all the sites noted above that will be preserved and those subject to other forms of mitigation (Figure 142).

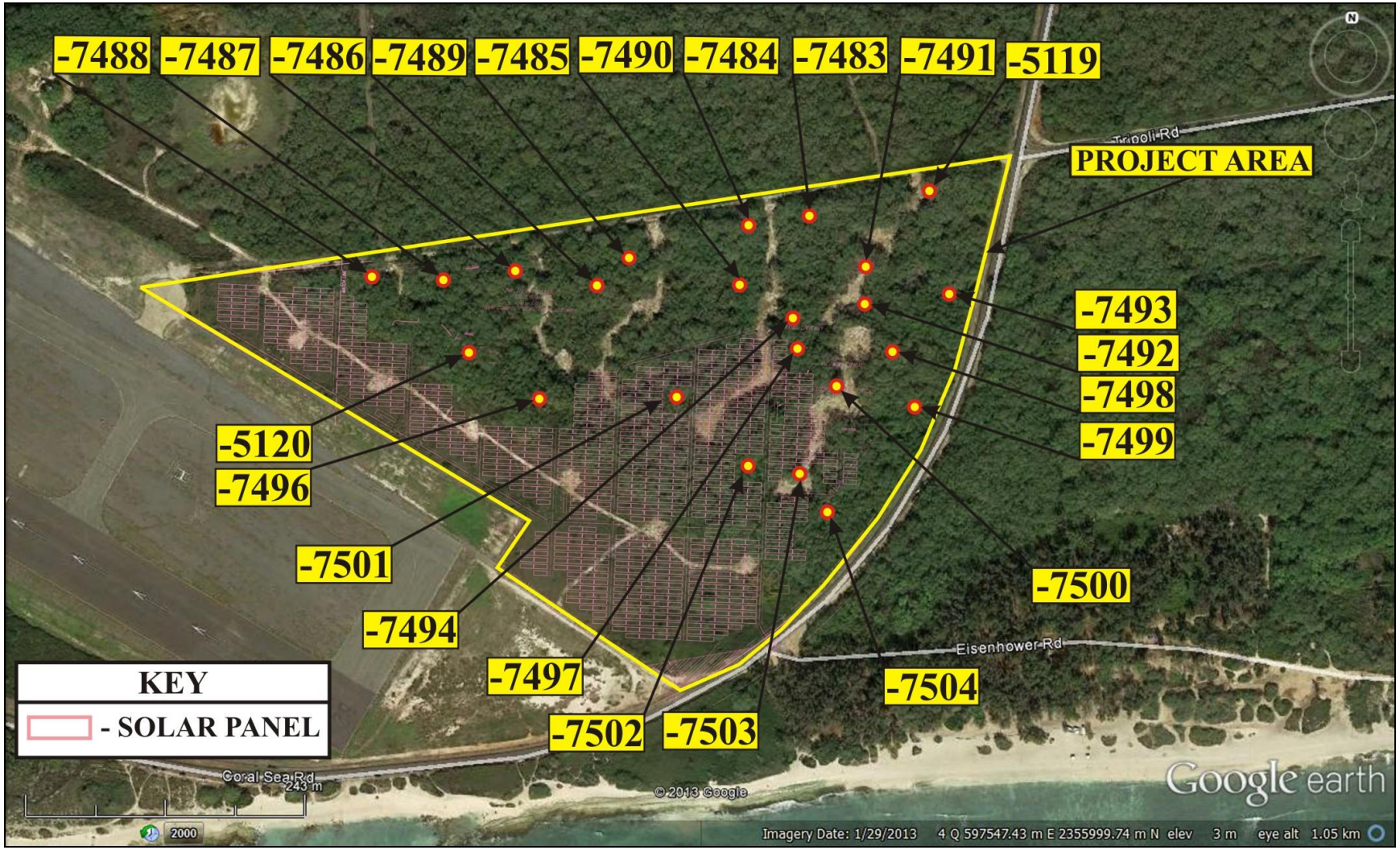

Figure 142: Google Earth Image (2014) showing Project Area Archaeological Sites and Proposed Solar Farm Structures.

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APPENDIX A: GPS COORDINATES

SCS PROJECT 1276 GPS Coordinates for State Sites -5119, -5120, -7483 through -7494, and -7496 through -7504				
State Site Number	**SCS Temporary Site and Feature Number**	**GPS Corrdinates Easting/Northing**		**Accuracy (± meters)**
50-80-12-5119	TS-1 F1	E 597748	N 2356209	3
50-80-12-5119	TS-1 F2	E 597731	N 2356202	3
50-80-12-5119	TS-1 F3	E 597738	N 2356207	4
50-80-12-5119	TS-1 F4	E 597733	N 2356193	3
50-80-12-5119	TS-1 F5	E 597740	N 2356196	3
50-80-12-5119	TS-1 F6	E 597727	N 2356186	3
50-80-12-5119	TS-1 F7	E 597726	N 2356182	3
50-80-12-5119	TS-1 F8	E 597719	N 2356184	3
50-80-12-5119	TS-1 F9	E 597723	N 2356190	3
50-80-12-5119	TS-1 F10	E 597720	N 2356182	3
50-80-12-5119	TS-1 F11	E 597722	N 2356182	3
50-80-12-5119	TS-1 F12	E 597723	N 2356181	3
50-80-12-5119	TS-1 F13	E 597723	N 2356185	3
50-80-12-5119	TS-1 F14	E 597720	N 2356185	3
50-80-12-5119	TS-1 F15	E 597726	N 2356181	4
50-80-12-5119	TS-1 F16	E 597716	N 2356189	3
50-80-12-5119	TS-1 F17	E 597748	N 2356209	3
50-80-12-5119	TS-1 F18	E 597719	N 2356174	3
50-80-12-5119	TS-1 F19	E 597736	N 2356196	3
50-80-12-5119	TS-1 F20	E 597739	N 2356173	3
50-80-12-5119	TS-1 F21	E 597731	N 2356181	3
50-80-12-5119	TS-1 F22	E 597733	N 2356168	3
50-80-12-5119	TS-1 F23	E 597734	N 2356188	3
50-80-12-5119	TS-1 F24	E 597736	N 2356187	4
50-80-12-5119	TS-1 F25	E 597741	N 2356194	3
50-80-12-5119	TS-1 F26	E 597743	N 2356194	3
50-80-12-5119	TS-1 F27	E 597741	N 2356186	3
50-80-12-5119	TS-1 F28	E 597750	N 2356172	3
50-80-12-5119	TS-1 F29	E 597748	N 2356181	3
50-80-12-5119	TS-1 F30	E 597710	N 2356196	3
50-80-12-5119	TS-1 F31	E 597709	N 2356198	3
50-80-12-5119	TS-1 F32	E 597707	N 2356194	3
50-80-12-5119	TS-1 F33	E 597700	N 2356191	3
50-80-12-5119	TS-1 F34	E 597696	N 2356193	3
50-80-12-5119	TS-1 F35	E 597702	N 2356188	3
50-80-12-5119	TS-1 F36	E 597706	N 2356195	3
50-80-12-5119	TS-1 F37	E 597693	N 2356176	3
50-80-12-5120	TS-14 F1	E 597337	N 2356044	3
50-80-12-5120	TS-14 F2	E 597328	2356052	3
50-80-12-5120	TS-14 F3	E 597333	N 2356068	3
50-80-12-5120	TS-14 F4	E 597310	N 2356040	3
50-80-12-5120	TS-14 F5	E 597353	N 2356017	3
50-80-12-5120	TS-14 F6	E 597363	N 2356019	3
50-80-12-5120	TS-14 F7	E 597358	N 2356003	3
50-80-12-5120	TS-14 F8	E 597374	N 2356012	3
50-80-12-5120	TS-14 F9	E 597353	N 2356025	3
50-80-12-7483	TS-2 F1	E 597673	N 2356179	3
50-80-12-7483	TS-2 F2	E 597627	N 2356165	3
50-80-12-7483	TS-2 F3	E 597630	N 2356131	3

SCS PROJECT 1276 GPS Coordinates for State Sites -5119, -5120, -7483 through -7494, and -7496 through -7504				
State Site Number	**SCS Temporary Site and Feature Number**	**GPS Corrdinates Easting/Northing**		**Accuracy (± meters)**
50-80-12-7483	TS-2 F4	E 597659	N 2356148	3
50-80-12-7483	TS-2 F5	E 597622	N 2356170	3
50-80-12-7483	TS-2 F6	E 597627	N 2356144	2
50-80-12-7483	TS-2 F7	E 597617	N 2356154	3
50-80-12-7483	TS-2 F8	E 597617	N 2356154	3
50-80-12-7483	TS-2 F9	E 597622	N 2356170	3
50-80-12-7483	TS-2 F10	E 597635	N 2356167	3
50-80-12-7484	TS-3 F1	E 597584	N 2356173	3
50-80-12-7484	TS-3 F2	E 597562	N 2356151	3
50-80-12-7484	TS-3 F3	E 597604	N 2356154	3
50-80-12-7485	TS-4 F1	E 597479	N 2356141	3
50-80-12-7485	TS-4 F2	E 597494	N 2356130	3
50-80-12-7486	TS-5 F1	E 597373	N 2356123	3
50-80-12-7486	TS-5 F2	E 597358	N 2356112	3
50-80-12-7486	TS-5 F3	E 597351	N 2356124	2
50-80-12-7486	TS-5 F4	E 597346	N 2356125	3
50-80-12-7486	TS-5 F5	E 597342	N 2356123	3
50-80-12-7487	TS-6 F1 A	E 597317	N 2356113	2
50-80-12-7487	TS-6 F1 B	E 597318	N 2356113	2
50-80-12-7487	TS-6 F1 C	E 597314	N 2356116	2
50-80-12-7487	TS-6 F1 D	E 597310	N2356118	2
50-80-12-7487	TS-6 F1 E	E 597303	N 2356115	2
50-80-12-7487	TS-6 F1 F	E 597303	N 2356114	2
50-80-12-7487	TS-6 F2 A	E 597304	N 2356100	2
50-80-12-7487	TS-6 F2 B	E 597298	N 2356092	3
50-80-12-7487	TS-6 F2 C	E 597263	N 2356109	2
50-80-12-7487	TS-6 F3	E 597283	N 2356099	3
50-80-12-7487	TS-6 F4	E 597266	N 2356075	2
50-80-12-7487	TS-6 F5	E 597316	N 2356074	3
50-80-12-7488	TS-7 F1	E 597244	N 2356112	3
50-80-12-7489	TS-8 F1	E 597451	N 2356113	3
50-80-12-7489	TS-8 F2	E 597443	N 2356095	3
50-80-12-7490	TS-9 F1	E 597580	N 2356117	3
50-80-12-7490	TS-9 F2	E 597603	N 2356120	3
50-80-12-7490	TS-9 F3	E 597604	N 2356127	3
50-80-12-7491	TS-10 F1	E 597790	N 2356171	3
50-80-12-7492	TS-11 F1	E 597767	N 2356120	3
50-80-12-7492	TS-11 F2	E 597759	N 2356131	3
50-80-12-7492	TS-11 F3 A	E 597752	N 2356115	3
50-80-12-7492	TS-11 F3 B	E 0597749	N 2356109	3
50-80-12-7492	TS-11 F4 A	E 597740	N 2356098	3
50-80-12-7492	TS-11 F4 B	E 597746	N 2356117	3
50-80-12-7492	TS-11 F4 C	E 597736	N 2356103	3
50-80-12-7492	TS-11 F4 D	E 597739	N 2356103	3
50-80-12-7492	TS-11 F5	E 597762	N 2356112	3
50-80-12-7492	TS-11 F6 A	E 597732	N 2356131	3
50-80-12-7492	TS-11 F6 B	E 597736	N 2356134	3
50-80-12-7492	TS-11 F6 C	E 597723	N 2356130	3
50-80-12-7492	TS-11 F6 D	E 597722	N 2356129	3

SCS PROJECT 1276 GPS Coordinates for State Sites -5119, -5120, -7483 through -7494, and -7496 through -7504				
State Site Number	**SCS Temporary Site and Feature Number**	**GPS Corrdinates Easting/Northing**		**Accuracy (± meters)**
50-80-12-7492	TS-11 F6 E	E 597715	N 2356129	3
50-80-12-7492	TS-11 F6 F	E 597715	N 2356129	3
50-80-12-7492	TS-11 F6 G	E 597711	N 2356127	3
50-80-12-7492	TS-11 F6 H	E 597716	N 2356125	3
50-80-12-7492	TS-11 F6 I	E 597719	N 2356125	3
50-80-12-7492	TS-11 F6 J	E 597722	N 2356130	3
50-80-12-7492	TS-11 F6 K	E 597733	N 2356130	3
50-80-12-7492	TS-11 F6 L	E 597723	N 2356123	3
50-80-12-7492	TS-11 F6 M	E 597723	N 2356119	3
50-80-12-7492	TS-11 F6 N	E 597716	N 2356120	3
50-80-12-7492	TS-11 F6 O	E 597726	N 2356110	3
50-80-12-7492	TS-11 F6 P	E 597728	N 2356108	3
50-80-12-7492	TS-11 F6 Q	E 597726	N 2356110	3
50-80-12-7492	TS-11 F6 R	E 597728	N 2356109	3
50-80-12-7492	TS-11 F6 S	E 597728	N 2356108	3
50-80-12-7492	TS-11 F6 T	E 597728	N 2356107	3
50-80-12-7492	TS-11 F6 U	E 597725	N 2356098	3
50-80-12-7492	TS-11 F6 V	E 597721	N 2356102	3
50-80-12-7492	TS-11 F6 W	E 597721	N 2356102	3
50-80-12-7492	TS-11 F6 X	E 597705	N 2356133	3
50-80-12-7492	TS-11 F6 Y	E 597698	N 2356135	3
50-80-12-7492	TS-11 F7	E 597725	N 2356118	3
50-80-12-7492	TS-11 F8	E 597723	N 2356121	3
50-80-12-7492	TS-11 F9	E 597722	N 2356116	3
50-80-12-7492	TS-11 F10	E 597726	N 2356114	3
50-80-12-7492	TS-11 F11	E 597726	N 2356113	3
50-80-12-7492	TS-11 F12	E 597697	N 2356105	3
50-80-12-7492	TS-11 F13	E 597716	N 2356115	3
50-80-12-7492	TS-11 F14	E 597702	N 2356123	3
50-80-12-7492	TS-11 F15	E 597698	N 2356133	3
50-80-12-7492	TS-11 F16	E 597704	N 2356116	3
50-80-12-7492	TS-11 F17	E 597722	N 2356112	3
50-80-12-7493	TS-12 F1	E 597697	N 2356105	3
50-80-12-7494	TS-13 F1	E 597627	N 2356092	2
50-80-12-7496	TS-15 F1	E 597404	N 2356009	3
50-80-12-7496	TS-15 F2	E 597412	N 2356004	2
50-80-12-7497	TS-16 F1	E 597634	N 2356062	3
50-80-12-7498	TS-17 F1	E 597722	N 2356064	3
50-80-12-7498	TS-17 F2 A	E 597748	N 2356071	3
50-80-12-7498	TS-17 F2 B	E 597762	N 2356079	3
50-80-12-7499	TS-18 F1	E 597742	N 2356018	3
50-80-12-7499	TS-18 F2	E 597759	N 2356039	3
50-80-12-7499	TS-18 F3	E 597751	N 2356041	3
50-80-12-7500	TS-19 F1	E 597673	N 2356030	3
50-80-12-7501	TS-20 F1	E 597527	N 2356021	3
50-80-12-7502	TS-21 F1	E 597590	N 2355962	3
50-80-12-7503	TS-22 F1	E 597642	N 2355960	3
50-80-12-7504	TS-23 F1	E 597668	N 2355917	3
50-80-12-7504	TS-23 F2	E 597659	N 2355905	3

APPENDIX B: RADIOCARBON DATA

BETA ANALYTIC INC.
DR. M.A. TAMERS and MR. D.G. HOOD
4985 S.W. 74 COURT
MIAMI, FLORIDA, USA 33155
PH: 305-667-5167 FAX:305-663-0964
beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Dr. Robert L. Spear

Report Date: 5/17/2013

Scientific Consultant Services, Incorporated

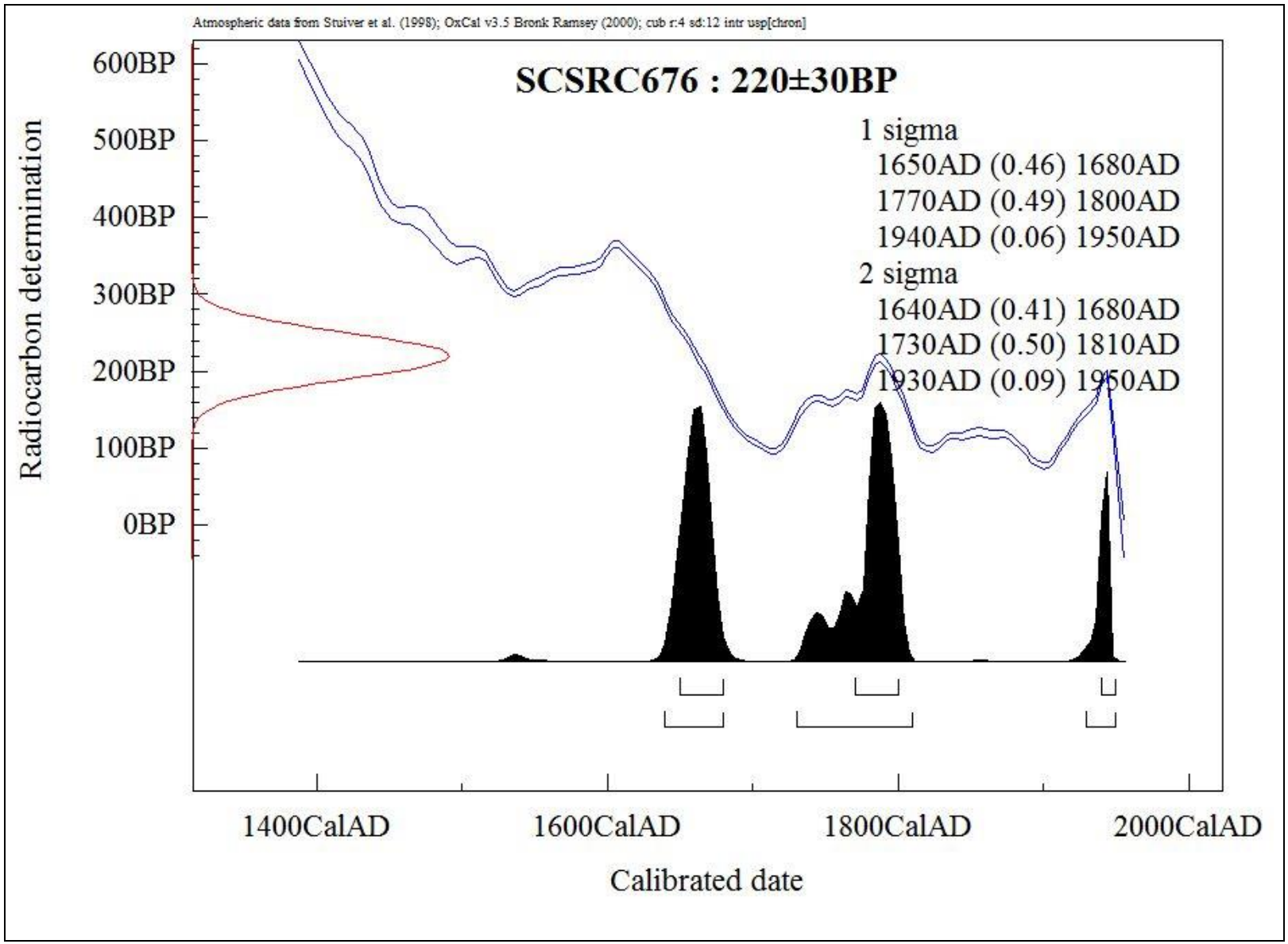
Material Received: 5/13/2013

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 348684	230 +/- 30 BP	-25.8 o/oo	220 +/- 30 BP

SAMPLE : SCSRC676
ANALYSIS : AMS-Standard delivery
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid
2 SIGMA CALIBRATION : Cal AD 1640 to 1680 (Cal BP 310 to 270) AND Cal AD 1740 to 1760 (Cal BP 210 to 190)
Cal AD 1760 to 1800 (Cal BP 190 to 150) AND Cal AD 1940 to post 1950 (Cal BP 10 to post 1950)

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the 14C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby 14C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta 13C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta 13C, the ratio and the Conventional Radiocarbon Age will be followed by "*". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.


Atmospheric data from Stuiver et al. (1998); OxCal v3.5 Bronk Ramsey (2000); cub r:4 sd:12 intr usp[chron]
SCSRC676 : 220±30BP
1 sigma
1650AD (0.46) 1680AD
1770AD (0.49) 1800AD
1940AD (0.06) 1950AD
2 sigma
1640AD (0.41) 1680AD
1730AD (0.50) 1810AD
1930AD (0.09) 1950AD
Radiocarbon determination
600BP
500BP
400BP
300BP
200BP
100BP
0BP
1400CalAD
1600CalAD
1800CalAD
2000CalAD
Calibrated date

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-25.8:lab. mult=1)

Laboratory number: **Beta-348684**

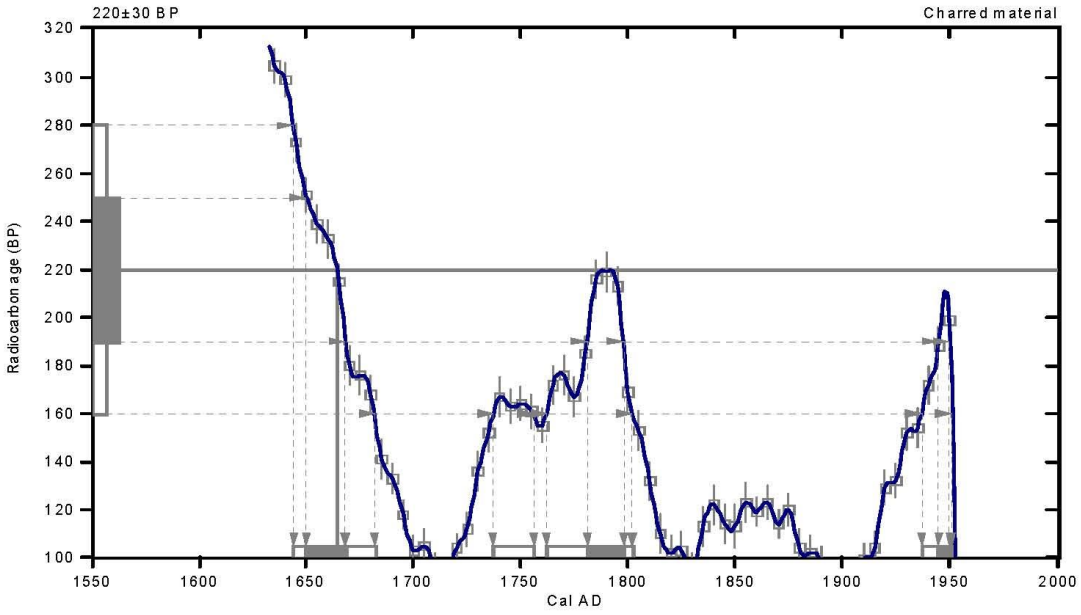
Conventional radiocarbon age: **220±30 BP**

2 Sigma calibrated results: **Cal AD 1640 to 1680 (Cal BP 310 to 270) and**
(95% probability) **Cal AD 1740 to 1760 (Cal BP 210 to 190) and**
Cal AD 1760 to 1800 (Cal BP 190 to 150) and
Cal AD 1940 to post 1950 (Cal BP 10 to post 1950)

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 1660 (Cal BP 290)

1 Sigma calibrated results: Cal AD 1650 to 1670 (Cal BP 300 to 280) and
(68% probability) Cal AD 1780 to 1800 (Cal BP 170 to 150) and
Cal AD 1940 to 1950 (Cal BP 0 to 0)



References:

Database used

INTCAL09

References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):1-244, Oeschger,et.al.,1975,Tellus 27:168-192

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

Beta Analytic Radiocarbon Dating Laboratory

4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • E-Mail: beta@radiocarbon.com

APPENDIX C: ARTIFACTS AND FOOD MIDDEN

SCS PROJECT 1276 CULTURAL MATERIAL INVENTORY										
Lab Bag	**State Site**	**Feature**	**Artifact Locus**	**Excavation Unit**	**Layer/ Level**	**Depth (cmbs)**	**Collected Item**	**Measurements**	**Count[1]**	**Remarks**
1-1	50-80-12-5119	30	-	-	Surface	-	0.30-Caliber Brass Rifle Ammunition Casing		1	0.30-caliber casing, expended, cartridge is rimless and bottlenecked, Type 4 basestamp
1-2	50-80-12-5119	30	-	-	Surface	-	0.50-Caliber Ferrous Metal Link	-	1	Corroded
2-1	50-80-12-7484	3	1	-	Surface	-	Marine Invertebrate	0.4 g	1	Bivalvia: *Brachidontes crebristriatus*
2-1	50-80-12-7484	3	1	-	Surface	-	Euryhaline or Marine Invertebrate	0.2 g	2	Bivalvia: *Pinctada* sp.
2-2	50-80-12-7484	3	2	-	Surface	-	Euryhaline Invertebrate	0.1 g	1	Bivalvia: *Brachidontes crebristriatus*
2-3	50-80-12-7484	3	3	-	Surface	-	Marine Invertebrate	0.3 g	1	Gastropoda: *Nerita picea*
2-4	50-80-12-7484	3	4	-	Surface	-	Euryhaline Invertebrate	< 0.1 g	1	Bivalvia: *Brachidontes crebristriatus*
2-5	50-80-12-7484	3	5	-	Surface	-	Euryhaline Invertebrate	< 0.1 g	1	Bivalvia: *Brachidontes crebristriatus*
2-6	50-80-12-7484	3	6	-	Surface	-	Euryhaline Invertebrate	0.2 g	1	Bivalvia: *Brachidontes crebristriatus*
2-7	50-80-12-7484	3	7	-	Surface	-	Marine Invertebrate	0.7 g	2	Gastropoda: *Nerita picea*
2-7	50-80-12-7484	3	7	-	Surface	-	Marine Invertebrate	1.7 g	1	Gastropoda: *Cymatium muricinum*
2-7	50-80-12-7484	3	7	-	Surface	-	Euryhaline Invertebrate	0.1 g	1	Bivalvia: *Brachidontes crebristriatus*

SCS PROJECT 1276 CULTURAL MATERIAL INVENTORY										
Lab Bag	**State Site**	**Feature**	**Artifact Locus**	**Excavation Unit**	**Layer/ Level**	**Depth (cmbs)**	**Collected Item**	**Measurements**	**Count[1]**	**Remarks**
2-8	50-80-12-7484	3	8	-	Surface	-	Marine Invertebrate	0.4 g	1	Gastropoda: *Nerita picea*
2-9	50-80-12-7484	3	9	-	Surface	-	Euryhaline Invertebrate	< 0.1 g	1	Bivalvia: *Brachidontes crebristriatus*
2-10	50-80-12-7484	3	10	-	Surface	-	Euryhaline Invertebrate	0.1 g	1	Bivalvia: *Brachidontes crebristriatus*
2-11	50-80-12-7484	3	11	-	Surface	-	Marine Invertebrate	0.4 g	1	Gastropoda: *Nerita picea*
2-12	50-80-12-7484	3	12	-	Surface	-	Marine Invertebrate	0.2 g	1	Gastropoda: *Nerita picea*
2-13	50-80-12-7484	3	13	-	Surface	-	Marine Invertebrate	0.3 g	1	Gastropoda: *Nerita picea*
2-14	50-80-12-7484	3	14	-	Surface	-	Marine Invertebrate	0.6 g	1	Gastropoda: *Turbo sandwicensis*
2-15	50-80-12-7484	3	15	-	Surface	-	Euryhaline Invertebrate	< 0.1 g	1	Bivalvia: *Brachidontes crebristriatus*
2-16	50-80-12-7484	3	16	-	Surface	-	Vertebrate	0.4 g	1	Osteichthyes: non-diagnostic
2-16	50-80-12-7484	3	16	-	Surface	-	Marine Invertebrate	< 0.1 g	1	Echinoidea: *Echinometra oblonga*
2-17	50-80-12-7484	3	17	-	Surface	-	Euryhaline Invertebrate	< 0.1 g	1	Bivalvia: *Brachidontes crebristriatus*
2-18	50-80-12-7484	3	18	-	Surface	-	Marine Invertebrate	0.2 g	1	Echinoidea: non-diagnostic
2-19	50-80-12-7484	3	19	-	Surface	-	Euryhaline Invertebrate	0.1 g	1	Bivalvia: *Brachidontes crebristriatus*
2-20	50-80-12-7484	3	20	-	Surface	-	Euryhaline Invertebrate	0.4 g	1	Bivalvia: *Brachidontes crebristriatus*
2-21	50-80-12-7484	3	21	-	Surface	-	Marine Invertebrate	0.4 g	1	Gastropoda: *Nerita picea*
2-22	50-80-12-7484	3	22	-	Surface	-	Volcanic Glass Debitage	-	1	Interior flake

SCS PROJECT 1276 CULTURAL MATERIAL INVENTORY										
Lab Bag	**State Site**	**Feature**	**Artifact Locus**	**Excavation Unit**	**Layer/ Level**	**Depth (cmbs)**	**Collected Item**	**Measurements**	**Count[1]**	**Remarks**
2-23	50-80-12-7484	3	23	-	Surface	-	Euryhaline Invertebrate	0.1 g	1	Bivalvia: *Brachidontes crebristriatus*
2-24	50-80-12-7484	3	24	-	Surface	-	Marine Invertebrate	0.5 g	1	Echinoidea: non-diagnostic
2-25	50-80-12-7484	3	25	-	Surface	-	Marine Invertebrate	0.6 g	1	Gastropoda: *Cypraea* sp.
2-26	50-80-12-7484	3	26	-	Surface	-	Marine Invertebrate	3.1 g	1	Gastropoda: *Cypraea caputserpentis*
2-27	50-80-12-7484	3	27	-	Surface	-	Marine Invertebrate	< 0.1 g	1	Echinoidea: non-diagnostic
2-28	50-80-12-7484	3	28	-	Surface	-	Marine Invertebrate	0.3 g	1	Gastropoda: *Cypraea* sp.
2-29	50-80-12-7484	3	29	-	Surface	-	Euryhaline Invertebrate	< 0.1 g	1	Bivalvia: *Brachidontes crebristriatus*
2-30	50-80-12-7484	3	30	-	Surface	-	Euryhaline Invertebrate	0.1 g	2	Bivalvia: *Brachidontes crebristriatus*
2-31	50-80-12-7484	3	31	-	Surface	-	Euryhaline Invertebrate	< 0.1 g	1	Bivalvia: *Brachidontes crebristriatus*
2-32	50-80-12-7484	3	32	-	Surface	-	Euryhaline Invertebrate	< 0.1 g	1	Bivalvia: *Brachidontes crebristriatus*
2-33	50-80-12-7484	3	33	-	Surface	-	Euryhaline Invertebrate	< 0.1 g	1	Bivalvia: *Brachidontes crebristriatus*
2-34	50-80-12-7484	3	34	-	Surface	-	Marine Invertebrate	< 0.1 g	1	Gastropoda: *Nerita picea*
2-34	50-80-12-7484	3	34	-	Surface	-	Euryhaline Invertebrate	< 0.1 g	1	Bivalvia: *Brachidontes crebristriatus*
2-35	50-80-12-7484	3	35	-	Surface	-	Euryhaline Invertebrate	< 0.1 g	1	Bivalvia: *Brachidontes crebristriatus*
2-36	50-80-12-7484	3	36	-	Surface	-	Euryhaline Invertebrate	0.1 g	1	Bivalvia: *Brachidontes crebristriatus*
2-36	50-80-12-7484	3	36	-	Surface	-	Marine Invertebrate	0.1 g	1	Bivalvia: *Tellina palatam*

SCS PROJECT 1276 CULTURAL MATERIAL INVENTORY										
Lab Bag	**State Site**	**Feature**	**Artifact Locus**	**Excavation Unit**	**Layer/ Level**	**Depth (cmbs)**	**Collected Item**	**Measurements**	**Count[1]**	**Remarks**
2-36	50-80-12-7484	3	36	-	Surface	-	Marine Invertebrate	< 0.1 g	1	Echinoidea: non-diagnostic
2-36	50-80-12-7484	3	36	-	Surface	-	Marine Invertebrate	< 0.1 g	1	Echinoidea: *Echinometra oblonga*
2-36	50-80-12-7484	3	36	-	Surface	-	Vertebrate	0.3 g	1	Osteichthyes: non-diagnostic
2-37	50-80-12-7484	3	37	-	Surface	-	Vertebrate	0.9 g	1	Osteichthyes: non-diagnostic
2-38	50-80-12-7484	3	38	-	Surface	-	Euryhaline or Marine Invertebrate	0.1 g	1	Bivalvia: *Pinctada* sp.
2-39	50-80-12-7484	3	39	-	Surface	-	Vertebrate	0.3 g	1	Osteichthyes: non-diagnostic
2-40	50-80-12-7484	3	40	-	Surface	-	Vertebrate	1.4 g	1	Osteichthyes: non-diagnostic
2-41	50-80-12-7484	3	41	-	Surface	-	Euryhaline Invertebrate	0.1 g	1	Bivalvia: *Brachidontes crebristriatus*
2-42	50-80-12-7484	3	42	-	Surface	-	Vertebrate	3.3 g	2	Osteichthyes: non-diagnostic
2-43	50-80-12-7484	3	Weed Pulling	-	I	2 cmbs	Basalt Micro-Adze	Length: 6.5 cm Width: 1.8 cm Thickness: 1.5 cm Weight: 36.8 g	1	Minimum four polished facets, rectangular cross-section, proximal end pinched to a dull point.
2-44	50-80-12-7484	3	-	SP-1	I	-	Marine Invertebrate	0.1 g	1	Gastropoda: *Turbo sandwicensis*
2-44	50-80-12-7484	3	-	SP-1	I	-	Marine Invertebrate	0.4 g	1	Gastropoda: *Cypraea caputserpentis*
2-44	50-80-12-7484	3	-	SP-1	I	-	Euryhaline Invertebrate	0.4 g	1	Bivalvia: *Brachidontes crebristriatus*
2-44	50-80-12-7484	3	-	SP-1	I	-	Marine Invertebrate	1.0 g	1	Bivalvia: *Tellina palatam*
2-44	50-80-12-7484	3	-	SP-1	I	-	Marine Invertebrate	0.1 g	1	Echinoidea: non-diagnostic
2-44	50-80-12-7484	3	-	SP-1	I	-	Marine Invertebrate	1.1 g	1	Echinoidea: *Echinometra oblonga*
2-44	50-80-12-7484	3	-	SP-1	I	-	Vertebrate	1.6 g	1	Osteichthyes: non-diagnostic

SCS PROJECT 1276 CULTURAL MATERIAL INVENTORY										
Lab Bag	**State Site**	**Feature**	**Artifact Locus**	**Excavation Unit**	**Layer/ Level**	**Depth (cmbs)**	**Collected Item**	**Measurements**	**Count[1]**	**Remarks**
2-45	50-80-12-7484	3	-	SP-3	I	-	Marine Invertebrate	0.1 g	1	Gastropoda: *Nerita picea*
2-45	50-80-12-7484	3	-	SP-3	I	-	Euryhaline Invertebrate	0.7 g	2	Bivalvia: *Brachidontes crebristriatus*
2-45	50-80-12-7484	3	-	SP-3	I	-	Marine Invertebrate	0.1 g	1	Bivalvia: *Tellina palatam*
2-45	50-80-12-7484	3	-	SP-3	I	-	Marine Invertebrate	0.2 g	1	Echinoidea: non-diagnostic
2-45	50-80-12-7484	3	-	SP-3	I	-	Vertebrate	0.1 g	1	Osteichthyes: non-diagnostic
2-45	50-80-12-7484	3	-	SP-3	I	-	Volcanic Glass Debitage	-	1	Primary flake
2-46	50-80-12-7484	3	-	SP-5	I	-	Marine Invertebrate	0.1 g	1	Gastropoda: *Nerita picea*
2-46	50-80-12-7484	3	-	SP-5	I	-	Euryhaline Invertebrate	0.4 g	1	Bivalvia: *Brachidontes crebristriatus*
2-47	50-80-12-7484	3	-	SP-6	I	-	Marine Invertebrate	0.3 g	1	Gastropoda: *Nerita picea*
2-47	50-80-12-7484	3	-	SP-6	I	-	Marine Invertebrate	0.3 g	1	Echinoidea: non-diagnostic
2-47	50-80-12-7484	3	-	SP-6	I	-	Vertebrate	0.1 g	1	Osteichthyes: non-diagnostic
2-47	50-80-12-7484	3	-	SP-6	I	-	Volcanic Glass Debitage	-	3	Secondary flakes
2-48	50-80-12-7484	3	-	SP-7	I	-	Euryhaline Invertebrate	0.3 g	1	Bivalvia: *Brachidontes crebristriatus*
2-48	50-80-12-7484	3	-	SP-7	I	-	Marine Invertebrate	0.1 g	1	Echinoidea: non-diagnostic
2-48	50-80-12-7484	3	-	SP-7	I	-	Marine Invertebrate	0.1 g	1	Echinoidea: *Echinometra oblonga*
2-48	50-80-12-7484	3	-	SP-7	I	-	Terrestrial Vertebrate	< 0.1 g	1	*Mus* sp.

SCS PROJECT 1276 CULTURAL MATERIAL INVENTORY										
Lab Bag	**State Site**	**Feature**	**Artifact Locus**	**Excavation Unit**	**Layer/ Level**	**Depth (cmbs)**	**Collected Item**	**Measurements**	**Count[1]**	**Remarks**
2-48	50-80-12-7484	3	-	SP-7	I	-	Volcanic Glass Debitage	-	1	Interior flake
3-1	50-80-12-7487	2	-	-	Surface	-	Aluminum Gas Hose	Length: ~ 45.0 cm Hose diameter: 1.2 cm	1	Gas hose has a metal band that says "JAN66"; item from an F-4J Phantom that crashed in 1971
4-1	50-80-12-7487	5	-	TU-1	I	-	Glass Tubes	Length range: 3.4–4.0 cm Outside diameter: 0.8 cm Inner diameter: 0.7 cm Weight range: 1.7–1.8 g	3	one end horizontally uneven, opposite end irregularly domed
4-1	50-80-12-7487	5	-	TU-1	I	-	Possible Aluminum Aircraft Fragment	-	1	-
4-1	50-80-12-7487	5	-	TU-1	I	-	Ferrous Metal Roofing Nails	Length: 2.4 cm Head diameter: 1.1 cm Head thickness: < 0.1 g Shaft diameter: 0.35 cm	3	-
4-1	50-80-12-7487	5	-	TU-1	I	-	Ferrous Metal Finishing Nail	Length: 6.3 cm	1	Corroded
4-1	50-80-12-7487	5	-	TU-1	I	-	Ferrous Metal Box Nails	-	3	Corroded, 1-size 7d and 2-size 8d
4-1	50-80-12-7487	5	-	TU-1	I	-	Ferrous Metal Bottle Caps	-	10	Corroded
4-1	50-80-12-7487	5	-	TU-1	I	-	Window Glass Sherds	Thickness range: 0.2–0.3 cm	5	4 sherds 0.3 cm thick, 1 sherd 0.2 cm thick

SCS PROJECT 1276 CULTURAL MATERIAL INVENTORY										
Lab Bag	**State Site**	**Feature**	**Artifact Locus**	**Excavation Unit**	**Layer/ Level**	**Depth (cmbs)**	**Collected Item**	**Measurements**	**Count[1]**	**Remarks**
4-1	50-80-12-7487	5	-	TU-1	I	-	Copper Wire Fragments	Diameter: 0.2 cm	2	Wires have charred black plastic cover
4-1	50-80-12-7487	5	-	TU-1	I	-	Terrestrial Vertebrate	2.0 g	1	*Rattus* sp.
4-1	50-80-12-7487	5	-	TU-1	I	-	Avian Vertebrate	0.2 g	1	Aves: non-diagnostic
4-1	50-80-12-7487	5	-	TU-1	I	-	Bottle Glass Body Sherds	-	8	3 stippled amber sherds, 2 stippled clear sherds (1 sherd embosse**d...turn**), 3 plain clear sherds
4-1	50-80-12-7487	5	-	TU-1	I	-	Bottle Glass Base Sherds	-	1	Clear and stippled
4-2	50-80-12-7487	5	-	TU-2	I	-	Bottle Glass Finish Sherds	-	17	13-amber, 4 clear
4-2	50-80-12-7487	5	-	TU-2	I	-	Bottle Glass Body Sherds	-	130	See below.
14-amber (stippled and embossed **NO DEPOSIT NO RETURN NOT TO BE REFILLED**, 56-amber (over 90% stippled), 6-clear (stippled and embossed **NO DEPOSIT NO RETURN NOT TO BE REFILLED**, 42-clear (over 80% stippled), 17-possible panel bottle sherds.										
4-2	50-80-12-7487	5	-	TU-2	I	-	Possible Glass Tumbler Sherds	-	3	Possible table glass sherds
4-2	50-80-12-7487	5	-	TU-2	I	-	Bottle Glass Base Sherds	-	34	See below.
6-clear sherds and embossed [2 sherds fitted and embossed **JERGEN**, and **LO**…, 2 sherds displays the Owens Illinois Glass Company (Toledo, Ohio) stamp (mark utilized between 1929 and 1954), 1 sherd embossed with a **2**, 1 sherd has a indistinguishable embossment], 9-amber [5 embossed with either the Owens Illinois Glass Company of Toledo, Ohio (mark utilized between 1929 and 1954) and/ or Duraglas (in cursive; used since September 1940) marks], 3 sherds embossed with the Anchor Hocking Glass Corporation (Lancaster, Ohio) stamp (utilized since 1938), 1-sherd possibly embossed with the **BALL** (cursive) manufacturer's stamp although only the two **LL**s and the upper right curve of the letter **BALL** is visible (no exact date for the name **BALL** could be defined), 14-non-embossed amber sherds.										

SCS PROJECT 1276 CULTURAL MATERIAL INVENTORY										
Lab Bag	**State Site**	**Feature**	**Artifact Locus**	**Excavation Unit**	**Layer/ Level**	**Depth (cmbs)**	**Collected Item**	**Measurements**	**Count[1]**	**Remarks**
4-2	50-80-12-7487	5	-	TU-2	I	-	Ferrous Metal Bottle Caps	-	7	Corroded
4-2	50-80-12-7487	5	-	TU-2	I	-	D-Battery	Length: 6.1 cm Diameter:m 3.2 cm	1	Wrapped with cardboard
4-2	50-80-12-7487	5	-	TU-2	I	-	Galvanized Pipe Fragment	Diameter: 1.7 cm	1	Ends mechanically cut
4-2	50-80-12-7487	5	-	TU-2	I	-	Non-Diagnostic Ferrous Metal Fragment	-	1	Corroded
4-2	50-80-12-7487	5	-	TU-2	I	-	Possible Ceramic Tile Fragment	Thickness : 0.4 cm	1	Surface top glazed gray
4-3	50-80-12-7487	5	-	TU-2	II	-	Bottle Glass Finish Sherds	Crown top inner mouth diameter: 1.8 cm Screw top inner mouth diameter: 0.8 cm	7	5-clear sherds (2 crown top finish sherds (since 1904), 1 screw top finish (since 1919), 2 partial finishes], 2-amber
4-3	50-80-12-7487	5	-	TU-2	II	-	Bottle Glass Body Sherds	-	15	See below.
8-clear sherds (2 embossed with **NO DEPOSIT NO RETURN**; stippled, 5 not embossed), 7-amber (2 embossed with **NO DEPOSIT**… **NOT TO BE REFILLED**; stippled), 5 not embossed.										
4-3	50-80-12-7487	5	-	TU-2	II	-	Bottle Glass Base Sherds	-	14	See below.
4-clear sherds [1 embossed with the Owens Illinois Glass Company (Toledo, Ohio) stamp (1929 to 1954), 1 embossed with the Anchor Hocking Glass Corporation stamp (since 1938), 2 not embossed], 10-amber sherds [3 embossed with the Owens Illinois Glass Company (Toledo, Ohio) stamp (1929 to 1954) and Duraglas (in cursive; utilized since September 1940), 7 not embossed].										

SCS PROJECT 1276 CULTURAL MATERIAL INVENTORY										
Lab Bag	**State Site**	**Feature**	**Artifact Locus**	**Excavation Unit**	**Layer/ Level**	**Depth (cmbs)**	**Collected Item**	**Measurements**	**Count[1]**	**Remarks**
4-3	50-80-12-7487	5	-	TU-2	II	-	Possible Glass Tumbler Sherd	-	1	Clear, multi-faceted table glass body/ base sherd
4-3	50-80-12-7487	5	-	TU-2	II	-	Ferrous Metal Bottle Caps	-	14	Corroded
4-3	50-80-12-7487	5	-	TU-2	II	-	Ferrous Metal Jar Cap Fragments	-	2	Corroded
4-3	50-80-12-7487	5	-	TU-2	II	-	Wound Ferrous Metal Band	Width: 0.5 cm	1	Corroded
4-3	50-80-12-7487	5	-	TU-2	II	-	Non-Diagnostic Ferrous Metal Fragment	-	1	Corroded
4-3	50-80-12-7487	5	-	TU-2	II	-	Ferrous Metal Finishing Nail	-	1	Corroded, bent
4-3	50-80-12-7487	5	-	TU-2	II	-	Ferrous Metal Box Nail	-	1	Corroded
4-3	50-80-12-7487	5	-	TU-2	II	-	Possible Ferrous Metal Nail Fragment	-	1	Corroded
4-3	50-80-12-7487	5	-	TU-2	II	-	Ferrous Metal Flat Head Screw	-	1	Corroded, item identified as a slotted wood screw

SCS PROJECT 1276 CULTURAL MATERIAL INVENTORY										
Lab Bag	**State Site**	**Feature**	**Artifact Locus**	**Excavation Unit**	**Layer/ Level**	**Depth (cmbs)**	**Collected Item**	**Measurements**	**Count[1]**	**Remarks**
4-4	50-80-12-7487	5	-	TU-2	III	-	Bottle Glass Finish Sherd	-	1	Clear screw top finish (post 1919)
4-4	50-80-12-7487	5	-	TU-2	III	-	Bottle Glass Base Sherds	-	2	1-clear, 1-amber (embossed with **45**)
4-4	50-80-12-7487	5	-	TU-2	III	-	Basalt Gravel	-	1	Sub-angular basalt gravel piece
5-1	50-80-12-7494	1	-	SP-1	Surface	-	Marine and Euryhaline Invertebrate	2.0 g	1	Bivalvia: *Pinctada radiata*
5-2	50-80-12-7494	1	-	SP-1	I	-	Terrestrial Vertebrate	0.2 g	1	*Rattus/ Mus* sp.
5-2	50-80-12-7494	1	-	SP-1	I	-	Charcoal	1.4 g	-	0.5 g submitted for radiocarbon dating (SCSRC676)
6-1	50-80-12-7496	1	-	TU-1	I/II Interface	-	Marine Invertebrate	6.6 g	17	Gastropoda: *Nerita picea*
6-1	50-80-12-7496	1	-	TU-1	I/II Interface	-	Marine Invertebrate	1.4 g	3	Gastropoda: *Littorina pintado*
6-1	50-80-12-7496	1	-	TU-1	I/II Interface	-	Marine Invertebrate	6.5 g	1	Gastropoda: *Cypraea caputserpentis*
6-1	50-80-12-7496	1	-	TU-1	I/II Interface	-	Marine Invertebrate	1.4 g	1	Bivalvia: *Tellina palatam*
6-2	50-80-12-7496	1	-	TU-1	II	-	Marine Invertebrate	33.4 g	82	Gastropoda: *Nerita picea*
6-2	50-80-12-7496	1	-	TU-1	II	-	Marine Invertebrate	9.5 g	25	Gastropoda: *Littorina pintado*
6-2	50-80-12-7496	1	-	TU-1	II	-	Marine Invertebrate	1.1 g	1	Echinoidea: non-diagnostic
6-2	50-80-12-7496	1	-	TU-1	II	-	Vertebrate	0.4 g	1	Osteichthyes: non-diagnostic
6-2	50-80-12-7496	1	-	TU-1	II	-	Terrestrial Vertebrate	0.6 g	3	*Rattus/ Mus* sp.
6-3	50-80-12-7496	1	-	TU-1	III	-	Marine Invertebrate	17.1 g	42	Gastropoda: *Nerita picea*

SCS PROJECT 1276 CULTURAL MATERIAL INVENTORY										
Lab Bag	**State Site**	**Feature**	**Artifact Locus**	**Excavation Unit**	**Layer/ Level**	**Depth (cmbs)**	**Collected Item**	**Measurements**	**Count[1]**	**Remarks**
6-3	50-80-12-7496	1	-	TU-1	III	-	Marine Invertebrate	5.2 g	14	Gastropoda: *Littorina pintado*
6-3	50-80-12-7496	1	-	TU-1	III	-	Marine Invertebrate	0.2 g	1	Gastropoda: non-diagnostic
6-3	50-80-12-7496	1	-	TU-1	III	-	Marine Invertebrate	0.2 g	1	Echinoidea: non-diagnostic
6-3	50-80-12-7496	1	-	TU-1	III	-	Vertebrate	0.6 g	1	Osteichthyes: non-diagnostic
6-3	50-80-12-7496	1	-	TU-1	III	-	Terrestrial Vertebrate	0.2 g	2	*Rattus/ Mus* sp.
7-1	50-80-12-7496	2	-	-	Surface	-	Metal and Plastic Flare Gun	Overall length: ~ 20.0 cm	1	See below.
Flare gun constructed of ferrous metal, aluminum, and plastic; artifact extremely corroded. Artifact identified as a Pyrotechnic Pistol AN-M8; single shot, double action, breech-loading; manufactured by the Eureka Vaccuum Cleaner Company during World War Two and utilized into the early 21st century.										
8-1	Project Area	-	-	-	Surface	-	Stainless Steel United State Navy Spoon	Length: 18.4 cm	1	Top of handle engraved **USN**, underside near neck stamped **REED BARTON**

Note #1: If invertebrates (excluding coral) or vertebrates, then count is Minimum Number of Individuals (MNI). If artifact, then count is amount of artifacts.

SCS PROJECT 1276 CULTURAL MATERIAL INVENTORY										
Lab Bag	**State Site**	**Feature**	**Artifact Locus**	**Excavation Unit**	**Layer/ Level**	**Depth (cmbs)**	**Collected Item**	**Measurements**	**Count[1]**	**Remarks**
4-3	50-80-12-7487	5	-	TU-2	II	-	Possible Glass Tumbler Sherd	-	1	Clear, multi-faceted table glass body/ base sherd
4-3	50-80-12-7487	5	-	TU-2	II	-	Ferrous Metal Bottle Caps	-	14	Corroded
4-3	50-80-12-7487	5	-	TU-2	II	-	Ferrous Metal Jar Cap Fragments	-	2	Corroded
4-3	50-80-12-7487	5	-	TU-2	II	-	Wound Ferrous Metal Band	Width: 0.5 cm	1	Corroded
4-3	50-80-12-7487	5	-	TU-2	II	-	Non-Diagnostic Ferrous Metal Fragment	-	1	Corroded
4-3	50-80-12-7487	5	-	TU-2	II	-	Ferrous Metal Finishing Nail	-	1	Corroded, bent
4-3	50-80-12-7487	5	-	TU-2	II	-	Ferrous Metal Box Nail	-	1	Corroded
4-3	50-80-12-7487	5	-	TU-2	II	-	Possible Ferrous Metal Nail Fragment	-	1	Corroded
4-3	50-80-12-7487	5	-	TU-2	II	-	Ferrous Metal Flat Head Screw	-	1	Corroded, item identified as a slotted wood screw

SCS PROJECT 1276 CULTURAL MATERIAL INVENTORY										
Lab Bag	**State Site**	**Feature**	**Artifact Locus**	**Excavation Unit**	**Layer/ Level**	**Depth (cmbs)**	**Collected Item**	**Measurements**	**Count[1]**	**Remarks**
6-3	50-80-12-7496	1	-	TU-1	III	-	Marine Invertebrate	5.2 g	14	Gastropoda: *Littorina pintado*
6-3	50-80-12-7496	1	-	TU-1	III	-	Marine Invertebrate	0.2 g	1	Gastropoda: non-diagnostic
6-3	50-80-12-7496	1	-	TU-1	III	-	Marine Invertebrate	0.2 g	1	Echinoidea: non-diagnostic
6-3	50-80-12-7496	1	-	TU-1	III	-	Vertebrate	0.6 g	1	Osteichthyes: non-diagnostic
6-3	50-80-12-7496	1	-	TU-1	III	-	Terrestrial Vertebrate	0.2 g	2	*Rattus/ Mus* sp.
7-1	50-80-12-7496	2	-	-	Surface	-	Metal and Plastic Flare Gun	Overall length: ~ 20.0 cm	1	See below.
Flare gun constructed of ferrous metal, aluminum, and plastic; artifact extremely corroded. Artifact identified as a Pyrotechnic Pistol AN-M8; single shot, double action, breech-loading; manufactured by the Eureka Vaccuum Cleaner Company during World War Two and utilized into the early 21st century.										
8-1	Project Area	-	-	-	Surface	-	Stainless Steel United State Navy Spoon	Length: 18.4 cm	1	Top of handle engraved **USN**, underside near neck stamped **REED BARTON**

Note #1: If invertebrates (excluding coral) or vertebrates, then count is Minimum Number of Individuals (MNI). If artifact, then count is amount of artifacts.

APPENDIX D: HCDA INVESTIGATIVE REPORT OF GEOLABS, INC. BULLDOZING INCIDENT

Investigation Report
Kalaeloa, Coral Seas Lot TMK (1) 9-1-013:70, Parcel #13073E

April 24, 2012

The HCDA Staff conducted a site visit to investigate the above stated report on Tuesday, April 24, 2012. The following evidence of six bulldozer pushes or cuts with GEOLABS markers were found:

1. The first cut is 45'-135' wide by 1070' long:

2. The second cut is 20'-75' wide by 745' long:

3. The third cut is 20'-40' wide by 610' long:

Exhibit C

cont.

4. The fourth cut is 20'-30' wide by 446' long:

5. The fifth cut is 20' wide by 140' long:

6. The sixth cut had an established dirt road and appears to have bulldozer pushes along the road:

cont. Exhibit C

APPENDIX F

ADDENDUM AIS TO MEDRANO ET AL. 2014 AIS: ARCHAEOLOGICAL ASSESSMENT REPORT AUGUST, 2017

SCIENTIFIC CONSULTANT SERVICES, INC.

(DOT HIGHWAYS DIVISION CONSULTATION LETTER- APRIL, 2017)

(SHPD CONSULTATION LETTER – MAY, 2017)

(SHPD APPROVAL LETTER – SEPTEMBER 2017)

DAVID Y. IGE
GOVERNOR

HIGHWAY DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SERVICE, ROOM 688
LANDSCAPE DESIGN SECTION, ROOM 609

RIGHT-OF-WAY BRANCH, ROOM 691

TRAFFIC BRANCH, ROOM 602

MOTOR VEHICLE SAFETY OFFICE, ROOM 511

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION AT KAPOLEI
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:
HWY-RM 3.93442

April 17, 2017

TO: SUSAN LEBO, PH.D., ARCHAEOLOGICAL BRANCH CHIEF
DEPARTMENT OF LAND AND NATURAL RESOURCES

FROM: CHRIS M. YAMAMOTO
RIGHT-OF-WAY MANAGER

SUBJECT: HAWAII REVISED STATUTES 6E-8
REVIEW FOR ALOHA SOLAR ENERGY FUND II LLC PROJECT TO UNDERGO INVENTORY SURVEY WITH STATE OF HAWAII, DEPARTMENT OF TRANSPORTATION RIGHT-OF-WAY ALONG CORAL SEA ROAD
TMK: (1) 9-1-13: ROAD

Under Hawaii Revised Statutes 6E-8 and Hawaii Administrative Rules 13-275-5 (Identification and Inventory of Historic Properties), we are engaging in consultation with State Historic Preservation Division (SHPD), on behalf of the applicant to determine whether or not the proposed Aloha Solar Energy Fund II LLC (ASEF II) Project would need to undergo an archaeological inventory survey (AIS). Per the applicant, the overall proposed action is comprised of two components, the first of which is a proposed photovoltaic utility installation on TMK: (1) 9-1-013:70 which is an approximate 44.28 acre parcel owned by Hawaii Community Development Authority. This component was covered under a separate AIS completed and approved by SHPD in February 2014.

The Project described herein is the second component which includes approximately 9,400 linear feet (1.78 miles) of a single 12 kV electrical distribution line that would extend from TMK (1) 9-1-013:070 and cross over into the 30-foot-wide right-of-way (ROW) as an overhead line on the eastern edge of Coral Sea Road (CSR). The ROW is managed by Hawaii Department of Transportation (HDOT).

Due to the presence of an avigation easement that extends from the adjacent Kalaeloa Airport runway approach through a central portion of CSR, approximately 3,800 feet of the proposed project would be an underground conduit with the remainder of the distribution line connected via a series of overhead utility poles.

The proposed 12 kV line would stay within the HDOT ROW running parallel to CSR until it would eventually cross as an overhead line over Roosevelt Avenue then connecting to a Hawaiian Electric conduit located on the northern mauka portion of Roosevelt Avenue and Renton Road.

In February 2017, an archaeological field inspection within the CSR HDOT ROW was conducted by Scientific Consultant Services, Inc. who is the contract archaeologist for the ASEF II Project. The purpose of the field inspection was to record any potential historic resources that could possibly be impacted by the project. The inspection also informed HDOT as the management authority of CSR and its ROW as to the likelihood of possible subsurface historic resources within the immediate areas of disturbance based upon conceptual plans for the 12 kV distribution line.

Results from the visual inspection in the field indicate that there are a number of limestone dissolution pit caves that lie just immediately outside of the CSR HDOT ROW. However, during the archaeological field inspection, there were no historic properties observed within the CSR HDOT ROW in which the Project would be built.

The density of observed limestone dissolution pit caves observed beyond the CSR HDOT ROW would indicate that there could be a higher concentration of these undocumented features within ten meters from the CSR HDOT ROW. As the proposed ASEF II project is to be conducted within the CSR HDOT ROW, the likelihood to encounter surface historic properties is extremely low. However, the chances of uncovering historic properties are still a possibility within unidentified dissolution pit caves that might have been infilled within the CSR HDOT ROW during the time of the initial construction of the road.

Based on past archaeological studies that were conducted in the immediate region and the results of the field inspection, it is our recommendation that an archaeological inventory survey with limited subsurface testing be conducted, primarily in the portion of the proposed Project that would be an underground conduit. We recommend a limited testing strategy due to the fact that: 1) the primary area of greatest disturbance is the underground segment of the proposed line; 2) the number of archaeological sites found within a half-mile radius of the proposed project area in past studies; 3) a lack of available data on the stratigraphy within the CSR HDOT ROW; and 4) the possibility of a dissolution pit cave containing culturally significant properties having been present but infilled during previous construction of CSR. We also suggest limiting the areas of testing due to the fact there exists other utilities within the CSR HDOT ROW that need to be protected from unnecessary disturbance.

In anticipation of SHPD's approval to proceed with a limited AIS, HDOT would like to propose that the ASEF II as the project proponent and its qualified archaeologist conduct an archaeological subsurface testing strategy that includes five test trenches within the underground corridor with at least one additional test unit to be conducted where utility poles would be placed to support the overhead line segment of the Project.

Prior to any archaeological trenching activity that would be conducted within the CSR HDOT ROW, a Permit to Perform Work Upon State Highways (DOT 4-222) needs to be filed by the ASEF II Project team and approved by our office. In order to help assist and expedite this request to conduct archaeological testing, we would kindly ask for your fullest consideration to provide an approval on the proposed archaeological testing strategy before April 17, 2017 as this would need to be submitted as part of the permit.

We appreciate your attention to this matter. Should you have any questions, please contact Dean M. Nishimura (808) 692-7342 or email him at dean.n.nishimura@hawaii.gov.

c: Aloha Solar Energy Fund II LLC

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
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CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

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601 KAMOKILA BLVD, STE 555
KAPOLEI, HAWAII 96707

May 29, 2017

Chris M. Yamamoto
Right-of-Way Manager
Highways Division
Department of Transportation
Right-of-Way Branch, Rm 691
Kapolei, HI 96707
Email: Chris.M.Yamamoto@hawaii.gov

Log No.: 2017.00844
Doc. No.: 1705KM06
Archaeology

Dear Mr. Yamamoto:

SUBJECT: **Chapter 6E-8 Historic Preservation Review –**
Request for Consultation – HWY-RM 3.93442
Aloha Solar Energy Fund II LLC Project along Coral Sea Road
Honouliuli Ahupua‘a, ‘Ewa District, Island of O‘ahu
TMK: (1) 9-1-013:070 por. and Coral Sea Road Right-of-Way

Thank you for the request for consultation regarding the proposed Aloha Solar Energy Fund II LLC (ASEF) project. The State of Hawaii Department of Transportation (HDOT) is consulting on behalf of the project proponent, ASEF. The State Historic Preservation Division (SHPD) received this submittal on April 27, 2017. The submittal includes a cover letter and an attached field inspection report titled *Archaeological Literature Review and Field Inspection in Support of the Proposed Utility Corridor of the Proposed Kalaeloa Solar Farm Undertaking through FDR/CRS Terminal Along Coral Sea Road and Across Roosevelt Avenue, Honouliuli Ahupua‘a, ‘Ewa District, Island of O‘ahu, Hawai‘i, TMK No. [1] 9-1-013:070 por. and Coral Sea Road Right-of-Way* (Kingsbury and Spear, February 2017).

The submittal indicates that the proposed project involves two components: installation of a photovoltaic utility farm within Parcel 070, and installation of a 12kV electrical line extending from Parcel 070 and into the Coral Sea Road Right-of-Way (CSR ROW). The first component, the solar farm within Parcel 070, includes 44.28 acres owned by the Hawaii Community Development Authority (HCDA) and the SHPD accepted the archaeological inventory survey (AIS) for the project on February 25, 2014 (Log No. 2013.6641, 2014.00823, 2014.00528; Doc. No. 1402SL27). The second component, the 12 kV electric line, includes 9400 linear feet that includes a portion of Parcel 070 and the CSR ROW owned by HDOT. Approximately 3800 ft. of the line will be underground while the remaining portions will be overhead lines. The line will be installed parallel to CSR and eventually connect to a conduit near Roosevelt Avenue and Renton Road.

In support of the historic preservation review process, a literature review and field inspection (LRFI) of the second component was completed in February 2017 (Kingsbury and Spear). The LRFI involved a 100% pedestrian survey of the 18.32 project area. No surface historic properties were identified within the project area; however, a number of limestone dissolution pit caves were observed outside of the CSR ROW. Although dissolution pit caves are sometimes known to contain cultural deposits (including artifacts, midden remains, human burials, etc.) no dissolution pit caves occurred within the CSR ROW and the density of caves increases away from the ROW. The LRFI recommends an AIS due to the potential to encounter pit caves and subsurface deposits below the CSR ROW.

In addition to the LRFI, the submittal indicates that an AIS is recommended and proposes a testing strategy. The proposed testing strategy involves limited subsurface testing of 5 test trench excavations within the underground

portion of the utility corridor and at least one additional trench in the area where utility poles will be placed for the overhead segments of the corridor.

Based on the above information, the SHPD concurs with the recommendation for an AIS. SHPD requests that the selected archaeological consultants contact us regarding the proposed AIS testing strategy, to ensure that the study meets the requirements of HAR §13-276.

SHPD looks forward to reviewing the archaeological inventory survey report, pursuant to HAR §13-276, as well as any subsequent mitigation plans as appropriate, based on the survey findings, prior to initiation of the proposed project. Please refer to the SHPD website for a listing of archaeological firms.

Finally, although the LRFI (Kingsbury and Spear, February 2017) document does not fulfill the requirements of an archaeological inventory survey as specified in Hawai‘i Administrative Rules (HAR) §13-276, it serves to facilitate project planning and supports the historic preservation review process. Please send one hardcopy of the document, clearly marked FINAL, along with a copy of this review letter and a text-searchable PDF version on CD to the Kapolei SHPD office, attention SHPD Library.

Please contact Kimi Matsushima at (808) 692-8027 or at Kimi.R.Matsushima@hawaii.gov for questions regarding archaeological resources or this letter.

Aloha,

Susan A. Lebo

Susan A. Lebo, PhD
Archaeology Branch Chief

cc: Dean Nishimura, HDOT (Dean.N.Nishimura@hawaii.gov)
Morgan Davis, SCS (morgan@scshawaii.com)

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September 11, 2017

IN REPLY REFER TO:
Log No.: 2017.01876
Doc. No.: 1709KM03
Archaeology

Michael Stout, Project Manager
Aloha Solar Energy Fund II
2969 Mapunapuna Place, Suite 220
Honolulu, HI 96819
Email: MStout@ecc.net

Dear Mr. Stout:

SUBJECT: **Chapter 6E-8 Historic Preservation Review –**
Addendum Archaeological Inventory Survey for the Proposed Utility Corridor for the Kalaeloa Solar Farm Project
Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu
TMK: (1) 9-1-013:070 por. And Coral Sea Road Right-of-Way

Thank you for the opportunity to review the draft report titled *Addendum AIS to Medrano et al. (2014) AIS: Archaeological Assessment Report in Support of the Proposed Utility Corridor of the Proposed Kalaeloa Solar Farm Project through FDR/CRS Terminal Along Coral Sea Road and Across Roosevelt Avenue, Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu, Hawai'i, TMK [1] 9-1-013 [por.] and Coral Sea Road Right-of-Way* (Kingsbury and Spear, August 2017). The State Historic Preservation Division (SHPD) received this submittal on August 23, 2017. The SHPD previously concurred with the recommendation for additional survey work for the newly-added utility corridor work on May 29, 2017 (Log No. 2017.00844, Doc. No. 1705KM06). The testing strategy for the additional work was accepted on June 9, 2017 via email (Kimi Matsushima [SHPD] to Morgan Davis [Scientific Consultant Services]).

This addendum archaeological inventory survey was prepared at the request of G70 on behalf of the HCDA and the Aloha Solar Energy Fund II (ASEF), the project proponents. The proposed project involves two components: installation of a photovoltaic utility farm within Parcel 070, and installation of a 12kV electrical line extending from Parcel 070 and into the Coral Sea Road Right-of-Way (CSR ROW). The first component, the solar farm within Parcel 070, includes 44.28 acres owned by the Hawaii Community Development Authority (HCDA) and the SHPD accepted the archaeological inventory survey (AIS) for that portion of project on February 25, 2014 (Log No. 2013.6641, 2014.00823, 2014.00528; Doc. No. 1402SL27). The second component, the 12kV electric line, includes 9400 linear feet with a portion of Parcel 070 and the CSR ROW owned by HDOT. Approximately 3800 ft. of the line will be underground while the remaining portions will be overhead lines. The 12kV line component includes approximately 18.32 acres and will be installed parallel to CSR and eventually connect to a conduit near Roosevelt Avenue and Renton Road.

The AIS fieldwork involved a 100% pedestrian survey and subsurface testing involving the excavation of 6 trenches within the area that the 12kv is planned to be underground. In general, the excavations revealed a relatively uniform stratigraphy of recent fill deposits, with some natural alluvium, overlying a very shallow limestone bedrock. All of the excavations terminated above 1.0 mbs and at least two excavations (ST-4 and ST-5) encountered the limestone bedrock immediately below the roadway/road ROW surface. Additionally, two excavations (ST-1 and ST-6) terminated due to buried utility lines. No subsurface cultural deposits or historic properties were identified during the AIS fieldwork. Due to the negative findings, the results of this inventory survey are reported as an archaeological assessment (AA) per Hawaii Administrative Rules (HAR) §13-275-5.

Although no historic properties were identified within the 12kV portion of the project, historic properties were identified within the Parcel 070 area during the original Medrano et al. (2014) AIS. Therefore, the current addendum AA recommends the project effect determination remain, "effect, with proposed mitigation commitments." Kingsbury and Spear (2017) recommend that the 12kV portion also be covered under the archaeological monitoring program; however, the low potential to encounter historic properties warrants on-call monitoring.

Based on the above information, the results of the addendum AA work does not change the original project effect determination for the overall project. Therefore, the SHPD's determination remains "effect, with proposed mitigation commitments." The SHPD concurs with the recommendation of on-call monitoring for the 12kV portion and additional mitigation as appropriate for the other portion (Parcel 070) of the project.

The report meets the minimum requirements of Hawaii Administrative Rules (HAR) §13-276-5. **It is accepted**. Please send one hardcopy of the document, clearly marked FINAL, along with a text-searchable PDF version to the Kapolei SHPD office, attention SHPD Library.

Please contact Kimi Matsushima at (808) 692-8027 or at Kimi.R.Matsushima@hawaii.gov for questions regarding archaeologic al resources or this letter.

Aloha,

Susan A. Lebo

Susan A. Lebo, PhD
Archaeology Branch Chief

cc: Kawika McKeague, G70 (kawikam@g70.design)
Morgan Davis, SCS (morgan@scshawaii.com)
Nigel Kingsbury, SCS (nigel@scshawaii.com)
Chris M. Yamamoto, HDOT (Chris.M.Yamamoto@hawaii.gov)

SCS Project No. 2022-1 AA

ADDENDUM AIS TO MEDRANO ET AL. 2014 AIS:

ARCHAEOLOGICAL ASSESSMENT REPORT IN SUPPORT OF THE PROPOSED UTILITY COORIDOR OF THE PROPOSED KALAELOA SOLAR FARM PROJECT THROUGH FDR/CRS TERMINAL ALONG CORAL SEA ROAD AND ACROSS ROOSEVELT AVENUE, HONOULIULI AHUPUA'A, 'EWA DISTRICT ISLAND OF O'AHU, HAWAI'I (TMK [1] 9-1-013:070 [por.] AND CORAL SEA ROAD RIGHT-OF-WAY)

Prepared by:
Nigel T. Kingsbury, B.A.,
and
Robert L. Spear, Ph.D.

August 2017

Prepared for:
Aloha Solar Energy Fund II, LLC
Mr. Michael Stout, ASEF II Project Manager
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Honolulu, HI 96819
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Attn: Mr. Jesse Souki, Executive Director
email: dbedt.hcda.contact@hawaii.gov

On Behalf of the Landowner
State of Hawai'i Department of Transportation
Highways Division at Kapolei
601 Kamokila Boulevard
Kapolei, Hawai'i 96707
Attn: Chris M. Yamamoto, Right-of-Way Manager
Reference Letter HWY-RM 3.93442

SCIENTIFIC CONSULTANT SERVICES Inc.
1347 Kapiolani Blvd., Suite 408 Honolulu Hawai`i 96814

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INTRODUCTION

At the request of G70 on behalf of the Hawai‘i Community Development Authority (HCDA) and Aloha Solar Energy Fund II (ASEF), Scientific Consultant Services, Inc. (SCS) has performed an Archaeological Inventory Survey (AIS) in support of the proposed installation of a 12 kilovolt (kV) interim electrical distribution line that would be routed from the proposed new electrical substation at the utility installation (TMK: [1] 9-1-013:070) crossing over Coral Sea Road and eventually connecting to the “Kapolei Circuit” at a HECO manhole on the *mauka* (toward the mountain) side of Franklin D. Roosevelt Avenue. The proposed distribution line corridor would be a combination of an overhead line on poles with a segment that is an underground duct line. The underground segment is required due to Federal Aviation Administration (FAA) height restrictions that are in place for an aviation approach of Runway 22L and 22R at the adjacent Kalaeloa Airport (John Rodgers Field). This aviation approach extends over a small portion of Coral Sea Road that is in the proposed project area. The 12 kV interim electrical distribution line would be installed within an existing State of Hawai‘i Department of Transportation-Highways Division Right-of-Way (ROW) (Landowner) along the eastern side of Coral Sea Road. The ROW extends approximately 30 feet from the edge of Coral Sea Road on the eastern side. The overhead portion of the 12 kV interim electrical distribution line would be approximately 5,600 feet in length with the underground portion approximately 3,800 feet. The project area is located in Honouliuli Ahupua‘a, ‘Ewa District, Island of O‘ahu, Hawai‘i. The project area encompasses a total of approximately 18.32 acres. The project proponent is Mr. Michael Stout, ASEF II Project Manager of Aloha Solar Energy Fund II and can be contacted at MStout@ecc.net.

The Addendum AIS testing strategy was agreed to by Ms. Kimi Matsushima, B.A., Oahu Island Archaeology Branch Lead via e-mail (Matsushima [SHPD] to Davis [SCS] dated June 9, 2017). This e-mail was in responses to an earlier e-mail from Davis [SCS] to Matsushima [SHPD] dated June 9, 2017 with attached figures showing approximate locations of six (6) Stratigraphic Trenches (ST) and was in reference to a June 8, 2017 meeting between Davis [SCS] and Matsushima [SHPD]. The e-mail correspondence is included in Appendix A of this report (see Appendix A). Additionally, this AIS report is being presented as an Addendum to the initial AIS (Medrano et al. 2014) for this project. The initial AIS was accepted by the SHPD in a formal acceptance letter dated February 25, 2014 (Log No.:2013.6641, 2014.00823, 2014.00528 and Doc. No.: 1402SL27; see Appendix A).

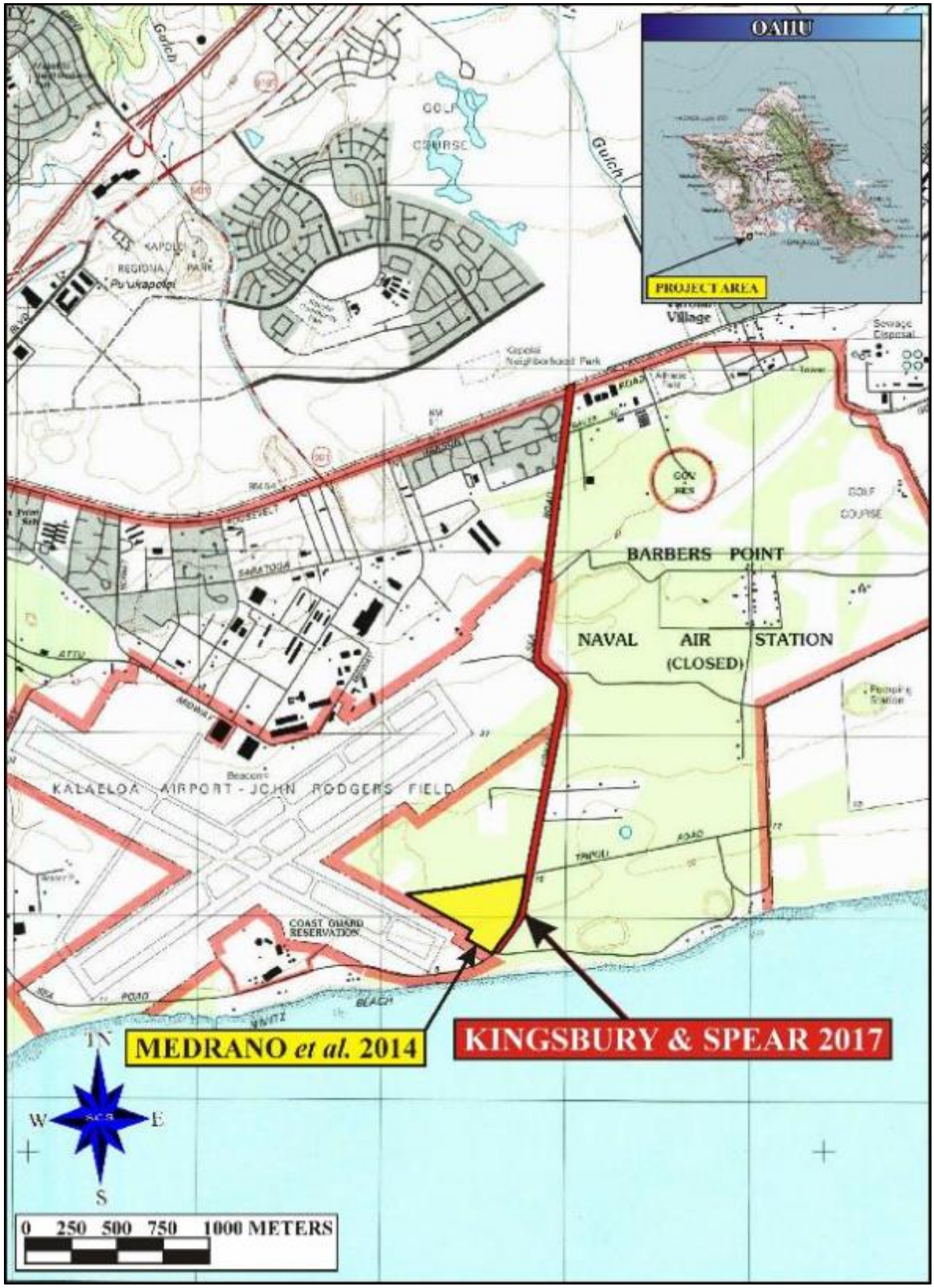

Figure 1. 1998 USGS 1:24,000 Ewa Quadrangle the Addendum Survey project area is illustrated in red (Kingsbury and Spear 2017).

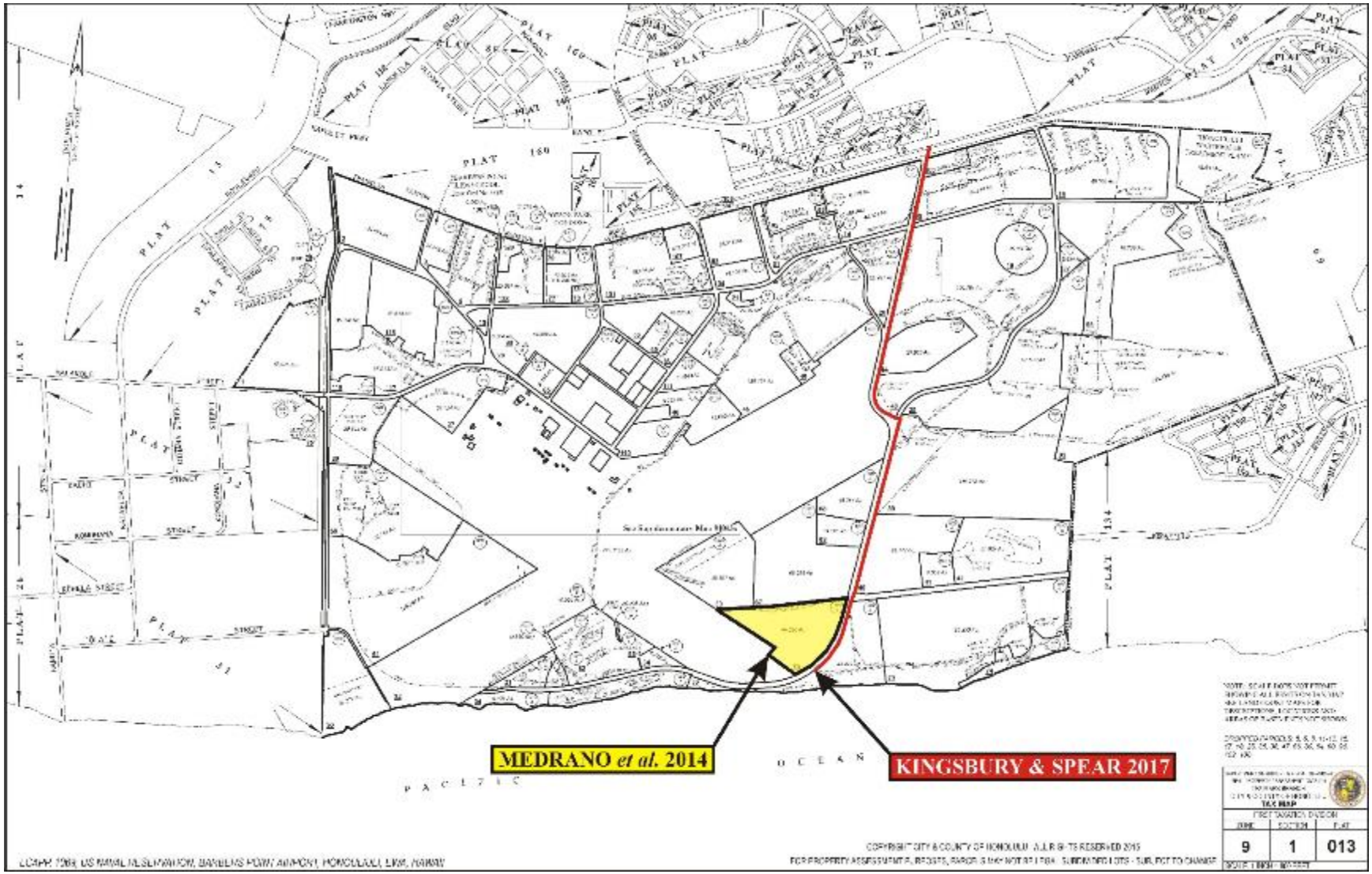

Figure 2. City and County of Honolulu Tax Map Key showing the Addendum Survey project location in red (Kingsbury and Spear 2017).

Figure 3. 2016 Google Earth Aerial Image illustrating the Addendum Survey location in red (Kingsbury and Spear 2017).

This report includes: Field inspection results and literature review (Kingsbury and Spear 2017); and, background research, and previous archaeology sections are contained therein as Appendix B.

This Addendum AIS has been prepared to present the lack of finds encountered while excavating six Stratigraphic Trenches (ST) during an Archaeological Inventory Survey of the proposed utility alignment for the ASEF II Kalaeloa Solar Farm Project. This report has been written in accordance to HAR § 13-276 and is intended to meet the criteria/standards of an Archaeological Inventory Survey as defined within the HAR § 13-276.

The project area is identified on a 1:24, 000 United States Geologic Survey (USGS) Ewa Quadrangle Map, a City and County of Honolulu Tax Map Key, and on a Google Earth 2016 Aerial Image as Kingsbury and Spear 2017 (Figure 1 through Figure 3).

ENVIRONMENTAL SETTING

This portion looks at the environmental setting of the project area through discussions on climate, geology, hydrology, flora, topography, and expected soils. Analysis of these environmental indicators can help understand possible pre-Contact to historical land use patterns. Additionally, it may indicate that a landscape had no land use value and would therefore have a very miniscule probability for containing archaeological deposits.

PROPOSED PROJECT AREA

The proposed project area is located from approximately 138m north of the ʻEwa coastline to approximately 3,300m north of the ʻEwa Coastline (see Figures 1 through 3). The project area is between 4m and 12m above mean sea level (amsl) located in Honouliuli Ahupuaʻa, ʻEwa District, Island of Oʻahu, Hawaiʻi [TMK (1) 9-1-013], and is located alongside the former Naval Air Station (NAS) Barbers Point. The proposed project area is located within the right-of-way (ROW) of a portion of Coral Sea Road, with a connection via above and below ground electrical wires to the existing electrical substation located within a portion of TMK: (1) 9-1-105:118.

CLIMATE

The proposed project area lies in the dry, southwest portion of O‘ahu. Rainfall indicators show that project area environs receive between 300 to 500 mm per *annum*, although some fluctuations do occur on a year to year basis (Price 1983:62). Temperatures in the area range between 60° and 90°F, with the highest typically occurring in August and September (Price 1983). Prevailing winds are from the north and northeast as trade winds in the winter months. Prevailing winds in the summer consist of intermittent trade winds (north to northeast) and Kona (southern) winds.

GEOLOGY

The ‘Ewa Plain or ‘Ewa Coral Plain, is an emergent reef platform formed in the late Pleistocene during the high-level sea stand approximately 125,000 years ago (MacDonald et al. 1979:355). The emerged reefs of O‘ahu are more prevalent than those of the other Hawaiian Islands and are recognized as a significant geological feature of the island (MacDonald et al. 1983:420). The age of the exposed reef has yet to be determined due in part that the fossils within the reef are still extant species within the region or still extant in the south Pacific (MacDonald et al. 1983:420). The identification of these fossils indicate that the reef is no older than the late Pleistocene. Additionally, these fossils indicate that the sea temperature was warmer than that observed today (Ostergaard, 1928 in MacDonald et al. 1983:420), suggesting the reef formation formed during interglacial stages (MacDonald et al. 1983:420).

MacDonald et al (1983:279) describes the exposed shorelines of O‘ahu that are currently visible above sea level “are marked by wave-cut terraces, nips, and sea cliffs, and by deposits of sediment containing marine fossils”. MacDonald et al. (1983:279) continues by explaining that the “Waimanalo shoreline bench that forms much of the Ewa Plain” exemplifies this wave-cut terraces, nips, and sea cliffs. Additionally, MacDonald et al. (1983:279) states “the benches at the plus 3.6meter and plus 1.5meter levels… were formed partly by wave erosion of the older Waimanalo reef, and partly also by building of new reef”. Fringing the southern flanks of the Wai‘anae Mountain Range and the central Wahiawa Plateau, the plain extends continuously from Kahe Point east to Pearl Harbor and beyond, beneath Honolulu and Waikīkī to Diamond Head. At its widest, the ‘Ewa Plain reaches approximately 5 to 8 kilometers (km) seaward from the Wai‘anae Mountains.

TOPOGRAPHY

The project area is situated on a very flat portion of exposed Pleistocene epoch coral reef formation MacDonald et al. (1983:423). The ʻEwa Plain is essentially flat, although it does exhibit moderate sloping to seaward. The only significant relief is provided by the eroded bluffs bordering the West Loch of Pearl Harbor and the volcanic cores of Puʻu o Kapolei and Puʻu Palailai. The latter is important archaeologically as it is one of only three known sources of volcanic glass on the Island of Oʻahu (Davis 1986). Volcanic glass was an important component of traditional Hawaiian tool kits and has proven to be a consistent element in the archaeological assemblages from the ʻEwa Plain. There is a large depression illustrated on the 1998 United States Geological Survey map (Ewa quadrangle) within the northwestern boundary of the project area. This depression appears to be a large karstic formation.

HYDROLOGY

The project area is located within a very arid environment on the ʻEwa Plain. The project area has no access to perennial or intermittent streams. The only forms of documented freshwater that existed in the area appears to have been a "wetland pond" 0.9 miles to the northwest and "Ordy Pond" approximately 0.31 miles to the northeast. Fresh water is gleaned from sheet wash and groundwater in the aquifers. Water in the area is primarily brackish in nature (e.g., Athens et al. 1999). There may have been other sources of freshwater during pre-Contact times both within the property or in the immediate vicinity in the form of ground water fed dissolution pit caves.

SOILS

According to the United States Department of Agriculture's Natural Resources Conservation Service's Web Soil Survey (https://websoilsurvey.sc.egov.usda.gov), the project area is primarily located within a Coral outcrop (CR) series (Figure 4). "Coral outcrops consist of coral or cemented calcareous sand on the Island of Oʻahu. The coral reefs formed in shallow ocean water during the time the ocean stand was at a higher level. Small areas of coral outcrop are exposed on the ocean shore, on the coastal plains, and at the foot of the uplands" (Foote et al. 1972:29).

Coral outcrop makes up about 80 to 90 percent of the acreage with the remaining 10 to 20 percent consisting of a thin layer of friable, red soil material in cracks, crevices, and depressions within the coral outcrop, similar to that of Mamala series deposits (Foote et al.

Figure 4. Aerial image map indicating the soil type occurring in the project area (https://websoilsurvey.sc.egov.usda.gov).

1972:29). Mamala Series deposits consist of shallow, well drained soils along the coastal plains on the island of O'ahu. These soils formed in alluvium deposited over coral limestone and consolidated calcareous sand. This land type is used for military installations, quarries, and urban development (Foote et al. 1972:93).

The subject parcel includes the near-coastal coralliferous lowlands. Here, the coral substrate was found to be largely exposed to sub-aerial weathering, which has produced a shallow, karst topography of ridges, hollows, pinnacles, and "sinkholes" interspersed among flat surfaces (Kennedy 2010). The marine-terrestrial interface where the reef adjoins the volcanic foundation of the island is situated further inland. However, as has been documented during previous archaeological projects conducted in the region, a thin mantle of terrestrial sediments may extend into the project area as alluvial encroachment and aeolian transport are deposited from the volcanic uplands and elsewhere (Davis 1986, 1990; Dega et al. 2002, Kennedy 2010).

FLORA

The observed flora within the Coral Sea Road ROW consists primarily of *Boerhavia coccinea* (Four-o'clock family), *Indigofera suffruticosa* (Hawaiian name *inikō*; English common name indigo), assorted grasses, and *Leucaena leucocephala* (Hawaiian name *Haole koa*; English common name wild tamarind). These plants are all non-native, invasive species.

FIELD METHODS

The subsurface testing program for the project was designed to target areas of ground disturbance associated with the proposed under-ground 12 kilovolt (kV) interim electrical distribution line.

To scale profile drawings of at least one entire ST long axis sidewall were recorded on graph paper in the field. Photographs of each ST were taken utilizing an Apple iPhone 6s and an appropriate sized and legible scale with alternating yellow and black decimeter blocks. To scale plan views were also recorded utilizing graph paper. ST sidewalls were cleaned with a trowel prior to profile drawings and photographs. All photographs of plan views included a north arrow with cm scale. All photographs taken during the Addendum AIS fieldwork were recorded on a photo log designating the associated excavation, direction of the photograph, the time, and a brief description. A Suunto MC-2 Global System compass with a declination of 9.5

degrees east was utilized in the field to determine profile orientations. Sediment descriptions were recorded utilizing the United States Department of Agriculture Soil (USDA) Survey Manual standard. All sediment colors were determined utilizing the Munsell Soil-Color Chart.

PEDISTRIAN SURVEY

A 100% pedestrian inspection of the project area shall be undertaken for the purpose of historic property identification and documentation. The pedestrian inspection of the project area was accomplished through systematic sweeps. All surface historic properties will be documented with a detailed written description, an evaluation of function, interrelationships, and significance, photographs, scale drawings using standard tape-and-compass mapping procedures, and location information acquired with Garmin 64ST handheld GPS unit (+/– 3m accuracy).

GPS

The location of each test excavation will be recorded using a Garmin 64ST hand held GPS unit (a point at each end of the ST). GPS location information will later be differentially corrected and converted into Google Earth Pro.

LABORATORY METHODS

All artifacts and samples collected during the project (excluding human remains) will be transported to SCS's Honolulu, O'ahu laboratory for analysis in accordance with HAR §13-276. They will be cleaned, sorted, counted, weighed (metric), and analyzed (both qualitative and quantitative data), with all data recorded on standard laboratory forms. Midden samples will be minimally identified to major class (e.g., bivalve, gastropod mollusk, echinoderm, fish, bird, and mammal). Digital photographs with scales will be taken of a representative sample of the diagnostic artifacts. Tables and text discussing the artifact and sample results will be provided in the report, along with appropriate digital photographs.

Samples (wood charcoal, shell, non-human bone, kukui nut) identified as potentially suitable for dating from an undisturbed context (e.g., cultural layer, pit feature) shall be considered for radiocarbon dating in consultation with SHPD and the landowner. Prior to submittal, potential wood charcoal samples shall first be submitted to International

Archaeological Research Institute, Inc. (IARII) for wood taxa identification. Only samples identified as short-lived endemic or Polynesian-introduced species will be selected for dating purposes.

CURATION OF MATERIALS

SCS shall store all project documentation (field notes, photographs, profiles and plan view drawings, laboratory data, etc.) in their Honolulu office/laboratory. They shall also store all collected artifacts and sample material until final disposition of the artifacts and samples is determined in consultation with SHPD and the landowner.

PREVIOUS ARCHAEOLOGY

Initial settlement of the Hawaiian Islands, conservatively estimated at around the A.D. 900-1000+ range (Athens and Ward 1993; Athens et al. 1995), is believed to have occurred along the wetter and more fertile windward areas where "conditions were optimal for marine and terrestrial exploitation along lines followed previously in Eastern Polynesia" (Green 1980:1). Leeward settlement is thought to have commenced only after windward areas were settled. More than 75 archaeological studies have been conducted on the 'Ewa Plain, extending from 'Ewa Beach to West Beach. Synthesis of recent archaeological and paleoenvironmental projects conducted on the 'Ewa Plain, particularly in near coastal and coastal settings, sheds much light on pre-Contact settlement patterns for the area.

When assessing settlement pattern models for the 'Ewa area, it is apparent that most archaeological studies have been conducted in the lowland karst zone, with general settlement pattern models somewhat skewed towards human adaptations to this semi-arid, soil-poor region (Tuggle and Tomonari-Tuggle 1997:12). During pre-Contact times, the 'Ewa Plain contained habitation and agricultural settlements, with "sinkholes" and stone mounds being the chief cultivation media. As Davis (1986) notes, the sinks and mounds provided moisture conservation to the plants in an otherwise marginal environment. It is with adaptations such as these that the Hawaiians were able to proliferate the area with features. Hawaiian features have been identified in almost every area of the 'Ewa Plain not damaged by sugar cane cultivation or twentieth century construction (Tuggle and Tomonari-Tuggle 1997:49).

Many of the previously documented sites occur within or very close to perceived coastal dunes or beach deposits. According to Tuggle and Tomonari-Tuggle (1997:60), cultural deposits recorded in dunes or beach sand have only been reported at four features along the entirety of the ʻEwa Plain coastline. Human burials, commonly associated with coastal sand deposits (Kirch 1985), have been documented in all contexts of the ʻEwa Plain and were not clustered or centered in coastal beach deposits. Cultural resources such as midden, hearths or ovens, and modest cultural strata have revealed coastal ʻEwa features to be of short-term habitation loci most often associated with fishing activities. However, just inland of this beach sand zone are backwater marsh areas and soil-poor areas dominated by vertically protruding limestone benches on which architectural structures are often constructed. The project area appears representative of the latter area, although no standing architecture was identified.

The following is a thorough presentation of archaeological projects previously conducted in the area of the current project area. These previous archaeological studies will allow for the presentation of the expected project findings.

An Archaeological Inventory Survey was conducted by SCS (Medrano et al. 2014) on the project area in Kalaeloa, Honouliuli Ahupuaʻa, ʻEwa District, Island of Oʻahu, Hawaiʻi [TMK: (1) 9-1-013:070]. Twenty-one historic properties (State Sites 50-80-12-7483 through 50-80-12-7494 and 50-80-12-7496 through 50-80-12-7504), comprised of 146 features, were identified during the project (Figure 5). Two previously identified archaeological sites were re-located (State Sites 50-80-12-5119 and -5120).

Site descriptions are presented below and are summarized in Table 1. Site GPS points have been tabulated and are presented in Appendix A. Please note that feature descriptions for the unmodified karst pits and agricultural mounds are described, and organized by feature type, rather than in numerical sequence, within the site descriptions (*e.g.* within State Site 50-80-12-5119, all of the karst pits are described in the same section, all of the rock mounds are discussed in the same section, etc.). Also, please note that while feature dimensions and orientation are provided, plan view drawings were not compiled for the unmodified karst pits or for the agricultural mounds.

State Site 50-80-12-7483 (Feature 4) and State Site 50-80-12-7486 (Feature 2) are limestone rock mounds thought to possibly contain human burials based on feature morphology (size and shape, particularly in comparison to other features within the project area), construction methods, and construction materials. State Site 50-80-12-7483 (Feature 4)

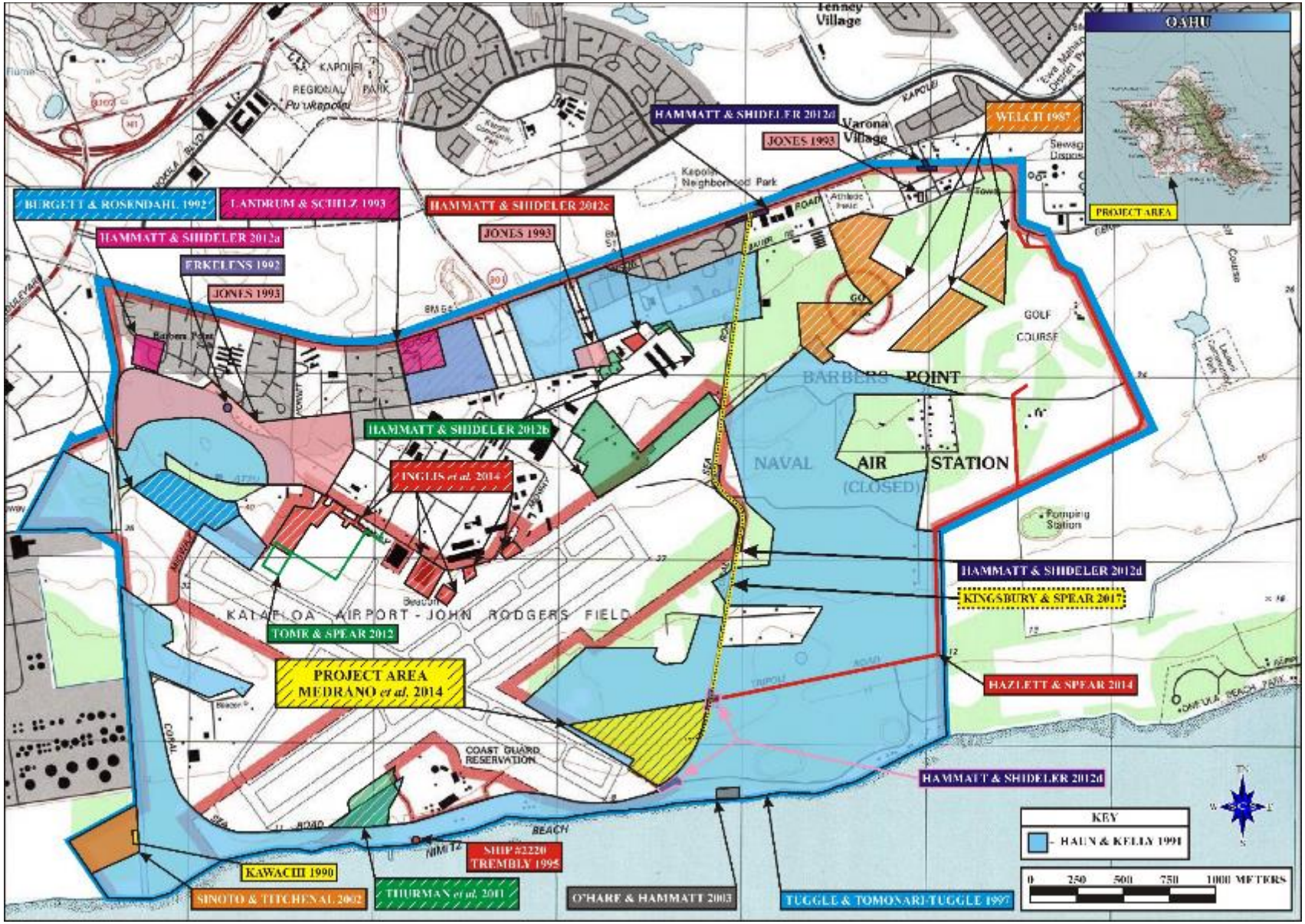

Figure 5. Previous Archaeological Studies within and near the Project Area, shown in striped yellow.

Table 1. Previous Archaeological Studies Overview.

Reference	Type of Study	Location	Findings
Welch 1987	Reconnaissance survey	Ewa Marine Corps Air Station at Barbers Point	Two sites identified: SIHP # -3721(Hawaiian habitation complex with pre-Contact features), SIHP # -3722 (sisal plantation wall)
Kawachi 1990	Inadvertent burial find	Canal at east end of Ōlaʻi Street	SHPD recorded burial exposed in canal bank (SIHP # -4209)
Burgett and Rosendahl 1992	Archaeological inventory survey	Naval Air Station at Barbers Point	Newly-identified 20 Native Hawaiian habitation and agricultural site complexes (SIHP #s -4548 through -4567); included mounds, walls, enclosures, terraces and modified pit caves
Erkelens 1992	Archaeological site survey	Naval Air Station at Barbers Point	Mapped SIHP # -1719, previously described by Haun and Kelly (1991); newly-identified features, including large high walled enclosure, small enclosures, C-shapes and mounds
Jones 1993	Archaeological inventory survey	Naval Air Station at Barbers Point	Re-documented SIHP #s -1718 through -1720, -1723 and -1726, previously described by Haun and Kelly (1991); newly identified Native Hawaiian habitation and agricultural features, historic and military remains
Landrum and Schilz 1993	Reconnaissance and subsurface testing	Naval Air Station at Barbers Point	Identified five new sites; SIHP #s -1728, -4649, and -4653 (sisal plantation walls), SIHP #s -4650 through -4652 (Native Hawaiian habitation/agricultural complexes)
Trembly 1995	Inadvertent burial find	Nimitz Beach	Native Hawaiian flexed pit burial of child 2-3 yrs discovered eroding out of Nimitz Beach dunes; burial added to SIHP # -2220

Reference	Type of Study	Location	Findings
Tuggle and Tomonari-Tuggle 1997	Cultural resource inventory	Naval Air Station at Barbers Point	Re-evaluated sites previously recorded by Haun and Kelly (1991); newly-identified 35 sites (SIHP #s -5093 through -5130, and -5307); including pre-Contact habitation sites, nineteenth century habitation and ranching features, and trail remnants, early twentieth century habitation features, WWII buildings and sites, and cold war structures; paleo-environmental samples collected from pit caves and wetland features
Reference	**Type of Study**	**Location**	**Findings**
Sinoto and Titchenal 2002	Archaeological inventory survey	Desalination facility south of east end of Ōlaʻi Street	Three sites discovered: SIHP # -6373 (short-term Native Hawaiian habitation site), SIHP # -6374 (pit cave utilized as a lime kiln), SIHP # -6375 (complex of seven pit caves with faunal remains representing 13 bird species); carved bone toggle (potentially human) discovered at SIHP # -6373
O'Hare and Hammatt 2003	Field inspection	Naval Air Station at Barbers Point	No cultural resources identified
Thurman et al. 2011	Archaeological inventory survey	Kalaeloa Airport, former Naval Air Station at Barbers Point	Investigated pit caves associated with SIHP # -5121; limited cultural material (basalt cobbles and volcanic glass flake) encountered
Hammatt and Shideler 2012a	Archaeological Inventory Survey	National Guard Kalaeloa Facility	No cultural resources identified
Hammatt and Shideler 2012b	Archaeological field inspection	Northwestern corner of the Kalaeloa Airport, former Naval Air Station at Barbers Point	No cultural resources identified

Reference	Type of Study	Location	Findings
Hammatt and Shideler 2012c	Archaeological assessment	Northern side of the Kalaeloa Airport, former Naval Air Station at Barbers Point	No cultural resources identified
Hammatt and Shideler 2012d	Archaeological field inspection	Eastern side of Kalaeloa Airport, former Naval Air Station at Barbers Point	No cultural resources identified
Tome and Spear 2012	Archaeological monitoring report	TMK (1) 9-1-013: Portion of 032	Absence of archaeological cultural material or subsurface features
Hazlett and Spear 2014	Archaeological inventory survey	Shoulder area of Essex Road, Tripoli Street, Bismark Sea Street, Gambier Bay Street	Three new archaeological sites (State Sites 50-80-12-7572, -7573, and -7574) were identified.
Inglis et al. 2014	Archaeological monitoring plan	TMKs: [1] 9-1-013: 032 por., 088, 089, and 103	Recommended archaeological monitoring.
Medrano et al. 2014	Archaeological inventory survey	TMK: (1) 9-1-013:070. east of the Kalaeloa Airport	Identified twenty-three archaeological sites (State Sites 50-80-12-5119, and -5120, and 50-80-12-7483 through -7494, and 50-80-12-7496 through -7504, comprised of 146 features. State Sites 50-80-12-5119 and -5120 was relocated were re-located and documented with additional features added. State Sites 50-80-12-5119 and -5120 were initially identified by Tuggle and Tomonari-Tuggle (1994). Sites -5119, -7483 through -7485, -7487 (Features 1 and 4), -7488 through -7494, -5120 (Features 1 and 2), and -7496 through -7504 associated with the pre- and /or post-Contact Period. State Sites 50-80-12-7486 (Feature 5) and 50-80-12-7491 were interpreted as trails associated with the pre- and/or post-Contact Period, with use possibly extending into the Historic Ranching Period. State Sites 50-80-12-7487 (Feature 3

Reference	Type of Study	Location	Findings
			and 5) and -5120 (Features 3 through 9) are military historic period structures. Based on feature type, construction methods, construction materials, and observed artifacts, Site -5119, associated with Traditional Hawaiian and historic (military) occupation of the project area.
Kingsbury and Spear 2017	Archaeological field inspection and literature review	(TMK (1) 9-1-013:070) and DOT-H Rights-of-Ways Along Coral Sea Road	Two limestone dissolution pit caves contained historic debris and military historic structures were identified.

and State Site 50-80-12-7486 (Feature 2) are among the historic properties found during the current Archaeological Inventory Survey selected for preservation.

BACKGROUND

This Addendum AIS relies on the historic background included in the Medrano et al. 2014 AIS. Additionally, SCS completed a Literature Review and Field Inspection report on this project area (Kingsbury and Spear 2017) that included a large discussion of the historic background; this report is included in Appendix B.

CONSULTATION

The following consultation meetings were held to inform interested parties about the need for the 12 kV interim electrical distribution line and updates on existing mitigation commitments. The consultation meetings found all parties supportive of the supplemental work documented in this Addendum AIS. Meeting overviews with consulted parties are presented below.

CULTURAL DESCENDANTS

G70 held a meeting with the recognized cultural descendants on April 10th, 2017 to discuss the need for the installation of the 12 kV interim electrical distribution line within the Coral Sea Road ROW and to discuss the ongoing mitigation commitments of the ASEF II solar farm project. Attendees at this meeting included:

> Kilinahe Keliinoi, Kala Keliinoi, Aliikaua Kaleikini, Ka'anohi Kaleikini, Mike Lee, Michael Dega, Mana Caceres, Kalehua Caceres, Makoa Caceres, Hiehie Caceres, Kamana Caceres, Kawika McKeague, Ryan McCauley, and Lani Ma'a Lapilio.

The cultural descendants did not express any concern regarding this additional phase of work.

O'AHU ISLAND BURIAL COUNCIL

G70 presented the project (the need for the 12 kV interim electrical distribution line) at the April 12th, 2017 O'ahu Island Burial Council Meeting, a copy of the meeting minutes is included within Appendix A. G70 also presented the ongoing mitigation commitments of the project. No objections were raised by those in attendance.

'Ahahui Siwila Hawai'i O Kapolei ('ASHOK)

G70 conducted a consultation meeting with 'ASHOK on March 21st, 2017 to discuss the need to install the 12 kV interim electrical distribution line and the ongoing mitigation commitments of the project. 'ASHOK raised no concerns with the supplemental work associated with the 12 kV interim electrical distribution line. 'ASHOK wanted to know if the Solar Farm 12 kV interim electrical distribution line would power local homes and businesses. Also, 'ASHOK requested that they be informed of any historic properties identified in the supplemental work.

KALAELOA HERITAGE AND LEGACY FOUNDATION BOARD

G70 met with the Kalaeloa Heritage and Legacy Foundation Board on April 11, 2017, 6pm in the parking lot outside of the Hawai'i Maoli Building (Door was locked and no one had a key). G70 presented the need to install the 12 kV interim electrical distribution line along the Coral Sea Road ROW. Kalaeloa Heritage and Legacy Foundation Board did not express concern

for the proposed 12 kV interim electrical distribution line. Kalaeloa Heritage and Legacy Foundation Board had more concerns regarding potential impacts to the runway and opportunities for long-term tie-in to the 12 kV interim electrical distribution line. G70 informed the group that determination of who can tie-in will be handled by HECO once the line is transferred.

PREDICTIVE MODEL

SCS had previously completed a Field Inspection and Literature Review (FILR) of this project area (Nigel T. Kingsbury and Robert L. Spear 2017). The field inspection did not identify any historic properties within the project area. However, it did identify numerous dissolution pit caves on either side of Coral Sea Road (beyond the boundaries of the ROW), and a surface concrete structural remnant (beyond the boundaries of the ROW).

SCS's predictive model is based on a mixture of the previous archaeological studies performed in the area surrounding the current project area (including the SCS 2017 FILR), the USDA Natural Resources Conservation Service Soils Survey data, and the local geology. These lines of data indicate that the project area may have the possibility to contain buried limestone dissolution pit caves that contain cultural materials. Furthermore, the area was extensively utilized by the military and may contain deposits associated with the military's former land use.

The predictive model could not isolate a specific portion of the project area that would be most likely to contain these buried deposits as the landscape is fairly uniform and the previously identified historic properties in the area do not appear to have a predictable pattern. Therefore, the entire project area was considered to contain these properties.

FIELD RESULTS

This section presents the results of the Archaeological Inventory Survey both the pedestrian survey and subsurface excavation results. The AIS fieldwork was accomplished on July 24, 2017 by SCS archaeologist Nigel T. Kingsbury, B.A. This work required approximately 8 hours to complete. All the fieldwork for the project was completed under the general supervision of principal investigator Robert L. Spear, Ph.D.

Following a pedestrian inspection, the historic property identification effort focused on a limited subsurface testing program, which targeted the portion of the survey area which

would involve the proposed under-ground 12 kilovolt (kV) interim electrical distribution line. The subsurface testing program consisted of the excavation of six (6) Stratigraphic Trench (ST) test excavations. These test excavations were excavated to assess the stratigraphy and potential for subsurface cultural deposits within the project area. Figure 6 (see below) shows the locations of the Stratigraphic Trenches (ST -1 through ST-6).

The excavations were completed utilizing a Hitachi Z-axis 50U excavator with a two-foot wide bucket. All six excavations measured 5m long by 0.80m wide with varying depths between 0.26mbs and 0.95mbs. Four of the six excavations ceased upon encountering limestone bedrock, while two excavations (ST 1 and ST 6) ceased upon encountering an existing waterline (Figures 7 and 8). ST 1 and ST 6 both showed evidence that the natural limestone bedrock had been excavated through for the modern construction of the waterline and thus did not warrant further excavation at the risk of damaging critical infrastructure.

Figure 6. 2016 Google Earth Aerial Image with all 6 ST locations marked in red.

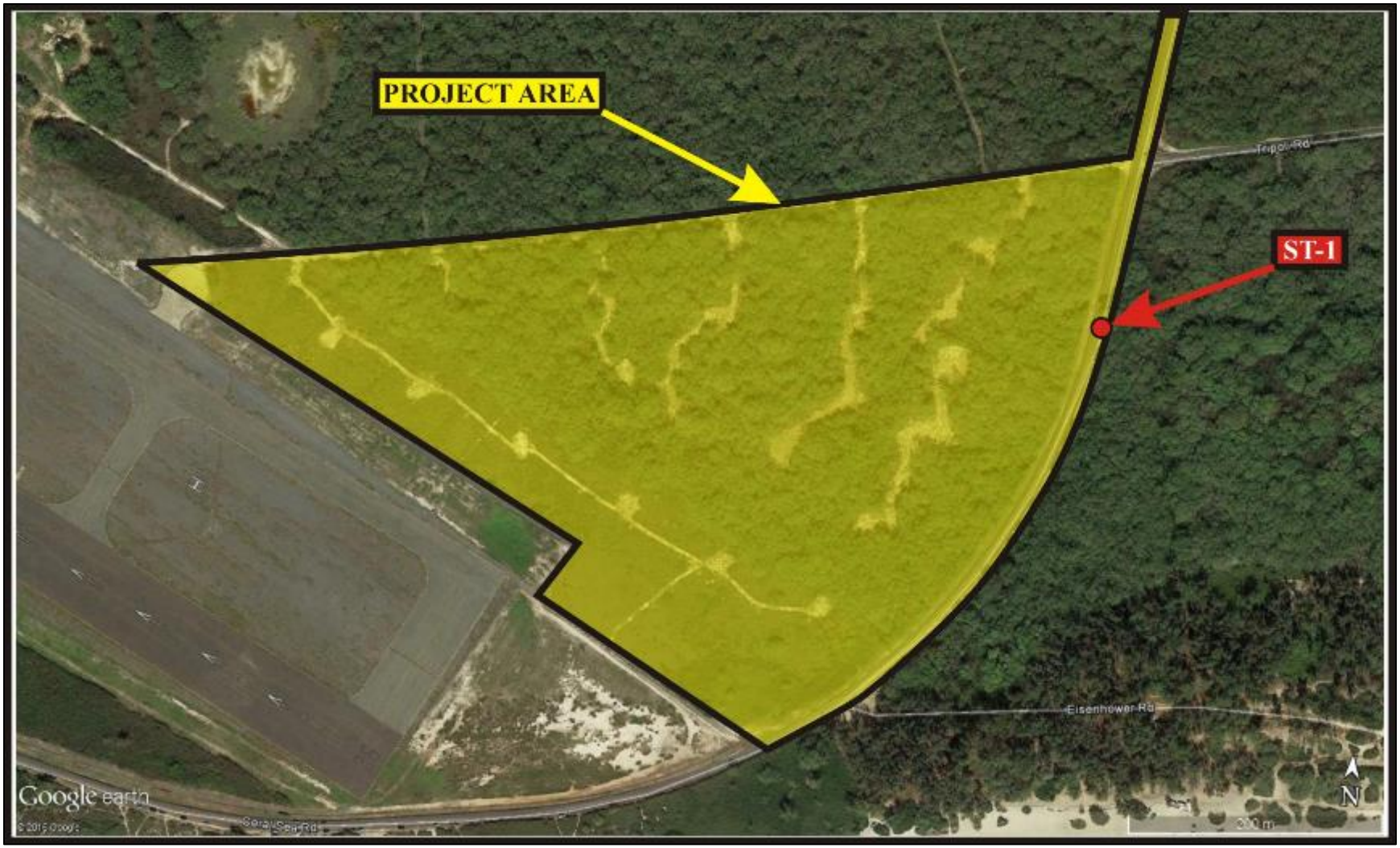

Figure 7. 2016 Google Earth Aerial Image showing the location of ST-1.

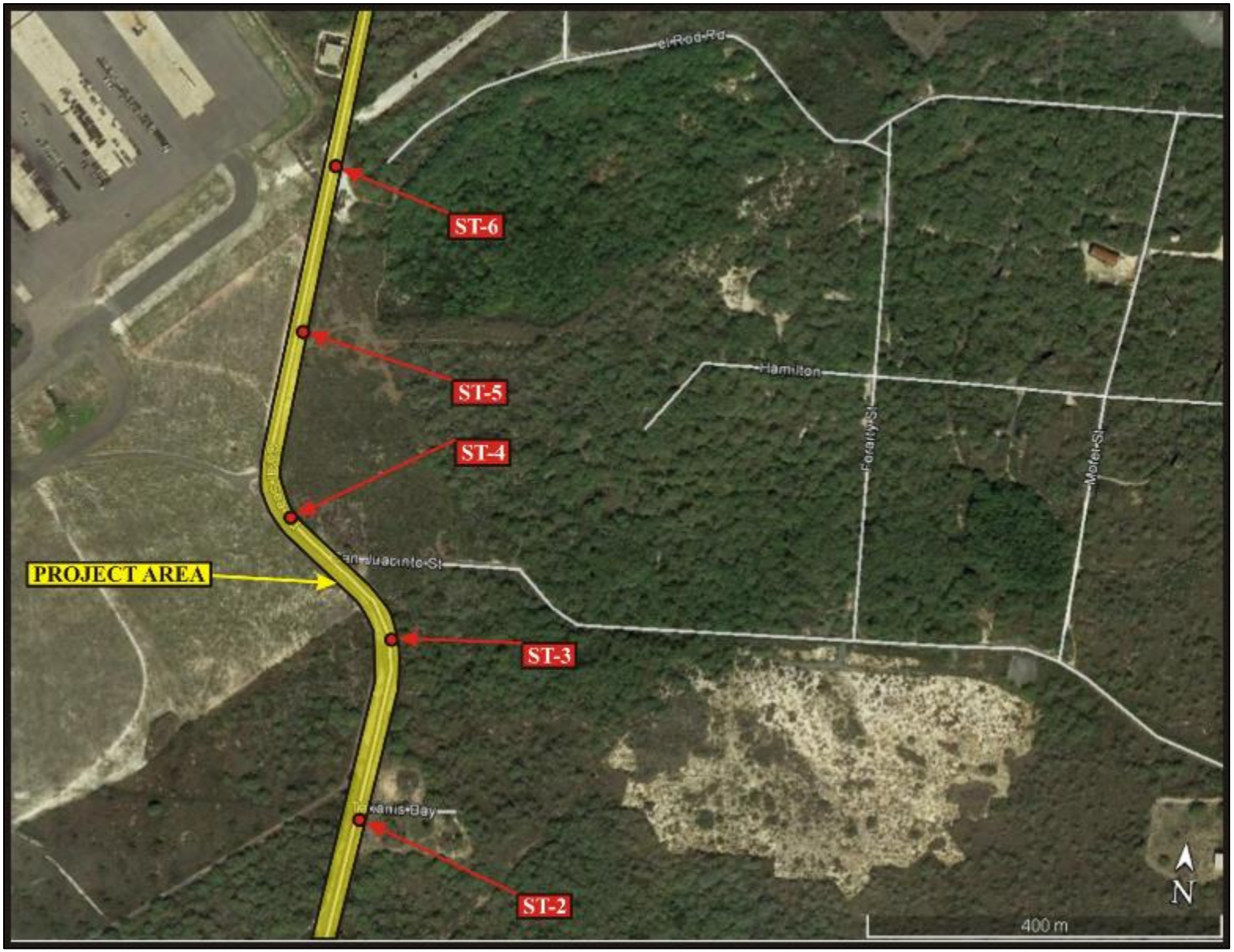

Figure 8. 2016 Google Aerial Image depicting the locations of ST-2 through ST-6.

PEDESTRIAN SURVEY RESULTS

The 100% pedestrian survey resulted in no historic properties identified within the project area. This was the expected result due to the level of previous grading and roadway construction. Photographs taken during the pedestrian survey are included here so that the reader may better orient themselves to the project area (Figures 9 through 11).

SUBSURFACE RESULTS

The Addendum AIS subsurface testing program was accomplished on July 24, 2017 and included six mechanically-excavated Stratigraphic Trenches. These excavations targeted the proposed underground installation of the 12 kilovolt (kV) interim electrical distribution line. Four of the six excavations, ST-2 through ST-5, ceased upon encountering solid limestone bedrock. ST-1 and ST-6 ceased upon encountering portions of a modern water line. ST-1 and ST-6 also presented evidence that a solid limestone bedrock formation was cut to install the modern water line. No historic properties were identified in the subsurface excavations.

STRATIGRAPHIC TRENCH 1 (ST 1)

ST 1 was located within the Coral Sea Road ROW (east, ‘Ewa side) approximately 150m south of Tripoli Street, in the area of the proposed 12 kV interim electrical distribution line crossing Coral Sea Road, furthest southern extent of the proposed 12 kV interim electrical distribution line. ST 1 is oriented north to south at 002°/184° true north (Figure 12). The excavation measures 5m long by 0.80m wide and reached a maximum depth of 0.80 meters below surface (mbs). Excavation of ST 1 ceased upon encountering an active waterline within the excavation. The stratigraphy documented in ST 1 consists of a modern anthropogenic A-horizon (Layer I), a modern era fill (Layer II), a commercial utility fill (Layer III), and natural limestone bedrock (Layer IV). (Figures 13 and 14; Table 2). No historic properties were identified within the excavation.

Of note was the presence of natural limestone bedrock at 0.40mbs in the southwestern corner of the excavation. The implication of the documented limestone bedrock within the southwest corner of the excavation is that the limestone bedrock was previously removed throughout the remainder of the excavation during the installation of the waterline (Figure 15; see Table 2).

Figure 9. Photograph of the Coral Sea Road Row, view to south from Roosevelt Ave seaward (makai).

Figure 10. Photograph of the Coral Sea Road ROW, view to southwest. Photograph from south of Takanis Bay Road and Long Island Street.

Figure 11. Photograph of Coral Sea Road ROW, view to south. Photograph taken north of Tripoli Road seaward (makai) toward Eisenhower Road.

Figure 12. Photograph of ST 1 base of excavation, view to east. Note dark brown fill in base of excavation; water line cushion fill.

Figure 13. Photograph of ST 1 west profile wall, view to northwest. Note cut limestone bedrock in southwest portion of ST 1.

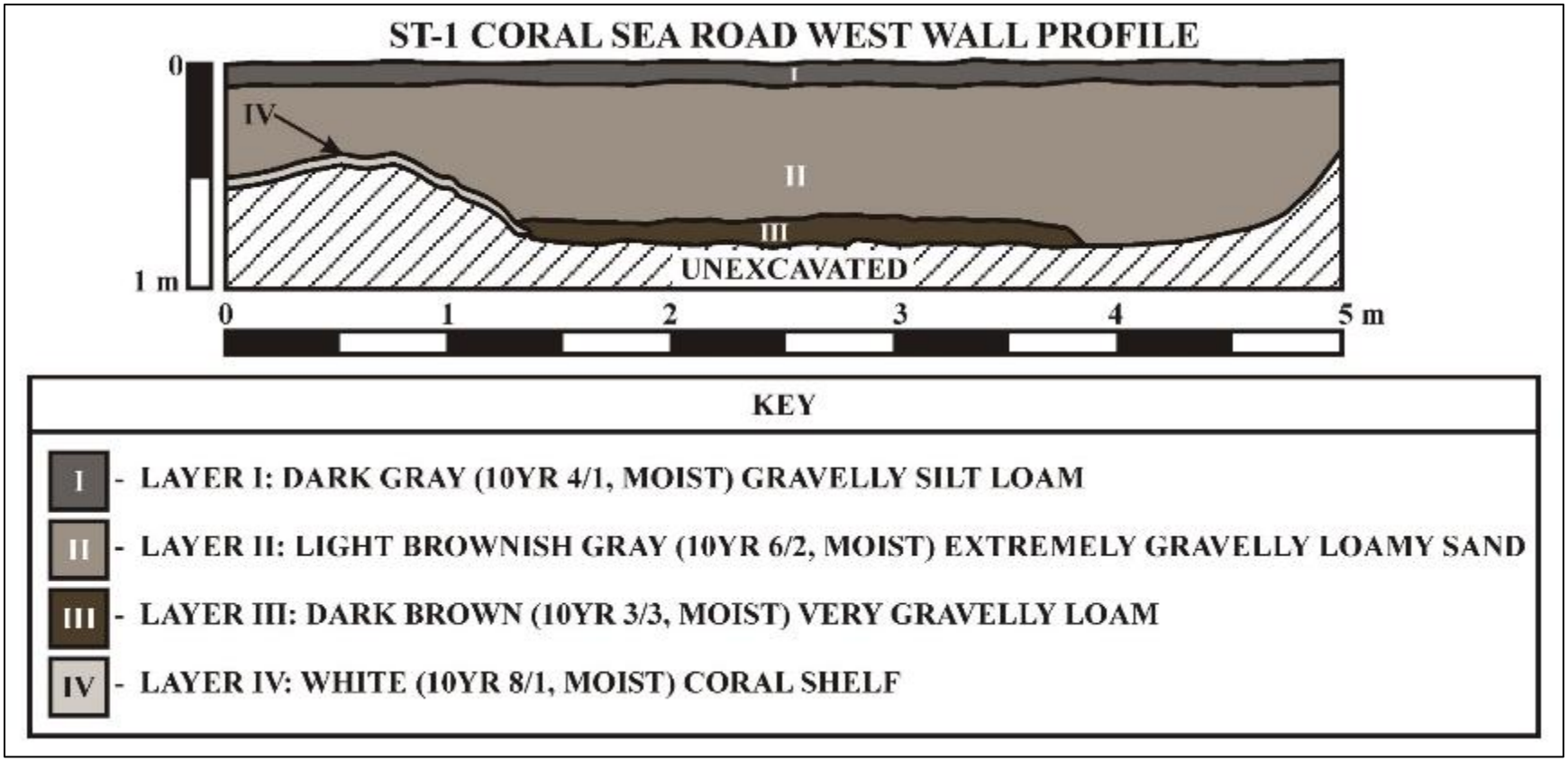

Figure 14. To scale stratigraphic drawing of the west wall of ST 1.

Figure 15. Photograph of ST 1 east profile wall, view to southeast. Note in situ "Caution Water" tape in side wall and dark brown fill in base of excavation.

Table 2. ST 1 Sediment Descriptions.

Layer Designation	Depth (cmbs)	Description
Layer I	0-10	fill; 10YR 4/1, dark grey; gravelly silt loam; weak grade; fine sized; granular structure; moist, friable consistence; mixed origin; non-plastic; many, fine roots; clear lower boundary; smooth topography. Layer I is a modern anthropogenic A-horizon formed from an exposed fill event.
Layer II	10-70	fill; 10YR 6/2, light brownish grey; extremely gravelly course grain sand; structureless, single-grain; moist, loose consistence; marine origin; non-plastic; no roots observed; abrupt lower boundary; smooth topography. Layer II represents a modern fill event likely associated with the construction of Coral Sea Road and with the back filling of utilities.
Layer III	70-80	fill; 10YR 3/3, dark brown; very gravelly loam; weak grade; fine, subangular blocky structure; moist, friable consistence; terrigenous origin; non-plastic; no roots observed; lower boundary not visible; topography not visible. Layer III is a commercial fill material utilized as a waterline cushion material.
Layer IV	40-80	natural; 10YR 8/1, white; limestone; structureless, massive; moist, very rigid consistence; cementation, indurated; marine origin; non-plastic; no roots observed; lower boundary not visible; topography not visible. Layer IV is a natural limestone formation of Pleistocene origins.

STRATIGRAPHIC TRENCH 2 (ST 2)

ST 2 is located at approximately 35m south of Takanis Bay Road, North of Tripoli Street. ST 2 is oriented north to south at 002°/182° true north. ST 2 measures 5m long by 0.8m wide and reached a maximum depth of 0.70mbs. Excavation ceased upon encountering limestone bedrock. The recorded stratigraphy consists of two fill layers (Layer I and Layer II), overlying a natural, non-culturally enriched, silt loam deposit (Layer III), overlying a natural limestone bedrock. No historic properties were identified within ST 2 (Table 3 and Figures 16 through 18).

Table 3. ST 2 Sediment Descriptions.

Layer Designation	Depth (cmbs)	Description
Layer I	0-10	fill; 10YR 3/3, dark brown; very gravelly loam; weak grade; fine, subangular blocky structure; moist, friable consistence; mixed origin; slightly plastic; many, fine roots; abrupt lower boundary; smooth topography. Layer I is a modern anthropogenic A-horizon formed in a modern fill event.
Layer II	10-40	fill; 10YR 6/2, light brownish grey; extremely gravelly course grain sand; structureless, single-grain; moist, loose consistence; marine origin; non-plastic; no roots observed; abrupt lower boundary; smooth topography. Layer II represents a modern fill event likely associated with the construction of Coral Sea Road and with the back filling of utilities.
Layer III	37-70	natural; 10YR ¾, dark yellowish brown; silt loam; weak grade; fine subangular blocky structure; moist, friable consistence; terrigenous origin; slightly plastic; common fine roots; abrupt lower boundary; wavy topography. Layer III is a natural soil formed in alluvium and covered the limestone bedrock.
Layer IV	BOE	natural; 10YR 8/1, white; limestone; structureless, massive; moist, very rigid consistence; cementation, indurated; marine origin; non-plastic; no roots observed; lower boundary not visible; topography not visible. Layer IV is a natural limestone formation of Pleistocene origins

Figure 16. Photograph of ST 2 west long axis profile wall, view to northwest.

Figure 17. Photograph is an overview of the completed ST 2 excavation, view to north.

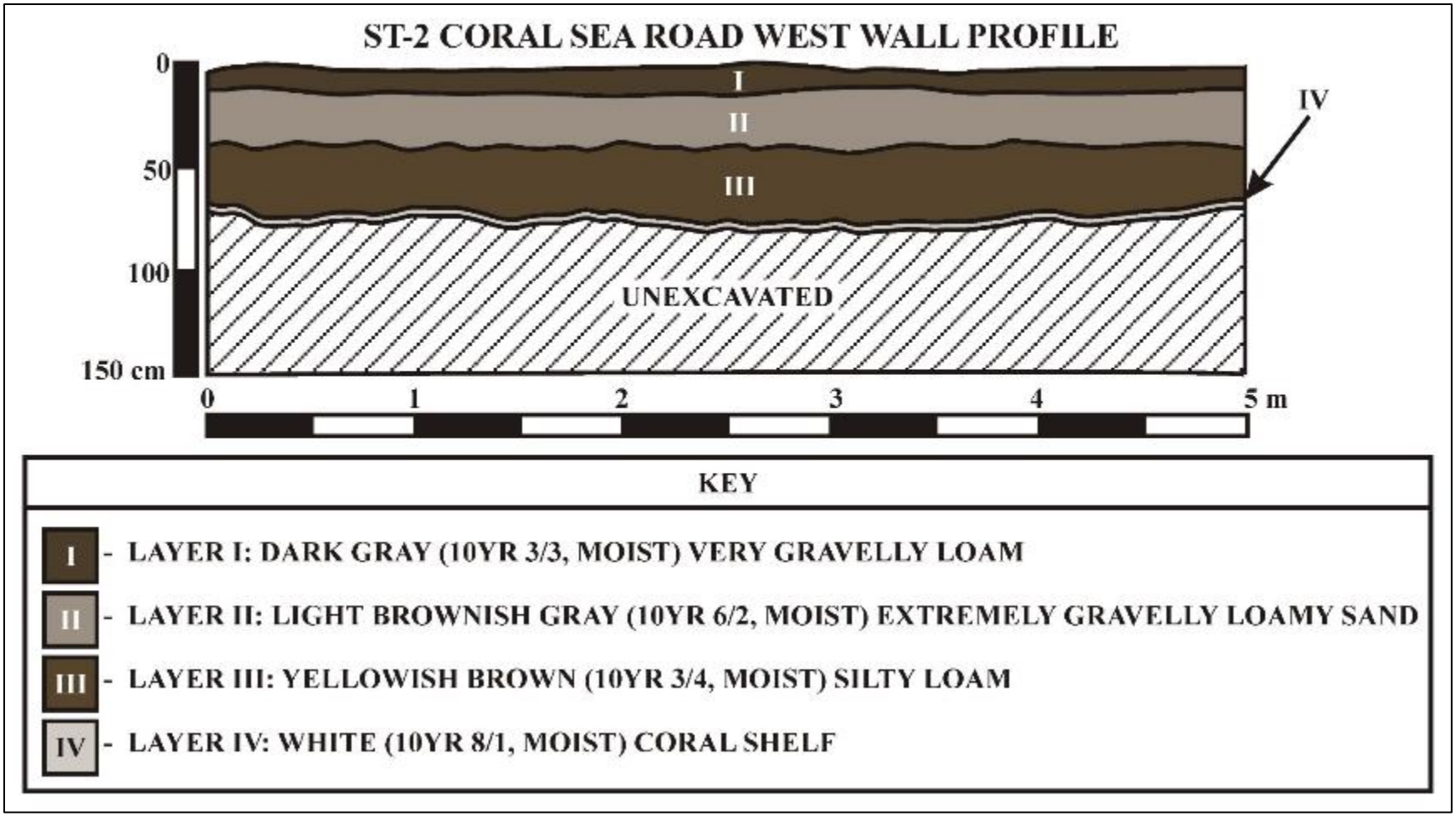

Figure 18. To scale stratigraphic profile drawing of ST 2 west wall.

STRATIGRAPHIC TRENCH 3 (ST 3)

ST 3 is located approximately 60m south of San Juacinto Street, within the Coral Sea Road ROW on the ‘Ewa side. ST 3 is oriented northwest to southeast at 334°/154° true north. ST 3 measures 5m long by 0.80m wide and reached a maximum depth of 0.60mbs. The excavation ceased upon encountering limestone bedrock. The documented stratigraphy consists of two fill layers (Layer I and Layer II) overlying natural limestone bedrock (Layer III) (Table 4 and Figures 19 through 21). Two undulations were noted in the limestone bedrock within the base of the excavation (Figure 22). No historic properties were observed within the excavation.

Table 4. ST 3 Sediment Descriptions.

Layer Designation	Depth (cmbs)	Description
Layer I	0-10	fill; 10YR 4/1, dark grey; gravelly silt loam; weak grade; fine sized; granular structure; moist, friable consistence; mixed origin; non-plastic; many, fine roots; clear lower boundary; smooth topography. Layer I is a modern anthropogenic A-horizon formed from an exposed fill event.
Layer II	10-60	fill; 10YR 6/2, light brownish grey; extremely gravelly course grain sand; structureless, single-grain; moist, loose consistence; marine origin; non-plastic; no roots observed; abrupt lower boundary; smooth topography. Layer II represents a modern fill event likely associated with the construction of Coral Sea Road and with the back filling of utilities.
Layer III	BOE (60)	natural; 10YR 8/1, white; limestone; structureless, massive; moist, very rigid consistence; cementation, indurated; marine origin; non-plastic; no roots observed; lower boundary not visible; topography not visible. Layer IV is a natural limestone formation of Pleistocene origins.

Figure 19. Photograph of ST 3 southwest sidewall, view to west.

Figure 20. Photograph of ST 3 base of excavation, view to northwest.

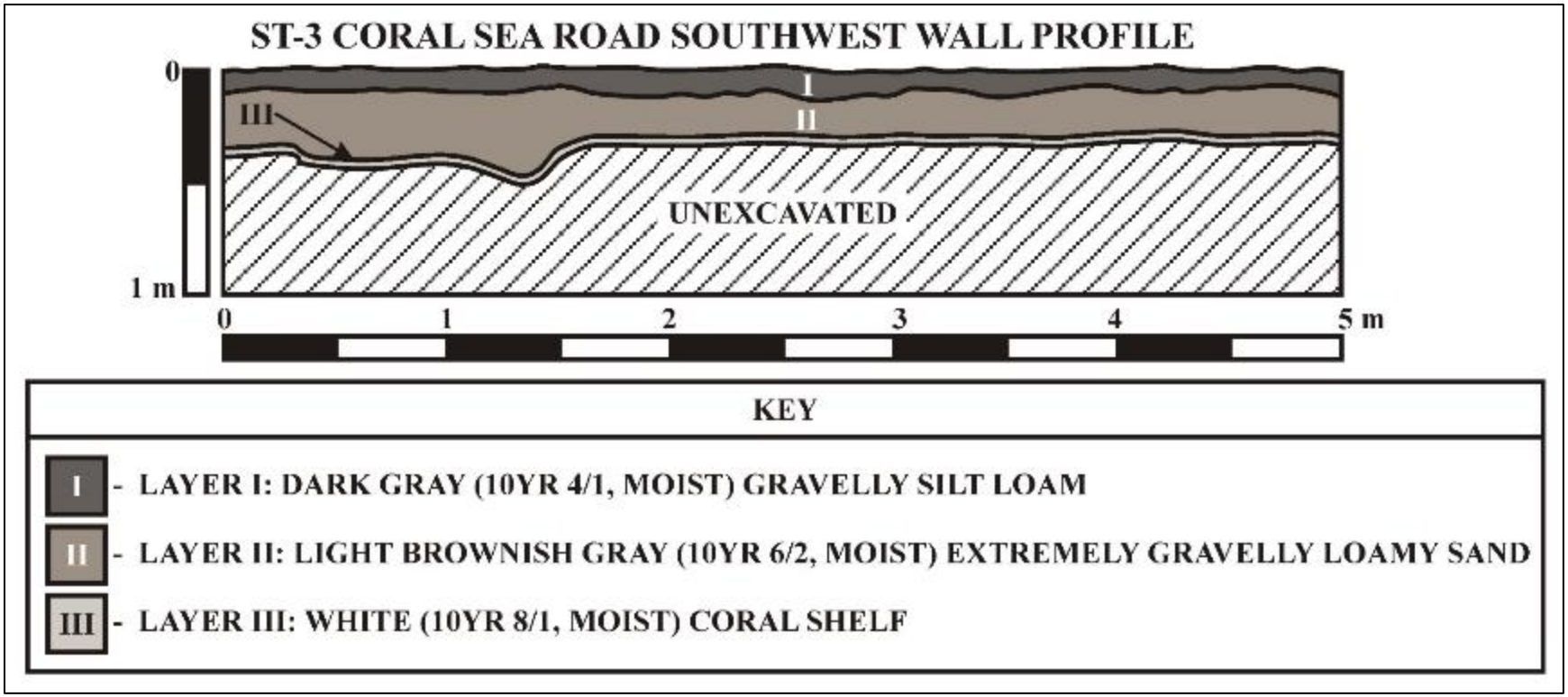

Figure 21. To scale stratigraphic profile drawing of ST-3 southwest wall.

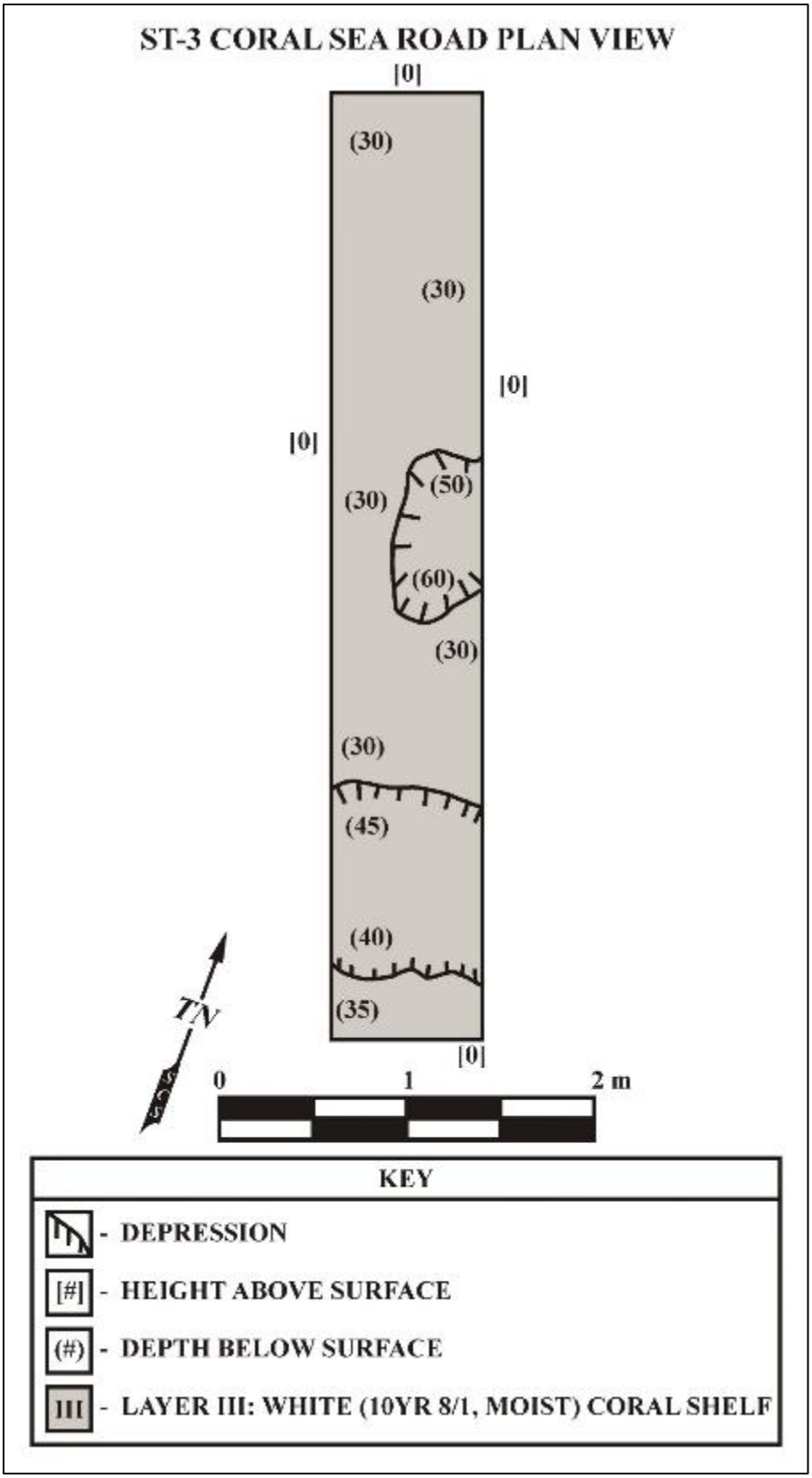

Figure 22. To scale plan view drawing of ST-3.

STRATIGRAPHIC TRENCH 4 (ST 4)

ST 4 is located approximately 50m north of San Juacinto Street (ST 4 was moved south of the original Addendum AIS proposed location because of safety and machine operating constraints). ST 4 is oriented northwest to southeast at 296°/116° true north. ST 4 measures 5m long by 0.80m wide and reached a maximum depth of 0.35mbs. Excavation ceased upon encountering limestone bedrock (Figure 23). Documented stratigraphy consists of a modern anthropogenic A-horizon (Layer I) overlying the natural limestone bedrock (Table 5 and Figures 24 through 27). No historic properties were identified within the ST 4 excavation.

Table 5. ST-4 Sediment Descriptions

Layer Designation	Depth (cmbs)	Description
Layer I	0-35	fill; 10YR 4/1, dark grey; gravelly silt loam; weak grade; fine sized; granular structure; moist, friable consistence; mixed origin; non-plastic; many, fine roots; clear lower boundary; smooth topography. Layer I is a modern anthropogenic A-horizon formed from an exposed fill event.
Layer II	BOE (35)	natural; 10YR 8/1, white; limestone; structureless, massive; moist, very rigid consistence; cementation, indurated; marine origin; non-plastic; no roots observed; lower boundary not visible; topography not visible. Layer IV is a natural limestone formation of Pleistocene origins.

Figure 23. Photograph of ST-4 base of excavation overview, view to northwest.

Figure 24. Photograph of ST-4 southwest sidewall southern portion, view to south.

Figure 25. Photograph of ST-4 southwest sidewall northern portion, view to west.

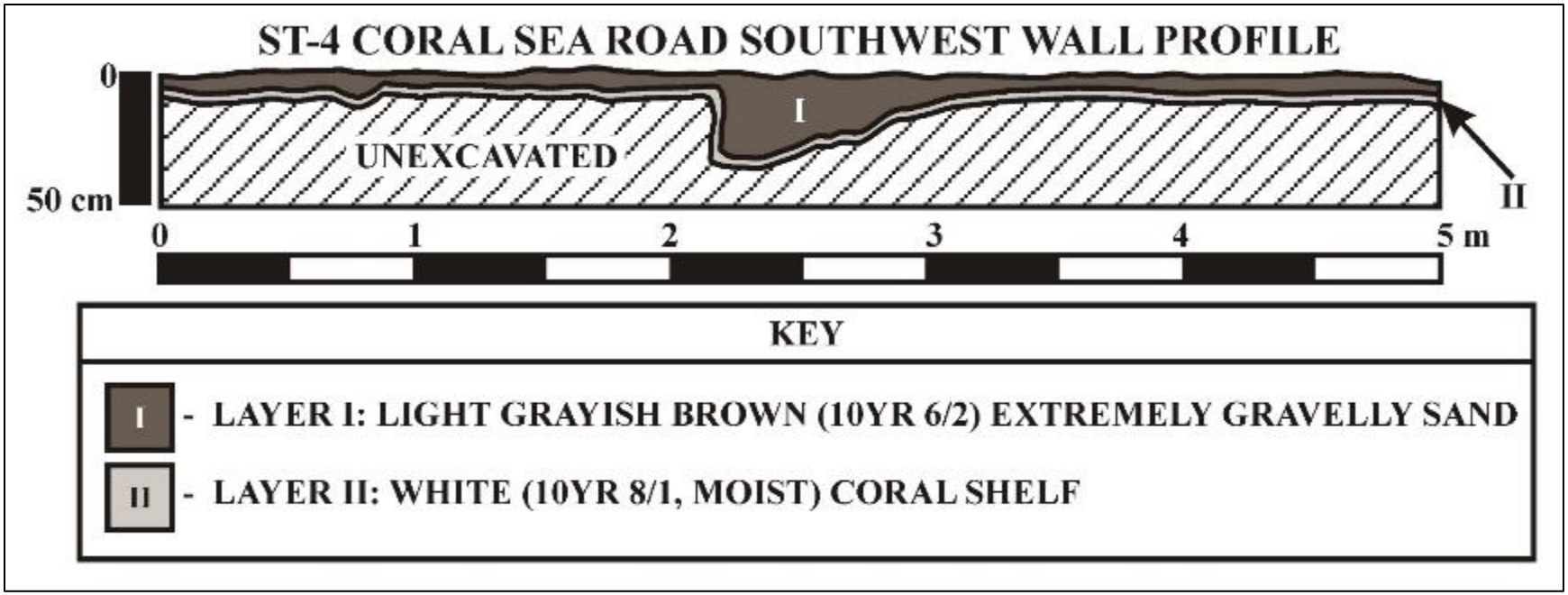

Figure 26. To scale stratigraphic drawing of ST-4 southwest sidewall.

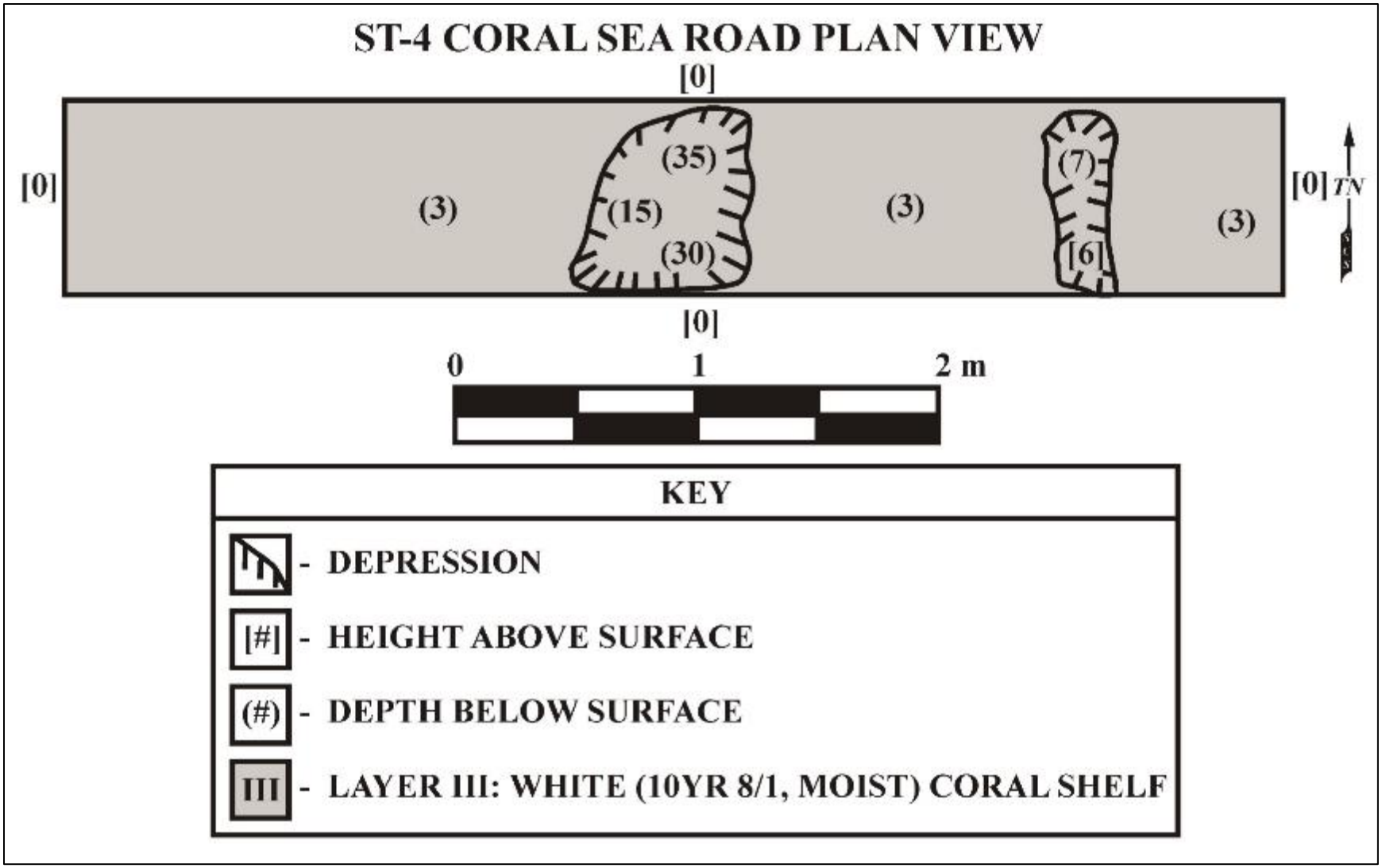

Figure 27. To scale plan view drawing of ST 4. Note two dissolution pit caves.

STRATIGRAPHIC TRENCH 5 (ST 5)

ST 5 is located approximately 210m south of Bismarck Street within the ‘Ewa side of the Coral Sea Road ROW. ST 5 is oriented north to south at 006°/186° true north. ST 5 measure 5m long by 0.80m wide and reached a maximum depth of 0.25mbs. Excavation of ST 5 ceased upon encountering the natural limestone bedrock (Figure 28). The documented stratigraphy consists of a modern anthropogenic A-horizon formed in a fill event (Layer I) overlying the natural limestone bedrock (Layer II) (Table 6 and Figures 29 through 32). No historic properties were identified within ST 5.

Table 6. ST-5 Sediment Descriptions

Layer Designation	Depth (cmbs)	Description
Layer I	0-26	fill; 10YR 4/1, dark grey; gravelly silt loam; weak grade; fine sized; granular structure; moist, friable consistence; mixed origin; non-plastic; many, fine roots; clear lower boundary; smooth topography. Layer I is a modern anthropogenic A-horizon formed from an exposed fill event.
Layer II	26	natural; 10YR 8/1, white; limestone; structureless, massive; moist, very rigid consistence; cementation, indurated; marine origin; non-plastic; no roots observed; lower boundary not visible; topography not visible. Layer IV is a natural limestone formation of Pleistocene origins.

Figure 28. Photograph of ST-5 base of excavation overview.

Figure 29. Photograph of ST-5 west profile wall southern portion, view to west.

Figure 30. Photograph of ST-5 west profile wall northern portion, view to northwest.

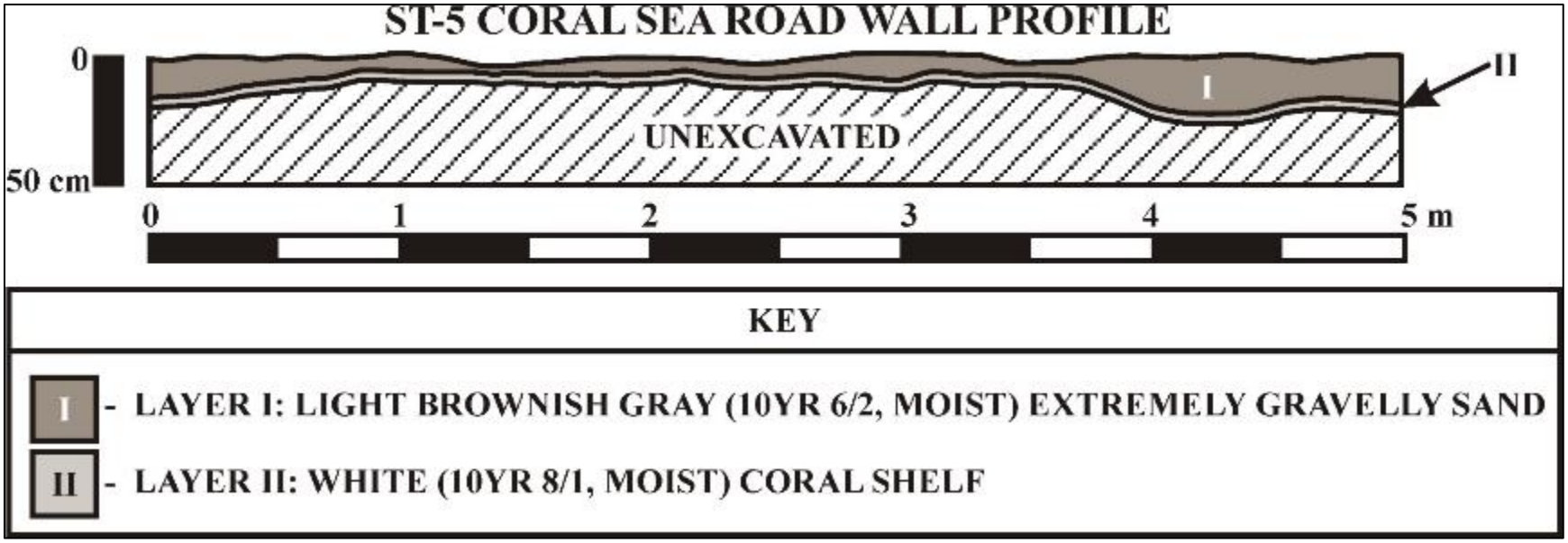

Figure 31. To scale stratigraphic drawing of ST-5 west sidewall.

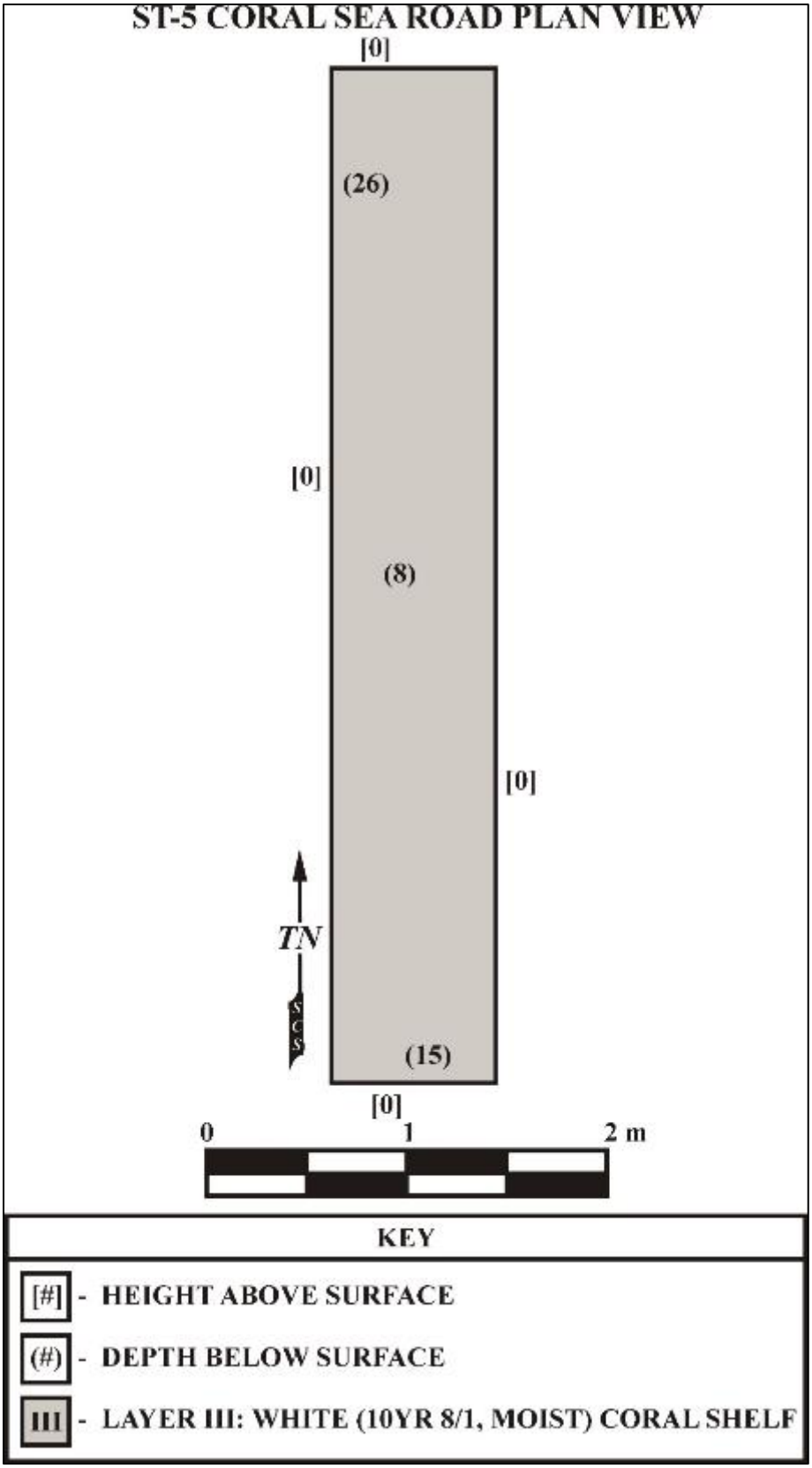

Figure 32. To scale plan view drawing of ST-5.

STRATIGRAPHIC TRENCH 6 (ST 6)

ST 6 is located approximately 12m south of the El Rod Road intersection with Coral Sea Road ROW ('Ewa side). ST 6 is oriented north to south at 010°/190° true north. ST 6 measures 5m long by 0.80m wide and reached a maximum depth of 0.96mbs. Excavation ceased upon encountering both limestone bedrock (western half of excavation) and a live waterline (eastern half of excavation) (Figure 33). The observed stratigraphy consists of a modern anthropogenic A-horizon formed on a modern fill event (Layer I), a modern fill event associated with the construction of Coral Sea Road and the water line installation (Layer II), a commercial fill imported and utilized as a cushion material for a modern waterline (layer III), a natural, non-culturally enriched, silt loam deposit (Layer IV) overlying the natural limestone bedrock (Table 7 and Figures 34 through 39). No historic properties were identified within the ST 6 excavation.

Table 7. ST-6 Sediment Descriptions.

Layer Designation	Depth (cmbs)	Description
Layer I	0-10	fill; 10YR 4/1, dark grey; gravelly silt loam; weak grade; fine sized; granular structure; moist, friable consistence; mixed origin; non-plastic; many, fine roots; clear lower boundary; smooth topography. Layer I is a modern anthropogenic A-horizon formed from an exposed fill event.
Layer II	10-65	fill; 10YR 6/2, light brownish grey; extremely gravelly course grain sand; structureless, single-grain; moist, loose consistence; marine origin; non-plastic; no roots observed; abrupt lower boundary; smooth topography. Layer II represents a modern fill event likely associated with the construction of Coral Sea Road and with the back filling of utilities.
Layer III	65-71	fill; 10YR 4/1, dark grey; extremely gravelly loam; weak grade; fine, subangular blocky structure; moist, friable consistence; non-plastic; terrigenous origin; no roots observed; lower boundary not visible; topography not visible. Layer III is a commercial fill material utilized as a cushion material for a modern waterline.
Layer IV	60-96	natural; 10YR 3/4, dark yellowish brown; silt loam; weak grade; fine subangular blocky structure; moist, friable consistence; terrigenous origin; slightly plastic; common fine roots; abrupt lower boundary; wavy topography. Layer IV is a natural soil formed in alluvium and covered the limestone bedrock.
Layer V	62-96	natural; 10YR 8/1, white; limestone; structureless, massive; moist, very rigid consistence; cementation, indurated; marine origin; non-plastic; no roots observed; lower boundary not visible; topography not visible. Layer V is a natural limestone formation of Pleistocene origins

Figure 33. Photograph of southern portion of west profile wall, view to southwest.

Figure 34. Photograph of north end of west profile wall, view to northwest.

Figure 35. Photograph of north end of east sidewall, view to southeast. Note blue "Caution Water" tape in sidewall.

Figure 36. Photograph of base of excavation, view to north. Note waterline trench on east side of excavation and blue "Caution Water" tape.

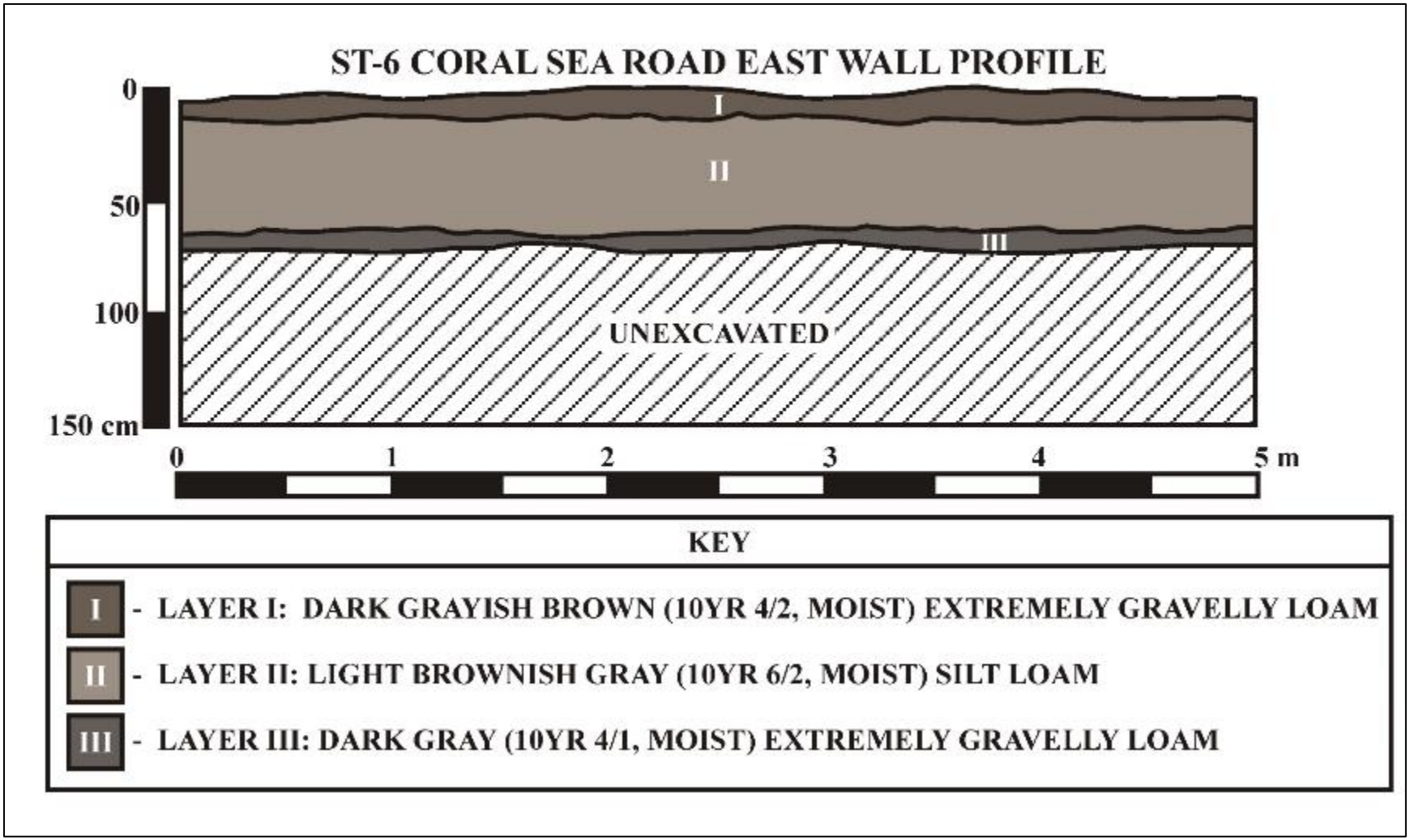

Figure 37. To scale stratigraphic drawing of ST-6 East Side wall.

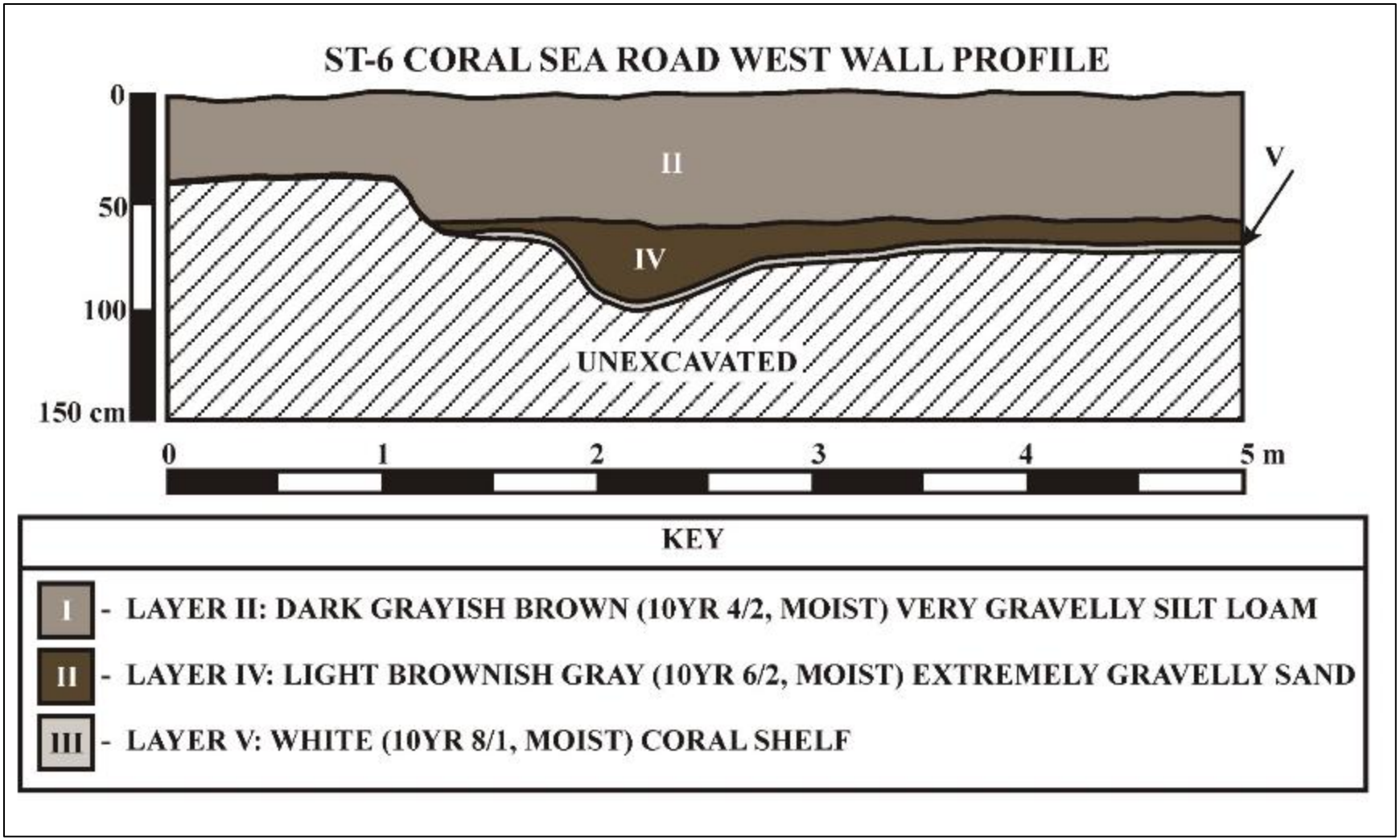

Figure 38. To scale stratigraphic drawing of ST-6 West Side wall.

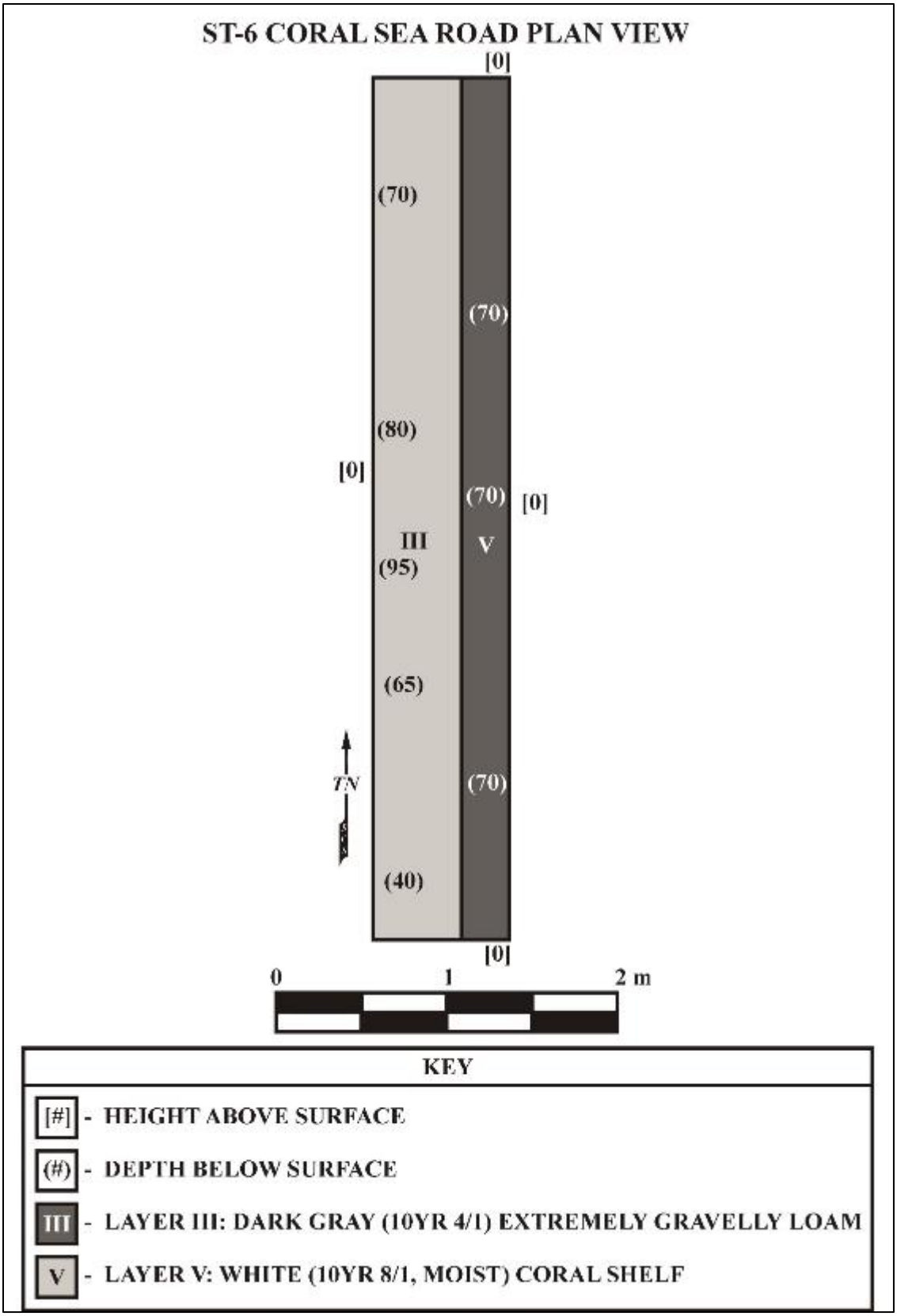

Figure 39. To scale plan view drawing of ST-6.

LABORATORY RESULTS

No materials were observed or collected during the AIS. Based on an absence of cultural materials, no laboratory processing of materials occurred for the Coral Sea Road ROW fieldwork.

SUMMARY AND INTERPRETATION

SCS, at the request of G70 and on behalf of the HCDA and ASEF, in consultation with the SHPD, community consultation groups and civic clubs, and the recognized cultural descendants of the area, completed a comprehensive pedestrian survey and limited sub-surface testing strategy inclusive of six mechanically-excavated 5m long by 0.80m wide Stratigraphic Trenches.

The Stratigraphic Trenches indicate that the depth of the limestone bedrock varies between 0 cmbs and 96cmbs. Additionally, the excavations did encounter buried dissolution pit caves. However, the majority of these were buried by natural processes and all failed to yield cultural materials.

The general stratigraphic sequence observed during the Coral Sea Road ROW Addendum AIS (Addendum to Medrano et al. 2014), consists largely of one to two layers of modern fill overlying coral shelf. The stratigraphic trench excavation results indicate that the level of previous disturbance in the Coral Sea Road ROW ranges from very minor (ST 2 through ST 5) to extensive (ST 1 and ST 6). Additionally, a natural, culturally sterile, soil (10YR 3/4, dark yellowish brown; silt loam) was observed overlying the limestone bedrock in ST 2 and ST 6. While it is impossible to rule out the possibility that pre-Contact to historic era deposits could exist in other portions of the project area, the likelihood of such deposits is exceedingly minute.

PROJECT EFFECT AND MITIGATION RECOMMENDATIONS

The following project effect discussion and cultural resource management recommendations are intended to facilitate project planning and support the project's historic preservation review.

PROJECT EFFECT

SCS's project effect recommendation is "effect with agreed upon mitigation commitments" as indicated in the Medrano et al. 2014 AIS. However, SCS recommends that monitoring for the Coral Sea Road ROW portion be covered under an approved project wide Archaeological Monitoring Plan but that this roadway utility corridor portion be limited to on-call monitoring due to the low likelihood of encountering historic properties within the Coral Sea Road ROW.

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APPENDIX A: CONSULTATION AND CORRESPONDENCE

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ESTHER KIA'AINA
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

HISTORIC PRESERVATION DIVISION
DEPARTMENT OF LAND AND NATURAL RESOURCES

601 Kamokila Boulevard, Suite 555
Kapolei, HI 96806

February 25, 2014

Dr. Robert Spear
Scientific Consultant Services, Inc.
1347 Kapiolani Boulevard, Suite 408
Honolulu, Hawaii 96814

LOG NO: 2013.6641, 2014.00823, 2014.00528
DOC NO: 1402SL27
Archaeology

Dear Dr. Spear:

SUBJECT: **Chapter 6E-8 Historic Preservation Review–**
Archaeological Inventory Survey Report for a Proposed Solar Farm in Kalaeloa Honouliuli Ahupua'a, 'Ewa District, O'ahu Island, Hawai'i
TMK: (1) 9-1-013:070

Thank you for the opportunity to review this revised report titled *Archaeological Inventory Survey Report for a Proposed Solar Farm in Kalaeloa, Honouliuli Ahupua'a,'Ewa District, O'ahu Island, Hawai'i [TMK: (1) 9-1-013:070]* (Medrano et al., February 2014). We received this submittal on February 25, 2014.

The archaeological inventory survey (AIS) was conducted by Scientific Consultant Services, Inc. (SCS) of 44 acres of undeveloped land in support of a proposed solar farm. The property owner is Hawai'i Community Development Authority (HCDA). The AIS identified 23 historic properties (Table 1), of which two were previously identified (Sites 5119 and 5120). The sites mainly consist of complexes of Traditional Hawaiian habitation and/or agricultural, refuse, and storage features. Also present are two probable burial features (Site 7483, Feature 4, and Site 7486, Feature 2), one site containing a military airplane wreckage (Site 7487) and one site containing military structural remnants (Site 5120).

Data recovery is recommended for Site 7487, Features 2A-2C and for Site 7502, Feature 1, while all other sites and/or features are recommended for preservation. Site 7487, Features 2A-2C (airplane crash wreckage) were recommended for data recovery because the Pacific Aviation Museum expressed interest in having the site further documented and having all materials collected for possible display. Site 7502, Feature 1 (agricultural rock mound) was recommended for data recovery because it will be impacted during installation of the solar farm structures. All of the sites are recommended as significant pursuant to Hawai'i Administrative Rules (HAR) §13-275-6 under Criterion d (have yielded, or has potential to yield, information important to prehistory or history). Sites 7483 and 7486 also are recommended as significant under Criterion e (importance to Native Hawaiians) because of the probable presence of Native Hawaiian burials. Four mitigation measures are recommended to address potential for construction of the solar farm to adversely affect historic properties. These consist of (1) a preservation plan for all historic properties recommended for preservation (see Table 1); (2) a burial treatment plan for Site 7483, Feature 4 and for Site 7486, Feature 2 which have been identified as probable burial features; (3) a data recovery plan for Site 7487, Features 2A-2C and for Site 7502, Feature 1; and (4) an archaeological monitoring plan for on-site monitoring during all project-related ground disturbing activities to address any potential subsurface historic properties that may be encountered and to ensure that the sites recommended for preservation are not adversely impacted during construction. We concur with the site assessments and mitigation recommendations.

The report provides adequate discussion of the project environs, cultural and historical background, previous archaeological investigations, field and laboratory methods and results, and the site assessment and mitigation recommendations. The revisions adequately address the issues and concerns raised in our earlier review correspondence (October 18, 2013; Log No. 2013.4819, Doc. No. 1310SL16), and in our project meetings and email correspondence pertaining to several interim drafts (November 22, 2013; February 5, 21, and 25, 2014).

Figure 40. SHPD Acceptance Letter for Medrano et al. (2014) AIS.

Dr. Spear
February 25, 2014
Page 2

The archaeological inventory survey report meets the requirements specified in HAR §13-276-5. It is accepted by SHPD. Please send one hardcopy of the document, clearly marked FINAL, along with a copy of this review letter and a text-searchable PDF version on CD to the Kapolei SHPD office.

Please contact me at (808) 692-8019 or at Susan.A.Lebo@hawaii.gov if you have any questions regarding this letter.

Aloha,

Susan A. Lebo

Susan A. Lebo, PhD
Oahu Lead Archaeologist

Table 1. Archaeological Historic Properties Identified During AIS.

SIHP	Total Features	Feature Types	Function	Significance Recommendation	Mitigation Recommendation
7483	10	Karst pits, mounds (possible burial), mounds (agriculture)	Ag/refuse, w/possible burial component	d, e (Feature 4)	Preservation
7484	3	Karst pits, midden scatter	Ag/refuse, habitation complex	d	Preservation
7485	2	Karst pit, mound	Ag/refuse	d	Preservation
7486	5	Karst pits, linear path, and rock mound	Ag/refuse, ranching, transportation, w/possible burial component	d, e (Feature 2)	Preservation
7487	12	Karst pits, airplane crash remnants, concrete pads, L-shaped structure, and platform/wall	Ag/refuse, storage, military, and boundary	d	Preservation, Data Recovery (Features 2A-2C)
7488	1	Karst pit	Ag/refuse	d	Preservation
7489	2	Karst pits	Ag/refuse	d	Preservation
7490	3	Karst pits, walled karst pit	Ag/refuse	d	Preservation
7491	1	Path	Transportation	d	Preservation
7492	45	Rock mounds, enclosures, and C-, reverse J-, L-, T-, and U-shaped structures	Ag/habitation complex	d	Preservation
7493	1	Karst pit	Storage/refuse	d	Preservation
7494	1	Walled karst pit	Ag/storage	d	Preservation
7496	2	Platform, platform/mound	Ag/habitation and storage complex	d	Preservation
7497	1	Rock mound	Ag	d	Preservation
7498	3	Karst pits	Ag/refuse, storage complex	d	Preservation
7499	3	Karst pits, walled karst pit	Ag/storage and refuse complex	d	Preservation
5119	37	Karst pits, and C-, L-, and U-shaped structures	Ag/refuse, storage, habitation complex	d	Preservation
5120	9	Karst pit, wall, concrete pad, guard shack, and concrete enclosure, foundations, and pillbox	Ag/refuse, military, boundary	d	Preservation
7500	1	Karst pit	Ag/refuse	d	Preservation
7501	1	Mound	Dozer push pile	d	Preservation
7502	1	Mound	Ag	d	Data Recovery (Feature 1)
7503	1	C-shaped structure	Habitation	d	Preservation
7504	2	Karst pit, mound	Ag/refuse	d	Preservation

Figure 41. SHPD Acceptance Letter for Medrano et al. (2014) AIS.

From: Matsushima, Kimi R
Sent: Friday, June 9, 2017 10:56:44 AM
To: morgan@scshawaii.com
Subject: RE: Trenching fieldwork for Coral Sea Road's AIS (SCS #2022)

Hi Morgan,

I don't have a problem with the proposed locations but please add in these following provisions as part of the testing methodology.

1. Features shall be documented in a profile and plan view map;
2. Prior to profiling and photographing, the excavation sidewalls shall be thoroughly cleaned so that stratigraphy and/or features are visible;
3. At least one full-length profile of an excavation's long-axis wall will be completed;
4. If significant cultural layers or features are identified within an excavation then two or more profiles shall be completed (full length of both long-axis walls, etc.);
5. All photographs of excavations, features, etc. shall include an appropriately sized and legible scale;
6. Stratigraphic descriptions shall be done to USDA soil standards; and

If you concur then send me an email and we'll call the testing strategy approved and they can move forward.

Thanks!
Kimi

From: morgan@scshawaii.com [mailto:morgan@scshawaii.com]
Sent: Friday, June 09, 2017 10:19 AM
To: Matsushima, Kimi R <kimi.r.matsushima@hawaii.gov>
Subject: Trenching fieldwork for Coral Sea Road's AIS (SCS #2022)

Aloha Kimi,

Thank you for meeting with me to go over the proposed subsurface trenching locations for the Coral Sea Road transmission corridor AIS in Kalaeloa. Attached are the three maps we discussed, with the trench locations marked by dots. Each of these trenches will be along the east/Ewa side of the road, parallel to it, within the ROW. They will be 5.0m long by 0.40m wide and the depth will be determined by the coral shelf or water table, whichever is reached first.

If you could let me know that these graphics meet your approval, they are waiting to start a DOT permit submittal which would include these as an attachment.

Mahalo,

Morgan

Figure 42. SHPD acceptance of AIS Testing Strategy via e-mail correspondence.

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

JEFFREY T. PEARSON
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
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COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
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FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD. STE 555
KAPOLEI, HAWAII 96707

APPROVED MINUTES
OAHU ISLAND BURIAL COUNCIL MEETING

DATE: **Wednesday, April 12th, 2017**
TIME: **10:06 AM**
PLACE: **Department of Land and Natural Resources**
Board Room
Kalanimoku Building, 1st Floor
1151 Punchbowl Street
Honolulu, HI 96813

Attendance:
Chuck Ehrhorn, Chair; Large Landowner Representative
Beverly Amaral; Large Landowner Representative
Mana Caceres; Ewa Moku Representative
Kali Fermantez; Koolauloa Representative
Danna Holck; Large Landowner Representative
Aulii Mitchell; Waianae Moku Representative

Staff:
Regina K. Hilo, Burial Sites Specialist, SHPD
Susan Lebo, Archaeology Branch Chief, SHPD
Kimi Matsushima, Oahu Lead Archaeologist, SHPD
Stephanie Hacker, Oahu Assistant Archaeologist, SHPD

Guests:
Matt McDermott, Cultural Surveys Hawaii (CSH)
Kumu Mike Lee, Cultural Descendant
Daniel Akiyama, CSH
Kira-Lin Kow, Park Engineering
Steven Harano, Park Engineering
Kawika McKeague, G70
Hal Hammatt, CSH
Zoe Hammatt, CSH
Kaanohi Kaleikini, OCR/Descendant
Steve Clark, PCSI
Marc Chun, Board of Water Supply (BWS)
David Nagano, BWS
Joanna Seto, DOH- SDWB
Michael Cummings, DOH-SDW
Rick Ellis, BWS-NORESCO
Will Travers, BWS-NORESCO
Henry Chang, Ililani LLC
Mike Miyahira, DOH-SDWB
Ellen Kitamura, BWS

APPROVED

Figure 43. OIBC 04/12/2017 Meeting Minutes pg. 1

David Shideler, CSH
Ron Hashiro, Yogikwong Engineers
Aaron Lee, Ililani
Mark Babilonia, Kawaiahao Church
Lani Maa Lapilio, Aukahi
Morgan Davis, SCS

I. CALL TO ORDER
Meeting called to order by Chair Ehrhorn at 10:06 AM

II. ROLE CALL/PULE
Pule offered by Council member Fermantez
Council members introduced themselves in the following order: Aulii Mitchell, Beverly Amaral, Kali Fermantez, Chuck Ehrhorn, Danna Holck, and Mana Caceres

III. APPROVAL OF MINUTES
Items B, C, D, and F were deferred to a future OIBC meeting

A. Minutes from 7/13/2016

Motion: to approve the minutes from the 7/13/2016 OIBC meeting
Moved by: Bev
2nd: Aulii
VOTE: ALL IN FAVOR

~~**B. Minutes from 9/14/2016**~~
~~**C. Minutes from 11/09/2016**~~
~~**D. Minutes from 12/14/2016**~~
E. Minutes from 02/08/2017

Motion: to approve the minutes from the 02/08/2017 OIBC meeting
Moved by: Aulii
2nd: Mana
VOTE: ALL IN FAVOR

~~**F. Minutes from 03/08/2017**~~

IV. Business

A. Discussion on O'ahu Island Burial Council membership, roles, and responsibilities
Information/Discussion: Discussion on the above items.

[Chair Ehrhorn read the above agenda item onto the record]
Summary of testimony provided, below:
Hearings for Island Burial Council nominees, new and returning, in Senate's Hawaiian Affairs committee is scheduled for Thursday, April 13; OIBC nominees are Hina Wong-Kalu, Danna Holck, Kali Fermantez, and Bev Amaral
Chuck will be at hearings to lend support
Mike Lee thanked the Council for help with Hoakalei and Kauhale Preserve

APPROVED

Figure 44. OIBC 4/12/2017 Meeting Minutes pg.2

B. Proposed Bills and/or Measures Relating to Historic Preservation under consideration in the 29th convening of the Hawaii State Legislature, 2017: HB875 – Relating to Historic Preservation; SR91/SCR177 – Requesting the State Historic Preservation Division of the Department of Land and Natural Resources conduct a survey throughout the state of Hawaii and recommend sites for inclusion on the National Register of Historic Places; HB1213 – Relating to the Department of Land and Natural Resources
Information/Discussion: Discussion on the above item.

Item presented by Regina K. Hilo, SHPD
Summary of testimony follows, below:
HB875, HB1213
Senate Resolution 91/Senate Concurrent Resolution 177 tasks the State Historic Preservation Division (SHPD) to identify properties eligible for the state and national register; does not provide funding or an implementation mechanism

C. Honolulu Board of Water Supply's Energy Savings Archaeological Inventory Survey Project, National Historic Preservation Act Section 106 and Hawaii Revised Statutes Chapter 6E, at 650 S. Beretania Street, Honolulu Ahupuaʻa, Honolulu District, Oʻahu, TMK: [1] 2-1-036:005 (por.)
Information/Discussion: Update on the above item.

Presented by Alani Apio, Steve Clark, Rick Ellis, Ellen Kitamura
PowerPoint presentation
Summary of testimony provided below:
Burial find under AIS, able to preserve in place
Federal funds for 58 projects, energy savings and production, discontiguous areas
Large-size and scale, not made for houses; a drop in the bucket energy-wise, but provides economic benefit to BWS; BWS is a semi-autonomous government non-profit, system is bought in for 20 years, savings of millions; more efficient usage of BWS funds, less consumption of fossil fuels
Ellen Kitamura introduced herself: BWS has not been in front of OIBC for a few years, has a large pipeline project as part of its 30-year master plan; BWS is sensitive to Hawaiian community's needs and concerns, and is committed to work with the OIBC; BWS mission is to provide water to communities, identify impacts; for inadvertent finds, it will work with OIBC
Danna: Why was BWS not been here?
Alani (summarized): recession of 2008 hit hard, and BWS pulled back on all their capital improvement projects
Ellen (summarized): [distributed business card] contact her directly if there are any questions
Alani (summarized): well pump replacement projects, putting in systems to utilize energy more efficiently; 28 areas already dug-up, on-call monitoring
Steve Clark: err on the side of caution
Alani: rooftop PVC, built-out area; ground disturbance needed for utility tie-in
(RKH left meeting at 10:50 AM)

Barbers Point 215 NP – On Site Assessment
Stony soils, reservoir for many years, sites w/in hundreds of meters, will do an assessment just in case

D. Honolulu Board of Water Supply proposal for burial vault construction on Oʻahu in preparation of large-scale pipeline replacement projects, pipeline section, segment, and/or alignment TBD

APPROVED

Figure 45. OIBC 4/12/2017 Meeting Minutes pg. 3

Information/Discussion: Introduction and discussion of the above proposal.

Presented by Alani Apio, Kamau LLC
Summary of testimony:
Board of Water Supply will be replacing 2500 miles of pipeline, some segments are over 60 years old; e.g. Punaluu segment – 64 sets of iwi kupuna, which took 8 years to re-bury; some of the replacement pipeline segments cannot be moved, and new lines cannot be placed into the old line excavations because water service needs to be maintained
Discussion: work with community to identify areas where burial vaults can be built; not a pre-determination, but will be site, project, and kupuna specific; construction of burial vaults takes time; kakoo finding locations, but not necessarily the construction of burial vaults ahead of time; the proposed process may become the norm; has taken years to get SHPD approval for vault construction in Kailua, currently on year 5; go out into community, consult with descendants, use every engineering approach; suggestions received can be and are conflicting, and the goals ahead to be met are challenging; Council members want to be kept appraised of meetings with and in communities; BWS broaching the topic, and if the Council is a decision-making entity in these cases, BWS would be supportive of their recommendations; BWS is not trying to pre-determine any decisions; at this time, Council recommends going out and talking with the communities as they are not opposed to the suggestion and appreciate the consideration and thought-process behind getting kupuna back into the ground sooner rather than later; attendee and some Council members are opposed to the idea

E. Aloha Solar Energy Fund II Project, ASEF II, in Kalaeloa, Honouliuli Ahupuaa, Ewa District, Oahu Island, TMK: [1] 9-1-013:070
Information/Discussion: Update on the above project.

Presented by Kawika McKeague, G70
Summary of testimony
....
1997 Navy decommissioned Barbers Point
1999
Fieldwork in April 2013, OIBC Kalu and Shad Kane did site visit; Dec. 2013 recognized 22 CDs, 2014 recognized one; 1st CD meeting in 2014; went on hold for a number of reasons – rehab old Kalaeloa East Energy lines, not cost feasible; to be cost-savvy, need to create the line and connect it; intact sites throughout the area; culturally important plants: kauanaoa, ilima,
146 features, red and yellow; natural barriers (kiawe) are intact
Coral dry-stacked wall; sites exposed to natural elements; preservation plan will propose
4 conditions: amp, adr, pp, btp
Probable burial site 1: no testing; by size, shape, and convex, looks like other Kalaeloa burial sites; confirmed no need to test opinion via recognized descendants, and OIBC stated the same; H&C recommended the probable burials be treated as burials
Kali: when did
K: Dec 2014
Probable burial 2:
Aulii: what are the traditional burial practices in Kalaeloa
K: above surface, and in karst pits, sand burials too
Kali:
Kawika: Malden trail, also Kaahupahau trail; portions are aligned with Coral Sea Road; best practices solution, respond to cultural features; all orange areas become part of a
Land is HCDA owned, project proponents are in lease agreement negotiations with HCDA; mauka portion is owned by Kalaeloa Cultural Heritage Foundation

Figure 46. OIBC 4/12/2017 Meeting Minutes pg. 4

APPROVED

Protect two wahi kanu as part of larger archaeo preserve with passive preservation activity inclusive of periodic ….; sense of place and space – pueo; (2), (3), (4)

F. Howard Hughes Corporation Block O Project, Kakaʻako, Honolulu Ahupuaʻa, Honolulu (Kona) District, Oʻahu, TMK: [1] 2-1-050:001, 061, and 062
Information/discussion: Update on the above project.

Presented by Matt McDermott
Intersection of Ward and Halekauila, where Dixie Grill used to be; ffordable housing, Longs Drugs; 2013-2014 AIS, 27 test excavations plus 3 excavations for HART along Halekauwila and Ward, no iwi kupuna, one historic property ID'ed w historic land use; 1884 Bishop Map showing Land Commission Awards; mixed use area in 1884;
Burial finds on Feb. 15-16, 2017, and Feb. 24, 2017

Item V.A. taken next

G. Ililani Project, Kakaʻako, Honolulu Ahupuaʻa, Honolulu (Kona) District, Oʻahu, TMKs: [1] 2-1-051:011 and 012
Information/Discussion: Update on the above project.

Presented by Matt, Lani, (Aaron Lee)
Summary, below:
AIS is underway
Intersection of Halekauila and Keawe St.; concrete coring indicated no crawlspace and standard fill; fieldwork started this past Monday
Workforce housing tower w 33 floors; 7-8 floors of parking with open community deck adjacent to the tower building
(PowerPoint presentation); preliminary testing strategy = 17 test trenches
Shoring boxes utilized in areas with fill

H. Ala Moana Tributary Basin Sewer I/I Relief and Rehabilitation Project, Uluniu Avenue, Waikīkī Ahupuaʻa, Honolulu (Kona) District, Oʻahu, TMK: [1] 2-6-023 plat
Information/Discussion: Update on the above project.

Presented by Matt McDermott, CSH; Lani Maa Lapilio, Aukahi; Steve Harada, Engineering; Ed Miyashiro, DDC
(Danna left at 12:58)
Summary, below:
Water table between 5 to 6 ft in the project area
Existing line, new line would be straight; any route and methodology used will require jet grouting;
Microtunnelling would require jacket and receiving area to be excavated in full
Discussed at the meeting on March 12th; AIS strategy does not seem appropriate; how to minimize jet grouting
Submit AMP to SHPD
No clear idea of what method will be chosen, and leave the methodology choice up to the bidders
Chuck: bid packet should include taking care of the iwi kupuna treatment if they are encountered
Finds, if any, will be inadvertent

APPROVED

Figure 47. OIBC 4/12/2017 Meeting Minutes pg.5

I. Kihapai Place Project, Kailua Ahupua'a, Ko'olaupoko District, O'ahu, TMKs: [1] 4-3-058: 047, 048, and 065
Information/Discussion: Update on the above project.

Presentation by Alani, liaison for Green Waters development; Hal Hammatt, CSH; Josh Kogen, Green Waters development
Summary, below:
Alani: project has been ongoing for about 2 years
Company purchased the land, approached the Kailua descendant group for consultation to minimize as much impact as possible; 3 story, 42 unit building; building on imported fill; sewer, storm line, BWS, utility tie-in, elevator pit.
Tried to compact everything as much as possible; AIS approval, hired a company with a primary (in Kauai); PI did not follow her own stated methodology for doing the AIS, resulting in the removal of 3 burials; descendants were upset; SHPD got involved, Susan Lebo came out on her own time and oversaw the completion of the AIS fieldwork; descendants asked for temporary curation in the trench from which the iwi kupuna were removed; placed with ceremony and protocol, the retrieved remains from the excavation back into the trench; all info from the fieldwork needed to be put in the AIS for SHPD's review; Green Waters has let that archaeo firm go, and hired CSH to take over the project.
Burial find
Hal: reopen trenches, avoid opening trench 6; ID'd trench boundaries; GIS staff will GPS existing trenches; reopen trenches because the fieldnotes from the previous project proponents are not understandable; collected soil samples are not usable and will be returned to the trench; starting over, but not exactly; shoveling by hand, using tarps to collect and screen; previously identified burial, BTP will be submitted to SHPD then come to OIBC; hopes that the project will be healing to all parties involved
Chuck: how much fill will be brought in?
Jonah: depends on the location and how the grading works out, will slope property away from the marsh so as not to impact the marsh;
Jonah: this area has been more of a low-income type area; some of the area buildings have transferred ownership in the past 3 years.
Chuck: grey water outlets
Alani: risk is where the connection will be dug out to the existing system. When BTP is presented, the recognized cultural descendants will be able to join.
Hal: depends on the preparation and review of the SHPD

J. Kawaiaha'o Church Multi-Purpose Building Renovation Project, Honolulu Ahupua'a, Kona District, Island of O'ahu, TMK: [1] 2-1-032:017
Information/Discussion: Update on the above project.

Presented by Lani, Aukahi; David Shideler, CSH
Updates presented by David Shideler
Compendium of email correspondence
AIS has been focused on the proposed utility trenches; work is proceeding, approx. 50% of the way through hand excavation of utility alignments;

RKH read Dana Naone Hall's letter onto the record

David: seek to answer any questions OIBC has
David: 2 foot wide, 4 foot deep trench is sufficiently wide for the utility trench
5 site visits, stratigraphy is clear cut in sidewalls; different scenario than in the makai area;
Chuck: she said shallow, and might find burials below that; any comments?

APPROVED

Figure 48. OIBC 4/12/2017 Meeting Minutes pg. 6

David: many of the burials found in the makai area were deeper;
Kali: utilities will not be deeper?
David: normal AIS studies
RKH: stratigraphy is clear
Susan: width of trench is determined by project, not SHPD recommendations;
Hal: excavations in Queen Street in the 1980's; pits that were dug for interments showed straightforward stratigraphy; can see actual pits themselves
Lani: first descendant meeting will be on Monday, May 15th, at Kaumakapili Church;
Bill Haole: meeting will be opened to a broader community than just the CDs
Kaanohi: appreciate the call for more descendants, but new descendants comments will likely not be included

V. INADVERTENTS/COMMUNICATIONS

A. Inadvertent discovery of human skeletal remains on March 20, 2017, at Howard Hughes Corporation's Block M project, Aeo, Kaka'ako Ahupua'a, Kona District, Island of O'ahu, TMK: [1] 2-3-002:106
Information/Discussion: Discussion on the above find.
Presented by Matt McDermott; near intersection of Queen and Kamakee, area required on site monitoring; excavation being prepared for jet grouting; considered an inadvertent find; disinerment and curation – March 22nd, curated at Layton Construction off-site offices across the street; will be relocated in landscaped planter w native vegetation; mahalo to Oiwi CR and SHPD for being on site for consultation

B. Mokapu/Marine Corps Base Hawaii, Kāne'ohe Ahupua'a, Ko'olaupoko District, Island of O'ahu, TMK: [1] 4-4-008:001
Information/Discussion: Discussion on the above item.

Summary:
Regina talked with June, schedule is hectic for the next several months, can accommodate a site visit at some point in the future; reinterment area for reburial has already been selected, NHO's cannot agree on reburial protocol which is why the remains stay out of the ground; Kaanohi is making progress in talking with the descendants; updates will be provided as things and discussion progress

VI. ANNOUNCEMENTS

A. Next meeting date is scheduled for Wednesday, May 10th, 2017 at 10 AM

Motion: to adjourn the meeting
Moved by: Bev
2nd: Kali
VOTE: ALL IN FAVOR

Meeting adjourned at 2:10 PM

Approved and ratified at the Oahu Island Burial Council's meeting on May 10th, 2017
Respectfully submitted by Regina K. Hilo, Burial Sites Specialist, History and Culture Branch, on 05/11/2017

APPROVED

Figure 49. OIBC 4/12/2017 Meeting Minutes pg. 7

APPENDIX B: LITERATURE REVIEW AND FIELD INSPECTION

APPENDIX G
CULTURAL IMPACT ASSESSMENT
APRIL, 2017

SCIENTIFIC CONSULTANT SERVICES, INC.

SCS Project Number 2023-Final CIA

A CULTURAL IMPACT ASSESSMENT FOR THE ALOHA SOLAR ENERGY FUND II PROJECT

KALAELOA, HONOULIULI AHUPUA‘A
‘EWA DISTRICT
ISLAND OF O‘AHU
HAWAI‘I

TMK: (1) 9-1-013:070 and 000

Prepared by:
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May 2017
FINAL

Prepared for:
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INTRODUCTION

At the request of Group 70 International, Inc. (G70), on the behalf of the Hawai‘i Community Development Authority (HCDA) and ECC Inc., Scientific Consultant Services, Inc. (SCS), has prepared a Cultural Impact Assessment (CIA), in advance of the proposed Aloha Solar Energy Fund 2 (ASEF2) Kalaeloa Project.

The Hawaii State Office of Environmental Quality Control (OEQC 2012:11) states that “an environmental assessment of cultural impacts” gathers information about cultural practices and cultural features that may be affected by significant environmental effects:

> **Cultural impacts differ from other types of impacts assessed in environmental assessments or environmental impact statements. A cultural impact assessment includes information relating to the practices and beliefs of a particular cultural or ethnic group or groups.**

The purpose of a Cultural Impact Assessment is to identify the possibility of previous and current cultural practices and resources within a project area and ahupua‘a, and then to assess the potential for impacts to these cultural resources.

PROJECT DESCRIPTION

The proposed undertaking consists of two primary components: 1) a 5-megawatt utility installation for a renewable energy photovoltaic system and 2) an approximate 1.78-mile long 12-kilovolt (kV) electrical distribution line to connect the utility installation to the Hawaiian Electric Company (HECO).

The utility installation would be built on TMK: (1) 9-1-013:070, currently owned and managed by the HCDA, and the adjacent Coral Sea Road right-of-way [TMK: (1) 9-1-013:000], which is owned by the State of Hawai‘i Department of Transportation (H-DOT) (Figures 1 through 3). The vacant and undeveloped parcel is comprised of approximately 44.28 acres situated within the traditional *moku* (district) of ‘Ewa in the *ahupua‘a* of Honouliuli. The parcel today is a part of the Kalaeloa Community Development District (KCDD). The proposed project would involve the installation of 900 elevated photovoltaic panel racks, which will be mounted above ground on a series of posts that align in a series of columns on approximately 22 of the 44.28 acres. The utility installation would include an electrical transfer substation. Access to/from the parcel would be provided off Coral Sea Road that would lead to an internal network of

paths to be primarily used for maintenance and inspection. The remaining parcel acreage would be included in an archaeological preserve area to be established.

The proposed project also includes the installation of a 12-kV distribution line that would be routed from the new electrical substation at the utility installation crossing over Coral Sea Road and eventually connecting to the "Kapolei Circuit" at a HECO manhole on the mauka side of Franklin D. Roosevelt Avenue. The proposed distribution line corridor would be a combination of an overhead line on poles with a segment that is an underground ductline. The underground segment is required due to Federal Aviation Administration height restrictions that are in place for an aviation approach of Runway 22L and 22R at the adjacent Kalaeloa Airport (John Rodgers Field). This aviation approach extends over a portion of Coral Sea Road. The 12 kV line would be installed within an existing State Department of Transportation-Highways Division Right-of-Way (ROW) along the eastern side of Coral Sea Road. The ROW extends approximately 30 feet from the edge of Coral Sea Road on the eastern side. The overhead portion of the 12 kV line would be approximately 5,600 feet in length and the underground portion would be approximately 3,800 feet.

CULTURAL IMPACT ASSESSMENT METHODOLOGY

The Constitution of the State of Hawai‘i clearly states the duty of the State and its agencies is to preserve, protect, and prevent interference with the traditional and customary rights of Native Hawaiians. Article XII, Section 7 (2000) requires the State to "protect all rights, customarily and traditionally exercised for subsistence, cultural and religious purposes and possessed by *ahupua‘a* tenants who are descendants of Native Hawaiians who inhabited the Hawaiian Islands prior to 1778." Additionally, Article IX, other state laws, and the courts of the State, impose on government agencies a duty to promote and protect cultural beliefs and practices, and resources of Native Hawaiians as well as other ethnic groups.

Figure 1: USGS (Ewa, 1998; 1:24,000) Quadrangle Map Showing Project Area.

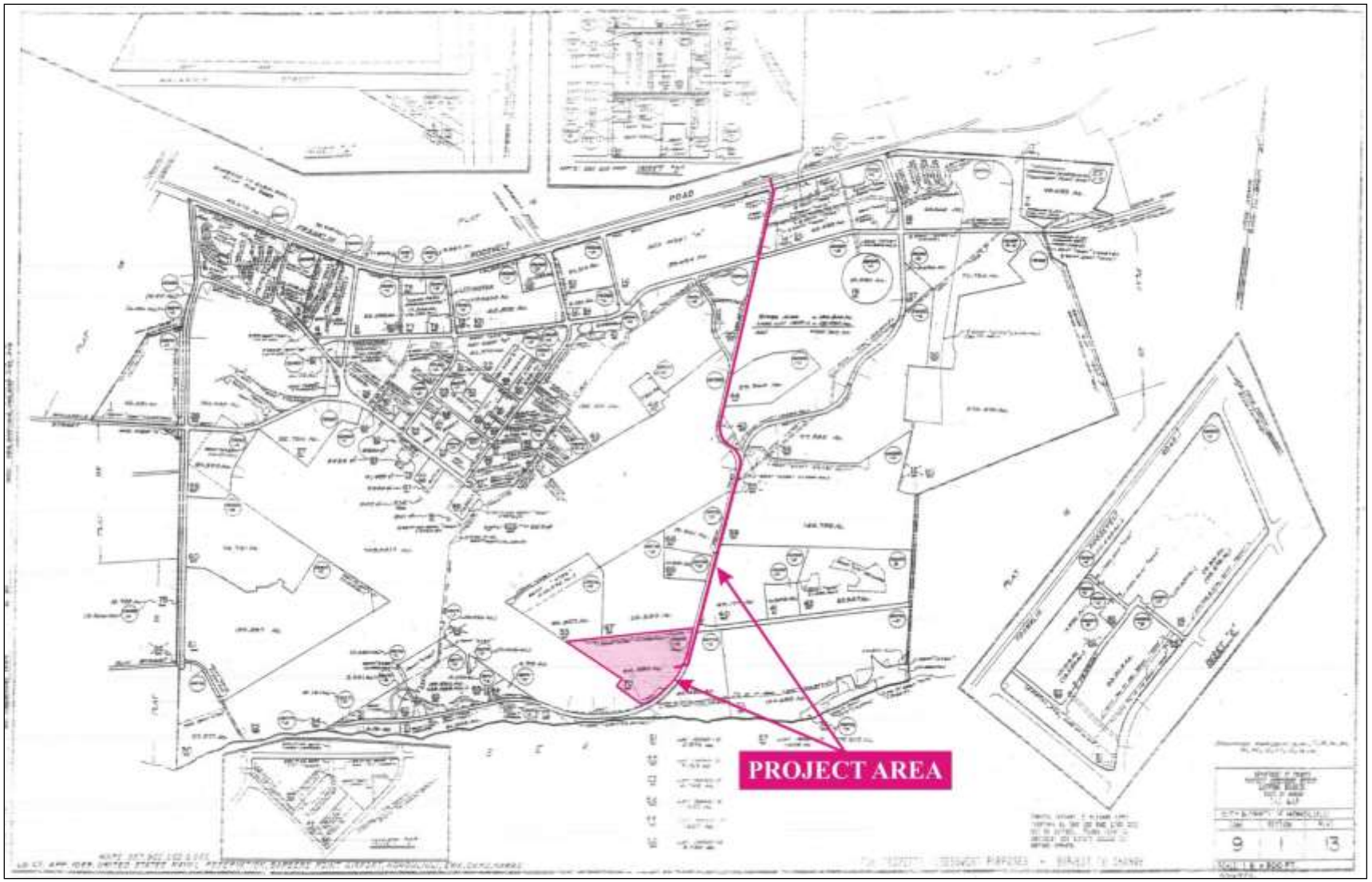

Figure 2: Tax Map Key [TMK: (1) 9-1-013] Showing Project Area.

Figure 3: Google Earth Aerial Image (Image Dated February 28, 2017) Showing Project Area.

Kamehameha III (Kauikeaouli) preserved the people's traditional right to subsistence. As a result, in 1850, the Hawaiian Government confirmed the traditional access rights to Native Hawaiians to gather specific natural resources for customary uses from undeveloped private property and waterways under the Hawaiian Revised Statutes (HRS) 7-1. In 1992, the State of Hawai'i Supreme Court, reaffirmed HRS 7-1 and expanded it to include, "native Hawaiian rights…may extend beyond the *ahupua'a* in which a Native Hawaiian resides where such rights have been customarily and traditionally exercised in this manner" (Pele Defense Fund v. Paty, 73 Haw.578, 1992).

Act 50, enacted by the Legislature of the State of Hawai'i (2000) with House Bill (HB) 2895, relating to Environmental Impact Statements, proposes that:

> **There is a need to clarify that the preparation of environmental assessments or environmental impact statements should identify and address effects on Hawaii's culture, and traditional and customary rights… [H.B. NO. 2895].**

Act 50 also requires state agencies and other developers to assess the effects of proposed land use or shoreline developments on the "cultural practices of the community and State" as part of the HRS Chapter 343 (2001) environmental review process.

It also re-defined the definition of "significant effect" to include "the sum of effects on the quality of the environment including actions that impact a natural resource, limit the range of beneficial uses of the environment, that are contrary to the State's environmental policies, or adversely affect the economic welfare, social welfare or cultural practices of the community and State." Cultural resources can include a broad range of often overlapping categories, including places, behaviors, values, beliefs, objects, records, stories, etc. (H.B. 2895, Act 50, 2000).

GEOGRAPHICAL EXTENT

As defined by the Hawaii State Office of Environmental Quality Control (OEQC 2012:11), the geographical extent should be greater than the area over which the proposed project will take place in order to ensure that cultural practices that occur outside of the project area, but which may still be affected, are included in the assessment. For example, a project that may not itself physically impact traditional gathering practices, but may block access to those locations would be included within the assessment. The concept of geographical expansion is recognized by using, as an

example, "the broad geographical area, e.g. district or *ahupua'a*." In some cases, the geographical extent could extend beyond the *ahupua'a* if cultural practices do so as well.

OEQC GUIDELINES FOR ASSESSING CULTURAL IMPACTS

According to the Guidelines for Assessing Cultural Impacts established by the Hawaii State Office of Environmental Quality Control (OEQC 2012:12):

> **The types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religions and spiritual customs. The types of cultural resources subject to assessment may include traditional cultural properties or other types of historic sites, both manmade and natural, which support such cultural beliefs.**

The meaning of "traditional" is defined in *National Register Bulletin 38*:

> **Traditional" in this context refers to those beliefs, customs, and practices of a living community of people that have been passed down through the generations', usually orally or through practice. The traditional cultural significance of a historic property then is significance derived from the role the property plays in a community's historically rooted beliefs, customs, and practices. . . [Parker and King 2012:1]**

This Cultural Impact Assessment was prepared in accordance with the Guidelines for Assessing Cultural Impacts (OEQC 2012:11-13). The Guidelines recommend that preparers of assessments analyzing cultural impacts adopt the following protocol:

1. Identify and consult with individuals and organizations with expertise concerning the types of cultural resources, practices and beliefs found within the broad geographical area, e.g., district or ahupua'a;

2. Identify and consult with individuals and organizations with knowledge of the area potentially affected by the proposed action;

3. Receive information from or conduct ethnographic interviews and oral histories with persons having knowledge of the potentially affected area;

4. Conduct ethnographic, historical, anthropological, sociological, and other culturally related documentary research;

5. Identify and describe the cultural resources, practices and beliefs located within the potentially affected area; and

6. Assess the impact of the proposed action. alternatives to the proposed action, and mitigation measures, on the cultural resources, practices and beliefs identified.

CULTURAL IMPACT ASSESSMENT CONTENTS

The Guidelines state that an assessment of cultural impacts should address, but not be limited to:

1. Organizations identified by the preparer as being familiar with cultural practices and features associated with the project area, including any constraints or limitations which might have affected the quality of the information obtained.

2. Description of methods adopted by the preparer to identify, locate, and select the persons interviewed, including a discussion of the level of effort undertaken.

3. Ethnographic and oral history interview procedures, including the circumstances under which the interviews were conducted, and any constraints or limitations which might have affected the quality of the information obtained.

4. Biographical information concerning the individuals and organizations consulted, their particular expertise, and their historical and genealogical relationship to the project area, as well as information concerning the persons submitting information or interviewed, their particular knowledge and cultural expertise, if any, and their historical and genealogical relationship to the project area.

5. Discussion concerning historical and cultural source materials consulted, the institutions and repositories searched and the level of effort undertaken. This discussion should include, if appropriate, the particular perspective of the authors, any opposing views, and any other relevant constraints, limitations or biases.

6. Discussion concerning the cultural resources, practices and beliefs identified, and, for resources and practices, their location within the broad geographical area in which the proposed action is located, as well as their direct or indirect significance or connection to the project site.

7. Discussion concerning the nature of the cultural practices and beliefs, and the significance of the cultural resources within the project area affected directly or indirectly by the proposed project.

8. Explanation of confidential information that has been withheld from public disclosure in the assessment.

9. Discussion concerning any conflicting information in regard to identified cultural resources, practices and beliefs.

10. Analysis of the potential effect of any proposed physical alteration on

cultural resources, practices or beliefs; the potential of the proposed action to isolate cultural resources, practices or beliefs from their setting; and the potential of the proposed action to introduce elements which may alter the setting in which cultural practices take place.

11. A bibliography of references, and attached records of interviews which were allowed to be disclosed.

PROJECT METHODOLOGY

This report contains archival and documentary research, as well as communication with organizations and individuals having knowledge of the project area, its cultural resources, and its practices and beliefs. An example of the initial letter of inquiry is presented in Appendix A, copies of the posted newspaper notice and affidavit are presented in Appendix B, an example of the initial follow up letter is presented in Appendix C; an example of the revised letter of inquiry is presented in Appendix D, an example of the revised follow up letter is presented in Appendix E, and the signed information release forms are presented in Appendix F. This Cultural Impact Assessment was prepared in accordance with the suggested methodology and content protocol provided in the Guidelines for Assessing Cultural Impacts (OEQC 2012:13), whenever possible. The assessment concerning cultural impacts may include, but not be limited to:

ARCHIVAL RESEARCH

Archival research focused on a historical documentary study involving both published and unpublished sources. These included legendary accounts of native and early foreign writers; early historical journals and narratives; historic maps, land records, such as Land Commission Awards, Royal Patent Grants, and Boundary Commission records; historic accounts, and previous archaeological reports.

INTERVIEWS

Interviews are conducted in accordance with Federal and State laws, and guidelines, when knowledgeable individuals are able to identify cultural practices in, or in close proximity to, the project area. If they have knowledge of traditional stories, practices and beliefs associated with a project area or if they know of historical properties within the project area, they are sought out for additional consultation and interviews. Individuals who have particular knowledge of traditions passed down from preceding generations and a personal familiarity with the project area are invited to share their relevant information concerning particular cultural resources. Often people are recommended for their expertise, and indeed, organizations, such as Hawaiian Civic Clubs, the Island Branch of Office of Hawaiian Affairs (OHA), historical societies, Island

Trail clubs, and Planning Commissions are depended upon for their recommendations of suitable informants. These groups are invited to contribute their input, and suggest further avenues of inquiry, as well as specific individuals to interview. It should be stressed again that this process does not include formal or in-depth ethnographic interviews or oral histories as described in the OEQC's *Guidelines for Assessing Cultural Impacts* (2012). The assessments are intended to identify potential impacts to on-going cultural practices, or resources, within a project area or in its close vicinity.

If knowledgeable individuals are identified, personal interviews are sometimes taped and then transcribed. These draft transcripts are returned to each of the participants for their review and comments. After corrections are made, each individual signs a release form, making the interview available for this study. When telephone interviews occur, a summary of the information is usually sent for correction and approval, or dictated by the informant and then incorporated into the document. If no cultural resource information is forthcoming and no knowledgeable informants are suggested for further inquiry, interviews are not conducted.

ENVIRONMENTAL SETTING

PROJECT AREA

The proposed project area is located on or alongside the former Naval Air Station (NAS) Barbers Point, currently part of the KCDD, and is under the authority of the HCDA. The proposed project area is located from approximately 138m north of the ʻEwa District coastline to approximately 3,300 m north of the ʻEwa Coastline (see Figures 1 through 3). The project area is between 4m and 12 m above mean sea level (amsl) located in Honouliuli Ahupuaʻa, ʻEwa District, Island of Oʻahu, Hawaiʻi [TMK (1) 9-1-013], A portion of the proposed project area is located within the right-of way (ROW) of a section of Coral Sea Road, with a connection via above-ground electrical wires to the existing electrical substation located within a portion of TMK: (1) 9-1-015.

CLIMATE

The project area lies is the dry, southwest portion of Oʻahu. Rainfall indicators show that project area environs receive between 300 to 500 mm inches per *annum*, although some fluctuations do occur on a year-to-year basis (Price 1983:62). Higher elevations within Honouliuli Ahupuaʻa are prone to receive more precipitation due to increased rainfall, fog drip, and lower temperature climates. The frequency of the project

area receiving much upland runoff is unlikely. No visible linear water sources (*e.g.*, a stream or river) occur within or near the current project area. The water table, however, is between 10 to 20 feet below surface in areas and may yield small amounts of brackish-fresh water. In addition, while dissolution pits or caves trap soil, they also trap some moisture. Temperatures in the area range between 60° and 90°F, with the highest typically occur in August and September (Price 1983).

PHYSICAL SETTING

The natural environment of the ʻEwa Plain, particularly the coastal and near-coastal zones, has been examined in various degrees of detail in a number of studies (*e.g.*, Ripperton and Hosaka 1942; Selling 1948; Stearns 1946; Stearns and Vaksvic 1935; Davis 1990; Moberly *et al.* 1975; Colbourn *et al*. 1988; Barry 1995; Hampton *et al*. 2002; Allen 1990; Charvet-Pond and Davis 1992; Athens *et al*. 1999, and Dunn *et al*. 1991). The ʻEwa Plain or ʻEwa Coral Plain, is an emergent reef platform formed in the late Pleistocene during the high level sea stand c. 125,000 years ago (MacDonald *et al*. 1979:355). Fringing the southern flanks of the Waiʻanae Mountain Range and the central Wahiawa Plateau, the plain extends continuously from Kahe Point east to Pearl Harbor and beyond, beneath Honolulu and Waikīkī to Diamond Head. At its widest, the ʻEwa Plain reaches approximately 5 to 8 kilometers (km) seaward from the Waiʻanae Mountains. Poorly defined fringing reefs run the length of the coast where the near-shore zone is largely comprised of hard coral and calcareous algae reef bottoms interrupted by small sand channels. The region is very arid and removed from the drainages of the Koʻolau and Waiʻanae Mountain ranges.

The proposed project area includes the near-coastal coralliferous lowlands. Here, the coral substrate remains largely exposed to sub-aerial weathering, which has produced a shallow, karst topography of ridges, hollows, pinnacles, and "sinkholes" interspersed among flat surfaces (see Kennedy 2010). The marine-terrestrial interface where the reef adjoins the volcanic foundation of the island is situated further inland. However, as has been documented during previous archaeological projects conducted in the region, a thin mantle of terrestrial sediments may extend into the project area as alluvial encroachment and aeolian transport are deposited from the volcanic uplands and elsewhere (Davis 1986, 1990; Dega *et al*. 2002, Kennedy 2010).

The ʻEwa Plain is essentially flat, though moderately sloping to seaward. The only significant relief is provided by the eroded bluffs bordering the West Loch of Pearl

Harbor and the volcanic cores of Puʻu o Kapolei and Puʻu Palailai. The latter is important archaeologically as it is one of only three known sources of volcanic glass on the Island of Oʻahu (see Davis 1986). Volcanic glass was an important component of traditional Hawaiian tool kits and has proven to be a consistent element in the archaeological assemblages from the ʻEwa Plain. Topographic relief in the project area is primarily restricted to artificial mounding and small uplifted karstic areas.

The ʻEwa Plain is a semi-arid region composed of coastal marshlands containing primarily xeric (dry) vegetation. The shoreline area most likely supported wetland habitats dominated by sedge and other hydrophytic vegetation. Palynological studies of the coastal environment (Athens *et al*. 1999) have shown that the area contained savannah-like vegetation regimes of grasslands with thickets and small groves of trees. This contrasts sharply with windward environments in which vegetation systems are widely varied and prolific (see Athens and Ward 1991). The marginality of the leeward environment is perhaps best known through rainfall and groundwater studies. Essentially, rainfall averages only 300 to 500 mm per annum and primary fresh water is gleaned from sheet wash and groundwater in the aquifers. Water in the area is primarily brackish in nature (*e.g.,* Athens *et al*. 1999).

Although the ʻEwa Plains was a marginal environment, the exploitation of other natural resources made the area hospitable to native Hawaiians. Archaeological evidence (see Davis 1986, 1990; Tuggle and Tomonari-Tuggle 1994) has shown that Hawaiian settlers of the ʻEwa Plain exploited both marine and terrestrial resources to various degrees. Subsistence-related tasks such as fishing, collecting shellfish, gathering, bird hunting, and gardening would have supported, to some degree, the economy of the area during pre-Contact times. The main subsistence resources in the area were birds, terrestrial plants (breadfruit, sweet potato), fish, shellfish, and seaweed. These subsistence regimes have been confirmed through several studies (*e.g.*, Davis 1990). However, further refinement, in terms of the degree each of the subsistence regimes contributed to the diet along the coast and in the chronological order of adaptations and the nature of settlement in the area, is needed. While the subsistence of the ʻEwa Plain population has been interpreted as following the pattern of combined cultivation and marine exploitation (see Davis 1990), several important questions remain. These include determining any temporal changes in subsistence patterns, including variation in the subsistence base over time and settlement organization that may have provided for such change in subsistence activity over time (see Tuggle and Tomonari-Tuggle 1997).

SOILS

According to Foote *et al*. (1972:29, Sheet Map 45), the project area is primarily located within a Coral outcrop (CR) series. "Coral outcrops consist of coral or cemented calcareous sand on the Island of Oʻahu. The coral reefs formed in shallow ocean water during the time the ocean stand was at a higher level. Small areas of coral outcrop are exposed on the ocean shore, on the coastal plains, and at the foot of the uplands" (Foote *et al*. 1972:29).

Coral outcrop makes up about 80 to 90 percent of the acreage with the remaining 10 to 20 percent consisting of a thin layer of friable, red soil material in cracks, crevices, and depressions within the coral outcrop, similar to that of Mamala series deposits (Foote *et al*. 1972:29). Mamala Series deposits consist of shallow, well-drained soils along the coastal plains on the island of Oʻahu. These soils formed in alluvium deposited over coral limestone and consolidated calcareous sand. This land type is used for military installations, quarries, and urban development (Foote *et al*. 1972:93).

LANDFORM: KARST ENVIRONMENT

Several important natural features dominate the ʻEwa Plain, and the formation of the area itself is integral to understanding cultural use of the environment. Over 80% of the ʻEwa Plain consists of a karstic limestone landscape. The current project area occurs wholly within this karstic zone.

It is known that the reef limestone formed during the Pleistocene at the high-level sea stand. From that point, the water receded through time to present day levels. The water recession has left behind an undulating topography due to the dendritic nature of reef formation, as well as the formation of "sinkholes" and collapse of thin limestone mantles near the surface (see Halliday 2001). Archaeologists working in the ʻEwa Plain have focused much research on the sinkholes, given the results of early studies showing the presence of cultural materials, burials, and extinct bird bones, among others (see Tuggle and Tomonari-Tuggle 1997). However, is the term "sinkhole" geologically accurate?

Halliday (2001:31) states, "Readers of the Hawaiian archaeological literature receive the impression that innumerable karstic sinkholes are present in elevated reef limestones. This is a fallacy." He cites the following characteristics as to why these features do not conform to standard sinkhole definitions: most occur in pseudokarstic terrain and many are not funnel-shaped (Halliday 2001:31). The question then arises:

What does one call the many depressions, fissures, or holes occurring across the ʻEwa Plan landscape? Certainly, sinkholes are present, but what of the thousands of other features in the landscape? This problem is genuine as the current project contains many "pseudokarstic sinkholes."

A reading of the geologic literature attests to several more accurate descriptions (Halliday 1998, 2001; Mylroie and Carew 1995). The features archaeologists often designate as "sinkholes" in Hawaiʻi have been classified by karstographers, speleologists, and geologists as "small pit caves," "small dissolution pit caves," and/or "flank margin caves" (Halliday 1998, 2001; Mylroie and Carew 1995). For general classification, the phreatic dissolution caves are often called "banana holes" in the Caribbean Islands and Central America. The "small dissolution pit caves" appear to best fit the cavities in the current project area, although there is variation, as is discussed below. A good example of a true sinkhole is the Makauwahi sinkhole on the southern shore of Kauaʻi. David Burney and colleagues have extensively explored the sink and recovered numerous species of fossil, including ubiquitous bird bones of antiquity (see Burney *et al*. 2001).

Thus, most of the natural features previously termed "sinkholes" in the ʻEwa Plain appear to be caves or fissures of one sort or another. As Halliday (2001:31) notes, "Although the archaeological literature contains references to a large number of sinkholes in reef limestone, most of these actually are small pit caves, as defined by Mylroie and Carew (1995), one to four meters deep. These are commonly impacted by man, rather than the reverse." While the definitions may be important for scientific classification, the main point for archaeologists is that these numerous "pits" occur across the ʻEwa Plain, most contain soil, and have the potential to yield important paleoenvironmental and anthropological data.

VEGETATION

Vegetation identification within the project area [TMK: (1) 9-1-013:070] was conducted June 6, 2013 by Eric Guinther and Reginald David of AECOS Inc. Table 1 contains the identified vegetation (Guinther and David 2013).

Prior to Contact (*i.e.,* 1778), the ʻEwa Plain presumably would have been dominated by scrub-type vegetation able to survive in this very arid climate. These include *wili wil* (*Erythina sandwicensis*), *lama* (*Diospyros ferrea*), sandalwood *(Santalum*

sp.), *ʻa ʻali ʻi* (*Dodonea ericarpa*), *ohia* (*Metrosideros collina*), and *pili* grass (*Heteropogon contortus*) (Whistler 1995).

TRADITIONAL AND CULTURAL CONTEXT

Archaeological settlement pattern data suggests that initial colonization and occupation of the Hawaiian Islands first occurred on the windward shoreline areas of the main islands between A. D. 850 and 1100, with populations eventually settling in drier leeward areas during later periods (Kirch 2011). Although coastal settlement was dominant, Native Hawaiians began cultivating and living in the upland *kula* (plains) zones. Greater population expansion to inland areas began around the 14th century and continued through the 16th century. Large scale or intensive agriculture was implemented in association with habitation, religious, and ceremonial activities.

The Hawaiian economy was based on agricultural production and marine exploitation, as well as raising livestock and collecting wild plants and birds. Extended household groups settled in various *ahupuaʻa*. During pre-Contact times, 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* (*Colocasia esculenta*) agriculture that incorporated pond fields and irrigation canals. Other cultigens, such as *kō* (sugar cane, *Saccharum officinaruma*) and *maiʻa* (banana, *Musa* sp.), were also grown and, where appropriate, such crops as *ʻuala* (sweet potato, *Ipomoea batatas*) were produced. This was the typical agricultural pattern seen during traditional times on all the Hawaiian Islands (Kirch and Sahlins 1992, Vol. 1:5, 119; Kirch 1985). Agricultural development on the windward side of Oʻahu was likely to have begun early (AD 1100–1300) during what is known as the Expansion Period (Kirch 1985).

Table 1. Identified vegetation (Guinther and David 2013).

Table 1. Listing of plants (flora) at the Aloha Solar Energy Fund II, LLC site, Kalaeloa, west O'ahu, Hawai'i.

Family *Species*	Common name	Status	Abundance* (site / line)	Notes
	FERNS			
POLYPODIACEAE				
Phymatosorus grossus (Langsd. & Fisch.) Brownlie	*laua'e*	Nat	- / R	<1>
	FLOWERING PLANTS DICOTYLEDONES			
ACANTHACEAE				
Asystasia gangetica (L.) T. Anderson	Chinese violet	Nat	O3 / A	
Dicliptera chinensis (L.) Juss.	---	Nat	- / R	<1>
Ruellia blechum L.	---	Nat	- / U	<1>
AMARANTHACEAE				
Achyranthes aspera L.	---	Nat	R / -	
Alternanthera pungens Kunth	khaki weed	Nat	O / C	
Ameranthus viridis L.	slender amaranth	Nat	- / R	
ANACARDIACEAE				
Schinus terebinthefolius Raddi	Christmas berry	Nat	U / -	
ASCLEPIADACEAE				
Cryptostegia cf. *grandifolia Roxb.* ex R. Br.	rubber vine	Nat	A / O	
Stapelia gigantea N.E. Brown	giant toad plant	Nat	/ U1	
ASTERACEAE (COMPOSITAE)				
Ageratum conyzoides L.	*maile hohono*	Nat	R	
Bidens alba (L.) DC.	beggartick	Nat	- / U2	
Bidens pilosa L.	beggartick	Nat	O2 / -	
Calyptocarpus vialis Less.	---	Nat	U / C	
Conyza bonariensis (L.) Cronq.	hairy horsewed	Nat	U / R	
Emilia fosbergii Nicolson	Flora's paintbrush	Nat	- / U	
Flaveria trinerva (Spreng.) C. Mohr	---	Nat	O1 / -	
Lactuca serriola L.	prickly lettuce	Nat	R / -	
Pluchia carolinensis (Jacq.) G. Don	sourbush	Nat	O2 / O	
Pluchea indica (L.) Less.	Indian fleabane	Nat	A2 / -	
Pluchia x *fosbergii* Cooperr. & Galang	---	Nat	R / U2	
Sonchus oleraceus L.	sow thistle	Nat	U / U	
Taraxacum officinale W.W. Weber ex Wigg.	common dandelion	Nat	- / R	<1>

Table 1 (continued).

Family *Species*	Common name	Status	Abundance	Notes
ASTERACEAE (continued)				
Tridax procumbens L.	coat buttons	Nat	U / O2	
Verbesina enceliodes (Cav.) Benth. & Hook.	golden crown-beard	Nat	O2 / -	
BIGNONIACEAE				
Spathodea campanulata P. Beauv.	African tulip	Nat	R / -	
BORAGINACEAE				
Heliotropum procumbens Mill.	---	Nat	R / O3	
CHENOPODIACEAE				
Atriplex semibaccata R. Br.	Australian saltbush	Nat	R / R	
Chenopodium carinatum R. Br.	---	Nat	U1 / R	
Chenopodium murale L.	*'aheahea*	Nat	O / -	
CONVOLVULACEAE				
Ipomoea obscura (L.) Ker-Gawl.	---	Nat	O2 / U2	
Merremia aegyptia (L.) Urb.	hairy merremia	Nat	R / -	
CUCURBITACEAE				
Cucumis dipsaceus Ehrenb. ex Spach	teasel gourd	Nat	U / R	
Sicyos pachycarpus Hook. & Arnott	*kūpala*	**End**	O / -	<2>
EUPHORBIACEAE				
Codiaeum variegatum (L.) Blume	croton	Orn	R	<1>
Euphorbia hirta L.	garden spurge	Nat	R / U3	
Euphorbia prostrata L.	prostrate spurge	Nat	- / U	
Ricinus communis L.	castor bean	Nat	R / -	
FABACEAE				
Acacia farnesiana (L.) Willd.	*klu*	Nat	- / R	
Desmanthus virgatus (L.) Willd.	virgate mimosa	Nat	C3 / O2	
Desmodium tortuosum (Sw.) DC.	Florida beggarweed	Nat	R / R	
Leucaena leucocephala (Lam.) deWit	*koa haole*	Nat	A / AA	
Indigofera hendecaphylla Jacq.	creeping indigo	Nat	R / U	
Macroptilium lathyroides (L.) Urb.	wild bean, cow pea	Nat	R / R	
Pithecelobium dulce (Roxb.) Benth.	*'opiuma*	Nat	U / O	
Prosopis pallida (Humb. & Bonpl. ex Willd.) Kunth	*kiawe*	Nat	AA/AA	
Senna sp.	unidenified	Nat	- / R	
GENTIANACEAE				
Centaurium erythraea Raf.	bitter herb	Nat	- / R	
LAMIACEAE				
Leonotis nepetifolia (L.) R. Br.	lion's ear	Nat	O / -	
Ocimum gratissimum L.	wild basil	Nat	R / -	

Table 1 (continued).

Family *Species*	Common name	Status	Abundance	Notes
LAURACEAE				
Cassytha filiformis L.	*kauna'oa pehu*	Nat	O / O	
MALVACEAE				
Abutilon grandifolium (Willd.) Sweet	hairy abutilon	Nat	R / -	
Malva parviflora L.	cheese weed	Nat	- / O	
Malvastrum coromandelianum (L.) Garck	false mallow	Nat	U / A	
Sida ciliaris L.	---	Nat	A / AA	
Sida fallax Walp.	*`ilima*	**Ind**	C1 / A	
Sida rhombifolia L.	Cuba jute	Nat	R / -	
Sida spinosa L.	prickly sida	Nat	R / U3	
Waltheria indica L.	*'uhaloa*	**Ind?**	O / A	
MORACEAE				
Morus alba L.	white mulberry	Nat	- / R	<2>
MORINGACEAE				
Moringa oleifera Lam.		Nat	- / R	<1>
NYCTAGINACEAE				
Boerhavia coccinea Mill.	false *alena*	Nat	- / O2	
OXALIDACEAE				
Oxalis corniculata L.	yellow wood sorrel, *'ihi'ai*	**Pol?**	- / R	
PASSIFLORACEAE				
Passiflora foetida L.	running pop	Nat	R / -	
Passiflora suberosa L.	*huehue haole*	Nat	R / -	
PHYTOLACCACEAE				
Rivina humilis L.	coral berry	Nat	O / -	
PLUMBAGINACEAE				
Plumbago zeylanica L.	*'ilie'e*	**Ind**	U2 / -	
PORTULACACEAE				
Portulaca oleracea L.	pigweed	Nat	- / U	
Portulaca pilosa L.	---	Nat	- / O	
RUBIACEAE				
Morinda citrifolia L.	*noni*	**Pol**	R / -	
Spermacoce assurgens Ruiz & Pav.	buttonweed	Nat	- / U	
SOLANACEAE				
Nicotiana glauca R.C. Graham	tree tobacco	Nat	R / R	
Solanum americanum Mill.	*pōpolo*	**Pol**	O / R	

Table 1 (continued).

Family *Species*	Common name	Status	Abundance	Notes
SOLANACEAE (continued)				
Solanum lycopersicum var. *cerasiforme* (Dunal) Spooner, G.J. Anderson & R.K. Jansen	cherry tomato	Nat	O / -	
Solanum seaforthianum Andr.	---	Nat	R / O	
VERBENACEAE				
Duranta erecta L.	golden dewdrop	Orn	- / R	<1>
Stachytarpheta jamaicensis (L.) Vahl.	Jamaican vervain	Nat	- / U	
MONOCOTYLEDONES				
AGAVACEAE				
Agave sisalana Perrine	sisal	Nat	- / R	
ALOEACEAE				
Aloë vera (L.) N.L. Burman	aloe vera	Nat	- / R	
CYPERACEAE				
Cyperus rotundus L.	nut grass	Nat	- / R	<1,2>
LILIACEAE				
Crinujm asiaticum L.	giant lily	Orn	- / R	<1>
POACEAE				
Axonopus compressus (Swartz) P. Beauv.	broad-leaved carpetgrass	Nat	- / A	<1>
Bothriochloa pertusa (L.) A. Camus	pitted beardgrass	Nat	- / A	<1>
Cenchrus ciliaris L.	buffelgrass	Nat	AA/AA	
Cenchrus echinatus L.	common sandbur	Nat	- / R	<1>
Chloris barbata (L.) Sw.	swollen fingergrass	Nat	O2 / C3	
Cynodon dactylon (L.) Pers.	Bermuda grass	Nat	O / A	
Digiteria insularis (L.) Mez. ex Ekman	sourgrass	Nat	U / -	
Eleusine indica (L.) Gaertn.	beach wiregrass	Nat	C / U	
Eragrostis amabilis (L.) Wight & Arnott	lovegrass	Nat	U / R	
Eragrostis pectinacea (Michx.) Nees	Carolina lovegrass	Nat	C / U2	
Megathyrsus maximus (Jacq.) B.K. Simon & W.L. Jacobs	Guinea grass	Nat	AA/AA	
Melinus repens (Willd.) Zizka	Natal redtop	Nat	- / R	
Setaria verticillata (L.) P. Beauv.	bristly foxtail	Nat	O / -	
Sporobolus diandrus (Retz.) P. Beauv.	Indian dropseed	Nat	R / O	
Indet. grass	"grey grass"	Nat	O	<1,2>

Table 1 (continued).

Legend to Table 1

STATUS = distributional status for the Hawaiian Islands:

end = endemic; native to Hawaii and found naturally nowhere else.

ind = indigenous; native to Hawaii, but not unique to the Hawaiian Islands.

nat = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation.

orn = exotic, ornamental or cultivated; plant not naturalized (not well-established outside of cultivation).

pol = Polynesian introduction before 1778.

ABUNDANCE = occurrence ratings for plants by area:

* Arranged in column as follows: site survey / transmission line survey; "-" not found.

R – Rare seen in only one or perhaps two locations.

U - Uncommon- seen at most in several locations

O - Occasional seen with some regularity

C - Common observed numerous times during the survey

A - Abundant found in large numbers; may be locally dominant.

AA - Very abundant abundant and dominant; defining vegetation type.

Numbers following an occurrence rating indicate clusters within the survey area.

The ratings above provide an estimate of the likelihood of encountering a species within the specified survey area; numbers modify this where abundance, where encountered, tends to be greater than the occurrence rating:

1 = several plants present ; with C or A = in one area only.

2 = many plants present ; with C or A = in a few areas.

3 = locally abundant; with C or A = in several to many areas but still limited.

NOTES:

<1> – Plant associated with lawn fronting Navy housing area or planted there as an ornamental.

<2> – Plant observed was lacking fruit or flowers; identification uncertain.

In Hawaiʻi, much of the coastal lands were preferred for chiefly residence. Easily accessible resources such as offshore and onshore fishponds, the sea with its fishing and surfing—known as the sports of kings, and some of the most extensive and fertile wet taro lands were located in the coastal areas (Kirch and Sahlins, 1992 Vol. 1:19). Inland resources necessary for subsistence could easily be brought to the *aliʻi* residences on the coast from nearby inland plantations. The majority of farming was situated in the lower portions of stream valleys where there were broader alluvial flat lands or on bends in the streams where alluvial terraces could be modified to take advantage of the stream flow. Dry land cultivation occurred in colluvial areas at the base of gulch walls or on flat slopes (Kirch 1985; Kirch and Sahlins 1992, Vol. 2:59).

PAST POLITICAL BOUNDARIES

Traditionally, the division of Oʻahu's land into districts (*moku*) and sub-districts was said to be performed by a *Māʻilikukahi* who was chosen by the chiefs to be the *mōʻīhoʻoponopono o ke aupuni* (administrator of the government; Kamakau 1961:53–55). Cordy (2002) places Māʻilikukahi at the beginning of the 16th century. Māʻilikukahi created six districts and six district chiefs (*aliʻi ʻai moku*). Land was considered the property of the king or *aliʻi ʻai moku* (the *aliʻi* who eats the island/district), which he held in trust for the gods. The title of *aliʻi ʻai 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 *makaʻāinana* (commoners) worked the individual plots of land. It is said that Māʻilikukahi gave land to *makaʻāinana* (commoners) all over the island of Oʻahu (Cordy 2002).

In general, several terms, such as *moku*, *ahupuaʻa*, *ʻili* or *ʻiliʻāina* were used to delineate various land sections. A district (*moku*) contained smaller land divisions (*ahupuaʻa*) that customarily continued inland from the mountains (*mauka*) into the ocean (*makai*), where the *ahupuaʻa* boundary extended to the outermost edge of the outer-most reef. Extended household groups living within the *ahupuaʻa* were therefore able to harvest from both the land and the sea. Ideally, this situation allowed each *ahupuaʻa* to be self-sufficient by supplying needed resources from different environmental zones (Lyons 1875:111). The *ʻili ʻāina* or *ʻili* were smaller land divisions next to importance to the *ahupuaʻa* and were administered by the chief who controlled the *ahupuaʻa* in which it was located (Lyons 1875:33; Lucas 1995:40). The *moʻoʻāina* were narrow strips of land

within an *ʻili*. The land holding of a tenant or *hoa ʻāina* residing in an *ahupuaʻa* was called a *kuleana* (Lucas 1995:61).

PRE-CONTACT PERIOD (PRE-1778)

Traditionally, ʻEwa District was famous for its *ʻawa*, *māmaki*, and for a variety of *kalo* called *kāiʻi*. In wet lowlands, it was planted in mounds, a method called *puʻepu ʻe* (Handy and Handy 1978). As one went upland, bananas (*maiʻa, Musa* sp.) and yams (*uhi, Dioscorea alata*) were grown on the *kula* land and in the lower sections of the valleys. *ʻAwa* (*Piper methysticum*) would have been cultivated deeper in the valleys along with *olonā (Touchardia latifolia)* for cordage. Birds, valued as food (Malo 1951:38-40) and for their feathers, would have covered the extensive lowland forest. A large area was set aside for growing *wauke (Broussonetia papyrifera)* and *māmaki (Pipturus albidus)* (Handy and Handy 1978). This area was so productive that the *ali ʻi* (royalty, chiefly status) established their residence on the point of Waipi ʻo peninsula giving rise to some of the most powerful chiefs on Oʻahu (Fornander 1980, Vol 2:318).

ʻEwa was one of the largest of the six districts on the Island of Oʻahu. According to Fornander (1980, Vol 2: 47), in the early to middle part of the eleventh century, Māweke, a direct lineal descendant of the illustrious Nanaulu (the founder of Hawaiian royalty (Fornander 1980:168 Vol I), was a chief on Oʻahu. The second of his three sons, Keaunui, became the head of the powerful ʻEwa chiefs and tradition reports his cutting of a navigable channel allowing access to the Puʻu Loa River by canoe (Fornander 1980:48). His son, Lakona, became the progenitor of the ʻEwa chiefs. The line continued to Elani, a powerful ʻEwa chief at the time of Kahekili, and his nephew Kahahana, the ruler of Oʻahu in the late 1700s (Fornander 1980:217). Kahekili's treachery toward Kahahana provoked a rebellion of Oʻahu chiefs, resulting ultimately in the almost complete annihilation of the island's aristocracy. Oral tradition records that the stream of Hoaiai in ʻEwa was choked with the bodies of slain men, women, and children (Fornander 1980:224-226; Kamakau 1961:138). It is said that one of the Maui chiefs, Kalaikoa, used the bones of the slain to build a wall around his house at Lapakea in Moanalua. The house was known as Kauwalua and could be seen as one passed by the "old upper road to ''Ewa" (Fornander 1996:290). With the demise of the island's *aliʻi* went much of our knowledge of the history of the district's individual *ahupuaʻa*.

ʻEwa District is depicted as an abundant and populated land where chiefs of distinguished lineages were born and resided. The land was fertile and well fed by

mountain streams that helped sustain the agricultural lifestyle needed to support the chiefs, their households and their people. An examination of the place names reveal that water was a very important factor in this district. Six of the twelve *ahupuaʻa* names begin with wai, the Hawaiian word for water (Waikele, Waipiʻo, Waiawa, Waimano, Waiau, and Waimalu). At least twenty-six fishponds and many fish traps were established by the *aliʻi* at various points around ʻEwa District and in the Puʻuloa area, more than any other district on Oʻahu, indicates that agricultural/aquacultural intensification was a direct link to the chiefs who resided there and to the increasing needs of the population.

There are several places within Honouliuli Ahupuaʻa that are associated with traditional Hawaiian land uses, including Kalaeloa (the long point). The original Hawaiian name for this area was either Lae Loa or Kalaeloa; both names are seen in historic maps and text. *Lae* meaning cape or point and *loa* meaning distance or length. Lae Loa is also a point south of Hōnaunau Bay on Hawaiʻi Island (Pukui *et al*. 1974). Kalaeloa may translate to "clear or calm stretch" of either water or land. According to Pukui *et al*. (1971), *kalaʻe* means "clear or calm." At least one source (Emerson 1978:167) refers "to a part of the plain west of Puʻu-loa as Kane-hili," while Tuggle and Tomonari-Tuggle (1997: 19), refer to "the lower ʻEwa Plain as Kanehili."

Comparatively, no major population centers occurred in Kalaeloa. Land utilization was likely minimal until sugarcane production began in earnest during the 1920s. The general opinion regarding this area in archaeological literature (see Davis 1990), at least, is that it has always been, in an ecological sense, an impoverished land vacant of perennial streams, alluvial plains, and rich soils. Given these hardships, traditional Hawaiian settlement of the area would likely have related to people "on the edge of survival" if they did not have regular and abundant access to resources outside of this area (Tuggle and Tomonari-Tuggle 1997).

In 1793, Vancouver (1984:884) anchored off the entrance to West Loch and described the area as follows:

> The part of the island opposite to us was low, or rather only moderately elevated, forming a level country between the mountains that compose the east [Koʻolau] and west [Waianae] ends of the island. This tract of land was of some extent but did not seem to be populous, nor to possess any great degree of natural fertility; although we were told that at a little distance from the sea, the soil is rich and all necessities of life are abundantly produced.

Early settlement of the area was most likely made possible by a subsistence strategy aimed at both marine and avifauna resources. Handy (1940:82) reported that the *ahupua‘a* of Honouliuli supported large agricultural terraces boarding West Loch (outside the current project area), which were still being cultivated in the 1930s. In addition, J. Gilbert McAllister (1933:109) suggested that in the coral plains of Honouliuli:

> It is probable that the holes and pits in the coral were formerly used by the Hawaiians. Frequently the soil on the floor of the larger pits was used for cultivation, and even today one comes upon bananas and Hawaiian sugar cane still growing in them.

However, occupation of the area would have been temporary rather than permanent, owing simply to the lack of reliable water resources in the area and the difficulty in obtaining these resources. As faunal resources became depleted and as population density increased, a shift towards domestic and terrestrial resources *(i.e.*, animal husbandry, horticulture, and agriculture) is possible.

Early settlement of the ‘Ewa region, in general, is thought to have involved significant attention to avifauna resources (Davis 1990:136; James *et al*. 1987; Olson and James 1982). Visiting bird hunters may have been the first people to carry on traditional use of the project area, contributing to the utilization of temporary task-specific bird hunting sites. According to Sinoto (1976), sinkholes on the coast are full of bones of extinct bird species, which indicate that the general area witnessed large-scale depletion of avifauna. Humans are thought to have played a major role in the depletion of bird life throughout the Pacific Islands (Steadman 1989, 1995, 1997).

Overall, the environmental setting of the project area provides a set of limiting factors to traditional settlement. The dry ‘Ewa Plain may be considered similar to other extremely dry regions of leeward Hawaii where the remains of small communities have been found in agriculturally-impoverished lands (Tuggle and Tomonari-Tuggle 1997). Some of these dry leeward areas witnessed the development of complex dryland agricultural field systems as along the western coast of Hawai‘i Island (Kirch 1985:228-230; Rosendahl 1994). In contrast, the ‘Ewa Plain more closely fits the model proposed for dry areas of Moloka‘i (Tuggle 1993; Weisler and Kirch 1985) and for lower Mākaha

Valley on O‘ahu (Hommon 1969; Green 1980), where settlements represented “gardening families on the edge of survival” (Tuggle and Tomonari-Tuggle 1997).

During the early period of human occupation, the ‘Ewa Plain was an “open savannah-like grassland” where “trees such as Pritchardia, *wiliwili*, *noni*, and *kou*, formed small groves in favorable locations ...” (Davis 1990:342). This model is the most prevailing based on information derived from botanical data (Char and Balakrishan 1979:12), as well as from land snail analysis (Kirch and Christensen 1981).

THE KARST OF HONOULIULI

‘Ewa District was famous for the many limestone caves formed in the uplifted coral, called the “Ewa Karst.” This Pleistocene limestone outcrop, where not covered by alluvium or stockpiled material, has characteristic dissolution “pit caves” (Mylroie and Carew 1995), which are nearly universally, but erroneously, referred to as “sink holes” (Halliday 2005; see above). Traditional Hawaiian utilization of limestone sinkholes is a hallmark of ‘Ewa Plain sites. These pit caves, or sinkholes, vary widely in spatial extent and depth. Tuggle and Tomonari-Tuggle (1997:68) state “sinkholes range in size from several centimeters to 400 m in diameter and 50 cm to at least 60 cm in depth." In Traditional Hawaiian times (pre-1778), the areas of exposed coral outcrop were undoubtedly more extensive.

According to Tuggle and Tomonari-Tuggle (1994:8), “although arid by the measure of annual rainfall, the ‘Ewa Plain probably had much greater water availability in general than is now perceived.” It is uncertain whether rainfall was greater in pre-Contact times than it is today; it is however, unquestioned that the water table was higher. It has been estimated that with the drilling of artesian wells and water use for cane, the water table may have “been drained to a third of its former level” (Culiney 1988:233). Today, the water table is from one to three meters below the surface up to about 500 m from the coast and thus is accessible from sinkholes. With a higher water table and the hundreds of sinkholes that are found in the ‘Ewa Plain, there would have been significant water availability from small sinkholes within the project area (Tuggle and Tomonari-Tuggle 1994:8).

WAHI PANA (LEGENDARY PLACES)

“Wahi Pana” can be defined as celebrated or noted places or locations (Pukui and Elbert 1986:313, 376), and refers to legendary places or landmarks of historical significance. These places of note have distinctive features (*i.e.*, mountain peaks, streams,

wind, rain, etc.) that are given specific names through which the history of an area is passed down from generation to generation through chants, legends, and songs.

The project area lies within the *ahupua'a* of Honouliuli (blue harbor) in the *moku* of 'Ewa and is part of the unique geological feature known as the 'Ewa Plain (or the 'Ewa Karst). According to legend, 'Ewa (crooked) District received its name when the "Kāne and Kanaloa threw a stone to determine district boundaries:

> When Kane and Kanaloa were surveying the islands they came to Oahu and when they reached Red Hill saw below them the broad plains of what is now Ewa. To mark boundaries of land they would throw a stone and where the stone fell would be the boundary line. When they saw the beautiful land lying below them, it was their thought to include as much of the flat level land as possible. They hurled the stone as far as the Waianae range and it landed somewhere in the Waimanalo section. When they went to find it, they could not locate the spot where it fell, So Ewa (strayed) became known by that name. The stone that strayed.
>
> Eventually the stone was found at Pili OKahe. This is a spot where two small hills of the Waianae range come down parallel on the boundary between Honouliuli and Nanakuli (Ewa and Waianae). The anClent Hawaiians said the hill on the Ewa side was the male and the hill on the Waianae side was female. The stone was found on the Waianae side hill and the place is known as Pili 0 Kahe (Pili = to cling to, Kahe = to flow). The name refers, therefore, to the female or Waianae side hill. And that is where the boundary between the two districts runs[Sterling and Summers 1978:1].

Oral histories cited in *Sites of Oahu* (Sterling and Summers 1978) tell of the traditional importance of the *mauka* or upland areas of Honouliuli Ahupua'a. Being one of the largest traditional Hawaiian settlements on O'ahu, Honouliuli served as a crossroads to many points east (towards Pearl Harbor and Honolulu), west (towards Wai'anae) and north (towards Wahiawā and Waialua).

The traditional significance of the area is also reflected in the legend of Pele and Hi'iaka (Emerson 1978: 167-168), as they traveled through this area,

As the canoe drew near to the appointed rendezvous at Puʻuloa,
Hiiaka lifted her voice in a chanting song addressed to
Lohiau and Wahine-omaʻo:

Kuʻu aikane i ke awa lau (c) o Puʻuloa,
Mai ke kula o Peʻe-kaua,(d) ke noho oe,
E noho kaua e kui, e lei i ka pua o ke kaunoʻa,(0)
I ka pua o ke akuli-kuli, (/) o ka wili-wili; (g)
O ka iho'na o Kau-peʻe i Kane-hili, (t)
Ua hili(t') au ; akahi no ka hili o ka la pomaikaʻi;
Aohe mo-ewa'a (/) o ka po, e moe la nei.
E Lohiau ipo, e Wahine-omaʻo,
Hoe ʻa mai ka waʻa i aʻe aku au.

TRANSLATION

We meet at Ewa's leaf-shaped lagoon, friends;
Let us sit, if you will, on this lea
And bedeck us with wreaths of Kaunoʻa,
Of akuli-kuli and wili-wili.
My soul went astray in this solitude;
It lost the track for once, in spite of luck;
As I came down the road to Kau-peʻa.
No nightmare dream was that which tricked my soul.
This way, dear friends; turn the canoe this way;
Paddle hither and let me embark.

Nogelmeier (Hoʻoulumāhiehie 2006) provides a more complete translation and updated version of the epic legend of Pele and Hiʻiaka. Nogelmeier (Hoʻoulumāhiehie 2006) provides a breath of cultural context that enriches the importance of Honouliuli as a *wahi pana*, and contains many chants that reference the places in the vicinity of the project area

The Kaupeʻa Plain refers to the ʻEwa Plain, including all of the NAS, Barber's Point (Tuggle and Tomonari-Tuggle 1997:19). According to Sterling and Summers (1972:44):

The plain of Kaupea on the plain of Puuloa was
where the ghosts wandered to catch night moths and
spiders for food. It extended from the wiliwili trees
of Kaupea to Kanehili.

Kamakau (1964:49) elaborates:

On the plain of Kaupeʻa, beside Puʻuloa, wandering
souls would go to catch moths and spiders.

> However, wandering souls would not go far in the places mentioned earlier before they would be found catching spiders by ʻaumakua souls, and be helped to escape. These souls who had no such help were indeed friendless, and there were many who were called by this name (poʻe ʻuhane haukaʻa).

Mary Kawena Pukui (in Sterling and Summers 1972: 44) recounts an experience that she had at Keahi as young girl:

> A wide plain (Kaupea)·lies back of Keahi and Puʻuloa where the homeless, friendless ghosts were said to wander about. These were the ghosts of people who were not found by their family ʻaumakua (gods) and taken home with them or had not found the leaping places where they could leap into the nether world. Here they wandered, living on the moths and spiders they caught. They were often very hungry for it was not easy to find moths or to catch them when found. Perhaps I would never have been told of the plain of homeless ghosts if my cousin's dog had not fainted there one day. We (my cousin. aunt and 1) were walking to Kalae-loa (Barber's Point) from Puʻuloa accompanied by Teto, the dog. The dog was a native dog (not the so-called poi dog of today) with upright ears and body and size of a fox terrier. For no accountable reason, Teto fell into a faint and lay still. My aunt exclaimed and sent me to fetch sea water at once which she sprinkled over the dog saying, "Mai hana ino wale 'oukou i ka holoholona a ke kaikamahine. Uoki ko loukou makemake ilio." (Do not harm the girl's dog. Stop your desire to have it). Then with a prayer to her ʻaumakua for help she rubbed the dog. It revived quickly and after being carried a short way, was frisky and lively as ever.
>
> Then it was that my aunt told me of the homeless ghosts and declared that some of them must have wanted Teto that day because she was a real native dog, the kind that were roasted and eaten long before foreigners ever came to our shores,

According to Sterling and Summers (1972:44), "Keahi Point was noted for its good surfing. Also, the test ʻoʻio (fish) came foml these waters." Sterling and Summers (1972:44) elaborate on the area of Keahi:

> Keahi (lying between Puʻuloa and Barber's Point) is the place where the finest ʻolio fish (*Albula vulpes*) was caught. This fish is esteemed as one of the best for eating raw. Those caught at Keahi have a fragrance somewhat like that of the lipoa sea weed and when brought to the market, sold readily. All the market man had to say was "These are from Keahi," and his supply would vanish in a short time. There were times when the market man would try to palm off some ʻoʻio from another locality as Keahi's but no old timer was ever deceived, for his nose knew the difference.

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, Kauikeaouli (Kamehameha III) was forced to establish laws changing the traditional Hawaiian economy to that of a market economy (Kameʻeleihiwa 1992:169–70, 176; Kelly 1983:45, 1998:4; Daws 1962:111; Kuykendall 1938 Vol. I:145). The Māhele of 1848 divided Hawaiian lands between the king, the chiefs, the government, and began the process of private ownership of lands. The subsequently awarded parcels were called Land Commission Awards (LCAs). Once lands were made available and private ownership was instituted, the *makaʻāinana* (commoners) 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, *ʻokipū* (on Oʻahu), stream fisheries, or many other resources necessary for traditional survival (Kelly 1983; Kameʻeleihiwa 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).

Kamehameha's successful conquest of Oʻahu had resulted in a large-scale redistribution of lands, which set the stage for an ongoing series of land sales and transfers of ownership. Honouliuli Ahupuʻa ʻa was originally given as *punalaʻau* (conquered land) to Kalanimoku (Kameʻeleihiwa 1992:58, 112). Subsequently, Kalanimoku gave this land to his sister Wahinepiʻo, whose daughter Kekauʻonohi in turn received the land during the Māhele of the late 1840s (LCA 11216; Royal Patent 6971) (Waihona ʻAina Corporation 2013).

Although no lands were awarded within the project area, 96 individual claims were made in the *ahupua‘a* of Honouliuli and 72 individual claims in the *ahupua‘a* of Honouliuli were registered and awarded by King Kamehameha III to commoners (Tuggle and Tomonari-Tuggle 1997:34). The 72-kuleana awards were mainly adjacent to Honouliuli Gulch, which contained fishponds and irrigated taro fields. Soil suitable for cultivation was rare in the upland portions of Honouliuli where small soil pockets are distributed unevenly. Irregularly located sinkholes and small gulches often served to catch soil deposition appropriate for limited gardening activity. Stone mounds were also prepared for the cultivation of sweet potato in dryer areas (McAllister 1933:109).

HISTORIC PERIOD (POST-1778)

Despite the rapid and widespread changes of land ownership in Hawai‘i in the late 1800s, Honouliuli Ahupua‘a retained a semblance of its traditional form. After the death of Kekau‘ōnohi in 1851, the titles for Honouliuli and her, other lands were transferred to her husband Ha‘alelea. In the few decades following Ha‘alelea's death in 1864, his extensive lands became fragmented as they were sold or auctioned. Over subsequent decades, land parcels became increasingly fragmented and subdivided with further sales. The *ahupua‘a* of Honouliuli fortunately escaped this fate, as it was under lease to Captain John Meek for ranching at the time when Ha‘alelea’s lands were auctioned. Three years later, in 1867, Ha‘alelea's survivors regained a clear title to Honouliuli, and the *ahupua‘a* was immediately sold in its entirety to John Coney (Kelly 1991; Tuggle and Tomonari-Tuggle 1997:23). One decade later, in 1877, John Coney's wife sold Honouliuli Ahupua‘a (again in its entirety) to James Campbell for a sum of US $95,000 (Kelly 1991; Tuggle and Tomonari-Tuggle 1997:24).

James Campbell was convinced that the coast of the ‘Ewa Plain could be used successfully for sugar plantation land despite the overwhelming public opinion at the time that ‘Ewa was a barren wasteland best utilized for cattle ranching. Campbell hired an expert well digger from California to sink a well in Honouliuli in 1879. At a depth of 240 feet (71 m), water commenced to flow. This well gained recognition as Hawaii's first artesian well, called *Wai Aniani* (“crystal waters”). This well was productive until it was sealed in 1939 by the City & County of Honolulu. Additional wells found equal success in water flow. James Campbell proceeded to establish profitable cattle ranches and engaged in sugar plantation ventures in Honouliuli (James Campbell Estate n.d.).

Honouliuli played an important role in the sugar plantation business in Hawai‘i. In 1890, James Campbell leased land in Honouliuli to Benjamin F. Dillingham (Conde and Best 1973). Dillingham subleased the Honouliuli lowlands to W.R. Castle. Castle and Cooke then were in a position to organize the ‘Ewa Plantation Company (Frierson 1972; Tuggle and Tomanari-Tuggle 1997:24). A few years later, in 1897, Dillingham formed the O‘ahu Sugar Company, Ltd., utilizing the artesian well water to irrigate sugarcane plantations in the Honouliuli uplands (Conde and Best 1973). In 1970, the O‘ahu Sugar Company merged with the ‘Ewa Plantation Company (Dorrance and Morgan 2000). The lease to the Honouliuli lands lasted through 1996.

Subsequent to western contact in the area, the landscape of the ‘‘Ewa plains and Wai‘anae slopes was adversely affected by the removal of the sandalwood forest, and the introduction of domesticated animals and new vegetation species. Domesticated animals, including goats, sheep and cattle, were brought to the Hawaiian Islands by Vancouver in the early 1790s, and allowed to graze freely about the land for some time after. It is unclear when the domesticated animals were brought to O‘ahu; however, L.A. Henke reports the existence of a longhorn cattle ranch in Wai‘anae by at least 1840 (Frierson 1972:10). During this same time, perhaps as early as 1790, exotic vegetation species were introduced to the area. These typically included vegetation best suited to a terrain disturbed by the logging of sandalwood forest and eroded by animal grazing. Within the current project area, the majority of the non-cultivated vegetation is comprised of introduced species, mainly *kiawe* and grasses (Frierson 1972).

THE DEVELOPMENT OF NAVAL AIR STATION BARBERS POINT

Barbers Point is the post-contact name of the area and is attributed to Captain Henry Barber:

> In October 1795 Captain Henry Barber made
> one of several trips to Oahu. At this time Kamehameha
> I was on Oahu and he and Captain Barber became
> very friendly. When Barber departed he gave Kamehameha
> gifts. He intended giving him a keg of brandy but
> after thinking it over decided that to give the heathen
> king a whole keg of good brandy which he wouldn't appreciate
> was a great waste. He therefore had the keg
> half drained and filled up with water and sent this
> watered brandy to the king.
>
> On leaving Oahu he ran aground at Kalaeloa
> and when the natives saw the ship's plight they swarmed
> out to it taking everything they could lay their hands on.
> In the meantime Kamehameha had left for Kona and Barber

> seeking his help to recover the stolen goods went to
> Kona to see him. There he was treated cordially and a
> large feast was prepared. When the awa was passed
> around Barber was surprised and chagrined to find that
> his awa cup held nothing but watered awa, thus did Kamehameha
> remind Barber that he was not a fool. In
> spite of Barber's treatment of Kamehameha the king
> sent him back with kapu sticks and orders that the Hawaiians
> must return all which had been stolen. When
> the Hawaiians saw that Barber came with authority
> they immediately returned all that had been taken.
> [Joseph Emerson, as told to Mrs. Beatrice Greenwell cited in Sterling
> and Summer 1978:39].

Some accounts describe Barber as an unscrupulous man whose primary interest was in trading sea otter pelts and transporting supplies to and from penal colonies in Australia (Sterling and Summers 1978:39-40). Personality aside, Captain Barber's visit to Kalaeloa made a lasting mark on Hawaiian history, so much so that the point was relabeled (especially in written literature) in his name from 1796.

In the 1930s, the United States (U.S.) military moved into the ʻEwa Plain. Among the various military facilities established in the area was Barbers Point Training Area. In 1931, the U.S. Army began construction of an artillery battery at Barbers Point Training Area to contain two 16-inch guns that had an effective range of 44,000 yards (Denfeld 1994). These were the largest guns installed in an American coastal defense at the time. Battery Hatch was built on the top and into the sides of Pu'u o Kapolei and was comprised of two emplacements with 360-degree fields of fire. A railroad connected the dispersed emplacements, barracks, and pillboxes for machine guns. During World War II, the emplacements were casemated with 12-foot thick walls and an 8-foot thick roof covered with soil. The military reservation on which the battery stood was named Fort Barrette (Tuggle and Tomonari-Tuggle 1994).

In 1932, the U.S. Navy leased a little over 206 acres of the Campbell Estate for a steel tower mooring mast for the dirigible *Akron* (Denfeld 1994) and an oil-surfaced 150 by 1500-foot emergency landing field (Anonymous 1947). Crashes of both the *Akron*, in 1933, and the dirigible, the *Macon*, in 1935, caused the Navy to abandon its large dirigible program and the mooring mast, located about 1.5 km inland of the coast. Active military use was reinstituted when the Navy increased its lease holdings to 3,500 acres in 1940 in order to expand the airstrip for the U.S. Marine Corps. The mooring mast was used as a control tower and gave the field its name, the ʻEwa Mooring Mast Field. Paving

of the landing strip and a new cross-runway was completed by June 1941 (“Pacific Crossroads” 1947:144)

In late 1941, the construction of the NAS at Barbers Point began. Several 400-foot sections of the dense *kiawe* forest had to be cut before survey sights could be taken (Collins 1977:33, in Kelly 1991:166). The NAS was intended as an auxiliary airfield for the Navy's Ford Island facility (“Pacific Crossroads” 1947:145) and was designed to accommodate the land-based operations of two aircraft carrier groups.

On December 7, 1941, the ‘Ewa Mooring Mast Field was one of the targets of the Japanese attack on Pearl Harbor. At the time, there were 49 planes neatly lined up along the edge of the airfield. In the initial wave, 20 Japanese aircraft strafed the field in repeated passes, destroying nine Wildcat fighters, 18 Scout bombers, and all six utility planes. A second attack wave of dive-bombers dropped bombs on surviving aircraft and strafed the airfield as well. A third wave crossed the airfield, but found little remaining intact suitable for attack (Tuggle and Tomonari-Tuggle 1994).

With the onset of war, construction at the station accelerated. The station’s operational capacity was increased to handle four aircraft carrier groups and a mix of both permanent and temporary buildings was quickly constructed. Yoklavich *et al*. (1992: 17) relates that “of the 251 buildings remaining from the 1940’s two are listed as being built in 1941, 187 were built in 1942-43, 53 were completed in 1944, 3 in 1945, and only 6 in the next four years, 1946 to 1949." A series of aerial photographs indicates that runway construction was underway in February of 1942 and was completed by June of that year (Yoklavich *et al*.1992). The station was commissioned on April 15, 1942; ‘Ewa Marine Corps Air Station was formally established in September 1942 (Anonymous 1947:144).

There are numerous abandoned military features scattered across the NAS, Barbers Point that probably are of World War II age. These include coastal bunkers, inland anti-aircraft battery complexes, and training facilities (Tuggle and Tomonari-Tuggle 1994).

From the 1950s to the present, NAS Barbers Point has been an important mid-Pacific military installation, with a variety of functions, including anti-submarine patrol, headquarters of the Pacific Airborne Barrier Command (1958-1965), guided missile

units, and the Pacific Sound Surveillance System. In 1990, base tenants included Headquarter Patrol Wing Two; Fleet Composite Squadron One; five Patrol Squadrons; Fleet Reconnaissance Squadron Three; Helicopter Anti-Submarine (Light; HSL-37); U.S. Coast Guard Station Barbers Point; Hawaii Air National Guard; U.S. Army (Company B**,** 214th Aviation Regiment), and Naval Reserve units (Tuggle and Tomonari-Tuggle 1994). The Naval Air Station Barbers Point was closed in 1993 by Defense Base Closure and Realignment Commission in accordance with the DBCRA act of 1990 (Honolulu Star Bulletin.com 1999).

PREVIOUS ARCHAEOLOGY

The antiquated notion that leeward settlement in some form (temporary or permanent) followed protracted windward settlement is actually well supported from archaeological data (Davis 1990). Initial settlement of the Hawaiian Islands, conservatively estimated at around the A.D. 900-1000+ range (Athens and Ward 1993; Athens *et al*. 1995), is believed to have occurred along the wetter and more fertile windward areas where "conditions were optimal for marine and terrestrial exploitation along lines followed previously in Eastern Polynesia" (Green 1980:1). Leeward settlement is thought to have commenced only after windward areas were settled. More than 75 archaeological studies have been conducted on the ʻEwa Plain, extending from ʻEwa Beach to West Beach. Synthesis of recent archaeological and paleoenvironmental projects conducted on the ʻEwa Plain, particularly in near coastal and coastal settings, sheds much light on pre-Contact settlement patterns for the area.

When assessing settlement pattern models for the ʻEwa area, it is apparent that most archaeological studies have been conducted in the lowland karst zone, with general settlement pattern models somewhat skewed towards human adaptations to this semi-arid, soil-poor region (Tuggle and Tomonari-Tuggle 1997:12). During the pre-Contact Period, the ʻEwa Plain contained habitation and agricultural settlements, with "sinkholes" and stone mounds being the chief cultivation media. As Davis (1986) notes, the sinks and mounds provided moisture conservation to the plants in an otherwise marginal environment. It is with adaptations such as these that the Hawaiians proliferated the area with features. Hawaiian features have been identified in almost every area of the ʻEwa Plain not damaged by sugar cane cultivation or twentieth century construction (Tuggle and Tomonari-Tuggle 1997:49).

Many of the previously documented sites occur within or very close to perceived coastal dunes or beach deposits. According to Tuggle and Tomonari-Tuggle (1997:60), cultural deposits recorded in dunes or beach sand have only been reported at four features along the entirety of the ʻEwa Plain coastline. Human burials, commonly associated with coastal sand deposits (see Kirch 1985), have been documented in all contexts of the ʻEwa Plain and were not clustered or centered in coastal beach deposits. Cultural resources such as midden, hearths or ovens, and modest cultural strata have revealed coastal ʻEwa features to be of short-term habitation loci most often associated with fishing activities. However, just inland of this beach sand zone are backwater marsh areas and soil-poor areas dominated by vertically protruding limestone benches on which architectural structures are often constructed. The project area appears representative of the latter area, although no standing architecture was identified.

The following presentation of archaeological projects previously conducted near the current project area is not meant to be listing of all projects ever conducted, rather it is intended to present site, and feature, classes previously identified in the ʻEwa Plain. The reports utilized for research purposes were obtained from the State Historic Preservation Division, Kapolei; and the SCS library, Honolulu. Figure 4 depicts the previous archaeological studies within the former NAS, Barbers Point. Additionally, previous archaeological studies for the former Naval Air Station Barbers Point are presented in table format (Table 2).

In 1962, Lloyd Soehren of the Bernice Pauahi Bishop Museum recorded a human burial (Bishop Museum Site 50-0a-B6-9) at Naval Air Station Barbers Point (see Haun 1991:10). The human burial, described as a secondary interment, was cached in a "coral pit," presumably a sinkhole, located near house sites and modified pits. This human burial is most likely State Site 50-80-12-1753 Feature 1, however there are no maps or descriptions sufficient enough to verify this hypothesis (Haun 1991:32).

In 1974, State Historic Sites Section (now the State Historic Preservation Division, SHPD) archaeologists removed two human burials from the NAS Barbers Point property. These were from State Site 50-80-12 532, now subsumed under Site -2220, and from an eroding burial at a beach deposit at Kualakaʻi and a limestone cavity exposed in the drainage canal on the west side of the Naval Air Station (records of the SHPD; Haun 1991:31)

In 1977, Bernice Pauahi Bishop Museum (Sinoto 1978) conducted Archaeological and Paleontological Salvage at NAS Barbers Point for the U.S. Army Corps of Engineers, Pacific Ocean Division. The project was located in the proposed barge harbor area. Excavation associated with the project included preliminary sampling and analytical studies of avifaunal remains and terrestrial gastropods (land snails) and a geological study of the emerged coral reef based on the excavation of one sinkhole (Sinoto 1978). In Sinoto's (1979) cultural resources survey for the new dredged material disposal sites at NAS Barbers Point, Sinoto indicates that although sinkholes containing remains of extinct species were dispersed throughout the project area, only nineteen sinkholes were tested and only three (16%) contained extinct species. He further indicates that between 1,100 and 2,500 species existed (Sinoto 1979:34). Sinoto also indicates that the new disposal site had been utilized for chemical dumps and coral stockpiling.

In 1984, International Archaeological Research Institute, Inc. (Tuggle 1984) conducted a reconnaissance survey of the NAS Barbers Point Runway 11, clear zone, outlease parcel. Nine sites were identified, all subsumed under State Site 50-80-12-1725 (Haun 1991), and included three sinkholes, two coral vaults, a quadrangular coral alignment, and several features associated with historic ranching and military occupation. The coral vaults and two sinkholes were considered to have been utilized during the pre-Contact Period. Excavation testing of the sinkholes revealed bird and fish bone and charcoal fragments (Tuggle 1984; Haun 1991:32).

In 1984 and 1985, Bernice Pauahi Bishop Museum and the Pacific Division of the Naval Facilities Engineering Command conducted an Archaeological Survey of the Naval Air Station Barbers Point. The survey area totaled approximately 1,230 acres and resulted in a total identification of forty-three archaeological sites comprised of 385 discrete features (State Sites 50-80-12- -1725 through 50-80-12-2220, non-consecutive; see Haun 1991). The sites identified included enclosures, sinkholes (karsts), modified sinkholes, cairn (rock mound), platforms, alignments, walls, pavements, core-filled walls, stone-lined trails, and such. According to Haun (1991:137), of these, approximately 73 percent are most likely pre-Contact sites, and 27 percent are most likely historical, and approximately 47 percent of the pre-Contact sites are probably related to habitation activities. Subsurface testing resulted in datable charcoal, small samples of midden, and volcanic glass. Radiocarbon dates suggest occupation of the area from at least the 15th century A.D. The current project area is within area E6 of the Haun (1991) investigation (see Figure 4).

In 1987, International Archaeological Research Institute, Inc. conducted an archaeological reconnaissance in the vicinity of the former ʻEwa Marine Corps Air Station, NAS Barbers Point (Welch 1987). The survey located four stone structures, designated as State Sites 50-80-12-3721 and -3722, including a C-shape and a small enclosure (Welch 1987; Tuggle and Tomonari-Tuggle 1997:26).

In 1990, an isolated human burial, temporary site number NL-63 (see Tuggle and Tomonari- Tuggle 1997:32), of possible Polynesian ancestry was encountered during a cottage construction at the eastern end of the Naval Air Station Barbers Point coastline, west of White Plains Beach (Miller 1990). Ogden Environmental and Energy Services Co., Inc. later conducted archaeological monitoring of the area, however no other skeletal remains and no cultural material were recovered (Schilz and Landrum 1994).

In 1992, Paul H. Rosendahl, Ph.D., Inc., conducted an Archaeological Inventory Survey on the west side of Naval Air Station Barbers Point (Burgett and Rosendahl 1992). The survey resulted in the identification of several sinkholes and a number of Hawaiian features (State Sites 50-80-12-1727 and -4548 through -4567). In the same year, Ogden Environmental and Energy Services Co., Inc. conducted an archaeological reconnaissance with limited subsurface testing on the north side of Naval Air Station Barbers Point (Landrum 1993). This survey located several walls associated with sisal cultivation and three traditional Hawaiian sites. Subsurface testing resulted in the identification of Hawaiian occupational debris (*i.e.*, shell midden).

In 1992 and 1993, International Archaeological Research Institute, Inc. conducted an Archaeological Inventory Survey for construction projects at NAS Barbers Point (Tuggle 1997). The survey was conducted in two phases (I and II) to the west and northwest of the Naval Air Station. Phase I identified a total of 274 features, including five sites (State Sites 50-80-12-1718, -1719, -1720, -1723, and -1726) that were previously recorded by (Haun 1991). Features identified during this project were grouped

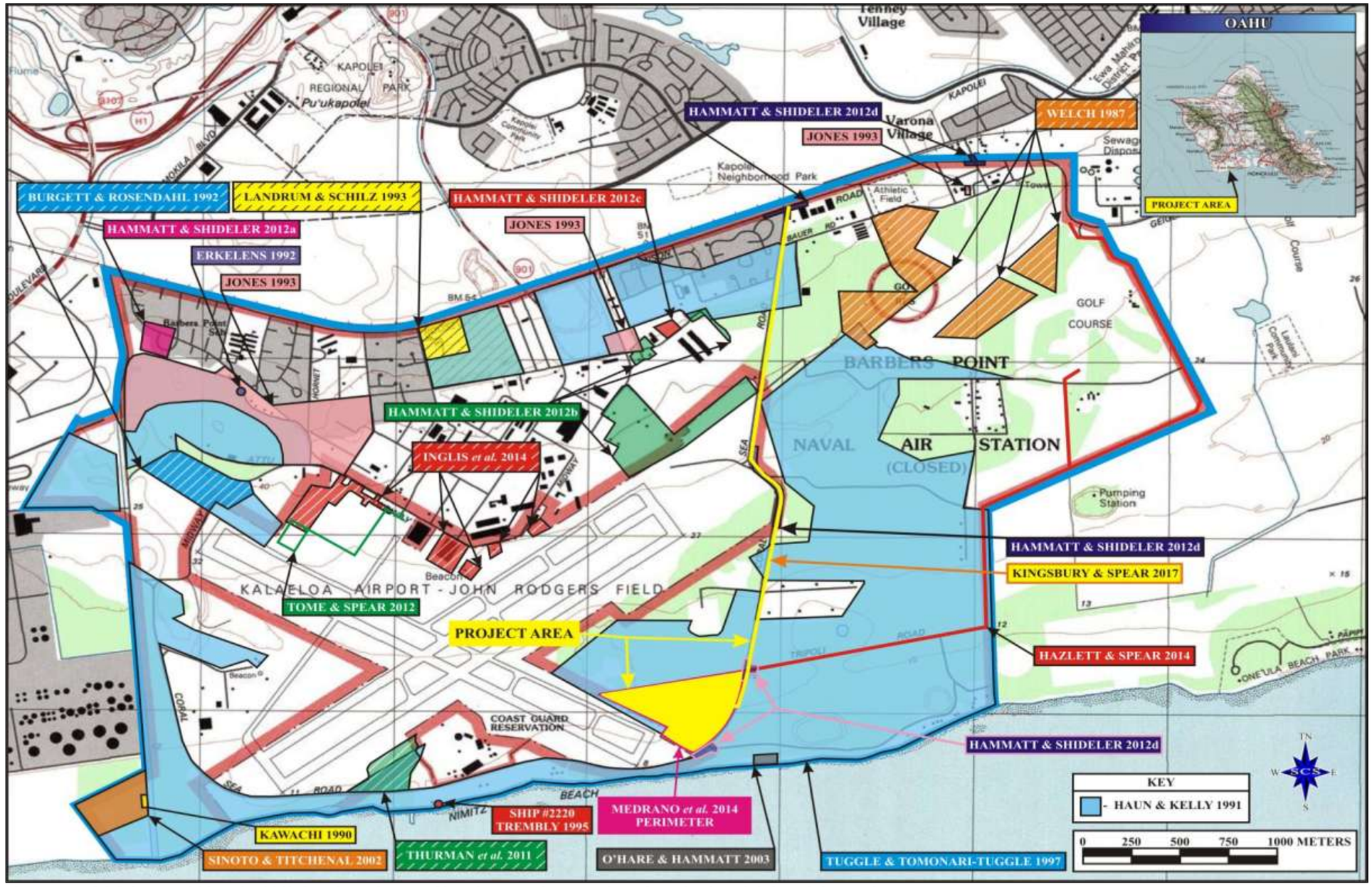

Figure 4: USGS (Ewa, 1998; 1:24,000) Quadrangle Map Showing Previous Archaeology in the Vicinity of the Project Area.

Table 2. Previous Archaeological Studies within the Former Naval Air Station Barbers Point.

Reference	Type of Study	Location	Findings
McAllister 1933	Survey	O'ahu	major sites within Honouliuli, extensive habitation and land use features
Tuggle 1984	Reconnaissance survey	NAS Barbers Point Runway 11, clear zone, out lease parcel	Nine sites were identified, all subsumed under State Site 50-80-12 -1725, and included three sinkholes, two coral vaults, a quadrangular coral alignment, and several features associated with historic ranching and military occupation. The coral vaults and two sinkholes were considered to have been prehistorically utilized.
Welch 1987	Reconnaissance survey	Ewa Marine Corps Air Station at Barbers Point. TMK: (1) 9-1-013:099 (por.), (1) 9-1-013:043 (por.), (1) 9-1-013:038 (por.), and (1) 9-1-013:096 (por.)	Two sites identified: SIHP # -3721(Hawaiian habitation complex with pre-Contact features), State Site 50-80-12-3722 (sisal plantation wall)
Haun and Kelly 1991	Archaeological inventory survey	TMK: (1) 9-1-013:031, :033, :040 -:042, :044, :069, :070-:074, :093, :094, :118-:119, :001 (por.), (por), :020 (por), :039 (por), :060 (por), :061 (por), :067 (por), 081 (por), 082 (por) :101 (por). And TMKs (1) 9-1-031:028 and :047.	Naval Air Station Survey identified 42 new sites, State Sites 50-80-12-1717 through -1757; majority were Hawaiian habitation and agricultural complexes; six had evidence of nineteenth and twentieth century ranching and occupation; remainder utilized and potentially utilized pit cave features.
Burgett and Rosendahl 1992	Archaeological inventory survey	Naval Air Station at Barbers Point. TMK: (1) 9-1-013:117 (por.) and :027 (por.)	Survey newly-identified 20 Native Hawaiian habitation and agricultural site complexes (State Sites 50-80-12-4548 through -4567); majority of features related to agriculture and included mounds, walls, enclosures, terraces and modified pit caves
Erkelens 1992	Archaeological site survey	Naval Air Station at Barbers Point. TMK: (1)9-1-013:118 (por.)	Mapped State Site 50-80-12-1719, previously described by Haun and Kelly (1991); numerous newly-identified features, including large high walled enclosure, small enclosures, C-shapes and mounds
Jones 1993	Archaeological inventory survey Letter Report	Naval Air Station at Barbers Point. TMK: (1) 9-1-013:026 (por.), :100 (por.), :117 (por.), :002 (por.), and :118 (por).	Re-documented State Sites 50-80-12-1718 through -1720, -1723 and -1726, previously described by Haun and Kelly (1991); numerous newly identified Native Hawaiian habitation and agricultural features as well as previously undocumented historic and military remains
Landrum and Schilz 1993	Reconnaissance and subsurface testing	Naval Air Station at Barbers Point. TMK: (1) 9-1-013:010 (por.)	Identified five new sites; State Sites 50-80-12-1728, -4649, and -4653 (sisal plantation walls), State Sites 50-80-12-4650 through -4652 (Native Hawaiian habitation/agricultural complexes)
Trembly 1995	Osteological Report on Human Skeletal Remains at Site 2220	Nimitz Beach TMK: (1) 9-1-013:071	Native Hawaiian flexed pit burial of child 2-3 years discovered eroding out of Nimitz Beach dunes; burial added to State Site 50-80-12-2220
Tuggle and Tomonari-	Cultural resource inventory	Naval Air Station at Barbers Point.	Re-evaluated sites previously recorded by Haun and Kelly (1991); newly-identified 35 sites (SIHP #s -

Reference	Type of Study	Location	Findings
Tuggle 1997b			5093 through -5130, and -5307); sites represented comprehensive range of time periods, including pre-Contact habitation sites, nineteenth century habitation and ranching features, and trail remnants, early twentieth century habitation features, WWII buildings and sites, and cold war structures; paleo-environmental samples collected from pit caves and wetland features
Sinoto and Titchenal 2002	Archaeological inventory survey	Desalination facility south of east end of Ōlaʻi Street. TMK: (1) 9-1-013:028	Three sites discovered: State Site 50-80-12-6373 (short-term Native Hawaiian habitation site), State Site 50-80-12-6374 (pit cave utilized as a lime kiln), SIHP # -6375 (complex of seven pit caves with faunal remains representing 13 bird species); carved bone toggle (potentially human) discovered at State Site 50-80-12-6373
O'Hare and Hammatt 2003	Field inspection	Naval Air Station at Barbers Point. TMK: (1) 9-1-013:072	No cultural resources identified
Thurman et al. 2011	Archaeological inventory survey	Kalaeloa Airport, former Naval Air Station at Barbers Point. TMK: (1) 9-1-013:031, :032, and :063	Investigated pit caves associated with State Site 50-80-12-5121;limited cultural material (basalt cobbles and volcanic glass flake) encountered
Hammatt and Shideler 2012a	Archaeological field inspection	Hawaii Army National Guard Kalaeloa Facility. TMK: (1) 9-1-013:002 (por.)	No cultural resources identified
Hammatt and Shideler 2012b	Archaeological field inspection	Northwestern corner of the Kalaeloa Airport, former Naval Air Station at Barbers Point. TMK: (1) 9-1-013: 045, 046, 032 (por.).	No cultural resources identified
Hammatt and Shideler 2012c	Archaeological assessment	Northern side of the Kalaeloa Airport, former Naval Air Station at Barbers Point. TMK: (1) 9-1-013:045 (por.).	No cultural resources identified
Hammatt and Shideler 2012d	Archaeological field inspection	Eastern side of Kalaeloa Airport, former Naval Air Station at Barbers Point. TMK (1) 9-1-013 at intersection of Tripoli Road and Coral Sea Avenue, Roosevelt Avenue and Coral Sea Avenue, and the "s" curve in Coral Sea Avenue.	No cultural resources identified
Tome and Spear 2012	Archaeological Monitoring	TMK (1) 9-1-013: Portion of 032	No findings.
Hazlett and Spear 2014 (Draft)	Archaeological inventory survey	Essex Road from a point south of Roosevelt Avenue to Tripoli Street and west along Tripoli Street to Coral Sea	The AIS recorded three newly identified archaeological sites (SIHP # 50-80-12-7572, 50-80-12-7573, and SIHP # 50-80-12-7574. These SIHPs are associated with military development of the area. SIHP # -7572 consists of 10 surface features

Reference	Type of Study	Location	Findings
		Road, and along Gambier Bay Street up to Bismark Sea Street.	consisting of sewer and water infrastructure. SIHP # -7573 is a military structure foundation at Gambier Bay Road and Bismarck Street. SIHP # -7574 is a concrete sidewalk on the north side of Essex Road aligned eat to west.
Inglis et al. 2014	Archaeological monitoring plan	TMKs: [1] 9-1-013: 032 por., 088, 089, and 103	Recommended archaeological monitoring.
Medrano *et al*. 2014	Archaeological inventory survey	TMK: (1) 9-1-013:070. east of the Kalaeloa Airport	Identified twenty-three archaeological sites (State Sites 50-80-12-5119, and -5120, and 50-80-12-7483 through -7494, and 50-80-12-7496 through -7504, comprised of 146 features. Relocated State Sites 50-80-12-5119 and -5120) were re-located and documented with additional features added to each site. State Sites 50-80-12-5119 and -5120 were initially identified by Tuggle and Tomonari-Tuggle (1994). Sites -5119, -7483 through -7485, -7487 (Features 1 and 4), -7488 through -7494, -5120 (Features 1 and 2), and -7496 through -7504 were interpreted to be associated with the pre- and /or post-Contact Period. State Sites 50-80-12-7486 (Feature 5) and 50-80-12-7491 were interpreted as trails associated with the pre- and/or post-Contact Period, with use possibly extending into the Historic Ranching Period. State Sites 50-80-12-7487 (Feature 3 and 5) and -5120 (Features 3 through 9) were interpreted to be associated with United States Military occupation of the area during the Historic Period. Based on feature type, construction methods, construction materials, and observed artifacts, Site -5119, Feature 30 was interpreted as having associations with Traditional Hawaiian and historic (military) occupation of the project area.

into five sites (State Sites 50-80-12-4701, -4702, -1723, -1724, and -1726), three of which use previous site numbers. Features identified during Phase I included linear alignments, circular mounds, elongated mounds, modified outcrops, enclosures, sinkholes, C-, U-, and L-shaped structures, platforms, cairns, hearth and linear-stacked rock, the majority of which are related to pre-contact and early post-contact Hawaiian occupation. Features from the 19th and 20th centuries also were recorded, including wall sections, a stone-lined irrigation ditch, concrete cistern, and a stone cattle tank. Military features include a concrete bunker and trash scatters. Phase II, was conducted in of a portion of Phase I (Area A) in order to provide detailed information on the cultural resources of the project area adequate for evaluation and management within the framework of historic preservation regulations (Tuggle 1997).

In 1994, International Archaeological Research Institute, Inc. conducted two archaeological projects, a Reconnaissance Survey and a Phase I Inventory Survey of the entire Naval Air Station Barbers Point property. All relatively undeveloped areas of the Naval Air Station were covered by intensive survey, moderately developed areas were

covered by either intensive survey or reconnaissance sweeps, and developed areas were covered by a general reconnaissance (Tuggle and Tomonari-Tuggle 1997:50). The 1994 Phase I survey covered the Haun (1991) survey areas (A through E), including four new areas (F through I) (Tuggle and Tomonari-Tuggle 1997: Fig 20). Thirty-five archaeological sites, including a human burial site, were newly identified (State Sites 50-80-12-5119 through -5130), horizontal boundaries were modified for eight previously recorded archaeological sites, several areas were identified for subsurface investigation, and locations were clarified for State Sites -1727 and -4548 through -4567. During the 1994 project, State Sites 50-80-12-5119 and 50-80-12-5120 were identified in an area described as E6c, which was re-identified during the current project and are discussed below.

Phase II of the 1994 Archaeological Inventory Survey (Tuggle and Tomonari-Tuggle 1997) was divided between International Archaeological Research Institute, Inc. (Wickler and Tuggle 1997) and Paul H. Rosendahl, Ph.D., Inc. (O'Hare *et al*. 1996). Work completed by International Archaeological Research Institute, Inc., consisted of mapping, and testing of feature complexes at two Hawaiian sites and detail mapping of military structures, including State Sites 50-80-12-5119 and 50-80-12-5120 (Wickler and Tuggle 1997). State Sites 50-80-12-5119 and 50-80-12-5120 were also identified in an area described as E6c, during the Paul H. Rosendahl, Ph.D., Inc. (O'Hare *et al*. 1996) Phase II Inventory Survey. State Sites 50-80-12-5119 and 50-80-12-5120 were re-identified during the current Archaeological Inventory Survey and are discussed below.

To summarize these last few projects with the concurrent research area, two previously identified sites, State Sites 50-80-12-5119 and -5120, occur in the current project area. State Sites 50-80-12-5119 and 50-80-12-5120 were originally recorded by Tuggle and Tomonari-Tuggle (1994) and again by Tuggle and Tomonari-Tuggle (1997). State Site 50-80-12-5119 was described in the latter report as a Hawaiian Agricultural Complex composed of seven rock mounds and one karst pit (:Tuggle and Tomonari-Tuggle 1997:169). Kingsbury and Spear (2017, in review) added 20 additional limestone rock mounds, two additional karst pits, and eight other substantial features to the State Site 50-80-12-5119. State Site 50-80-12-5120 was originally recorded by Tuggle and Tomonari-Tuggle (1994) and re-identified by Tuggle and Tomonari-Tuggle (1997:169). State Site 50-80-12-5120 was recorded then as a World War Two battery complex, bivouac, bulldozed, crash site (Tuggle and Tomonari-Tuggle 1997) with 10+ features.

The current Archaeological Inventory Survey study has added multiple archaeological features to the site, including structural concrete pads and a karst pit.

In 2002, Aki Sinoto Consulting (Sinoto and Titchenal 2002) conducted an Archaeological Inventory Survey of the desalination facility at NAS Barbers Point, south of the east end of Olaʻi Street. Three sites, two cultural and one paleontological, were identified. Cultural features included a circular enclosure, a capped sinkhole, a cist-like structure and a lime kiln. A possible human bone toggle artifact was the only *iwi* remains recovered (Sinoto and Titchenal 2002:58). In addition, thirteen species of birds were identified including many extinct species.

Cultural Surveys Hawaiʻi (Hammatt and Shideler 2012d) conducted an archaeological field inspection and literature review within portions of the proposed project area (within the Coral Sea Road Rights-of-Ways). The portions recorded by Hammatt and Shideler (2012d) included the intersection of Eisenhower and Coral Sea Road (Project Area 3), the intersection of Tripoli Road and Coral Sea Road (Project Area 4), the "S" curve in Coral Sea Road (Project Area 1), and the intersection of Coral Sea Road and Roosevelt Avenue (Project Area 5). Hammatt and Shideler (2012d) reported no historic properties identified within the proposed project area. The report did recommend archaeological monitoring based on a lack of subsurface data and due to proximity of previously identified sites Hammatt and Shideler (2012d:46).

Scientific Consultant Services, Inc. (Medrano *et al*. 2014 conducted an archaeological inventory survey for the proposed 44.28-acre solar farm project area in Honouliuli Ahupuaʻa, ʻEwa District, Island of Oʻahu [TMK: (1) 9-1-013:070]. During the survey, 23 historic properties (State Sites 50-80-12-5119, -5120 and 50-80-12-7483 through 50-80-12-7504), comprised of 146 features, were documented. Twenty-one sites (State Sites 50-80-12-7483 through -7494 and 50-80-12-7496 through -7504) were newly identified. Two sites (State Sites 50-80-12-5119 and -5120), previously identified by Tuggle and Tomonari-Tuggle (1994), were re-located and documented with new features being added to each site. Of the 146 features found within TMK: (1) 9-1-013:070, a total of eight features recorded by Wickler and Tuggle (1997) were re-located. Of the remaining 138 features nine features could not be confirmed as having been recorded by Wickler and Tuggle (1997) based on the current Archaeological Inventory Survey results and the site descriptions of Wickler and Tuggle (1997). The remaining 129 features were newly recorded.

Based on feature type, construction methods, and construction materials, (Medrano *et al*. 2014) interpreted State Sites 50-80-12-5119, -7483 through -7485, -7487 (Features 1 and 4), -7488 through -7494, -5120 (Features 1 and 2), and -7496 through -7504 to be associated with the pre- and /or post-Contact Period. Based on a 1928 aerial coastal photo, a 1927 USGS quadrangle (Barber's Point) map, general feature horizontal shape, and feature location within the project area, State Sites 50-80-12-7486 (Feature 5) and 50-80-12-7491 were interpreted as trails associated with the pre- and/or post-Contact Period, with use possibly extending into the Historic Ranching Period. State Sites 50-80-12-7487 (Feature 3 and 5) and -5120 (Features 3 through 9) were interpreted to be associated with United States Military occupation of the area during the Historic Period. Based on feature type, construction methods, construction materials, and observed artifacts, Site -5119, Feature 30 was interpreted as having associations with Traditional Hawaiian and historic (military) occupation of the project area.

A variety of site types were documented during the Medrano *et al*. (2014) study. The majority of the features recorded represent Traditional Hawaiian occupation of the area. These features include rock mounds, various small enclosures and structures, modified pits (karst), unmodified pits (karst), platforms, and small coastal trails. Most of the sites were composed of limestone, a locally available resource. They represent a range of features often associated with residential complexes. Military use of the landscape was also well-represented, as evidenced by a concrete building foundation, a pillbox, and a guard shack.

Scientific Consultant Services, Inc. (Kingsbury and Spear, 2017 in review) conducted a field inspection and literature review for the proposed ASEF2 underground utility alignment along Coral Sea Road, Honouliuli Ahupuaʻa, Ewa District, Island of Oʻahu, Hawaii, (TMK: (1) 9-1-013:070 and 000). During the field inspection three dissolution pit caves were observed within the proposed project area. These were the only dissolution pit caves identified in the proposed project area. However, the field inspection did observe a minimum of 34 dissolution pit caves, two historic or modern push piles, and a historic concrete building foundation with associated concrete pad beyond the proposed project area boundaries. These potential historic properties were all observed beyond the Coral Sea Road ROW, and predominately located opposite (western side) of Coral Sea Road from the proposed project area.

Based on feature type, construction methods, and construction materials, State Sites 58-80-12-5119, -7483 through -7485, -7487 (Features 1 and 4), -7488 through -7494, -5120 (Features 1 and 2), and -7496 through -7504 were interpreted to be associated with the pre - and/or post-Contact Period. Based on feature type, construction methods, and construction materials, State Site - 5119, -7483 through -7485, -7487 (Features 1 and 4), -7488 through -7494, -5120 (Features 1 and 2), -7496 through -7499, -7502 through -7504 were interpreted to be associated with the pre- and/or post-Contact Period. State Site 50-80-12-7501 (Feature 1), State Site 50-80-12-7487 (Features 3 and 5), State Site 50-80-12-5120 (Features 3 through 9) were interpreted to be associated with United States Military occupation of the area during Historic Periods. Two features within the project area (State Sites 50-80-12-7486, Feature 5, and 50-80-12-7491) were interpreted as trails associated with the pre- and/or post-Contact Period, with use possibly as extending into the Historic Ranching Period.

ARCHAEOLOGICAL SUMMARY

Based on previous archaeological work on Naval Air Station Barbers Point and institutional knowledge, a discussion of feature types occurring in the ʻEwa Plain is presented. This analysis of site types and discussion of such is treated both as a synthesis of previous work conducted in the area (see above) and the academic work of Scientific Consultant Services, Inc., in the area. References to specific site types are presented above.

ENCLOSURES AND PLATFORMS

Numerous stone-walled enclosures representing habitation loci proliferate in this inland zone beyond the coast where the soil mantle is shallow and deposits are most accurately assessed by their horizontal context rather than their vertical context. Features in this near-coastal zone consist of two common structural classes: platforms and mounds. Platforms are perhaps the vaguest of features in the ʻEwa Plain, a characteristic not common to the feature type in other parts of the islands. The low, small, and poorly constructed platforms are so impecunious that Davis (1986) even suggested these platforms to be possible pavings. Typically associated with a habitation function, free-standing platforms are basically unknown in the area and no large, well-constructed platforms typically associated with ceremonial or larger habitation dwellings have been recently documented in the ʻEwa Plain (Tuggle and Tomonari-Tuggle 1997:64). Both C-shapes and small rectangular enclosures are thought to have been the primary habitation loci on the ʻEwa Plain. No house platforms have been documented to date. The rectangular house features themselves are typically small, with only modest quantities of

artifacts and midden having been recovered from the features. This pattern is one that intimates limited feature occupational duration. Again, the question of permanent residences (and when) versus temporary/seasonal habitation loci emerges.

MOUNDS

Mounds are only slightly less ambiguous, with most researchers prescribing an agricultural function to these features. Sweet potato cultivation may be the primary function of most mounds, but these features take on many forms and sizes such that they have been designated as cairns, boundary markers, or even the very general term *ahu*. The mounds are variable in size, morphology, construction technique, and the presence/absence of cultural resources.

OTHER ARCHAEOLOGICAL FEATURE TYPES

Other classes of archaeological features occurring on the ʻEwa Plain consist of C- and U-shaped habitation loci, circular enclosures (likely collapsed rectangular-shaped structures; Tuggle and Tomonari-Tuggle 1997:104), and the ubiquitous limestone "sinkholes," which have been described above. Paleoenvironmental features such as the "sinkholes" and wetlands have revealed a wealth of cultural and natural resources allowing researchers to further document paleoenvironmental change on local and regional levels. It is from the environmental research specifically that more robust arguments pertaining to human settlement patterns, adaptation, and chronology have been established for the area.

TRAILS

Finally, trails are known to occur across the ʻEwa Plain but are, for the most part, not bounded by architecture such as other well-known trails *(e.g.*, Stepping Stone Trail, Kealakekua, Hawaiʻi Island). Trails, often overlooked as significant features, are important for facilitation between features and between resource zones. The trails in this area are coastal trails and not part of a regional system. Dating prehistoric trails is difficult, at best, and is typically done through relative dating of archaeological features or features which the trail course around or through.

Lieutenant Charles Robert Malden, a cartographer for Lord Byron on board the HMS Blonde, prepared a detailed map of the southern coastal area of the island of, Oʻahu. Figure 5, the Malden 1825 (Fitzpatrick 1986: Figure 11) map shows several trails extending from Honouliuli Settlement across the ʻEwa Plain to the coast. Figure 6 (ʻĪʻī (1959:96) shows coastal and inland trails which extend across the leeward side of the island of Oʻahu.

CHRONOLOGY

Chronology has been one issue at the center of many debates revolving around the timing of initial settlement of the ʻEwa Plain and the terminus of settlement following Western Contact (*i.e.*, 1778). Tuggle and Tomonari-Tuggle (1997:78) note that over 142 samples have been processed for radiocarbon analysis of ʻEwa Plain features. While a fairly complex argument with many competing theories, more conservative researchers intimate that the ʻEwa Plain was not settled prior to A.D. 900-1100, with most settlement occurring from A.D. 1400-1800 (Tomonari-Tuggle 1997:78).

Finally, as discussed above, much historic-era activity occurred across the ʻEwa Plain and should not be dismissed. In the 1800s, salt works were established and by the late 1800s, the lands were utilized for grazing, sugar cane, and railroads, along with many permanent settlements were established. Commencing in the 1930s with the building of defensive batteries to support Pearl Harbor, by 1945, hundreds of military buildings were constructed, as well as landing strips, bunkers, and additional gun placement locations. The historic record of the ʻEwa Plain is as rich as the pre-Contact record. In addition, the historic period (post-1778) includes pre-Contact sites well into the first half of the 1800, at the least.

Image from Library of Congress JUL 1947

SANDWICH ISLANDS

SOUTH COAST OF WOAHOO,
AND
HONORUROU HARBOUR
SURVEYED BY
LIEUT C. H. MALDEN, R.N.
1825.

Honolulu

AMERICAN GEOGRAPHICAL SOCIETY

HONORUROU
HARBOUR

PEARL LOCHS

PROJECT AREA

Low uncultivated plain

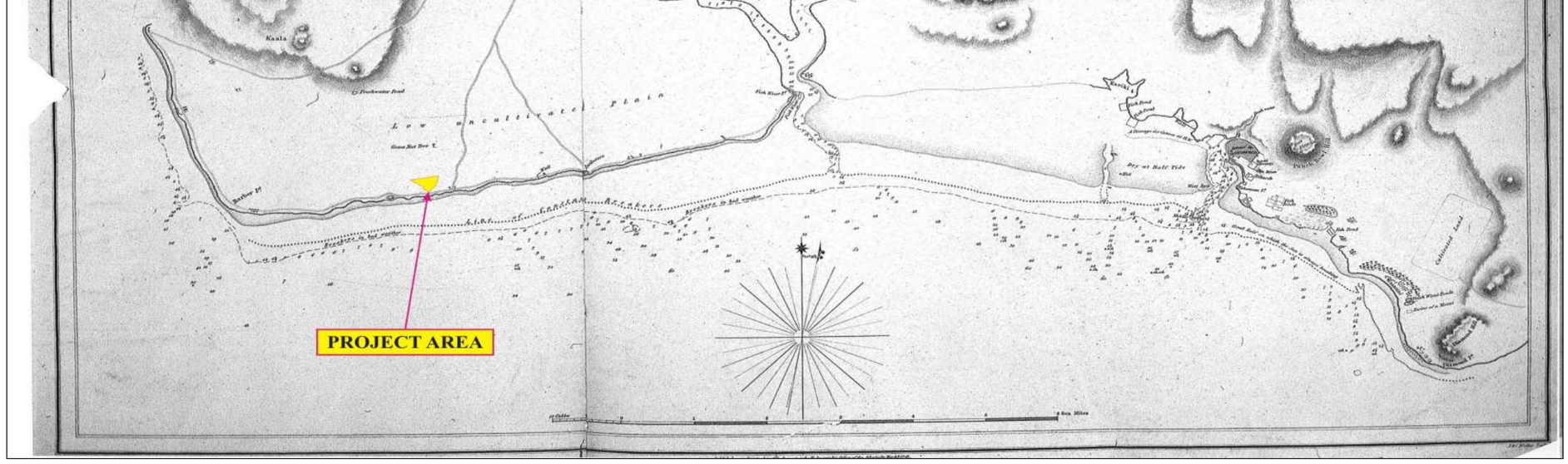

Figure 5: Malden 1825 (Fitzpatrick 1986: 62-63) Map of the Southern Coast of Woahoo and Honorurou Harbor Showing Traditional Trails Across the ‘Ewa Plain.

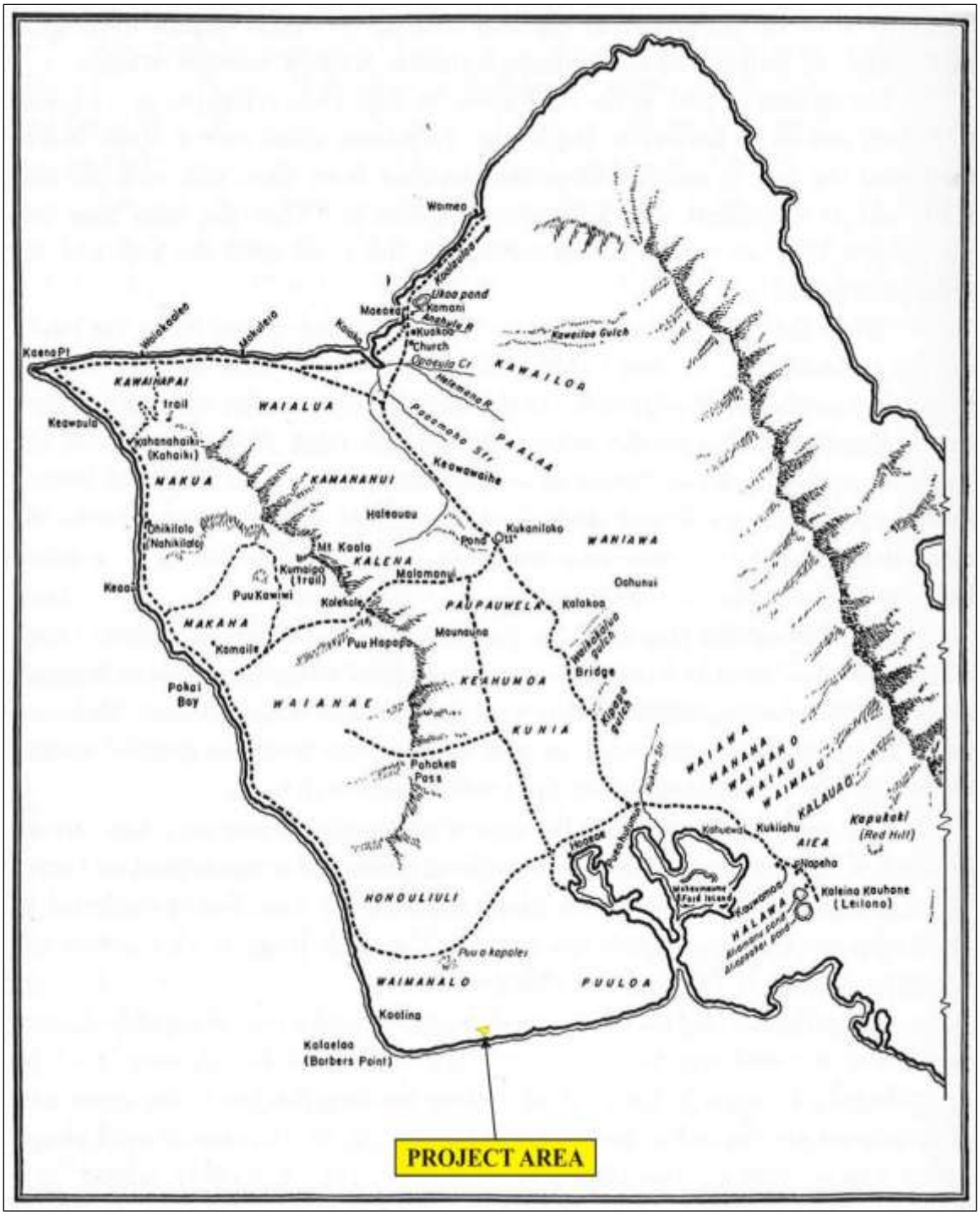

Figure 6: Trails of leeward Oahu as described by Ii (sic) (1959). Map by Paul Rockwood. (Modified by SCS).

CONSULTATION

Consultation was conducted via telephone, e-mail, and the U.S. Postal Service. The initial letters of inquiry (see Appendix A) were mailed between May and November 2012 and the initial follow up letters (see Appendix C) were mailed October 22 and 23, 2012, to the following individuals and organizations:

1. Kamanaʻopono M. Crabbe, Office of Hawaiian Affairs (OHA);
2. Phyllis (Coochie) Cayan, State Historic Preservation Division, Kapolei;
3. George Kaeliwai, Jr., Hawaiʻi Civic Club of ʻEwa;
4. Shad Kane, Former ʻEwa OIBC representative and Ahahui Siwila O Hawaii O Kapolei Hawaiian Civic Club;
5. Glenn Oamilda, ʻEwa Beach Community Association;
6. Kumu Kepa Maly, Historian, Kumu Pono Associates;
7. Kupuna Arline Wainaha Kuuleialoha Brede Eaton, Hoakalaei Cultural Foundation;
8. Aunty Mary Kaipo Malama Serrao, Hoakalaei Cultural Foundation;
9. Aunty Nettie Tiffany, Lanikuhonua;
10. Kamaki Kanahele, Hawaii Community Development Authority (HCDA) Cultural Specialist;
11. Judith Flanders, Ola Hawaii 2020;
12. Maeda Timson, Former Chair, Makakilo / Kapolei/Honokai Hale Neighborhood Board No. 34; Kumu Hula Kauionalani Serrao, ʻEwa Halau;
13. Kumu Hula Kehaulani Yonehiro, ʻEwa Halau;
14. Rona Rodenhurst, Ahahui Siwila Hawaii O Kapolei;
15. Shirley Swinney, Kapolei Community Development Corporation;
16. Melissa Lyman, Kalaeloa Heritage and Legacy Foundation;
17. Jan Becket, Ahahui Siwila Hawaii O Kapolei Kapolei Hawaiian Civic Club;
18. Dwight Victor, President, Kalaeloa Heritage and Legacy Foundation

19. Kaanohi (Paulette) Kaleikini, President, Hui Malama I Na Kupuna o Hawaii Nei and descendent;

20. Kimberly Kalama, Hoakalei Cultural Foundation;

21. Lance Holden, President, Ahahui Siwila Hawaii O Kapolei;

22. Mana Caceres, ʻEwa Moku Representative, Oʻahu Island Burial Council;

23. Kumu Michael Lee, a long time ʻEwa resident, descendent, Kahuna Lapaʻauokekaiolimu (traditional cultural practitioner of limu medicine), a royal descendent of the Kamehameha bloodline, and a member of Hui Kanehili;

24. John Bond, Kanehili Cultural Hui, President

Subsequently, the letters of inquiry and follow-up letters were revised to reflect the current description of the proposed undertaking (see Appendices D and E). The revised letters of inquiry were mailed, via USPS and e-mail, between March 8 and April 6, 2017. The revised follow-up letters were mailed, via USPS and e-mail, March 24, 2017. Both sets of revised letters were mailed to the individuals and organizations listed below:

1. Shad Kane, Former ʻEwa OIBC representative and Ahahui Siwila O Hawaii O Kapolei Hawaiian Civic Club;

2. Kumu Michael K. Lee a long time ʻEwa resident, descendent, Kahuna Lapaʻauokekaiolimu (traditional cultural practitioner of limu medicine), a royal descendent of the Kamehameha bloodline, and a member of Hui Kanehili;

3. Shirley Swinney, Kapolei Community Development Corporation;

4. Melissa Lyman, Kalaeloa Heritage and Legacy Foundation;

5. Dwight Victor, Kalaeloa Heritage and Legacy Foundation;

6. John Bond, Kanehili Cultural Hui, President;

7. Kaanohi (Paulette) Kaleikini, Hui Malama I Na Kupuna o Hawaii Nei, President, and cultural descendent;

8. Kimberly Kalama, Hoakalei Cultural Foundation;

9. Lance Holden, Ahahui Siwila Hawaii O Kapolei, President;

10. Mana Caceres, Oʻahu Island Burial Council, ʻEwa Moku Representative

In addition, a Cultural Impact Assessment Notice was published on May 20, 23, and 24, 2012, in *The Honolulu Star-Advertise*r, and the October 2013 issue of the OHA newspaper, *Ka Wai Ola* (see Appendix B). These letters of inquiry and newspaper notice stated that SCS was seeking information of cultural resources or activities in the proposed project vicinity, stated the Tax Map Key number, and where to respond with pertinent information. Based on the responses, an assessment of the potential effects on cultural resources in the project area and recommendations for mitigation of these effects can be proposed.

The minutes of a series of community meetings have been included in Appendix G, at the request of G70. Please note these meetings were not part of SCS's consultation process.

RESPONSES

Analysis of the potential effect of the project on cultural resources, practices or beliefs, the potential to isolate cultural resources, maintain practices or beliefs in their original setting, and the potential of the project to introduce elements that may alter the setting in which cultural practices take place is a requirement of the OEQC (No. 10, 1997). As stated earlier, this includes the cultural resources of the different groups comprising the multi-ethnic community of Hawai'i.

During the consultation process, SCS sought consultation from 24 individuals and organizations. This process resulted in SCS receiving four written responses, via e-mail, and one in-person interview in response to the inquiries seeking any information that individuals or organizations may have which might contribute to the knowledge of traditional cultural activities that were, or are currently, conducted in the vicinity of the proposed ASEF2) Kalaeloa Project. These responses and interview are presented below:

Kumu Kepa Maly, Historian, Kumu Pono Associates

On September 20, 2012, Kepa Maly responded, via e-mail, stating that "... Aunty Mary [Kaipo Malama Serrao] is not well, and cannot participate in an interview. Kupuna [Arline Wainaha Kuuleialoha Brede] Eaton is also in declining health, and her family is very protective of her time and energy..." Mr. Maly suggested reviewing some of the historical files (including two oral history interviews) posted on the Hoakalei Cultural Foundation website.

Concerns: None

Kaanohi (Paulette) Kaleikini, President, Hui Malama I Na Kupuna o Hawaii Nei and descendent

Kaanohi (Paulette) Kaleikini, President, Hui Malama I Na Kupuna o Hawaii Nei and descendent, provided comments in an e-mail dated March 9, 2017:

> **In this area, there may be low shallow burial caves; such caves were found in other areas close-by. Many native Hawaiians lived on leeward side; they were everywhere; traveling and moving around the island; mauka as well as makai.**
>
> **So I would advise an archaeological inventory survey and a plan to provide an honest search for cultural sites.**

Concerns: Ms. Kaleikini expressed concern regarding the potential for human burials in shallow caves. She recommends an Archaeological Inventory Survey be conducted of the project area to identify and document any historic properties, including human burials, within the project area.

Shad Kane, Former 'Ewa OIBC representative and Ahahui Siwila O Hawaii O Kapolei Hawaiian Civic Club

Mr. Kane provided comments via an e-mail dated March 10, 2017.

> **TO : Cathleen Dagher, Senior Archaeologist, SCS, Inc.**
> **FROM : Shad Kane, Cultural Consultant**
> **SUBJECT : Requested Information and Recommendation Toward your CIA**
>
> **General history as well as past and present land use of the project area:**
>
> The area of interest is within the former Barbers Point Naval Air Station at the eastern end of the east-west runway. Currently adjacent to the 77 acre Kalaeloa Heritage Park. The cultural landscape of the subject portion of the total 44 acres is identical to that of the Kalaeloa Heritage Park and is a continuation of the park landscape anciently. The disturbed portion of the Kualaka'i Trail passes through the subject property. Anciently this geographic region served as a place of subsistence for the farmer, the fisherman, and the gatherer at a place once known as Kualaka'i as identified on Malden's Map of 1825. It was further confirmed by Dr. Rubillite Johnson former professor of ethnic studies at the University of Hawaii as part of the base closure process.
>
> **Knowledge of cultural resources which may be impacted by future development of the project area:**
>
> It is my understanding that this 22-acre cultural landscape of the 44 acres will be protected due to the many cultural structures, probable burials and features whose protection I support. Structures are identical to those of the heritage park and are ohana complexes of house sites, water sinkhole features,

agricultural sinkhole features, L and C shaped structures and religious structures. It confirms that these ancient people lived apart of each other in family complexes each having their own source of water and agricultural components, residential and religious structures. All these cultural resources are unique in that they are all made of coral and are built in a Tahitian fashion.

Knowledge of traditional gathering practices in the project area, both past and ongoing Cultural associations of the project area such as legends, traditional uses and beliefs:

Subject property was anciently a place of subsistence where the water travelled underground in a system of caves or karst and made its presence known in water sinkholes. Agricultural features appeared as cultural mounds serving as agricultural mounds in the growing of sweet potatoes. Sinkholes with soil and sediment identified the banks of this hidden river also served as agricultural sinkholes in a subsistence lifestyle. Structures are Tahitian in origin due to the integration of upright stones as opposed to Hawaiian dry stacking lying flat. Site complex is identical each having its own water source, agricultural components, house sites and one religious structure supporting families living apart from one another. Amongst the stories associated with this region is the story of Kane and Kanaloa where Kane brought forth water from the sinkholes with the strike of his ko'oko'o at a place once known as Kanehili. Another story references Hi'iaka where she admired her reflection in the Spring of Hoakalei a short distance from this subject property.

Referrals of kupuna or elders and kamaaina who might who might be willing to share their cultural knowledge of the surrounding area and surrounding ahupua'a:

'Ewa Moku is unique in the sense that all those individuals who possessed generational knowledge were displaced or had their ties severed by both business interest and the military in the later part of the 1800s. The cultural landscape of 'Ewa was altered out of a partnership between business interest and the military. Interesting though today that cultural landscape can be found on military property due to their security measures and manner of construction using the native vegetation to conceal. Most everyone in 'Ewa are migrants who come from somewhere else perhaps Kona Moku, Ko'olaupoko or the other islands or the mainland or other countries. This is what I learned when was asked to put together a " list of cultural consultants" for the Office of Environmental Quality Control when I served as a commissioner. The few people who possess generational knowledge come from somewhere else or acquired it by study and research. The only generational people I knew who shared generational knowledge were Thelma Parrish, Arlene Eaton and Mary Serao. There may be others however I am not aware of they sharing with respect to this unique cultural landscape. Individuals may possess generic or general knowledge but not specific to this unique cultural landscape such as

those few I mentioned. I think they have all passed away. Regarding all the properties of the former BPNAS I am not aware of any kupuna who are as familiar as the few who are on the adjacent property daily in the care of the Kalaeloa Heritage Park.

Due to the sensitive nature regarding iwi kupuna and ancestral remains discovered, mana'o regarding na iwi kupuna will be greatly appreciated:

Known burials and probable burials should be protected in place. The challenge within this area is the displacement of iwi kupuna bones from above ground burial mounds by formerly cattle and kiawe roots. These modern circumstances have caused iwi to be found on the surface. Problem they often resemble coral. Anciently in this region burials occurred along the shoreline beaches in sand. There were no burials anciently within the area of the subject 22 acres. The only burials within the subject property are recent above ground burials or burial mounds and sinkhole burials. These burials however are post contact burials and more likely having occurred in the 1800 especially during the period of the small pox epidemic.

Any other cultural concerns the community has related to cultural practices within the project area or vicinity:

There are la'au practitioners who visit this area who gather la'au for medicinal practices. Some of the plants I see them gather are uhaloa, kaunaoa, kiawe and other la'au. I support the protection of the 22 acre cultural landscape on the 44 acre property identified as the future site of a photovoltaic power source. I also support the construction of the photovoltaic power plant on the 22 acre cleared portion.

Mahalo,
Shad S. Kane
Shad S. Kane

Concerns: Mr. Kane expressed concerned about known and probable burials and recommended that they be protected in place. He also expressed concern about access for cultural practitioners to gather traditional medicinal plants.

John Bond, Kanehili Cultural Hui

John Bond, Kanehili Cultural Hui, provided two written documents, via e-mail, which were received by SCS on April 12, 2017. These documents consisted of Mr. Bond's, President of Kanehili Cultural Hui, testimony on the Solar Project presented to SCS (Appendix H) and to the HCDA Board Members and the Makakilo/Kakapolei/Honokai Hale Neighborhood Board No. 34 Resolution in Opposition to the Current Hawaii Community Development Corporation Proposed Route for the Kalaeloa East Energy Corridor and the Board Opinion of Significant Impact with Regards to the Environmental Assessment (Appendix I).

Concerns: Mr. Bond expressed concerns in regards to the proposed undertaking, given to the cultural and historical significance of the area. Mr. Bond stated in his testimony that "[t]he site is directly within the identified Leina a ka uhane boundary identified by Kepa Maly for the HART Rail project." Mr. Bond expressed concern that construction activities will destroy cultural properties, including human burials; impact wildlife; and release WWII contaminants. He, also, expressed concerns that the construction workers may be injured by ground collapse during construction activities. Mr. Bond expressed concerns that the proposed undertaking, itself, may be impacted by natural disasters; Mr. Bond's signed information release form is presented in Appendix F.

During the consultation process, SCS conducted one in-person interview with Kumu Michael Kumukauoha Lee. Kumu Michael Kumukauoha Lee was interviewed by Cathleen Dagher, at the SCS office, Honolulu, November 7, 2012. Kumu Lee is an ʻEwa resident, a Kahuna Lapaʻauokekaiolimu (traditional cultural practitioner of limu medicine), a member of Hui Kanehili a long-time resident of ʻEwa Beach, and a royal descendant of the Kamehameha bloodline. As a direct descendant of Kaikioahu (k), Kumu Lee is recognized as a *kahu* (keeper of the *ʻiwi kupuna*) by the Oʻahu Island Burial Council (OIBC), as a cultural descendant of unidentified Native Hawaiian burials, in Honouliuli Ahupuaʻa, ʻEwa District, Oʻahu, as recommended by the State Historic Preservation Division (SHPD LOG NO: 2010:0875/DOC NO: 1004AJ02). Kumu Lee was trained by his *kupuna* (elders) and is formally recognized by the State of Hawaiʻi as having the qualities of a native Hawaiian Cultural Practitioner of Hawaiian *limu* (seaweed) medicine. Kumu Lee also was trained by his *kupuna* in Hawaiian star knowledge. Kumu Lee collects a variety of *limu* from the ʻEwa shoreline to make medicines used in his traditional medicine practice. This interview is summarized below and Kumu Lee stated in an e-mail dated April 25, 2017, that "the interview and taped content are correct" and granted his permission to include the interview in this document.

INTERVIEW

Kumu Michael Kumukauoha Lee

Kumu Michael Kumukauoha Lee stated that cultural practices conducted in the Honouliuli area and in Kaloi Gulch included different types of fishing and mentioned that several fresh water springs are located in the area, as presented in Sterling and Summers (1972:35). The Honouliuli area contains many underground karst systems, which are extremely important to Kumu Lee's traditional medical practice. Freshwater flows from the mountains to the ocean through an extensive system of interconnected underground karst caverns. These caverns reach the surface creating freshwater springs (waterholes), some of which are located underwater along the coastline creating the nutrient-rich environment necessary for *limu* to thrive. A disturbance to the balance of the freshwater/seawater can have a negative effect on *limu*.

Lieutenant Charles Robert Malden was a cartographer for Lord Byron on board the HMS Blonde, in 1824, which is the voyage from Great Britain to Hawaiʻi, which returned the body of Kamehameha II to Hawaiʻi following his death in Great Britain. Around 1825, Malden traveled on the Blonde mapping specific sections of the Big Island, Maui, and Oʻahu. Malden's (1825) map of the South Coast of Oʻahu is the most detailed map ever made in the earliest times that we can get. The sketches prepared by Captain Cook's cartographer are not as accurate or as detailed as the Malden 1825 map. Malden's 1825 map set the template of where Hoakalei Spring was and the locations of other freshwater ponds, which are part of the egress of the mountain water system in the karst. The Malden 1825 map also shows the locations of traditional trails that were used by the native Hawaiians traveling from what is now the West Loch area across the ʻEwa Plain to the ʻEwa coast for marine resources. Kumu Lee asks "Why are there so many paths here that were used to get to the sea?" The USGS water maps show that along the trail routes there are water features. So, the travelers do not have to pack water to go from Honouliuli Settlement all the way to the sea, where they are going to collect fish (protein) and limu (carbohydrates). The fish and the *limu* were prepared for storage with salt, which was also collected from the ocean and from the salt ponds. Two of the *limu* mentioned in the chant of Kaloi are *pa'akai limu* (salted limu), which can be kept for two years without refrigeration.

Because the sinkholes contained water, the native Hawaiians could plant taro *lo'i* inside of them. This practice eliminated the need for packing and carrying taro on their trip to the coast, as they could harvest and eat it along the way. All of the components for survival are laid out in front of you. It was much more energy efficient for the native Hawaiians to plant taro in the existing sinkholes than to dig through 13 feet of calcium carbonate. The native Hawaiians used the dry sinkholes to bury their dead for this reason. In sum, resources that were available to the

native Hawaiians along the trail routes included sweet potato, taro, ti roots, limu (dried and salted), fresh water from the karst system, and a flax seed plant used to make netting to catch the *ʻoʻo* birds that lived in the sandalwood trees. This energy efficient method of procuring subsistence resources while traveling allowed the native Hawaiians more time to focus on other aspects of their culture, such as weaving, preparing and designing *tap*a, wood carving, and the making of (feather, wiliwili seed, Niʻihau shell, etc.) leis. Some of the famous feather lei-making was made in this area.

The ecosystem of the sinkholes creates microenvironment of humidity that allows for the rare red *ʻilima*, which is actually a type of hibiscus, to flourish. So, there are micro-ecosystems and microenvironments within the karst system. The micro-environments include the anchialine pools in the Kalaeloa area which contained *ʻopaeʻula* (shrimp) that were used to catch *opelu* fish. The micro-environments of the Kalaeloa area created a fabric that worked to bring in calories comprised of carbohydrates and proteins so that enough calories (food resources) could be stored. This enabled the native Hawaiians to not have to spend all of their energy on subsistence procurement, but allowed them to have to for other, higher pursuits (*i.e*., building structures, such as *ahus*; etc.), which in turn leads to a more highly developed society. In other words, the less time a culture spends on food procurement, the more time they can spend on the more higher works like music (*i.e*., playing music, such as *kaʻekeʻeke* or bamboo playing), and art (*i.e*., preparing and designing *kapa*), the more highly developed the culture becomes.

Between 1778 and 1825, the Hawaiian population had drastically fallen due to the introduction of a variety of diseases which the western ships brought in from their travels to China, Hong Kong, etc. The Malden (1825) map shows the trails the native Hawaiians took from Honouliuli Settlement, which by that time was the largest settlement of Hawaiians in the Islands, by West Loch, which had fishponds throughout the area to Kalaeloa. As there was no *limu* in the Pearl River or in Pearl Harbor, the native Hawaiians were going to have to go to the sea. The West Loch area did not have open ocean fish because there was no access to the water. They could not get the diverse varieties of *limu* which occurred between Oneʻula and Barber's Point. There is a special *limu* called *lipoa*, which only came from this area. So, if they wanted open ocean fish, *limu*, and other marine resources, they had to travel to the Kalaeloa area. As this was a great distance, they could not carry their food, water, netting, and other materials. They had to travel light and get their food and water on the way. So, along the trails they had to plant ti leaf, from which they made *puolo* (carry all); they had to have the natural materials to make their net; they had to have the springs to replenish themselves; and the food to eat.

In order to use the same ocean for the same resources for centuries and not deplete the marine resources, they followed the konohiki system of increasing the opportunity of abundance by watching the cycles of nature and not collapsing it by resting it. So, they had taro growing throughout all of the sites and fishponds so that they were turning on/off switches so that they were resting nature all of the time. They built their *loko'ea* (fishponds) to mimic nature by building all of the around springs; a natural pulmonary system created to clean out waste. They used multiple sources of agricultural and marine resources for food procurement which did not stress the environment and provided a number of on/off switches throughout the system from *mauka* to the sea.

Concerns: As a traditional cultural practitioner of limu medicine, Kumu Lee collects *limu* from the project site for use in his medical practice. Ground disturbing construction related activities associated with the proposed solar farm have the potential to negatively impact the underground karst system through which freshwater flows to the ocean. This, in turn may negatively affect the balance of the freshwater/seawater ratio, which will negatively impact the *limu*.

CULTURAL IMPACT ASSESSMENT SUMMARY

This Cultural Impact Assessment was prepared in accordance with the Guidelines for Assessing Cultural Impacts (OEQC 2012:11-13). The Guidelines recommend that a CIA consult relevant individuals/organizations, conduct ethnographic interviews and archival and historical research, identify cultural resources and practices located within the project area or in proximity, and finally, assess the impact of the proposed action and its mitigation measures on the cultural practices or resources identified.

IDENTIFED CULTURAL PRACTICES

Letters of inquiry were sent to twenty-four individuals and organizations that may have knowledge or information pertaining to the collection of cultural resources and/or practices currently, or previously, conducted in the vicinity of the proposed project area. The consultation process resulted in SCS receiving four responses via e-mail and conducting one in-person interview. Two of those who provided responses did not express any concerns about the proposed undertaking.

Archaeological Resources

During the consultation process, three individuals expressed concerns that historic properties, including traditional Native Hawaiian burials, may be present within the proposed

project area. One of these individuals encouraged that an archaeological inventory survey be conducted.

Traditional Resource Gathering

Three individuals voiced concern about impacts to traditional resource gathering of traditional medicinal plants such as *limu* and *la'au*. Concern was also expressed about the gathering of other plants such as *uhaloa, kaunaoa,* and *kiawe*.

Two individuals were concerned that the project could have negative impacts on traditional resource gathering activities or the environmental integrity of the area. One individual was concerned that ground-disturbing construction activities might affect the underground karst system and the balance of the fresh/sea water ratio which could in turn negatively affect the coastal *limu* supply.

Native Hawaiian Burial and Historic Internment

Three individuals expressed concern about traditional and historic-era burials that could exist within the project area. It was thought likely that burials could be present in subsurface contexts and that these could be impacted during the course of construction. It was recommended that known or probable burials should be documented and protected in place.

IMPACT ASSESSMENT

Based on the information presented in the current CIA, the proposed undertaking could impact archaeological sites, traditional resource gathering activities, Native Hawaiian and historic-era burials, and the integrity of the environment.

As noted, SCS recently conducted an archaeological inventory survey within the project area (Medrano *et al*. 2014). The survey identified 146 features consolidated into 23 archaeological sites. State Site 50-80-12-7486, Feature 5 and State Site 50-80-12-7491, Feature 1, both coastal trail segments, have been recommended for preservation. State Site 50-80-12-7487, Features 2A through 2C (airplane crash location), State Site 50-80-12-7501 (possible military bulldozer push pile), and State Site 50-80-12-7502, Feature 21 (agricultural rock mound) were also recommended for preservation. In addition, a program of Archaeological Monitoring during all construction-related ground disturbing activities was recommended. Appropriate mitigation measures for these sites are still under discussion with SCS and SHPD.

In addition, SCS (Kingsbury and Spear, 2017 in review) conducted a field inspection in the preparation of an archaeological inventory survey of the distribution line corridor, which is

proposed to include subsurface testing in the form of four manually excavated test units. The field inspection resulted in negative findings for historic properties. As a precautionary measure based on the density and proximity of the proposed distribution line corridor to significant historic properties, Kingsbury and Spear (2017 in review) recommended a mitigation program of on-site Archaeological Monitoring during all ground-disturbing activities within the subject portion of TMK: [1] 9-1-013:000.

Additional measures are currently being undertaken to mitigate any impacts to archaeological resources in the project area. These include the preparation of a Burial Treatment Plan, Preservation Plan, and Archaeological Monitoring Plan.

The Environmental Assessment will address what efforts have been taken or are proposed to mitigate impacts to traditional resource gathering activities or to the environment of the project area and its proximity.

It should also be noted that Native Hawaiian and historic-era burials are both archaeological and cultural resources and the material loci of previous and on-going traditional cultural activities.

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APPENDIX A: EXAMPLE INITIAL LETTER OF INQUIRY

XXXX XX, 2012

Dear:

In compliance with the statutory requirements of the Federal National Environmental Policy Act (NEPA), the State of Hawai‘i Revised Statute (HRS) Chapter 343 Environmental Impact Statements Law, and in accordance with the State of Hawai`i Department of Health’s Office of Environmental Quality Control (OEQC) Guidelines for Assessing Cultural Impacts as adopted by the Environmental Council, State of Hawai`i on November 19, 1997, Scientific Consultant Services, Inc. (SCS) is in the process of preparing a Cultural Impact Assessment (CIA) pertaining to approximately 44 acres of land for a proposed Solar Farm Project. The Solar Farm Project will be located at Barbers Point, Honouliuli Ahupua`a, `Ewa District, Island of O`ahu, Hawai`i [TMK: (1) 9-1-013:070] (Figures 1 and 2).

According to the *Guidelines for Assessing Cultural Impacts* (Office of Environmental Quality Control, Nov. 1997):

> The types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs…The types of cultural resources subject to assessment may include traditional cultural properties or other types of historic sites, both man made and natural which support such cultural beliefs…

We are asking you for any information that you or other individuals might contribute to the knowledge of traditional cultural activities, or traditional rights that might be impacted by the construction of a solar farm. The assessment results are dependent on the response and contributions made by individuals, such as yourself.

Enclosed are maps showing the proposed project area. Please contact me at the Scientific Consultant Services, Honolulu, office at (808) 597-1182 with any information or recommendations concerning this Cultural Impact Assessment.

Sincerely yours,
Cathleen Dagher
Senior Archaeologist

Enclosures (2)

Cc:

APPENDIX B: NEWSPAPER NOTICE AND AFFIDAVIT

CULTURAL IMPACT ASSESSMENT NOTICE POSTED IN THE OFFICE OF HAWAIIAN AFFAIRS NEWSLETTER (KA Wai OLA NEWSPAPER) AND THE STAR-ADVERTISER NEWSPAPER

Information requested by Scientific Consultant Services, Inc. (SCS) on cultural resources or on-going cultural activities on or near the proposed Solar Farm Project, Barbers Point, Honouliuli Ahupua`a, `Ewa District, O`ahu Island, Hawai`i [TMK: (1)] 9-1-013:070]. Please respond within 30 days to Cathleen Dagher at (808) 597-1182

TO: Sierra Baker
FAX#/EMAIL: 597-1192 / 1193
CONTACT #: 597-1182
DATE: 5/9/12
ACCOUNT #: 54454
FROM: Star-Advertiser/MidWeek-Legal Advertising Dept.

FAX: 808-529-4829

	Lisa Kaukani (808-529-4344) Email: lkaukani@staradvertiser.com
X	**Rose Rosales** (808-529-4825) Email: rrosales@staradvertiser.com

CULTURAL IMPACT ASSESSMENT NOTICE
Information requested by Scientific Consultant Services, Inc. (SCS) on cultural resources or on-going cultural activities on or near the proposed Solar Farm Project, Barbers Point. Honouliuli Ahupua'a, 'Ewa District, O'ahu Island, Hawai'i [TMK: (1) 9-1-013:070]. Please respond within 30 days to Cathleen Dagher at (808) 597-1182
(SA415737 5/20, 5/23, 5/24/12)

Remit Payment to:
Honolulu Star-Advertiser/Midweek
500 Ala Moana Blvd., 7 Waterfront Plaza, Ste. 500
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PUBLICATION: 5/20, 5/23, 5/24/12
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AD PROOF

******APPROVAL BY******
10 am/pm Fri 5/18/12
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Please proof read thoroughly.
Oahu Publications, Inc. will not be responsible for any errors, typographical or otherwise, once the proof has been approved and signed by the customer.

Received Time May. 9. 5:05PM

APPENDIX C: EXAMPLE FOLLOW-UP LETTER

Dear:

This is a follow-up letter to our October 2, 2012 letter which was in compliance with the statutory requirements of the Federal National Environmental Policy Act (NEPA), the State of Hawai‘i Revised Statute (HRS) Chapter 343 Environmental Impact Statements Law, and in accordance with the State of Hawai`i Department of Health’s Office of Environmental Quality Control (OEQC) Guidelines for Assessing Cultural Impacts as adopted by the Environmental Council, State of Hawai`i, on November 19, 1997.

Scientific Consultant Services, Inc. (SCS) is in the process of preparing a Cultural Impact Assessment (CIA) pertaining to approximately 44 acres of land for a proposed Solar Farm Project. The Solar Farm Project will be located at Barbers Point, Honouliuli Ahupua`a, `Ewa District, Island of O`ahu, Hawai`i [TMK: (1) 9-1-013:070].

We are asking you for any information that you or other individuals might contribute to the knowledge of traditional cultural activities or traditional rights that might be impacted by the construction of a solar farm. The assessment results are dependent on the response and contributions made by individuals, such as yourself.

Please contact me at the Scientific Consultant Services, Honolulu, office at (808) 597-1182 with any information or recommendations concerning this Cultural Impact Assessment.

Sincerely yours,

Cathleen Dagher
Senior Archaeologist

APPENDIX D: EXAMPLE REVISED LETTER OF INQUIRY

March XX, 2017

Aloha kāua,

At the request of Group 70 International and on the behalf of **Aloha Solar Energy Fund, LLC,** Scientific Consultant Services, Inc. (SCS) is in the process of preparing a Cultural Impact Assessment (CIA) in advance of the proposed Aloha Solar Energy Fund (ASEF) Kalaeloa Project. The proposed solar farm project has been revised and we are sending out revised letters of inquiry to continue in our effort of seeking community members who are knowledgeable about traditional cultural practices conducted in the vicinity of the proposed project area.

The ASEF Kalaeloa Project can now be best described as consisting of two primary components: 1) a proposed 5 megawatt (MWac) utility installation for a renewable energy photovoltaic system; and 2) an approximate 1.78 mile long 12 kilovolt (kV) electrical distribution line to connect the utility installation to HECO. Details of each component are briefly summarized below.

The utility installation would be built on a parcel (TMK (1) 9-1-013:070) that is currently owned and managed by the Hawaii Community Development Authority (HCDA). The vacant and undeveloped parcel is comprised of approximately 44.28 acres situated within the traditional district (moku) of ʻEwa in the *ahupuaʻa* of Honouliuli. The parcel today is a part of the Kalaeloa Community Development District (KCDD). The proposed project would involve the installation of 900 elevated photovoltaic panel racks, which will be mounted above ground on a series of posts that align in a series of columns on approximately 22 acres of the 44.28. The utility installation would include a electrical transfer substation. Access to/from the parcel would be provided from Coral Sea Road that would lead to an internal network of paths to be primarily used for maintenance and inspection activities. The remaining parcel acreage would remain as a part of an archaeological preserve area to be established.

The proposed project also includes the installation of a 12 kilovolt (kV) distribution line that would be routed from the new electrical substation at the utility installation crossing over Coral Sea Road and eventually connecting to the "Kapolei Circuit" at a HECO manhole on the mauka side of Franklin D. Roosevelt Avenue. The proposed distribution line corridor would be a combination of an overhead line on poles with a segment that is an underground ductline. The

underground segment is required due to Federal Aviation Administration height restrictions that are in place for an avigation approach of Runway 22L and 22R at the adjacent Kalaeloa Airport (John Rodgers Field). This avigation approach extends over a portion of Coral Sea Road. The 12 kV line will be installed within an existing State Department of Transportation-Highways Division Right-of-Way (ROW) along the eastern side of Coral Sea Road. The ROW extends approximately 30 feet from the edge of Coral Sea Road on the eastern side. The overhead portion of the 12 kV line would be approximately 5,600 feet in length with the underground portion approximately 3,800 feet.

The purpose of this Cultural Impact Assessment (CIA) is to identify and understand the importance of any traditional Hawaiian and/or historic cultural resources or traditional cultural practices associated with the project area and the surrounding *ahupua'a.* In an effort to promote responsible decision making, the CIA will gather information about the project area and its surroundings through research and interviews with individuals that are knowledgeable about the area in order to assess potential impacts to the cultural resources, cultural practices, and beliefs identified as a result of the proposed project. We are seeking your *kōkua* and guidance regarding the following aspects of our study:

- General history as well as present and past land use of the project area
- Knowledge of cultural resources which may be impacted by future development of the project area (i.e. historic and archaeological sites, as well as burials)
- Knowledge of traditional gathering practices in the project area, both past and ongoing Cultural associations of the project area, such as legends, traditional uses and beliefs
- Referrals of kūpuna or elders and kama'āina who might be willing to share their cultural knowledge of the project area and the surrounding ahupua'a
- Due to the sensitive nature regarding iwi kūpuna or ancestral remains discovered, mana'o regarding nā iwi kūpuna will be greatly appreciated
- Any other cultural concerns the community has related to Hawaiian cultural practices within or in the vicinity of the project area.

The CIA is in compliance with the State of Hawai'i Revised Statute (HRS) Chapter 343 Environmental Impact Statements Law, and in accordance with the State of Hawai'i Department of Health's Office of Environmental Quality Control (OEQC) Guidelines for Assessing Cultural Impacts as adopted by the Environmental Council, State of Hawai'i on November 19, 1997:

> The types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs…The types of cultural resources subject to assessment may include traditional cultural properties or other types of historic sites, both man made and natural which support such cultural beliefs…

Enclosed are maps showing the locations of the existing transmission and distribution lines, as well as substations subject to improvement as part of this project. Please contact me at the Scientific Consultant Services, Honolulu office, at (808) 597-1182 or via e-mail

(cathy@scshawaii.com) with any information or recommendations concerning this Cultural Impact Assessment.

Sincerely Yours,

Cathleen Dagher
Senior Archaeologist

Enclosures (3)

CC: Kamanaʻopono M. Crabbe, Office of Hawaiian Affairs (OHA); Phyllis (Coochie) Cayan, State Historic Preservation Division, Kapolei; George Kaeliwai, Jr., Hawaiʻi Civic Club of ʻEwa; Shad Kane, former Oʻahu Island Burial Council (OIBC) and Ahahui Siwila Hawaii o Kapolei; Glenn Oamilda, ʻEwa Beach Community Association; Kepa Maly, Kumu Pono Associates; Kupuna Arline Wainaha Kuuleialoha Brede Eaton, Hoakalaei Cultural Foundation; Aunty Mary Kaipo Malama Serrao, Hoakalaei Cultural Foundation; Aunty Nettie Tiffany, Lanikuhonua; Kamaki Kanahele, Hawaii Community Development Authority (HCDA) Cultural Specialist; Judith Flanders, Ola Hawaii 2020; Maeda Timson, Former Chair, Makakilo/Kapolei/Honokai Hale Neighborhood Board No. 34; Kumu Hula Kauionalani Serrao, ʻEwa Halau; Kumu Hula Kehaulani Yonehiro, ʻEwa Halau; Rona Rodenhurst, Ahahui Siwila Hawaii O Kapolei; Shirley Swinney, Kapolei Community Development Corporation; Melissa Lyman, Kalaeloa Heritage and Legacy Foundation; and Jan Becket, Ahahui Siwila Hawaii O Kapolei Kapolei Hawaiian Civic Club; William Hoʻohuli, community member; P. Kaanohi Kaleikini, President, Hui Malama I Na Kupuna o Hawaii Nei and a descendant; Michael Kumukauoha Lee, ʻEwa Beach resident, Hui Kanehili member, and a descendant; Kimberly Kalama, Hoakalei Cultural Foundation; Lance Holden, President, Ahahui Siwila Hawaii O Kapolei; Dwight Victor, President, Kalaeloa Heritage and Legacy Foundation ; Mana Caceres, OIBC ʻEwa Moku Representative

APPENDIX E: EXAMPLE REVISED FOLLOW-UP LETTER

March XX, 2017

Aloha kāua,

This is the follow-up to our March 8, 2017, letter, which was in compliance with the statutory requirements of the State of Hawai‘i Revised Statute (HRS) Chapter 343 Environmental Impact Statements Law, and in accordance with the State of Hawai`i Department of Health's Office of Environmental Quality Control (OEQC) Guidelines for Assessing Cultural Impacts as adopted by the Environmental Council, State of Hawai`i, on November 19, 1997.

At the request of Group 70 International and on the behalf of **Aloha Solar Energy Fund, LLC,** Scientific Consultant Services, Inc. (SCS) is in the process of preparing a Cultural Impact Assessment (CIA) in advance of the proposed Aloha Solar Energy Fund (ASEF) Kalaeloa Project. The proposed solar farm project has been revised and we are sending out revised letters of inquiry to continue in our effort of seeking community members who are knowledgeable about traditional cultural practices conducted in the vicinity of the proposed project area.

The ASEF Kalaeloa Project can now be best described as consisting of two primary components: 1) a proposed 5 megawatt (MWac) utility installation for a renewable energy photovoltaic system; and 2) an approximate 1.78 mile long 12 kilovolt (kV) electrical distribution line to connect the utility installation to HECO. Details of each component are briefly summarized below.

The utility installation would be built on a parcel (TMK (1) 9-1-013:070) that is currently owned and managed by the Hawaii Community Development Authority (HCDA). The vacant and undeveloped parcel is comprised of approximately 44.28 acres situated within the traditional district (moku) of ‘Ewa in the *ahupua‘a* of Honouliuli. The parcel today is a part of the Kalaeloa Community Development District (KCDD). The proposed project would involve the installation of 900 elevated photovoltaic panel racks, which will be mounted above ground on a series of posts that align in a series of columns on approximately 22 acres of the 44.28. The utility installation would include an electrical transfer substation. Access to/from the parcel would be provided from Coral Sea Road that would lead to an internal network of paths to be primarily used for maintenance and inspection activities. The remaining parcel acreage would remain as a part of an archaeological preserve area to be established.

The proposed project also includes the installation of a 12-kilovolt (kV) distribution line that would be routed from the new electrical substation at the utility installation crossing over Coral Sea Road and eventually connecting to the "Kapolei Circuit" at a HECO manhole on the mauka side of Franklin D. Roosevelt Avenue. The proposed distribution line corridor would be a combination of an overhead line on poles with a segment that is an underground ductline. The underground segment is required due to Federal Aviation Administration height restrictions that are in place for an avigation approach of Runway 22L and 22R at the adjacent Kalaeloa Airport (John Rodgers Field). This avigation approach extends over a portion of Coral Sea Road. The 12 kV line will be installed within an existing State Department of Transportation-Highways Division Right-of-Way (ROW) along the eastern side of Coral Sea Road. The ROW extends approximately 30 feet from the edge of Coral Sea Road on the eastern side. The overhead portion of the 12 kV line would be approximately 5,600 feet in length with the underground portion approximately 3,800 feet.

The purpose of this Cultural Impact Assessment (CIA) is to identify and understand the importance of any traditional Hawaiian and/or historic cultural resources or traditional cultural practices associated with the project area and the surrounding *ahupua'a.* In an effort to promote responsible decision-making, the CIA will gather information about the project area and its surroundings through research and interviews with individuals that are knowledgeable about the area in order to assess potential impacts to the cultural resources, cultural practices, and beliefs identified as a result of the proposed project. We are seeking your *kōkua* and guidance regarding the following aspects of our study:

- General history as well as present and past land use of the project area
- Knowledge of cultural resources which may be impacted by future development of the project area (i.e. historic and archaeological sites, as well as burials)
- Knowledge of traditional gathering practices in the project area, both past and ongoing Cultural associations of the project area, such as legends, traditional uses and beliefs
- Referrals of kūpuna or elders and kama'āina who might be willing to share their cultural knowledge of the project area and the surrounding ahupua'a
- Due to the sensitive nature regarding iwi kūpuna or ancestral remains discovered, mana'o regarding nā iwi kūpuna will be greatly appreciated
- Any other cultural concerns the community has related to Hawaiian cultural practices within or in the vicinity of the project area.

The CIA is in compliance with the State of Hawai'i Revised Statute (HRS) Chapter 343 Environmental Impact Statements Law, and in accordance with the State of Hawai'i Department of Health's Office of Environmental Quality Control (OEQC) Guidelines for Assessing Cultural Impacts as adopted by the Environmental Council, State of Hawai'i on November 19, 1997:

> The types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs…The types of cultural resources subject to assessment may include traditional cultural properties

or other types of historic sites, both man made and natural which support such cultural beliefs…

Please contact me at the Scientific Consultant Services, Honolulu office, at (808) 597-1182 or via e-mail (cathy@scshawaii.com) with any information or recommendations concerning this Cultural Impact Assessment.

Sincerely Yours,

Cathleen Dagher
Senior Archaeologist

CC:

APPENDIX F: SIGNED INFORMATION RELEASE FORMS

INFORMATION RELEASE FORM

I, John M. Bond, the undersigned, provided written information to Cathleen Dagher, Senior Archaeologist, Scientific Consultant Services, Inc. on April 12 of the year 2017.

I understand that the information I have provided to Scientific Consultant Services, Inc., shall be submitted as part of a Cultural Impact Assessment report on a proposed Aloha Solar Energy Fund (ASEF 2) Kalaeloa Project. The proposed solar farm will be located at Kalaeloa (Barber's Point), Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu, Hawai'i [TMK: (1) 9-1-013:070 and 000].

I have reviewed SCS's copy of the material I provided. The information is true and accurate to the best of my knowledge. By signing this release form, I am providing my approval for the release of the information to Scientific Consultant Services, Inc., for the purpose outlined above.

Print Name: _____John M. Bond_____

Signature: _____ _____

Release Date: _____April 19, 2017_____

INFORMATION RELEASE FORM

I, SHAD KANE, the undersigned, provided written information to Cathleen Dagher, Senior Archaeologist, Scientific Consultant Services, Inc. on MARCH 11 of the year 2017.

I understand that the information I have provided to Scientific Consultant Services, Inc., shall be submitted as part of a Cultural Impact Assessment report on a proposed Aloha Solar Energy Fund (ASEF 2) Kalaeloa Project. The proposed solar farm will be located at Kalaeloa (Barber's Point), Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu, Hawai'i [TMK: (1) 9-1-013:070 and 000].

I have reviewed SCS's copy of the material I provided. The information is true and accurate to the best of my knowledge. By signing this release form, I am providing my approval for the release of the information to Scientific Consultant Services, Inc., for the purpose outlined above.

Print Name: SHAD KANE

Signature: Shad Kane

Release Date: MARCH 11, 2017

APPENDIX G: MINUTES FROM A SERIES OF COMMUNITY MEETINGS

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ESTHER KIA'AINA
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD STE 555
KAPOLEI HI 96707

AGENDA
OAHU ISLAND BURIAL COUNCIL MEETING

DATE: Wednesday, October 9, 2013
TIME: 10AM
PLACE: Department of Land and Natural Resources
Board Room
Kalanimoku Building, 1st Floor
1151 Punchbowl Street
Honolulu, Hawaii 96813

I. CALL TO ORDER

II. ROLL CALL/PULE

III. MINUTES

July 10, 2013 August 14, 2013 September 11, 2013

IV. BUSINESS

A. **Department's Recommendation to Recognize Chivas Oluolukeakua Naone as a Cultural Descendant to Unidentified Human Skeletal Remains Found in Phase IV City Center for Honolulu Authority for Rapid Transportation Project, Honolulu Ahupuaa, Kona District, Island of Oahu, TMK: 1-7-002:026, 2-1-051, 2-1-050:067 & 2-3-002:001. Discussion/Determination:** Discussion and determination to recognize above individual as a cultural descendant to unidentified human skeletal remains at above project.

The council may elect to go into executive session pursuant to HAR §13-300-25 (d) Meetings. The council may close a meeting whenever location or description of a Native Hawaiian burial site is under consideration. The chairperson, by concurrence of a majority of members present at the meeting, shall be authorized to require the public to leave the meeting while the confidential matter is being discussed and reopen the meeting once the confidential matter is no longer being considered.

B. **Department's Recommendation to Recognize Paulette Kaanohiokalani Kaleikini and Ohana (See attached List) as Cultural Descendants to Unidentified Human Skeletal**

Remains Encountered at SIHP 50-80-08-7331 at Kunia Mauka Loa Ridge C&C Farmlands Project, Honouliuli Ahupuaa, Ewa District, Island of Oahu, TMK: 9-2-004.
Discussion/Determination: Discussion and determination to recognize above individuals as cultural descendants to unidentified human skeletal remains at above project.

The council may elect to go into executive session pursuant to HAR §13-300-25 (d) Meetings. The council may close a meeting whenever location or description of a Native Hawaiian burial site is under consideration. The chairperson, by concurrence of a majority of members present at the meeting, shall be authorized to require the public to leave the meeting while the confidential matter is being discussed and reopen the meeting once the confidential matter is no longer being considered.

C. **Department's Recommendation to Recognize Michael Kumukauoha Lee as a Cultural Descendant to Unidentified Human Skeletal Remains Encountered at SIHP 50-80-08-7331 at Kunia Mauka Loa Ridge C&C Farmlands Project, Honouliuli Ahupuaa, Ewa District, Island of Oahu, TMK: 9-2-004.**
Discussion/Determination: Discussion and determination to recognize the above individual as a cultural descendant to unidentified human skeletal remains at above project.

The council may elect to go into executive session pursuant to HAR §13-300-25 (d) Meetings. The council may close a meeting whenever location or description of a Native Hawaiian burial site is under consideration. The chairperson, by concurrence of a majority of members present at the meeting, shall be authorized to require the public to leave the meeting while the confidential matter is being discussed and reopen the meeting once the confidential matter is no longer being considered.

D. **Department's Recommendation to Recognize Brandy Kalehua Kamohalii Caceres and Ohana (See attached List) as Cultural Descendants to Unidentified Human Skeletal Remains Encountered at SIHP 50-80-08-7331 at Kunia Mauka Loa Ridge C&C Farmlands Project, Honouliuli Ahupuaa, Ewa District, Island of Oahu, TMK: 9-2-004.**
Discussion/Determination: Discussion and determination to recognize above individuals as cultural descendants to unidentified human skeletal remains at above project.

The council may elect to go into executive session pursuant to HAR §13-300-25 (d) Meetings. The council may close a meeting whenever location or description of a Native Hawaiian burial site is under consideration. The chairperson, by concurrence of a majority of members present at the meeting, shall be authorized to require the public to leave the meeting while the confidential matter is being discussed and reopen the meeting once the confidential matter is no longer being considered.

E. **Department's Recommendation to Recognize Kimball Kekaimalino Kaopio as a Cultural Descendant to Unidentified Human Skeletal Remains Encountered at SIHP 50-80-08-7331 at Kunia Mauka Loa Ridge C&C Farmlands Project, Honouliuli Ahupuaa, Ewa District, Island of Oahu, TMK: 9-2-004.**
Discussion/Determination: Discussion and determination to recognize the above individual as a cultural descendant to unidentified human skeletal remains at above project.

The council may elect to go into executive session pursuant to HAR §13-300-25 (d) Meetings. The council may close a meeting whenever location or description of a Native Hawaiian burial site is under consideration. The chairperson, by concurrence of a majority of members present at the meeting, shall be authorized to require the public to

leave the meeting while the confidential matter is being discussed and reopen the meeting once the confidential matter is no longer being considered.

F. **Department's Recommendation to Recognize Carolyn Keala Norman and Justin Kepoohunaikeauoli Keliipaakaua as Cultural Descendants to Unidentified Human Skeletal Remains the Cove Waikiki Condominium Project, Waikiki Ahupuaa, Kona District, Island of Oahu, TMK: 2-6-012:037-044 and 055-058.**
Discussion/Determination: Discussion and determination to recognize above individuals as cultural descendant to unidentified human skeletal remains at above project.

The council may elect to go into executive session pursuant to HAR §13-300-25 (d) Meetings. The council may close a meeting whenever location or description of a Native Hawaiian burial site is under consideration. The chairperson, by concurrence of a majority of members present at the meeting, shall be authorized to require the public to leave the meeting while the confidential matter is being discussed and reopen the meeting once the confidential matter is no longer being considered.

G. **Kunia Mauka Loa Ridge C&C Farmlands Project, Honouliuli Ahupuaa, Ewa District, Island of Oahu, TMK: 9-2-004.**
Information/Discussion/Recommendation: Update by task force and discussion on above project.

H. **Burial Treatment Plan for the Hauula Community Park Wastewater System Reconstruction Project, Hauula Ahupuaa, Koolauloa District, Oahu Island, TMK: 5-4-009:007 por.**
Discussion/Recommendation: Update and discussion on above plan and recommendation to Department on whether the subject burial treatment plan should be accepted as revised.

I. **Discussion of Completed Archaeological Inventory Survey for Aloha Solar Energy Farm 2, Honouliuli Ahupuaa, Ewa District, Island of Oahu, TMK: 9-1-013:070.**
Information/Discussion/Recommendation: Update and discussion on above project.

J. **Update on Honolulu Authority for Rapid Transportation Project, Island of Oahu.**
Information/Discussion/Recommendation: Update and discussion on above project.

V. INADVERTENT DISCOVERIES/SECTION 106/OTHER

A. **Unidentified Human Skeletal Remains Encountered at 5794 Kalanianaole Highway, Waikiki Ahupuaa, Kona Distict, Island of Oahu, TMK: 3-8-014:007 & 001.**
Information/Discussion/Recommendation: Discussion on above find and proposed treatment.

B. **Unidentified Human Skeletal Remains Encountered Near Intersection of Date Street and Kamuela Avenue During City and County of Honolulu Drainage Improvement Project, Waikiki Ahupuaa, Kona District, Island of Oahu, TMK: 2-7-034.**
Information/Discussion/Recommendation: Discussion on above find and proposed treatment.

C. **Unidentified Human Skeletal Remains Encountered at Haleiwa Joe's Leach Field and Septic Replacement Project, Kawailoa Ahupuaa, Waialua District, Island of Oahu, TMK: 6-6-001:034.**

Information/Discussion/Recommendation: Discussion on above find and proposed treatment.

D. **Unidentified Human Skeletal Remains Encountered at 53-852 Kamehameha Highway, Hauula Ahupuaa, Koolauloa District, Island of Oahu, TMK: 5-3-013:013.**
Information/Discussion/Recommendation: Discussion on above project and proposed treatment.

E. **Request for Information Regarding Preparation of a Cultural Impact Assessment for Proposed Zip Line Project, Waimalu Ahupuaa, Ewa District, Island of Oahu, TMK: 9-8-073:001.**
Information/Discussion/Recommendation: Discussion on above correspondence.

F. **Request for Information Regarding Preparation of a Cultural Impact Assessment for Proposed Halau Ku Mana Charter School, Honolulu Ahupuaa, Kona Disctrict, Island of Oahu, TMK: 2-5-019:008; 2-5-020:003, 004, 005 & 008.**
Information/Discussion/Recommendation: Discussion on above correspondence.

G **Request for Information Regarding Preparation of a Cultural Impact Assessment for Proposed Iron Gate Project Adjacent to 2121 Kuhio Tower, Waikiki Ahupuaa, Kona District, Island of Oahu, TMK: 2-6-018:043.**
Information/Discussion/Recommendation: Discussion on above correspondence.

H. **Notification of Inadvertent Discovery of Human Skeletal Remain at Kaneohe Marine Corps Base During Testing for Proposed Cabins at Pali Kilo, Heeia Ahupuaa, Koolaupoko District, Island of Oahu.**
Information/Discussion/Recommendation: Discussion on above notification.

I. **Section 106 Consultation Request Regarding Plaza at Waikiki-1812 Kalakaua Avenue, Waikiki Ahupuaa, Kona District, Island of Oahu.**
Information/Discussion/Recommendation: Discussion on above correspondence.

J. **Request for Information Regarding Preparation of a Cultural Impact Assessment for Proposed Construction of Single Family Dwelling, Kailua Ahupuaa, Koolaupoko District, Island of Oahu, TMK: 4-2-004:001.**
Information/Discussion/Recommendation: Discussion on above correspondence.

K. **Request for Information Regarding Preparation of a Cultural Impact Assessment for Proposed Farrington Highway Improvement Project, Honouliuli Ahupuaa, Ewa District, Island of Oahu.**
Information/Discussion/Recommendation: Discussion on above correspondence.

L. **Section 106 Consultation Request Regarding Installation of Traffic Signals at Various Locations on Oahu.**
Information/Discussion/Recommendation: Discussion on above correspondence.

VI. ANNOUNCEMENTS

A. **Next meeting date is scheduled for Wednesday, November 13, 2013 at 10am.**

B. Office of Hawaiian Affairs Island Burial Councils summit scheduled for October 15, 2013.

VII. ADJOURNMENT

Pursuant to §92-3 HRS, all interested persons shall be afforded an opportunity to present oral testimony or submit data, views, or arguments, in writing on any agenda item. Additionally, pursuant to a policy adopted by the Oahu Island Burial Council at its September 14, 2005 meeting, oral testimony for items listed on the agenda is limited to three minutes per person, per agenda item.

Pursuant to sections §92-4, §92-5(a)(8), and §6E-43.5, Hawaii Revised Statutes (HRS), and upon compliance with the procedures set forth in section 92-4, HRS, the council may go into a closed meeting to consider information that involves the location or description of a burial site.

A request to be placed on a burial council meeting agenda must be made with the Burial Sites Program staff at least two weeks preceding the scheduled meeting date. In addition, the request must be accompanied by all related documents. Failure to comply with this procedure will delay the item to the following month's agenda.

Materials related to items on the agenda are available for review at the State Historic Preservation Division in room 555 of the Kakuhihewa Building located at 601 Kamokila Boulevard, Kapolei, Hawaii 96707. Persons with disabilities requiring special assistance should contact the division in advance at (808) 692-8015.

List of Names for Agenda Item IV-B

Paulette Kaanohiokalani Kaleikini
Moani Umiaimoku Kaleikini
Tuahine Kanekapolei Kaleikini
Kala Waahila Kalekini
Kalahikiola Mahikeahi Keliinoi
Kilinahe Ialuamoku Keliinoi
Aliikaua Keawenuiaumi Kaleikini
Nocau Kamehanaokala Kaleikini
Haloa Kekoo Namakaokalani Kaleikini
Mahiaimoku Kekaulike Kaleikini
Moehonua Keaweamahi Kaleikini
Jim Medeiros Senior
Michael Lani Keaweamahi
JR Keoneakapu Williams
April Leimomi Keaweamahi
Shanlyn Maile Keaweamhi Kanohokula

List of Names for Agenda Item IV-D

Brandy Kalehua Kamohalii Caceres
Norman "Mana" Christopher Moore Kaleilani Caceres
Kekamamakoaakailihou Kaleilani Kamohalii Caceres
Keahealaiianiikekamaehuokahikiku Kiekiekananiokuuleilehua Kamohalii Caceres
Kekamakeuakauiikuhaoikalai Kalehuahiehie Kamohalii Caceres

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ESTHER KIA'AINA
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD STE 555
KAPOLEI HI 96707

MINUTES
OAHU ISLAND BURIAL COUNCIL MEETING

DATE: Wednesday, October 9, 2013
TIME: 10:00am
PLACE: Department of Land and Natural Resources
Kalanimoku Building-Board Room
1151 Punchbowl Street
Honolulu, Hawaii 96813

ATTENDANCE:

Members:
Hinaleimoana Wong-Kalu, Chair
Jonathan Scheuer, Vice Chair
Steve Hoag
Kali Fermantez
Shad Kane
Pokii Magallanes

Absent:
Chuch Ehrhorn
Danna Holck
Steve Hoag

Staff:
Kawika Farm, SHPD Burial Site Specialist
Susan Lebo, SHPD Archaeologist
Deona Naboa, SHPD Archaeologist
Linda Chow, Deputy Attorney General

Guest:
Kaahiki Solis
Kekaimalino Kaopio
Mahi Kaleikini
Kanaloa Koko
Ray Iwamoto
Debbie Lui-Anderson
JR Keoneakapu Williams
Kaanohi Kaleikini
Moehonua Kaleikini
Nancy McMahon
Mike Lee
Sheila Valdez

Lauren Morawski	Mana Caceres
Lindsey Doi	Anthony Ching
Lani Maa Lapilio	Matt McDermott
Michael Dega	Adam Lauer
Alan Akina	Jeff Overton
Guerin Tome	Pono Kealoha
Dawn Chang	

I. CALL TO ORDER

The Oahu Island Burial Council (OIBC) chair, Hinaleimoana Wong-Kalu called the meeting to order at 10:13am.

II. ROLL CALL/PULE

OIBC members; Wong-Kalu, Jonathan Scheuer, Kali Fermantez, Shad Kane and Pokii Magallanes introduced themselves. From the State Historic Preservation Division (SHPD); Kawika Farm, Deona Naboa and Susan Lebo introduced themselves. From the attorney general's (AG) office, Linda Chow introduced herself. Fermantez gave the *pule wehe*.

III. MINUTES

August 14, 2013

Kane moved and Magallanes seconded, "to approve [minutes of August 14, 2013]"

VOTE: ALL IN FAVOR. Motion carried.

July 10, 2013

Scheuer moved and Fermantez seconded, "to accept the minutes of July 10, 2013."

VOTE: ALL IN FAVOR. Motion carried.

IV. BUSINESS

Wong-Kalu requested a motion be made to take agenda items out of order as she was aware the council at some point would lose quorum and wanted to make sure the council took action on those items that required action by the council.

Scheuer moved and Magallanes seconded, "we move through the agenda as scheduled [under business] from items A through F and then take item H before G."

VOTE: ALL IN FAVOR. Motion carried.

A. Department's Recommendation to Recognize Chivas Oluolukeakua Naone as a Cultural Descendant to Unidentified Human Skeletal Remains Found in Phase IV City Center for Honolulu Authority for Rapid Transportation Project, Honolulu Ahupuaa, Kona District, Island of Oahu, TMK: 1-7-002:026, 2-1-051, 2-1-050:067 & 2-3-002:001.

Wong-Kalu read the rights of individuals onto record informing the audience that those individuals that had an item on the OIBC's agenda seeking recognition as a descendant could request the council move into executive session when discussing their subject agenda item.

Scheuer informed the audience the OIBC has been requiring individuals seeking recognition as a descendant for the first time in an ahupuaa to attend the OIBC's meeting so the council has the opportunity to question that individual.

Scheuer moved and Fermantez seconded, "to defer action on this recommendation."

VOTE: ALL IN FAVOR. Motion carried.

B. Department's Recommendation to Recognize Paulette Kaanohiokalani Kaleikini and Ohana (See attached List) as Cultural Descendants to Unidentified Human Skeletal Remains Encountered at SIHP 50-80-08-7331 at Kunia Mauka Loa Ridge C&C Farmlands Project, Honouliuli Ahupuaa, Ewa District, Island of Oahu, TMK: 9-2-004.

Wong-Kalu read onto record the names of the following individuals seeking recognition as cultural descendants to the unidentified *iwi* encountered at the above project:

Paulette Kaanohiokalani Kaleikini
Moani Umiaimoku Kaleikini
Tuahine Kanekapolei Kaleikini
Kala Waahila Kalekini
Kalahikiola Mahikeahi Keliinoi
Kilinahe Ialuamoku Keliinoi
Aliikaua Keawenuiaumi Kaleikini
Noeau Kamehanaokala Kaleikini
Haloa Kekoo Namakaokalani Kaleikini
Mahiaimoku Kekaulike Kaleikini
Moehonua Keaweamahi Kaleikini
Jim Medeiros Senior
Michael Lani Keaweamahi
JR Keoneakapu Williams
April Leimomi Keaweamahi
Shanlyn Maile Keaweamhi Kanohokula

Scheuer moved and Kane seconded to recognize the individuals [named above and] read onto record by Wong-Kalu as cultural descendants.

VOTE: ALL IN FAVOR. Motion carried.

Kaanohi Kaleikini wanted to know why the OIBC's agenda now listed the names of all individuals seeking recognition as a descendant. Kaleikini said the agenda caused an individual to become concerned when that individual saw that JR Keoneakapu Williams was seeking recognition as a cultural descendant under Kaleikini's agenda item. Kaleikini wanted to know if the practice would continue since it wasn't practiced in the past.

Chow recommended the practice continue.

In light of the concern raised, Farm said the matter would be further discussed with the AG's office. Farm also noted an AG was present to weigh in on the matter.

Kaleikini was also concerned that listing the names of all individuals seeking recognition as a descendant may lead to problems relating to genealogy. Kaleikini said SHPD had grouped recognitions together in the interest of time but felt the practice did more harm the good.

Farm said SHPD was advised by the AG's office that the names of all claimants seeking recognition as a descendant must be listed or attached to the agenda in order to comply with the requirements of Sunshine Law. Farm said the practice would continue until informed differently by the AG's office.

Chow said the name of any individual seeking recognition had to be placed on the council's agenda.

Kaleikini said that JR Keoneakapu Williams name should not be listed under or as part of her recognition for any future agenda items.

C. Department's Recommendation to Recognize Michael Kumukauoha Lee as a Cultural Descendant to Unidentified Human Skeletal Remains Encountered at SIHP 50-80-08-7331 at Kunia Mauka Loa Ridge C&C Farmlands Project, Honouliuli Ahupuaa, Ewa District, Island of Oahu, TMK: 9-2-004.

Mike Lee said the *iwi* at the above project was not secured and advocated for cultural monitors. Lee had a lot of concerns with the project. Scheuer interjected and said the matter could be further discussed when that specific agenda item was taken up. Lee said he started caring for *iwi kupuna* in 1983 and has been doing so for 30 years.

Scheuer moved and Kane seconded to accept SHPD's recommendation.

VOTE: ALL IN FAVOR. Motion carried.

Wong-Kalu said the OIBC recognized Michael Kumukauoha Lee as a cultural descendant to the unidentified human skeletal remains at the above project.

D. Department's Recommendation to Recognize Brandy Kalehua Kamohalii Caceres and Ohana (See attached List) as Cultural Descendants to Unidentified Human Skeletal Remains Encountered at SIHP 50-80-08-7331 at Kunia Mauka Loa Ridge C&C Farmlands Project, Honouliuli Ahupuaa, Ewa District, Island of Oahu, TMK: 9-2-004.

Wong-Kalu read onto record the names of the following individuals seeking recognition as cultural descendants to the unidentified *iwi* encountered at the above project:

Brandy Kalehua Kamohalii Caceres
Norman "Mana" Christopher Moore Kaleilani Caceres
Kekamamakoaakailihou Kaleilani Kamohalii Caceres
Keahealaiianiikekamaehuokahikiku Kiekiekananiokuuleilehua Kamohalii Caceres
Kekamakeuakauiikuhaoikalai Kalehuahiehie Kamohalii Caceres

Kane moved and Scheuer seconded to recognize the individuals [named] above as cultural descendants to the unidentified *iwi* encountered at the above project.

VOTE: ALL IN FAVOR. Motion carried.

E. Department's Recommendation to Recognize Kimball Kekaimalino Kaopio as a Cultural Descendant to Unidentified Human Skeletal Remains Encountered at SIHP 50-80-08-7331 at Kunia Mauka Loa Ridge C&C Farmlands Project, Honouliuli Ahupuaa, Ewa District, Island of Oahu, TMK: 9-2-004.

Kane moved and Scheuer seconded to recognize Kimball Kekaimalino Kaopio as a cultural descendant to the unidentified i*wi* at the above project.

VOTE: ALL IN FAVOR. Motion carried.

F. Department's Recommendation to Recognize Carolyn Keala Norman and Justin Kepoohunaikeauoli Keliipaakaua as Cultural Descendants to Unidentified Human Skeletal Remains the Cove Waikiki Condominium Project, Waikiki Ahupuaa, Kona District, Island of Oahu, TMK: 2-6-012:037-044 and 055-058.

Kaleikini supported the recognition of the above claimants as they have been recognized previously by the OIBC to other *iwi* in the Kalia area.

Wong-Kalu acknowledged both she and Scheuer regularly sees the subject claimants participating at consultation meetings.

Scheuer moved and Kane seconded to accept [SHPD's] recommendation.

VOTE: ALL IN FAVOR. Motion carried.

H. Burial Treatment Plan for the Hauula Community Park Wastewater System Reconstruction Project, Hauula Ahupuaa, Koolauloa District, Oahu Island, TMK: 5-4-009:007 por.

Scheuer said the OIBC previously made a determination regarding the subject burial treatment plan (BTP). At that meeting, the OIBC requested the consultant further engage the Hauula community regarding the project and BTP. As a result of consultation efforts, the Hauula community recommended a different area to relocate the *iwi* encountered at the above project. Scheuer said procedurally, the BTP needed to be revised and formally presented before the council to allow the council the opportunity to comment and vote on whether the plan should be accepted as revised.

Kane moved and Scheuer seconded that the OIBC recommends SHPD accept the BTP as amended.

VOTE: ALL IN FAVOR. Motion carried.

G. Kunia Mauka Loa Ridge C&C Farmlands Project, Honouliuli Ahupuaa, Ewa District, Island of Oahu, TMK: 9-2-004.

Magallanes said the council's investigative working group met with representatives from the project in addition to other individuals to discuss concerns. Magallanes said representatives from the project expressed their commitment to protect and preserve the human skeletal

remains encountered at the above project. The project also had an archaeological inventory survey (AIS) done and submitted the AIS to SHPD for review. Magallanes was of the understanding the project is exempt from the City and County of Honolulu's permitting process because the project followed a state conservation plan. He was informed the project also had policies in place to address the treatment of human skeletal remains that have been encountered or may be encountered on individual lessee's properties. The project also received federal funding which brought up concerns regarding the federal Section 106 consultation process. Magallanes said the AIS identified one burial and seven possible burial sites. Only the confirmed burial site had a delineated preservation area with orange construction fencing. A BTP was also being developed. Concerns regarding the process on how violations are reported and conducted was also discussed at the meeting. Magallanes personally felt the project had a series of violations that need to be addressed. The investigative group scheduled a site visit for October 16, 2013 at 9am.

Scheuer wanted to know what jurisdiction the OIBC had regarding the project. Chow said the OIBC's jurisdiction would be limited to the burials. Chow said the project would need to work with the OIBC regarding development of their BTP. If Section 106 has been triggered, Chow said the OIBC would also be part of that consultation process.

Nancy McMahon said she was contracted to develop the project's preservation plan and BTP. McMahon thought the AIS should be part of the Section 106 process and that further consultation efforts would be made. McMahon also confirmed the one burial site as well as the seven possible burials sites would all be preserved in place. Additionally, another 27 archaeological sites would also be mitigated by a preservation plan.

Scheuer wanted to know how many of the known or possible burial sites were in lots already awarded to lessees. Debbie Lui-Anderson, one of the owners of the project said a couple of the burial sites were on lot 42 and that the lessee has been made aware of those sites. Lui-Anderson said there have been discussions with lessees and the lessees have been cooperative.

Scheuer wanted to know if the lots could still be reconfigured so the land containing the burial sites could be better managed and protected by another party. Lui-Anderson said lots that have not been purchased could still be realigned to carve out certain areas that could be conservation areas.

Scheuer wanted to know who currently monitored and/or will monitor the sites identified at the project. Lui-Anderson said currently there were a couple of individuals that regularly monitored the sites and that the project would have an association in the future to monitor the sites. Anderson said the future association could also have a committee specifically created to monitor the sites.

Scheuer thought there were other options that may be more effective to monitor and be responsible for the care of the sites identified rather than an association. Scheuer advised the project representatives to aggressively explore other options.

Kane said the city had programs with funding to help accomplish some of the suggestions made by Scheuer.

McMahon invited the recently recognized cultural descendants to the scheduled site visit on October 16.

Kaleikini suggested the project have cultural monitors and that recognized cultural descendants should be the cultural monitors.

Lee supported Kaleikini's suggestion. Lee also wanted the project to develop and burial agreement which was legally binding and enforceable rather than a BTP. Lee also questioned who the true landowner was as he felt James Campbell's prior ownership of the property was acquired illegally.

Pono Kealoha challenged McMahon's credibility.

Kane commended Magallanes for all his work and dedication with taking the lead with the investigative group and working with the project's representatives.

Wong-Kalu said the council would lose quorum momentarily and would only hear testimony on the remaining agenda items.

Wong-Kalu called a brief recess at 11:10am which was also when the council lost quorum.

The Following Are Notes From The OIBC's October 9, 2013 Meeting

Wong-Kalu reminded the public and council members that no discussion was permitted and only testimony would be heard as the council no longer had quorum.

I. Discussion of Completed Archaeological Inventory Survey for Aloha Solar Energy Farm 2, Honouliuli Ahupuaa, Ewa District, Island of Oahu, TMK: 9-1-013:070.

Scheuer said his wife worked for Group 70 as a consultant for the project and recused himself.

Jeff Overton of Group 70 introduced himself, Matt Blake of Aloha Solar Energy, Kamolei Wilhelm and Lani Kaanana. Overton said Scientific Consultant Services (SCS) was the project's archaeological consultant and introduced Guerin Tome and Mike Dega. Overton thanked council member Kane for his help with the project as well. Overton went over a PowerPoint presentation. The project proposed to construct a solar farm on 44 acres in the Kalaeloa area under the control of HCDA (Hawaii Community Development Authority). The project completed an AIS as part of the project's environmental assessment. A lot of consultation was involved with development of the AIS. The AIS identified 23 sites consisting of 96 features within the project area. The AIS also identified two burial mounds. No invasive testing occurred as a result of consultation with cultural advisors and community members. Government agencies also concurred with the recommendation to not conduct invasive testing. The burial mounds are slated for preservation in place. Other sites identified during the AIS would be mitigated in consultation with community members and SHPD. Overton expected the project would appear before the council early 2014 to formally present the BTP.

Kane commended the archaeological work completed for the project.

J. Update on Honolulu Authority for Rapid Transportation Project, Island of Oahu.

Dawn Chang on behalf of Honolulu Authority for Rapid Transportation said the project's AIS and interim protection plan were approved by SHPD. After acquiring the proper permit from the City and County of Honolulu, the project resumed construction on September 16, 2013.

Construction started in Phase I but no construction could start in Phase IV or the airport until the project's archaeological plan, archaeological data recovery report and burial treatment plan has been completed and approved. The BTP would be developed after completion of the archaeological data recovery plan.

V. INADVERTENT DISCOVERIES/SECTION 106/OTHER

Chow said the council could only hear testimony from the public and that the following agenda items could only be heard if there was representative for each agenda item to testify.

Wong-Kalu informed the public she would read off each agenda items and then take testimony from any interested party.

A. Unidentified Human Skeletal Remains Encountered at 5794 Kalanianaole Highway, Waikiki Ahupuaa, Kona Distict, Island of Oahu, TMK: 3-8-014:007 & 001.

Kakai Kaopio did not receive any notification regarding the inadvertent discovery of human skeletal remains at the above property and felt he should have.

Kaleikini agreed with Kaopio and felt SHPD was being inconsistent with notifying individuals.

B. Unidentified Human Skeletal Remains Encountered Near Intersection of Date Street and Kamuela Avenue During City and County of Honolulu Drainage Improvement Project, Waikiki Ahupuaa, Kona District, Island of Oahu, TMK: 2-7-034.

Kaleikini said she was not notified regarding the inadvertent discovery of the human skeletal remains and said she would be contacting the City and County of Honolulu.

Kaopio echoed Kaleikini's statement.

C. Unidentified Human Skeletal Remains Encountered at Haleiwa Joe's Leach Field and Septic Replacement Project, Kawailoa Ahupuaa, Waialua District, Island of Oahu, TMK: 6-6-001:034.

Kaopio said he was not aware of the project and used to be informed about projects in the Waialua area.

D. Unidentified Human Skeletal Remains Encountered at 53-852 Kamehameha Highway, Hauula Ahupuaa, Koolauloa District, Island of Oahu, TMK: 5-3-013:013.

Adam Lauer of International Archaeological Research Institute Incorporation (IARII) the contracted archaeological firm for the project said IARII was contracted on September 27 to conduct archaeological investigative work at the above project. The landowner was informed by SHPD of the inadvertent discovery of human skeletal remains which led to IARII's involvement. IARII started work on October 1 which included the recovery and consolidation of disturbed human skeletal remains, the examination of house pad foundations and pier trenches for in situ burials and controlled excavation at three locations. The controlled investigations involved exploration of one identified burial and two other possible burials. To date IARII identified an MNI (minimum number of individuals) of four. All burials are secured in place and all skeletal fragments recovered are also secured on site. IARII will monitor all future excavation at the above property.

Kealoha did not appreciate burials being referred to by numbers and felt those individuals deserved more respect.

Alan Akina on behalf of the landowner said they felt very bad about the *iwi* impacted and would work with IARII to take care of the *iwi* the best they could. Akina said the landowners were committed to doing whatever it took to right the situation.

E. Request for Information Regarding Preparation of a Cultural Impact Assessment for Proposed Zip Line Project, Waimalu Ahupuaa, Ewa District, Island of Oahu, TMK: 9-8-073:001.

No testimony received.

F. Request for Information Regarding Preparation of a Cultural Impact Assessment for Proposed Halau Ku Mana Charter School, Honolulu Ahupuaa, Kona Disctrict, Island of Oahu, TMK: 2-5-019:008; 2-5-020:003, 004, 005 & 008.

Kaleikini requested to be kept informed regarding the above agenda item.

G Request for Information Regarding Preparation of a Cultural Impact Assessment for Proposed Iron Gate Project Adjacent to 2121 Kuhio Tower, Waikiki Ahupuaa, Kona District, Island of Oahu, TMK: 2-6-018:043.

Kaleikini said she was contacted by SCS archaeology and would follow up with them.

H. Notification of Inadvertent Discovery of Human Skeletal Remain at Kaneohe Marine Corps Base During Testing for Proposed Cabins at Pali Kilo, Heeia Ahupuaa, Koolaupoko District, Island of Oahu.

Kaleikini said she spoke with June Cleghorn of the military's cultural resource management staff and that Cleghorn informed her that a molar was discovered. Kaleikini said the military had numerous projects ongoing and was also aware the military had a room full of *iwi* that needed to be repatriated. Kaleikini said she would pursue the matter through the federal NAGPRA (Native American Graves Protection and Repatriation Act) process.

I. Section 106 Consultation Request Regarding Plaza at Waikiki-1812 Kalakaua Avenue, Waikiki Ahupuaa, Kona District, Island of Oahu.

Kaleikini wanted to know who was requesting consultation and announced she wanted to be involved and part of the process.

J. Request for Information Regarding Preparation of a Cultural Impact Assessment for Proposed Construction of Single Family Dwelling, Kailua Ahupuaa, Koolaupoko District, Island of Oahu, TMK: 4-2-004:001.

No testimony received.

K. Request for Information Regarding Preparation of a Cultural Impact Assessment for Proposed Farrington Highway Improvement Project, Honouliuli Ahupuaa, Ewa District, Island of Oahu.

Kaleikini wanted more information and requested to be involved.

L. Section 106 Consultation Request Regarding Installation of Traffic Signals at Various Locations on Oahu.

Kaleikini wanted more information on the agenda item and requested contact information so that she could be involved.

Kaopio also wanted more information and suggested similar items not be placed on the council's agenda in the future if the matter could not be discussed.

VI. ANNOUNCEMENTS

Scheuer announced the next meeting date is scheduled for Wednesday, November 13, 2013 at 10am.

Scheuer said the Office of Hawaiian Affairs was hosting a meeting for Island Burial Council chairs and vice-chairs on October 15, 2013.

VII. ADJOURNMENT

The meeting ended as no further testimony was received.

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

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BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

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AQUATIC RESOURCES
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COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
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KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD STE 555
KAPOLEI HI 96707

AMENDED

AGENDA
OAHU ISLAND BURIAL COUNCIL MEETING

DATE: Wednesday, December 11, 2013
TIME: 10AM
PLACE: Department of Land and Natural Resources
Board Room
Kalanimoku Building, 1st Floor
1151 Punchbowl Street
Honolulu, Hawaii 96813

I. CALL TO ORDER

II. ROLL CALL/PULE

III. MINUTES

September 11, 2013 November 13, 2013

IV. BUSINESS

A. **Department's Recommendation to Recognize Kanaloa Kanaina Kakino Koko as a cultural descendant to Human Skeletal Remains Found in Phase IV City Center for Honolulu Authority for Rapid Transportation Project, Honolulu Ahupuaa, Kona District, Island of Oahu, TMK: 1-7-002:026, 2-1-051, 2-1-050:067 and 2-3-002:001. Discussion/Determination:** Discussion and determination to recognize above individual as a cultural descendant to unidentified human skeletal remains at above project.

The council may elect to go into executive session pursuant to HAR §13-300-25 (d) Meetings. The council may close a meeting whenever location or description of a Native Hawaiian burial site is under consideration. The chairperson, by concurrence of a majority of members present at the meeting, shall be authorized to require the public to leave the meeting while the confidential matter is being discussed and reopen the meeting once the confidential matter is no longer being considered.

B. **Department's Recommendation to Recognize Michael Kumukauoha Lee as a Cultural Descendant to Unidentified Human Skeletal Remains Encountered at Princess Kaiulani Redevelopment Project, Waikiki Ahupuaa, Kona District, Island of Oahu, TMK: 2-6-022:001 and 041.**

Discussion/Determination: Discussion and determination to recognize the above individual as a cultural descendant to unidentified human skeletal remains at above project.

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C. **Department's Recommendation to Recognize Michael Kumukauoha Lee as a Cultural Descendant to Unidentified Human Skeletal Remains Encountered with State Department of Transportation's Nimitz Highway and Ala Moana Boulevard Resurfacing and Highway Lighting Replacement Project (Aloha Tower Market Place/Hawaiian Electric Company), Honolulu Ahupuaa, Kona District, Island of Oahu, TMK: 2-1-014:006.**
Discussion/Determination: Discussion and determination to recognize the above individual as cultural descendant to unidentified human skeletal remains at above project.

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D. **Department's Recommendation to Recognize Michael Kumukauoha Lee as a Cultural Descendant to Unidentified Human Skeletal Remains Encountered with State Department of Transportation's Nimitz Highway and Ala Moana Boulevard Resurfacing and Highway Lighting Replacement Project (IBM Building/ Goodfellows Brothers, Inc.), Honolulu Ahupuaa, Kona District, Island of Oahu, TMK: 2-3-005:004.**
Discussion/Determination: Discussion and determination to recognize the above individual as a cultural descendant to unidentified human skeletal remains at above project.

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E. **Department's Recommendation to Recognize the Named Individuals (See Attached List) as Cultural Descendants to Unidentified Human Skeletal Remains Encountered at Waihonua Development Project, Honolulu Ahupuaa, Kona District, Island of Oahu, TMK: 2-3-006:017.**
Discussion/Determination: Discussion and determination to recognize the named individuals as cultural descendant to unidentified human skeletal remains at above project.

The council may elect to go into executive session pursuant to HAR §13-300-25 (d) Meetings. The council may close a meeting whenever location or description of a Native Hawaiian burial site is under consideration. The chairperson, by concurrence of a majority of members present at the meeting, shall be authorized to require the public to leave the meeting while the confidential matter is being discussed and reopen the meeting once the confidential matter is no longer being considered.

F. **Department's Recommendation to Recognize the Named Individuals (See Attached List) as Cultural Descendants to Unidentified Human Skeletal Remains Encountered at TMK: (1) 9-1-134:018 and Reinterred at the Kauhale Preserve Site: 50-80-14-3201, Honouliuli Ahupuaa, Ewa District, Island of Oahu, TMK: 9-1-134:007 & 029.**
Discussion/Determination: Discussion and determination to recognize named individuals as cultural descendants to unidentified human skeletal remains at above project.

The council may elect to go into executive session pursuant to HAR §13-300-25 (d) Meetings. The council may close a meeting whenever location or description of a Native Hawaiian burial site is under consideration. The chairperson, by concurrence of a majority of members present at the meeting, shall be authorized to require the public to leave the meeting while the confidential matter is being discussed and reopen the meeting once the confidential matter is no longer being considered.

G. **Department's Recommendation to Recognize the Named Individuals (See Attached List) as Cultural Descendants to Unidentified Human Skeletal Remains Found at International Market Place, Waikiki Ahupuaa, Kona District, Island of Oahu, TMK: 2-6-022: 036-039 & 043.**
Discussion/Determination: Discussion and determination to recognize named individuals as cultural descendants to unidentified human skeletal remains at above project.

The council may elect to go into executive session pursuant to HAR §13-300-25 (d) Meetings. The council may close a meeting whenever location or description of a Native Hawaiian burial site is under consideration. The chairperson, by concurrence of a majority of members present at the meeting, shall be authorized to require the public to leave the meeting while the confidential matter is being discussed and reopen the meeting once the confidential matter is no longer being considered.

H. **Department's Recommendation to Recognize the Named Individuals (See Attached List) as Cultural Descendants to Unidentified Human Skeletal Remains Encountered During Archaeological Inventory Survey for Aloha Solar Energy Farm 2, Honouliuli Ahupuaa, Ewa District, Island of Oahu, TMK: 9-1-013:070.**
Discussion/Determination: Discussion and determination to recognize named individuals as cultural descendants to unidentified human skeletal remains at above project.

The council may elect to go into executive session pursuant to HAR §13-300-25 (d) Meetings. The council may close a meeting whenever location or description of a Native Hawaiian burial site is under consideration. The chairperson, by concurrence of a majority of members present at the meeting, shall be authorized to require the public to leave the meeting while the confidential matter is being discussed and reopen the meeting once the confidential matter is no longer being considered.

I. **Department's Recommendation to Recognize William P. Haole, III as a Cultural Descendant to Unidentified Human Skeletal Remain Found with State Department of Transportation's Nimitz Highway and Ala Moana Boulevard Resurfacing and Highway Lighting Replacement Project (IBM Building/GoodFellows Brothers Inc.), Honolulu Ahupuaa, Kona District, Island of Oahu, TMK: 2-3-005:004.**
Discussion/Determination: Discussion and determination to recognize above individual as a cultural descendant to unidentified human skeletal remains at above project.

The council may elect to go into executive session pursuant to HAR §13-300-25 (d) Meetings. The council may close a meeting whenever location or description of a Native Hawaiian burial site is under consideration. The chairperson, by concurrence of a

majority of members present at the meeting, shall be authorized to require the public to leave the meeting while the confidential matter is being discussed and reopen the meeting once the confidential matter is no longer being considered.

J. **Draft Burial Treatment Plan for SIHP# 50-80-14-7435 for the Nimitz Highway & Ala Moana Boulevard Resurfacing and Highway Lighting Replacement Project, Honolulu and Waikiki Ahupuaa, Kona District, Island of Oahu, TMK: 2-1-Various; 2-3-Various; 2-6-Various: Nimitz Highway and Ala Moana Boulevard Right-of-Way.**
Information/Discussion/Recommendation: Discussion on the above plan.

K. **Central YMCA Redevelopment/Aloha Kai Project, Waikiki Ahupuaa, Kona District, Island of Oahu, TMK: 2-3-036:005.**
Information/Discussion/Recommendation: Introduction and discussion on the above project.

L. **Archaeological Inventory Survey Work for the Proposed Pai/Art Space Project at Waimanu Street, Honolulu Ahupuaa, Kona Distict, Island of Oahu, TMK: 2-3-003:038.**
Information/Discussion/Recommendation: Informational update on the above project.

M. **Kamehameha Schools- Kaiaulu O Kakaako Master Plan, Honolulu Ahupuaa, Kona District, Island of Oahu, TMK: 2-1-056:002, 007 and 008.**
Information/Discussion/Recommendation: Update and discussion on the above project.

N. **Ala Moana Center Ewa Expansion Project, Waikiki Ahupuaa, Kona District, Island of Oahu, TMK: 2-3-038:011.**
Information/Discussion/Recommendation: Update and discussion on the above project.

O. **King's Village Project, Waikiki Ahupuaa, Kona District, Island of Oahu, TMK: 2-6-023, 029, 037 and 076.**
Information/Discussion/Recommendation: Update and discussion on the above project.

P. **Honolulu Authority for Rapid Transportation Project, Multiple Ahupuaa, Multiple Districts, Island of Oahu, Multiple TMK.**
Information/Discussion/Recommendation: Update and discussion on above project.

Q. **Kunia Mauka Loa Ridge C&C Farmlands Project, Honouliuli Ahupuaa, Ewa District, Island of Oahu, TMK: 9-2-004.**
Information/Discussion/Recommendation: Update by task force and discussion on above project.

R. **Kawaiahao Church Multi-Purpose Building Renovation Project, Honolulu Ahupuaa, Kona District, Island of Oahu, TMK: 2-1-032:017.**
Information/Discussion/Recommendation: Update and discussion on most recent court ruling related to above project.

V. INADVERTENT DISCOVERIES/OTHER CORRESPONDENCE

A. **Inadvertent Discovery of Unidentified Human Skeletal Remains Along Farrington Highway, Keaau Ahupuaa, Waianae District, Island of Oahu, TMK: 8-3-001:036.**
Information/Discussion/Recommendation: Discussion on the above find.

B. **Request for Information Regarding Preparation of a Cultural Impact Assessment for Proposed Kaimuki Pump Station Redevelopment Project, Kaimuki Ahupuaa, Kona District, Island of Oahu, TMK: 2-7-030:012 and 055.**

Information/Discussion/Recommendation: Discussion on above correspondence.

C. **Follow up Letter Regarding Invitation to Participate as a Native Hawaiian Organization as Part of NAGPRA (Native American Graves Protection and Repatriation Act) Regarding the Proposed Kapolei High School RELO AT&T Site, Honouliuli Ahupuaa, Ewa District, Island of Oahu, TMK: 9-1-016:074.**
Information/Discussion/Recommendation: Discussion on above correspondence.

D. **Cultural Surveys Hawaii's Request for Consultation Regarding Archaeological Inventory Survey Plans for the Ward Neighborhood Master Plan Project, Honolulu, Ahupuaa, Kona District, Island of Oahu, TMK: 2-3-001:005; 2-3-002:001, 067, 086 & 087; 2-3-003:001; 2-1-052:011, 012, 020, 022, 024, 027, 028, 031-036, 038-040 & 051-053.**
Information/Discussion/Recommendation: Discussion on above correspondence.

E. **Section 106 Consultation Request Regarding Relocation of Marine Unmanned Aircraft System Squadron Three to Hawaii Aboard Marine Corps Base Hawaii, Kaneohe Bay and Aboard Wheeler Army Airfield, Kaneohe and Waianae Ahupuaa, Koolaupoko and Waianae District, Island of Oahu, TMK: 4-4-008:001 and 7-7-001.**
Information/Discussion/Recommendation: Discussion on above correspondence.

F. **Native American Graves Protection and Repatriation Act (NAGPRA) Federal Notification From the University of Texas, San Antonio Regarding the Donation of Two Human Skulls From Hawaii.**
Information/Discussion/Recommendation: Discussion on the above correspondence.

G. **Invitation to Oahu Burial Council Members to Attend Free Training Relating to Native Hawaiian Cultural and Natural Resources.**
Information/Discussion/Recommendation: Discussion on above correspondence.

VI. ANNOUNCEMENTS

A. **Next meeting date is scheduled for Wednesday, January 8, at 10am.**

VII. ADJOURNMENT

Pursuant to §92-3 HRS, all interested persons shall be afforded an opportunity to present oral testimony or submit data, views, or arguments, in writing on any agenda item. Additionally, pursuant to a policy adopted by the Oahu Island Burial Council at its September 14, 2005 meeting, oral testimony for items listed on the agenda is limited to three minutes per person, per agenda item.

Pursuant to sections §92-4, §92-5(a)(8), and §6E-43.5, Hawaii Revised Statutes (HRS), and upon compliance with the procedures set forth in section 92-4, HRS, the council may go into a closed meeting to consider information that involves the location or description of a burial site.

A request to be placed on a burial council meeting agenda must be made with the Burial Sites Program staff at least two weeks preceding the scheduled meeting date. In addition, the request must be accompanied by all related documents. Failure to comply with this procedure will delay the item to the following month's agenda.

Materials related to items on the agenda are available for review at the State Historic Preservation Division in room 555 of the Kakuhihewa Building located at 601 Kamokila Boulevard, Kapolei, Hawaii 96707. Persons with disabilities requiring special assistance should contact the division in advance at (808) 692-8015.

List of Names for Agenda Item IV-E

Brandy Kalehua Kamohalii Caceres
Norman "Mana" Christopher Moore Kaleilani Caceres
Kekamamakoaakailihou Kaleilani Kamohalii Caceres
Keahealaiianiikekamaehuokahikiku Kiekiekananiokuuleilehua Kamohalii Caceres
Kekamakeuakauiikuhaoikalai Kalehuahiehie Kamohalii Caceres

List of Names for Agenda Item IV-F

Brandy Kalehua Kamohalii Caceres
Norman "Mana" Christopher Moore Kaleilani Caceres
Kekamamakoaakailihou Kaleilani Kamohalii Caceres
Keahealaiianiikekamaehuokahikiku Kiekiekananiokuuleilehua Kamohalii Caceres
Kekamakeuakauiikuhaoikalai Kalehuahiehie Kamohalii Caceres
Kimball Kekaimalino Kaopio

List of Names for Agenda Item IV-G

Brandy Kalehua Kamohalii Caceres
Norman "Mana" Christopher Moore Kaleilani Caceres
Kekamamakoaakailihou Kaleilani Kamohalii Caceres
Keahealaiianiikekamaehuokahikiku Kiekiekananiokuuleilehua Kamohalii Caceres
Kekamakeuakauiikuhaoikalai Kalehuahiehie Kamohalii Caceres

List of Names for Agenda Item IV-H

Paulette Kaanohiokalani Kaleikini
Moani Umiaimoku Kaleikini
Tuahine Kanekapolei Kaleikini
Kala Waahila Kaleikini
Kalahikiola Mahikeahi Keliinoi
Kilinahe Ialuamoku Keliinoi
Aliikaua Keawenuiaumi Kaleikini
Noeau Kamehanaokala Kaleikini
Haloa Kekoo Namakaokalani Kaleikini
Mahiaimoku Kekaulike Kaleikini
Mochonua Keaweamahi Kaleikini
Jim Medeiros Senior
Michael Lani Keaweamahi
April Leimomi Keaweamahi
Shanlyn Maile Keaweamahi Kanohokula
Brandy Kalehua Kamohalii Caceres
Norman "Mana" Christopher Moore Kaleilani Caceres
Kekamamakoaakailihou Kaleilani Kamohalii Caceres
Keahealaiianiikekamaehuokahikiku Kiekiekananiokuuleilehua Kamohalii Caceres
Kekamakeuakauiikuhaoikalai Kalehuahiehie Kamohalii Caceres
JR Keoneakapu Williams
Kimball Kekaimalino Kaopio

Hawaii Community Development Authority
Regular Meeting
April 9, 2014
9:30 a.m.
Department of Hawaiian Home Lands
Hale Pono'i Conference Center
91-5420 Kapolei Parkway
Kapolei, Hawaii 96707

LIEUTENANT GOVERNOR'S OFFICE

'14 APR -3 A9:31

AGENDA
KALAELOA

I. CALL TO ORDER/ROLL CALL

II. APPROVAL OF MINUTES

1. Regular Kalaeloa Meeting of January 8, 2014

III. REPORT OF THE EXECUTIVE DIRECTOR

IV. KALAELOA BUSINESS

A. Kalaeloa Site Tour: Six significant areas in the district will be toured in order to provide more information for the Authority members. The schedule and summary of the six stops are described below:

9:45 a.m. Depart from Department of Hawaiian Home Lands, Hale Pono'i Conference Room

9:50 a.m. The first stop is at the intersection of Kapolei Parkway and Fort Barrette Road which is where the Kalaeloa Enterprise Energy Corridor Project will begin.

10:05 a.m. The second stop is at 91-1078 Yorktown. This is the site for the new Veterans/Cloudbreak's Hale Uhiwai Nalu project approved in December of 2013. Construction is anticipated to begin by summer of 2014.

10:10 a.m. The third stop is the State-owned Kalaeloa Airport public parking lot. The site will overlook the area where private hanger projects are being built.

10:20 a.m. The fourth stop is Building 77 the former Bachelors Quarters located at the corner of F.D. Roosevelt Avenue and Hornet Road. This is the site of the proposed Hunt's Renovation Development Project.

10:30 a.m. The fifth stop is at Parcel 13073-E located at the corner of Coral Seas and Tripoli Roads. This is the site for a future photovoltaic project and mitigation work.

10:40 a.m. The last stop is at Barbers Point Golf Course Parking lot. This site is where the Kalaeloa East Energy Project will be located.

10:50 a.m. Return to DHHL's, Hale Pono'i Conference Room.

B. Information and Discussion: Presentation of the Archaeological Inventory Survey for Parcel 13073-E conducted by Group 70 and Aloha Solar Energy Fund staff.

2. Decision Making: Shall the Authority Authorize the Executive Director to Extend the Right-of-Entry for One (1) Calendar Year from Its Current Expiration Date of May 10, 2014 to an Expiration Date of May 9, 2015 for the Kalaeloa Heritage Park that Includes Parcel Numbers 13073-B and 13073-D to the Kalaeloa Heritage and Legacy Foundation?

V. ADJOURNMENT

Pursuant to Section 92-3, Hawaii Revised Statutes, Section 15-219-28, HAR, and Article IV, Section 10 of HCDA's Bylaws, the Chairperson may limit public oral testimony on any agenda item to three minutes.

Pursuant to Sections 92-4 and 92-5(a), Hawaii Revised Statutes, the Authority may elect to convene in executive session if any of the exceptions in Section 92-5(a), Hawaii Revised Statutes, apply.

Individuals who require an auxiliary aid or accommodation due to a disability are invited to contact Lindsey Doi, HCDA's ADA Compliance Coordinator, by phone at (808) 594-0300, e-mail at contact@hcdaweb.org, or by facsimile at (808) 594-0299 at least 5 working days prior to the date required.

This agenda and additional information on the HCDA can be found on the HCDA website at: www.hcdaweb.org.

SUBMIT PUBLIC TESTIMONY ON HCDA'S WEBSITE: The HCDA welcomes public testimony on HCDA Agenda items. Written public testimony will be accepted through our website at www.hcdaweb.org up to 4:30 p.m. the day before date of the meeting. Persons

wishing to submit public testimony after the written testimony deadline are encouraged to appear in person at the meeting to present oral testimony, as HCDA cannot guarantee that any written testimony submitted after the written testimony deadline will be incorporated into the record. Persons who intend to present oral testimony on HCDA Agenda items shall sign-up at the beginning of each meeting. Please be advised that any written public testimony submitted to HCDA will be treated as a public record and, as such, any contact information contained therein may be available for public inspection and copying.

Hawaii Community Development Authority
Regular Meeting
April 9, 2014
9:30 a.m.
Department of Hawaiian Home Lands
Hale Pono'i Conference Center
91-5420 Kapolei Parkway
Kapolei, Hawaii 96707

LIEUTENANT GOVERNOR'S OFFICE

'14 APR -3 A9:31

AGENDA
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I. CALL TO ORDER/ROLL CALL

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10:10 a.m. The third stop is the State-owned Kalaeloa Airport public parking lot. The site will overlook the area where private hanger projects are being built.

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10:50 a.m. Return to DHHL's, Hale Pono'i Conference Room.

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2. Decision Making: Shall the Authority Authorize the Executive Director to Extend the Right-of-Entry for One (1) Calendar Year from Its Current Expiration Date of May 10, 2014 to an Expiration Date of May 9, 2015 for the Kalaeloa Heritage Park that Includes Parcel Numbers 13073-B and 13073-D to the Kalaeloa Heritage and Legacy Foundation?

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wishing to submit public testimony after the written testimony deadline are encouraged to appear in person at the meeting to present oral testimony, as HCDA cannot guarantee that any written testimony submitted after the written testimony deadline will be incorporated into the record. Persons who intend to present oral testimony on HCDA Agenda items shall sign-up at the beginning of each meeting. Please be advised that any written public testimony submitted to HCDA will be treated as a public record and, as such, any contact information contained therein may be available for public inspection and copying.

DRAFT

Minutes of a Special Meeting
of the Members of the
Hawaii Community Development Authority,
State of Hawaii

Wednesday, April 9, 2014

KALAELOA

I. CALL TO ORDER/ROLL CALL

A special meeting of the Kalaeloa Members of the Hawaii Community Development Authority ("Authority" or "HCDA"), a body corporate and public instrumentality of the State of Hawaii, was called to order by Mr. Brian Lee, Chairperson of the Authority, at 9:46 a.m. on Wednesday, April 9, 2014, at the Department of Hawaiian Home Lands ("DHHL"), Hale Ponoi Conference Center, 91-5420 Kapolei Parkway, Kapolei, Hawaii 96707, pursuant to Article IV, Section 1 of the Authority's Bylaws.

Members Present:	Linda Chinn (DHHL) (arrive 11:05 a.m.) Randy Grune (DOT) Rodney Funakoshi (DBEDT) Shirley Swinney Luis Salaveria (DBF)
Members Absent:	Miles Kamimura Dean Seki (DAGS)
Others Present:	Brian Lee, Chairperson of the Authority Brian Tamamoto, Member, Kakaako Authority Lori Tanigawa, Deputy Attorney General Tesha Malama, Kalaeloa Director of Planning & Development Shelby Hoota, Program Specialist Patricia Yoshino, Secretary Holly Hackett, Court Reporter

MATERIALS DISTRIBUTED:

1. Report of the Executive Director;
2. Summary Minutes of Regular Kalaeloa Meeting of January 8, 2014;
3. Information: Kalaeloa Site Tour Map;
4. Information: Status Report to the Authority on the Mitigation Measures to Rectify the Damages Resulting from Unauthorized Activities on Parcel 13073-E in the Kalaeloa Community Development District;
5. Decision Making: Shall the Authority Authorize the Executive Director to Extend the Right-of-Entry for One (1) Calendar Year from Its Current Expiration Date of

May 10, 2014 to an Expiration Date of May 9, 2015 for the Kalaeloa Heritage Park that Includes Parcel Numbers 13073-B and 13073-D to the Kalaeloa Heritage and Legacy Foundation.

Chairperson Lee announced that not enough Members were present for quorum. Per HRS 92-2.5(d), the Authority would proceed with the informational tour and receive public testimony.

Authority Members introduced themselves. Member Swinney also introduced Kalaeloa community members present at the meeting: Linda Painter, Barbers Point Bowling Center and Barbers Point Subway; Theresia McMurdo, Hunt Development; Lance Holden, president of Ahahui Siwila Hawaii O Kapolei, Kapolei Hawaiian Civic Club; and Steve Fredette, Airport Fire Department.

Chairperson Lee stated that the agenda would be taken out of order to start with the Kalaeloa Site Tour. The Authority would take a recess while driving to each stop and reconvene upon arrival at each subsequent stop.

The meeting was recessed at 9:50 a.m.

The meeting was reconvened at 10:00 a.m at the first site on the tour.

IV. KALAELOA BUSINESS

A. Kalaeloa Site Tour: Six significant areas in the district were toured in order to provide more information for the Authority Members. Ms. Tesha Malama, Kalaeloa Director of Planning and Development, narrated the tour at the following sites:

10:00 a.m.	#1: Intersection of Kapolei Parkway and Fort Barrette Road which is where the Kalaeloa Enterprise Energy Corridor Project will begin.
10:11 a.m.	#2: 91-1078 Yorktown, the site for the new Veterans/Cloudbreak's Hale Uhiwai Nalu project approved in December 2013.
10:17 a.m.	#3: Kalaeloa Airport public parking lot. The site overlooks the area where private hanger projects are being built.
10:27 a.m.	#4: Building 77 the former Bachelors Quarters located at the corner of F.D. Roosevelt Avenue and Hornet Road, the site of Hunt Development's proposed renovation development project.
10:39 a.m.	#5: Parcel 13073-E located at the corner of Coral Seas and Tripoli Roads, the site for a future photovoltaic project and mitigation work.
10:49 a.m.	#6: Barbers Point Golf Course Parking lot, site where the Kalaeloa East Energy Project will be located.

The meeting was reconvened at 11:07 a.m. at DHHL's Hale Ponoi Conference Room.

Member Chinn arrived at the meeting at 11:07 p.m. (quorum now present).

PUBLIC TESTIMONY

Chairperson Lee invited members of the public to comment on the site tour.

Lisa Mitchell stated there was a lot of land and landowners, and she was curious about the overall picture.

Steve Fredette from Kalaeloa Airport crash station asked if the buildings being renovated on the corner of Horton and Roosevelt Road would be brought up to code and modern standards with solar systems and sprinkler systems.

Ms. Malama explained that the administrative rules have guidelines that ask developers to see what they can do to incorporate sustainability and new technologies.

Linda Painter thanked the board for the continued support in keeping the Kalaeloa field office there.

Lisa Mitchell stated she was concerned that the military had so much land and wondered how much influence the agency had in terms of military operations. She wanted to bring a difference perspective to development.

II. APPROVAL OF MINUTES

1. Regular Kalaeloa Meeting of January 8, 2014

Chairperson Lee asked whether there were any corrections to the minutes of the January 8, 2014 meeting. There were no comments or corrections from the Members, and the minutes were approved as presented.

III. REPORT OF THE EXECUTIVE DIRECTOR

The report was provided by Ms. Malama in the absence of the executive director. She noted that the Kalaeloa Public Safety Group was requesting signs erected along the beach park area to enforce time zones. The Kalaeloa Heritage Foundation had been recognized on March 12, 2014 by Senator Gabbard in the Senate chambers. She noted that the U.S. Navy planned to increase the rates for electricity in the district, and would be phasing in the increase over 2 years instead of trying to recoup the deficit in one year.

There were no questions from Members or comments from the public on the report.

B. Information and Discussion: Presentation of the Archaeological Inventory Survey for Parcel 13073-E Conducted by Group 70 and Aloha Solar Energy Fund Staff.

Ms. Malama explained that the HCDA had entered into discussions in 2012 with Sunetric, who was associated at that time with Aloha Solar Energy Fund ("ASEF"), regarding a 5-megawatt project spanning over 44 acres. On April 24, 2012, HCDA staff conducted an investigation into unauthorized bulldozing on the parcel. On August 16, 2012, the Authority authorized the following mitigation measures to address the unauthorized activities: (1) ASEF would conduct an environmental assessment, including a resource inventory and damage report; and (2) erect perimeter fencing to prevent future occurrences.

Mr. Ryan McCauley, principal of Tritium 3 and project manager for ASEF, explained that Environmental Chemical Corporation ("ECC") was a major shareholder for ASEF, which was a special purpose entity to develop the photovoltaic project. ASEF hired several consultants, and Group 70 had been instrumental in leading the remediation and development phase.

Mr. Kawika McKeague, senior planner and director of cultural planning for Group 70, presented the summary, findings from the study, the plan mitigation and approval process with the State Historic Preservation Division ("SHPD") (see Exhibit A). The field work was conducted over 44 acres and revealed 23 sites comprised of 146 features. Only 2 sites had been previously identified on the property. The majority of the features represent traditional Hawaiian occupation primarily for agricultural use, and 2 sites were possible burials. All but 2 of the traditional Hawaiian sites will be recommended for preservation. The archaeological inventory survey ("AIS") was approved by SHPD on February 25, 2014. The study was presented to the Kalaeloa Heritage Park as well as to the Kapolei Hawaiian Civic Club, and Group 70 will continue to coordinate and consult with them as they move towards mitigation. SHPD called for 4 mitigation measures: preservation plan, data recovery plan, burial treatment plan, and a mounds plan. They will also present the findings on the 2 burials on the site to the Oahu Burial Council. It would probably take about 6 months to complete the 4 plans.

Member Swinney asked if the ASEF application would be on hold until the plans are completed.

Mr. McKeague replied that the AIS fulfills their requirements, but the mitigation steps would come after the entitlements and would be guided by the next steps in the letter of intent.

Ms. Malama clarified that the letter of intent was non-binding and had expired. Even without a letter of intent, ASEF is still required to provide the mitigation. She did not anticipate moving forward on any agreements until they get back the information to determine what the next steps would be.

PUBLIC TESTIMONY

Melissa Lyman, president of the Kalaeloa Heritage and Legacy Foundation, commended Group 70 and ASEF for their work. From the Hawaiian cultural side, they ended up with more knowledge and learned of 23 more sites they can preserve.

Lance Holden, president of the Kapolei Hawaiian Civic Club, stated that Group 70 and ASEF made a presentation to them and their club was in support of the report. Through the report, they realized that the areas were not damaged and discovered other areas to do research and continue with their preservation plans.

Member Salaveria stated that the Authority has policy decisions and, in this case, was dealing with historic preservation as well as a modern application of renewable energy. He asked how the club feels about the photovoltaic project.

Mr. Holden replied that they are regular people who go to work, come home and participate in the same conversations about where does Hawaii get its electricity and how long can we depend on outside sources to provide our energy. Photovoltaic makes sense if it is something that works and is not ugly.

Member Swinney asked how the witness felt about a solar array and its impact to the ground and its compatibility in preservation.

Mr. Holden replied that, from what they had seen, it was not a very large footprint and would not be digging down deep. It would be compatible with preservation.

The meeting was recessed at 12:00 p.m.

The meeting was reconvened at 12:10 p.m.

2. Decision Making: Shall the Authority Authorize the Executive Director to Extend the Right-of-Entry for One (1) Calendar Year from Its Current Expiration Date of May 10, 2014 to an Expiration Date of May 9, 2015 for the Kalaeloa Heritage Park that Includes Parcel Numbers 13073-B and 13073-D to the Kalaeloa Heritage and Legacy Foundation?

Ms. Malama explained that an environmental assessment "(EA") must be conducted prior to establishing a lease with the Kalaeloa Heritage and Legacy Foundation ("KHLF") for the park site. In the meantime, the Authority has issued a right of entry for the last 3 years to the KHLF. The Authority approved funding for an EA, and Townscape has been procured as the consultant. The City and County of Honolulu

issued a Notice of Violation ("NOV") for stockpiling activities conducted by the KHLF, which would be explained by Ms. Lyman.

Ms. Lyman reported that the NOV was received in September or October 2013. The KHLF had accepted a donation of a large amount of topsoil dirt and some gravel to prepare the property for temporary buildings. They did not realize that a permit was needed. They have found an engineering firm, Community Planning, to assist with obtaining the stockpiling permit from the City. She apologized for any hardship they may have caused.

Member Swinney commended the commitment and genuine sincerity regarding the work the KHLF does in Kalaeloa. In the previous agenda item, the Authority heard about another inadvertent misstep that required mitigation which ended up being good because it helped uncover things not previously known. She thanked the KHLF for its work, and asked that they remain in close contact with the HCDA staff as they move forward with their mitigation.

There were no comments offered by the public on the agenda item.

Chairperson Lee entertained a motion for the Authority to authorize the Executive Director to extend the Right-of-Entry for 1 calendar year from its current expiration date of May 10, 2014 to an expiration date of May 9, 2015 for the Kalaeloa Heritage Park that Includes Parcel Numbers 13073-B and 13073-D to the KHLF.

A motion was made by Member Swinney and seconded by Member Grune.

A roll call vote was conducted.

Ayes: Members Chinn, Grune, Funakoshi, Salaveria, and Swinney.

Nays: None.

The motion passed 5 to 0 with 3 excused (Members Kamimura and Seki and 2 vacant positions).

V. ADJOURNMENT

The meeting was adjourned at 12:25 p.m.

Respectfully submitted,

/s/

Brian Lee
Chairperson

Attachment: Exhibit A - Presentation of the Archaeological Inventory Survey for Parcel 13073-E, Kalaeloa, Honouliuli, Ewa, Oahu

Note: The transcript of this meeting contains a verbatim record and should be consulted if additional detail is desired.

PRESENTATION OF THE ARCHAEOLOGICAL INVENTORY SURVEY FOR PARCEL 13073-E KALAELOA, HONOULIULI, 'EWA, O'AHU

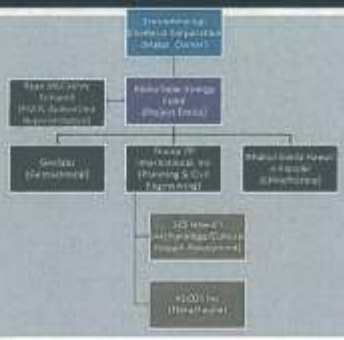
HCDA REGULAR MEETING
ITEM IV.B
APRIL 9, 2014

PRESENTATION BY ASEF PROJECT TEAM

PRESENTATION AGENDA

- Organization of Project Team
- Summary of AIS Findings & Planned Mitigation
- SHPD Approval
- Next Steps

PROJECT TEAM ORGANIZATIONAL CHART



ASEF SOLAR POWER PROJECT

- ASEF proposing one 5 MW solar "farm" power facility
- Project helps with Hawai'i Clean Energy initiative goals for renewable energy
- Vacant HCDA lands in Kalaeloa
- Project consists of PV array on concrete pads at grade, single story generation building, transfer substation

ARCHAEOLOGICAL INVENTORY SURVEY PROJECT AREA

ARCHAEOLOGICAL INVENTORY SURVEY APPROACH & SUMMARY FINDINGS

- Fieldwork conducted on ~44 acres between 2/20 to 4/10/13
- SCS/G70 assisted in the field by Mr. Shad Kane (ASHDK) as ethnohistorian
- 2013 SCS study documented 23 sites comprised of 146 features-exclusive of traditional Hawaiian sites and historic military remnants
- Two previously identified sites (-5119, -5120) were rediscovered

EXHIBIT A

1928 USGS AERIAL

AIS – PREVIOUS ARCHAEOLOGY ADAPTED FROM TUGGLE 1994

ARCHAEOLOGICAL INVENTORY SURVEY SITES

ARCHAEOLOGICAL INVENTORY SURVEY FEATURES

ARCHAEOLOGICAL INVENTORY SURVEY FINDINGS

- Majority of features represent traditional Hawaiian occupation and coastal cultivation that include rock mounds (agricultural and burial), small C- and U-shaped enclosures, modified pits (kars), platforms, and small trails
- Majority of traditional sites composed of limestone. Radiocarbon testing of charcoal sample (-7494 F1) suggest period of use/activity around AD 1730-1810
- Military features represent WWII-recent past uses and include concrete structures, remnants, guard shack, foundations/pad and one plane crash site

EXAMPLE OF TRADITIONAL HAWAIIAN SITE

- Site -7487, F4
- Traditional Hawaiian
- L-Shaped Rock Wall
- Boundary wall remnant
- Fair condition
- 2.8 m x 1.9 m
- L-shaped limestone rock wall 25.8 m long. Long axis oriented NE/SW- evidence of disturbance by tree growth, mechanical alteration

EXAMPLE OF MILITARY ERA SITE

- Site -7495, F7
- Historic
- Concrete Pillbox
- Guard Post
- Good condition
- Surface feature diameter 1.6 m, opening is 82x44 cm
- WWII era portable defense structure

AIS RECOMMENDATIONS

All sites assigned to criteria D of evaluation of significance (provided no potential to yield information important to history or pre-history)

7 sites additionally under criteria C (cultural significance to ethnic group (Native Hawaiians)- burials (-7483 and -7486)

Preserve in all patterns fragments (-7486, F5; -7486, F3)

All additional Hawaiian sites recommended for preservation except for: -7484, Feature 3 (modern stone) and -7502, F1 (agricultural mound) for data recovery

No further work for military era sites except for: -7487 (plane crash features for data recovery) and -7501, F1 (modern push pile)

SHPD approved AIS on Feb 25, 2014 with five mitigation requirements

RELATIONSHIP OF SITES TO DEVELOPMENT

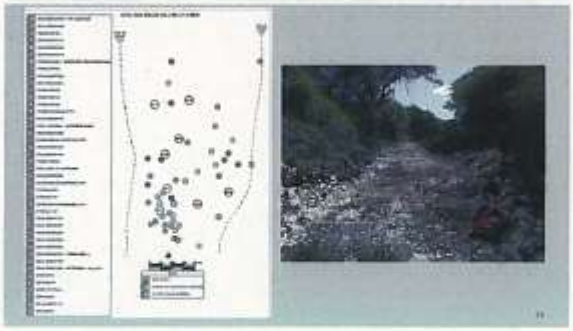
-7501 (MILITARY PUSH PILE) NO FURTHER WORK

- Site/Feature: Rock Mound
- Function: Military Push Pile
- Age: Historic
- Condition: Fair
- No vertically protruding outcrops of limestone – determined to be push pile

-7487 MILITARY ERA PLANE CRASH SITE (DATA RECOVERY)

- Site -7487, 2A to C
- Modern
- Aircraft Crash Site
- Military Aircraft
- Fair condition
- McDonnell Douglas Phantom II F-4J
- Accident on 12/17/71 Pilot Ltn. David Hughes WSO Ltn. Philip Skaff

-7484, F3 MIDDEN SCATTER (DATA RECOVERY)



-7502 AGRICULTURAL MOUND (DATA RECOVERY)

- Site/Feature: Rock Mound
- Function: Agriculture
- Age: pre- or early post-Contact period
- Condition: Fair
- 1.0mx1.0mx0.5m dry laid limestone cobble, piled – possible moisture trap for 'uala

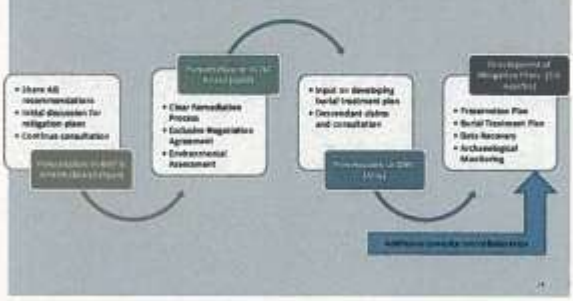
IDENTIFIED IMPACTS FROM GEOLAB CUTS

- Site -5119 (originally identified as an agricultural complex of seven features) initially reported in June 2012 as destroyed However, 2013 AIS identified 37 features - reassigned as -7482. The identified features consist of three karst pits, 26 rock mounds, two U-shaped structures, one semi-walled structure, three C-shaped structures, one L-shape structure, and one enclosure. Bulldoze Cut #1 runs through site.
- Related to bulldozed cuts, only TS-3 (-7484 F3, Midden Scatter) was shown to be affected with midden scattered within Cut #2- two traditional artifacts found- one micro adze and volcanic glass flake

SITE -5119/-7482 PLAN VIEW WITH GL CUT #1

-7484 IMPACT FROM GL CUT #2

NEXT STEPS



MAHALO
CONTACT: KMCKEAGUE@GROUP70INT.COM
808-523-5866

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

JESSE SOUKI
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
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CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD STE 555
KAPOLEI HI 96707

AGENDA
OAHU ISLAND BURIAL COUNCIL MEETING

DATE: Wednesday, May 14, 2014
TIME: 10AM
PLACE: Department of Land and Natural Resources
Board Room
Kalanimoku Building, 1st Floor
1151 Punchbowl Street
Honolulu, Hawaii 96813

I. CALL TO ORDER

II. ROLL CALL/PULE

III. MINUTES

April 9, 2014

IV. BUSINESS

A. **Draft Burial Treatment Plan for Site 50-80-11-7560, Boys and Girls Club of Hawai'i, Kailua Ahupua'a, Ko'olaupoko District, Island of O'ahu, TMK: 4-3-056: 009 Portion.**
Discussion/Recommendation/Determination: Discussion, recommendation and determination whether to preserve in place or relocate human skeletal remains at the above location. Discussion/Recommendation as to whether SHPD should accept the Burial Treatment Plan. Presentation by Chris Filimoehala.

B. **Honolulu Authority for Rapid Transportation Project, Honouliuli, Hō'ae'ae, Waikele, Waipi'o, Waiawa, Mānana, Waimano, Waiau, Waimalu, Kalauao, 'Aiea, Hālawa, Moanalua, Kahauiku, Kalihi, Kapālama, and Honolulu Ahupua'a, 'Ewa and Kona Districts, Island of O'ahu, Multiple TMKs.**
Information/Discussion/Recommendation: Update and discussion on the above project.

C. **133 Ka'iulani Project (Formerly King's Village Project), Waikīkī Ahupua'a Kona District, Island of O'ahu, TMK: 2-6-023, 029, 037 and 076.**
Information/Discussion/Determination: Update and discussion on the above project.

D. **Daft Burial Treatment Plan Information for SIHP 50-80-11-7586 and 50-80-11-7587 at Kailua Central Pacific Bank, Kailua Ahupua'a, Ko'olaupoko District, Island of O'ahu, TMK: 4-3-057 :073.**
Information/Discussion/Recommendation: Discussion on the above Burial Treatment Plan. This item is not up for determination. Presentation by Hal Hammatt and Alani Apio.

E. **Howard Hughes Corporation's Archaeological Inventory Survey for Ward Village Development Blocks B East C West, I and M, Honolulu Ahupua'a, Kona District, Island of O'ahu, TMK: 2-3-001:005, 2-3-002: 001 and 2-3-003:001.**
Information/Discussion/Recommendation: Update on the above project finds. Presentation by CSH.

F. **Kawaiaha'o Church Multi-Purpose Building Renovation Project, Honolulu Ahupua'a, Kona District, Island of O'ahu, TMK: (1) 2-1-032: 017.**
Information/Discussion/Recommendation: Update on the above project.

G. **Burial Treatment Plan for SIHP 50-80-06-7480 Kamehameha Schools Punalu'u Beach Lot 29 Project, 53-065 Kamehameha Highway, Punalu'u Ahupua'a, Ko'olau District, O'ahu, TMK: (1) 5-3-001: 029.**
Information/Discussion/Recommendation: Discussion on the above Burial Treatment Plan. This Plan is not up for determination. Presentation by CSH.

H. **Mauna Lahilahi Reinterment, Mākaha Ahupua'a, Wai'anae District, Island of O'ahu, TMK: (1) 8-4-001: 008 and 009.**
Information/Discussion: Update on the above reinterment that took place on March 15, 2014. Presentation by Hanale K. Hopfe.

I. **Completed Archaeological Inventory Survey for Aloha Solar Energy Farm 1, Honouliuli Ahupua'a, Ewa District, Island of O'ahu, TNK: 9-1-013: 070.**
Information/Discussion/Recommendation: Discussion on the above AIS that resulted in the discovery to two burials. Presentation by Kawika McKeague.

V. INADVERTENTS

A. **Store Project, Kailua Ahupua'a, Ko'olaupoko District, Island Of O'ahu, TMK: 4-2-001: 044.**
Information/Discussion: Update on the latest finds at the above project.

B. **International Market Place Project, Waikīkī Ahupua'a, Kona District, Island of O'ahu, TMK: 2-6-022: 036-039-043.**
Information/Discussion/Recommendation: Update on the above project. Presentation by Hal Hammatt and Alani Apio.

VI. ANNOUNCEMENTS

A. **Next meeting date is schedule for Tuesday, June 10, 2014 at 10am**

VII. ADJOURNMENT

Pursuant to §92-3 HRS, all interested persons shall be afforded an opportunity to present oral testimony or submit data, views, or arguments, in writing on any agenda item. Additionally, pursuant to a policy adopted by the Oahu Island Burial Council at its September 14, 2005 meeting, oral testimony for items listed on the agenda is limited to three minutes per person, per agenda item.

Pursuant to sections §92-4, §92-5(a)(8), and §6E-43.5, Hawaii Revised Statutes (HRS), and upon compliance with the procedures set forth in section 92-4, HRS, the council may go into a closed meeting to consider information that involves the location or description of a burial site.

A request to be placed on a burial council meeting agenda must be made with the Burial Sites Program staff at least two weeks preceding the scheduled meeting date. In addition, the request must be accompanied by all related documents. Failure to comply with this procedure will delay the item to the following month's agenda.

Materials related to items on the agenda are available for review at the State Historic Preservation Division in room 555 of the Kakuhihewa Building located at 601 Kamokila Boulevard, Kapolei, Hawaii 96707. Persons with disabilities requiring special assistance should contact the division in advance at (808) 692-8015.

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AGENDA
OAHU ISLAND BURIAL COUNCIL MEETING

DATE: Wednesday, July 9, 2014
TIME: 10AM
PLACE: Department of Land and Natural Resources
Board Room
Kalanimoku Building, 1st Floor
1151 Punchbowl Street
Honolulu, Hawaii 96813

I. CALL TO ORDER

II. ROLL CALL/PULE

III. VICE CHAIR ELECTION

Election of a new Vice Chair

IV. BUSINESS

A. **Department's Recommendation to Recognize Michael Kumukauoha Lee as a Cultural Descendant to Unidentified Human Skeletal Remains Encountered at Howard Hughes Corporation Ward Village Development Block B, East C West, I and M, Honolulu Ahupua'a, Kona District, Island of O'ahu, TMK: (1) 2-3-001: 005, 2-3-002: 001 and 2-3-003: 001.**
Discussion/Determination: Discussion and Determination to recognize the above individual as a Cultural Descendant to unidentified human skeletal remains at the above project.

The council may elect to go into executive session pursuant to HAR §13-300-25 (d). The council may close a meeting whenever location or description of a Native Hawaiian burial site is under consideration. The chairperson, by concurrence of a majority of members present at the meeting, shall be authorized to require the public to leave the meeting while the confidential matter is being discussed and reopen the meeting once the confidential matter is no longer being considered.

B. **Department's Recommendation to Recognize Michael Kumukauoha Lee as a Cultural Descendant to Unidentified Human Skeletal Remains Encountered at Aloha Energy Farm I, Honouliuli Ahupua'a, Ewa District, Island Of O'ahu, TMK: (1) 9-1-003: 070.**
Discussion/Determination: Discussion and Determination to recognize the above individual as a Cultural Descendant to unidentified human skeletal remains at above project.

The council may elect to go into executive session pursuant to HAR §13-300-25 (d). The council may close a meeting whenever location or description of a Native Hawaiian burial site is under consideration. The chairperson, by concurrence of a majority of members present at the meeting, shall be authorized to require the public to leave the meeting while the confidential matter is being discussed and reopen the meeting once the confidential matter is no longer being considered.

C. **Draft Burial Treatment Plan for SIHP #50-80-06-7480, Kamehameha Schools Punalu'u Beach Lot 29 Project, 53-065 Kamehameha Highway, Punalu'u Ahupua'a, Koolauloa District, Island Of O'ahu, TMK: (1) 5-3-001: 029.**
Discussion/Recommendation/Determination: Discussion and Determination whether to preserve in place or relocate human skeletal remains at the above location. Recommendation to SHPD whether to accept the above plan.

D. **Kalia Fort DeRussy Waste Water Systems Improvements Project (KFDWSI), Kalia Road, Ala Moana Boulevard, Kalakaua Avenue, Ili of Kalia Waikiki Ahupua'a, Island of Oahu, TMK: (1) 2-6-005: 001.**
Information/Discussion/Recommendation: Informational update to the OIBC to report out the finalized NAGPRA Plan of Action approved by the U.S. Army Garrison Hawai'i.

E. **Hilton Hawaiian Village Grand Islander Development Project (HHV-GID), Ili of Kalia, Waikiki Ahupua'a, Kona District, Island Of O'ahu, TMK: (1) 2-6-005: 001 por, 2-6-008: 001, 007, 012, 019, 034 (por.), and 038..**
Information/Discussion/Recommendation: Information disclosure of issued S106 letter and planned NAGPRA consultation to be initiated by the USAG-HI for proposed utility improvements within Federal parcel along Paoa Place and Kālia Road. Information regarding supplemental AIS to be conducted with HHV-GID parcel. Information and recommendations related to an existing Reburial Agreement for purposes to define an appropriate buffer and allowable improvements.

The council may elect to go into executive session pursuant to HAR §13-300-25 (d). The council may close a meeting whenever location or description of a Native Hawaiian burial site is under consideration. The chairperson, by concurrence of a majority of members present at the meeting, shall be authorized to require the public to leave the meeting while the confidential matter is being discussed and reopen the meeting once the confidential matter is no longer being considered.

F. **Kawaiaha'o Church Multi-Purpose Building Renovation Project, Honolulu Ahupua'a, Kona District, Island of O'ahu, TMK: (1) 2-1-032: 017.**
Information/Discussion/Recommendation: Update on above project.

V. INADVERTENTS/COMMUNICATIONS

A. **Inadvertent Discovery of Human Skeletal Remains at Target Store Project, Kailua Ahupua'a, Ko'olaupoko District, Island of O'ahu, TMK: (1) 4-2-001: 044.**
Information/Discussion: Report on above find.

B. **Letter Dated April 24, 2014 From Wesleyan University Regarding Repatriation of Items in Their Collection.**

C. **Letter From June 9, 2014 From Pacific Legacy in Re: Request for Consultation for the Cultural Impact Assessment and Ethnographic Inventory Survey for the Proposed Na Pua Makani Wind Farm, Located Within the Kahuku, Keana, Malaekahana Ahupua'a, Ko'olauloa District.**

D. **Letter Dated June 14, 2014 From State of Hawaii, Department of Transportation Dated in Re: National Historic Preservation Act, Section 106 Consultation Honoapiilani Highway Safety Improvements Kapoli Street to Papalaua Beach Park, Districts of Wailuku and Lahaina, Island of Maui, Ahupua'a of Ukumehame Federal-Aid Project No. HSIP-030-1 (45) Tax Map Keys (TMKS): 03-06-01, 04-08-02, 04-08-03, 04-08-04.**

E. **Letter Dated May 9, 2014 From the United States Marine Corp in Re: Demolish Non-Historic Airfield Buildings Aboard MCB Hawai'i, Ahupua'a of Heeia, District of Ko'olaupoko, on the Island of O'ahu, TMK: 1-4-4-010: 001.**

F. **Letter Dated May 28, 2014 From the United States Marine Corp in Re: Replace Sidewalk and Install Railing for Building 1613 Aboard MCB Hawai'i, Ahupua'a of Heeia, District of Ko'olaupoko, on the Island of O'ahu, TMK 1-4-4-010: 001.**

G. **Letter Dated May 28, 2014 From the United States Marine Corp in Re: Move North Beach Changing Station Aboard MCB Hawai'i, Ahupua'a of Kaneohe, District of Ko'olaupoko, on the Island of O'ahu TMK 1-4-4-010: 001.**

H. **Letter Dated May 30, 2014 From State of Hawaii, Department of Transportation in Re: Western Kapolei At-Grade Crossing of the Former O'ahu Railway and Land Company Right of Way Site No. 50-80-12-9714, TMK: (1) 9-1-015-002 National Historic Preservation Act Section 106 Consultation Honouliuli Ahupua'a, 'Ewa District, O'ahu.**

VI. ANNOUNCEMENTS

A. **Next meeting date is scheduled for Wednesday, August 13, 2014.**

VII. ADJOURNMENT

Pursuant to §92-3 HRS, all interested persons shall be afforded an opportunity to present oral testimony or submit data, views, or arguments, in writing on any agenda item. Additionally, pursuant to a policy adopted by the Oahu Island Burial Council at its September 14, 2005 meeting, oral testimony for items listed on the agenda is limited to three minutes per person, per agenda item.

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RECEIVED
2017 FEB 28 PM 5 00
HAWAII COMMUNITY
DEVELOPMENT
AUTHORITY

KANEHILI CULTURAL HUI
P.O. BOX 75578 KAPOLEI, HI. 96707

February 28, 2017

Chairperson and Members
Hawaii Community Development Authority
State of Hawaii
Honolulu, Hawaii
HCDA Board Members:

PUBLIC TESTIMONY ON SUBJECT:

Shall the Authority Authorize the Executive Director to Enter Into Lease Negotiations with Aloha Solar Energy Fund II (ASEF II)/ECC Energy Solutions, LLC (ECC) to Develop a 5 Megawatt Photovoltaic Solar Farm (Project) on Parcel 13073-E, Tax Map Key (TMK) (1) 9-1-013: 070 at Kalaeloa, Oahu, Hawaii

CC: Donna Wong, Hawaii Thousand Friends,
Michelle Matson, Oahu Parks Conservancy Board
Susan Lebo, SHPD
Alan Downer, SHPD

CC: Elizabeth Merritt, Attorney
National Trust for Historic Preservation
1785 Massachusetts Ave NW
Washington, DC 20036

CC: Kiersten Faulkner, Executive Director
Historic Hawai'i Foundation
680 Iwilei Road, Suite #690,
Honolulu, HI 96817

CC: Michael Kumukauoha Lee,
Ewa Honouliuli Cultural Descendant
Kanehili Cultural Hui

RE: ACTION ITEMS

3. Shall the Authority Authorize the Executive Director to Enter Into Lease Negotiations with Aloha Solar Energy Fund II/ECC Energy Solutions, LLC to Develop a 5 Megawatt Photovoltaic Solar Farm on Parcel 13073-E, Tax Map Key (1) 9-1-013:070 at Kalaeloa, Oahu, Hawaii?

Aloha Chairperson Souki and Board Members of HCDA,

Kanehili Cultural Hui (KCH) would like to provide testimony on issues about this project parcel project: 5 Megawatt Photovoltaic Solar Farm (Project) on Parcel 13073-E.

KCH is very familiar with the site and has extensively documented in photos and video the parcel before and after the extensive damage that was done. It was an especially disturbing experience, having seen prior land surveys done, that the damage was so widespread and extensive using a large bulldozer(s) in a wildly uncontrolled manner. There were not "trails" cut but instead wide city streets bulldozed as if there had been a complete approval to begin PV installations. It was truly the most insane, careless damage we have ever seen. Who could have possibly allowed this to happen in the first place?

Most importantly, this site is one of the most culturally and historically rich sites KCH members have ever seen, by just walking a few yards in any direction off the bulldozed roads was massive evidence of an ancient Hawaiian cultural habitation of all kinds, including trails, heiaus, burial sites, etc.

We have doubts about why the Kapolei Civic Club was hired when we had just witnessed a very similar massive destruction of Ordy Pond under their apparent supervision, which we extensively documented in photos and videos, and in conjunction with local news organizations. The Ordy Pond area was extensively "nuked" by a huge overkill of heavy construction equipment which destroyed numerous historic and archeological features. We were totally lied to by the consulting Navy archeologist as to what they would do and what they actually did when we arrived to see the actual massive destruction underway.

By the way, both of these projects were very similar Navy contractor companies that do UXO and powerline projects for the Navy and power companies, both located close to each other near the airport, and which have a demeanor of being completely careless of historic and cultural features while using their massive bulldozers, heavy trucks, etc to completely level and pulverize everything in the area.

Further, having been directly involved in the Ewa Field Kalaeloa PV farm project where an extensive and detailed Programmatic Agreement was made and signed with Stipulations that "insured" that only light vehicles and medium grubbing and grading equipment would be used, as soon as they had the signed entry agreement the contractors immediately brought in the largest heavy earthmoving equipment and largest heavy tractor trucks to completely crush and flatten the entire area like they were building a shopping mall. There were many karst caves and sinkholes on the site and they filled them all in with liquid concrete. They also caused major subsurface damage breaking un-surveyed WW-II water pipes and creating a huge water pond on the site for several days.

So we know now from there different experiences that these affiliated contractors have no regard at all for Hawaiian cultural sites and that once these companies get right of entry signed

contract they will go about completely destroying every single cultural and historic feature they can using typical "nuke out" heavy equipment obliteration .

Tuggles Map-Malden Map show major trails connections

The Navy BRAC commissioned the Navy to do studies of former NAS Barbers Point, and while very extensive compared to anything done previously, the work of the Tuggles were a major landmark of archeological research and documentation of what later became or now known as "Kalaeloa." While still highly limited by available funding and the general Navy policy of removing "sensitive evidence" of historic and cultural sites from their contracted survey reports, a great deal of Hawaiian and historic sites were identified. Sites like the Ewa Field battlefield were just a small circle around where the original mooring mast had been. No attempt was made to elaborate on the December 7, 1941 attack until decades later in 2012.

One of the important studies that the Tuggles were able to get into the BRAC reports were the approximate locations of the major Hawaiian trails documented in 1825 by Lt. Malden, a surveyor who was as part of the HMS Blonde expedition of 1824-25. KCH has spent considerable effort following the map diagrams made by the Tuggles and there is clear evidence of Hawaiian habitation, agricultural and burial sites along the ancient trail that runs along the east side Coral Sea Road. And where the trail crosses over (or the roadway crosses over it) and runs right through the Kalaeloa Heritage Park and then on down to Kualaka'i village, later called Nimitz Beach. Of course the runway obliterates the last major segment of the trail near the coast.

However inside 13073-E there is extensive evidence of large communal habitation that allowed Hawaiian people to move in and out and on up to the mauka areas of Kanehili and Kaupe'a and the slopes of the Waianae volcano. It is also very likely that native Hawaiian *Opae Ula* freshwater shrimp can be found below the 13073-E surface in sinkholes and caves where they thrive in fresh water from underground streams and springs near the shoreline.

Flood Plain Tsunami Zone

This 13073-E parcel is located in a major tsunami hurricane storm surge inundation area and will be wiped out by the many now FEMA and NOAA predicted major tsunamis from Alaska, California and the Pacific Northwest that are long overdue. A major West Coast FEMA exercise was conducted in 2016 that simulated a huge expected future tsunami. Having walked all through the area there is extensive evidence of ocean sand and small coral rocks being washed inland for up to at least ¼ mile due to historic tsunamis and hurricane storm surge.

Site Construction will disturb subsurface contaminants from WW-II, Cold War

13073-E is directly linked to many atomic bomb projects and later major Pacific nuclear bomb test projects. The parcel has a "hot site" for loading and unloading nuclear weapons where were stored in nearby protected bunkers. Planes flying through major bomb tests that

measured interior atomic clouds where often washed off in this area near the end of the runway. In the early bomb tests lots of materials were discarded in holes and trash pits.

Recent scientific research in Hawaii has now established submarine groundwater outflows that are contaminating near shore traditional fisheries, limu, etc. This destroys traditional cultural oceanic fishing rights and endangers seals, turtles and swimmers.

The 2011 Kalealoa Energy Corridor EA also states: *"Groundwater in Kalaeloa (generally) occurs near sea level. From published reports, groundwater is in unconfined conditions within the caprock and is in direct hydraulic contact with the ocean."*

The major cultural significance and value of below surface Karst streams, caves and sinkholes in Kalaeloa has only begun to be recently documented and better understood and basically not well documented at all in the 1990's. The below surface Karst water flows and runoff pollutants affect near shore marine habitats, fisheries and the stress the survival of once abundant limu which Ewa was widely known for.

Part of subsurface karst water flows from the large sinkhole pond near the center of the Kalaeloa airport runway and down to the Nimitz Beach shoreline. The evidence of this waterflow is clearly seen in aerial photos where it flows into the sea beneath the surface and into the adjacent White Plains beach area where many low sea level ponds exist behind the sand dune beach area.

Lots of bird nests, pueo, etc.

13073-E Parcel has many large older trees and we documented many types of bird nests and bird habitation areas. While not seen during our visits to this particular parcel, others have reported seeing Pueo owls in the area in the early morning and late afternoon. The parcel is an ideal hunting and nesting area, including for many other migratory birds and the Hawaiian bat.

Powerlines down Coral Sea Road?

Are these 12 kV or 46 kV power lines? For solar farm projects the powerlines would need to return to the HECO main distribution line by Roosevelt Avenue using a three wire 46 kV power line connection. The HCDA lease plan doesn't mention the 46 kV power line connection, only 12 kV which will not support a 5 megawatt solar farm.

So in reality the 46 kV powerline poles would have to be around 65 feet high placed at least 8-9 feet in the ground and run right along the glide path to the adjacent two (or more) active runways. The runway flight patterns depend on the wind direction. There is a long history of plane crashes at the threshhold of the NAS Barbers Point runways- meaning that power lines present a real possible hazard for helicopters and light planes.

Magnetic flux densities at ground level can range up to several μT. Electric field levels underneath power lines can be as high as 10 kV/m. However, the fields (both electric and magnetic) drop off with distance from the lines. At 50 m to 100 m distance the fields are normally at levels that are found in areas away from high voltage power lines.

Power lines can be blown down in wind storms, attract lightning strikes, chopped down by vandals, poles hit by cars and trucks, electrical lines can catch small planes and helicopters, which would impact all local residents and businesses with power outages. Downed power lines can cause fires, electrocute animals and people stepping into water puddles that electrical current has made hidden contact with. Power outages mean loss of hot water, spoiled food, business closure, no pumped gas, no ATM, etc. A HECO power pole corridor will require extensive maintenance over time and lead to sub-contractors using chemical pesticides to kill grassy areas and polluting the water table.

KCH testified about this several years ago and actually proposed that Coral Sea Road on the West side would be the best option for an "energy Corridor" and that the power lines should be placed into a five foot deep insulated trench with PV pipes insulating the power, telco and cable TV connections needed for the Coast Guard Air Station Barbers Point. This would be more expensive but much more survivable in the event of a major hurricane storm surge or tsunami.

Because the west side of the Coral Sea road route has no curbs, gutters, sidewalks, street lights or large trees to dig up, *trenching conditions for a five foot deep underground corridor in already disturbed ground coral are nearly ideal and would proceed very quickly.*

Here's how the 2011 Kalaeloa Energy Corridor EA justifies the UNDERGROUND choice:

"Overhead utility lines in lieu of underground duct lines were considered during the preliminary planning stages of the project. Although overhead utility lines are less expensive to install than underground ducts, ***the protective features of the new (underground) duct line makes this alternative more attractive."***

"Additionally, the underground location of the duct line would have real visual benefits to the community, as no unsightly overhead lines would occur along the main entry road of Kalaeloa."

And, *"The City and County of Honolulu General Plan has adopted land use policies and objectives that promote development that does not obstruct or interfere with existing vistas or view planes. The Revised Ordinances of Honolulu typically require electric and communication utilities to be installed underground... ...Furthermore, HCDA's Kalaeloa Community Development District Rules establishes similar underground requirements."*

In the 1920s The Outdoor Circle (TOC), a highly influential environmental organization, succeeded in requiring new electric lines in urban Honolulu to be buried. TOC has advocated for underground wiring over the years and made many in-roads along the way (all federal highways must have underground lines, all new subdivisions must also).

The City of Honolulu adopted this underground utility policy in the 1960's and HCDA's Kalaeloa Master Plan ALSO adopted this as planning policy.

The PV farm is only first development phase

These PV farms are just a phase development of the site where supposedly "careful" work is done to "preserve" historic and cultural features but actually they will largely be obliterated by bulldozers and heavy trucks, concrete pads, deep drilled holes for fencing, posts, transformers, etc, etc.

After the PV technology runs its course and some money is made the next phase is junking the old PV panels and then flattening of former PV site surface for buildings and strip malls near the White Plains beach. Because by then the original "historic integrity" will have been destroyed and the next environmental "study" will show there is "nothing there" except crushed coral and concrete pads with old fencing, poles, etc.

Conveyance is for "public benefit"

This 13073-E parcel shows as one of the original Navy BRAC City Park parcels in the 2008 map and was supposed to be used as open space park land. But then a quiet backroom deal was arranged to have the city release this parcel and a couple of other shoreline parcels to HCDA so they could apparently lease them commercially. It was all done so no one in the community was aware the BRAC promised Kalaeloa Regional Park was being chopped up and sold off for commercial development.

The original Navy BRAC and NPS transfer documents show that the City Park parcels including 13073-E were supposed to have had protective Historic Preservation Covenants and use as parkland for public benefit. It is hard to see how using the land for a commercial PV solar farm, after destroying its historic and cultural features, is in the benefit of the public.

Because nearly all HECO and related PV farms are all done on a large scale open area of land, developing this very complicated cultural site as a PV farm doesn't sound economically feasible but instead more like an agenda for phased land development for commercial buildings later.

The land title is clouded because of Allodial Title

The evidence of 13073-E going through the land court with Campbell Estate brings up the issue of who is the real owner of the land parcel and it wasn't actually the Navy or Campbell. The Navy acquired use of the lands under emergency access orders from President Roosevelt but never acquired true title ownership. The 13073-E land is actually Allodial and not owned by Campbell but instead to heirs of Mikahela Kekauonohi. After the Great Mahele in 1848, Kekau'ōnohi was given the second largest land allotments, seventy-seven 'āina (land parcels), many in Ewa, Honouliuli apupua'a, making her the largest landholder after the King. HCDA needs to have a consultation with Mr. Lee about this 13073-E parcel.

Keahikuni Kekau'ōnohi (c. 1805–1851) was a Hawaiian high chiefess who was a member of the House of Kamehameha. She was granddaughter to King Kamehameha I and one of the wives of Kamehameha II. Mikahela Kekauonohi is Mike Lee's 5th great aunt and he as well as his cousin Routh Bolomet are heirs of her allodial title no. 11216 42,000 acres. ROYAL PATENT No. 11216 Apana 8 and 9, to Mikahela Kekauonohi on page 655 of Volume 9, Land Commission Awards [Series 288]. Board of Commission to Quiet Land titles.

http://www.hoakaleifoundation.org/documents/helu-11216-claim-mikahela-kekauonohi

The Royal Patent says Allodial are higher than Fee Hold or Fee Simple. US patents are different from Hawaiian Kingdom patents because they are based on French Common Law not English Common law. Kamehameha III used the French legal dictionary ," Bouvier "as the foundation of the enure / inure interest that resides in the Hawaiian Royal Patents, not the English BLACK's legal dictionary, but Bouvier's legal dictionary 1856 4th edition.

This land title issue was previously brought up by Michael Kumukauoha Lee in the Haseko Marina case and subsequent testimonies and meetings, that are still on going, with the HART rail project. Mike Lee, is also a living descendent of Queen Kaomileika'ahumanu (a wife of King Kamehameha I, and true mother of King Kamehameha III.)

Michael Kumukauoha Lee Testimony to HCDA August 16, 2012

Minutes of a Regular Meeting of the Members of the Hawaii Community Development Authority, State of Hawaii MEETING NO. 376, Thursday, August 16, 2012

Decision Making: Shall the Authority Authorize the Executive Director to Accept the Remediation Measures Proposed by Aloha Solar Energy/Sunetric to Address the Damages Resulting from Unauthorized Activities on Parcel 13073-E in the Kalaeloa Community Development District?

Public Testimony:

Mr. Michael Kumukauoha Lee stated that he was the only cultural descendent recognized by SHPD and OIBC April 14, 2010 for this area. Mr. Shad Kane and the Civic Club were not cultural descendants recognized under state law. He stated that he represented the iwi and was a lineal descendant recognized for this area. Mikahela Kekauonohi was his 4th great grand-aunt and holder of the royal patent of 42,000 acres in the area. John Meek was his 5th great grandfather and the Campbell Estate derived the lands after his death. The Meek Estate held the leases on Pu'uloa 'Ewa with the Wilcox family and he had all the deeds. He questioned under what rules or statutes could the civic club take precedence over him and wanted the Authority to be aware that the civic club was the wrong party.

Mr. Ching stated that the HCDA has the position of landowner and did not currently have zoning rules which would give any jurisdiction. In this particular case where there has been fault found by a prospective tenant, the HCDA has sought to investigate the impact to historical cultural resources. In the course of the investigation, the HCDA consulted with SHPD, who has more expertise in the particular area and conducted its own analysis and research. Recognizing Mr. Lee's comments as to the status of and appropriateness of the Civic Club and SHPD, he would take under advisement and involve other appropriate parties in the development of a remediation plan.

Mr. Oamilda replied that it was. The 106 process was concerned first with historical and then with cultural. He represented the community on the cultural and historical levels which go arm-in-arm together. For over a hundred years, the underground has not been mitigated and they were concerned with what was underground considering the sensitivity of the cultural aspect of the area. They recommend an EIS above ground and underground. He was from the area and knows the area.

State Environmental Policy

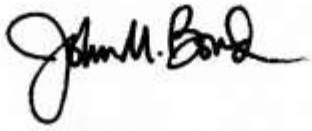
The State Environmental Policy under HRS Chapter 344 establishes an environmental policy that: (1) encourages productive and enjoyable harmony between people and their environment; (2) promotes efforts that will prevent or eliminate damage to the environment and biosphere; (3) stimulates the health and welfare of humanity; and (4) enriches the understanding of the ecological systems and natural resources important to the people of Hawaii.

Hawaiian Sacred Sites, Historic Trails

A Federally funded study for HART Rail produced with the work and research of Kepa Maly, KumuPono LLC, established that parcel 13073-E is in the designated *"Leina a ka 'uhane"* in the Ewa Plains area known in ancient times as *Kanehili* and *Kaupea*. This area today corresponds to a large area and includes the former MCAS Ewa, Barbers Point NAS which today still retains many relatively open and undeveloped areas that contain hundreds of sinkholes, caves, habitation sites, shrines, temples, ahus, trails, cairns and more that still evoke the special Traditional Cultural Property of the *Leina a ka Uhane*.

The Honolulu City Council passed unanimously in 2012 the Ewa Plain Trails resolution, advocating for the protection of the 1825 mapped Malden Trails (ancient Hawaiian trails) and Ewa Karst water system which fall within the former MCAS Ewa airbase.

Aloha,



John Bond, President
Kanehili Cultural Hui
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Kapolei, Hi. 96707
Honouliuli, Moku of Ewa
Ewabond@gmail.com

IDENTIFICATION OF NATIVE HAWAIIAN TRADITIONAL CULTURAL PROPERTIES

by H. David Tuggle, Ph.D. M.J. Tomonari-Tuggle, M.A. with the collaboration of Maria E. Ka'imipono Orr, Kepâ Maly Kumu Pono Associates, and Kalani Flores Mana 'o'i'o Principal Investigator: Thomas S. Dye, Ph.D.
International Archaeological Research Institute, Inc.
NavFac Engineering Command Pearl Harbor, Hawai'i March 2001

EXCERPTS:

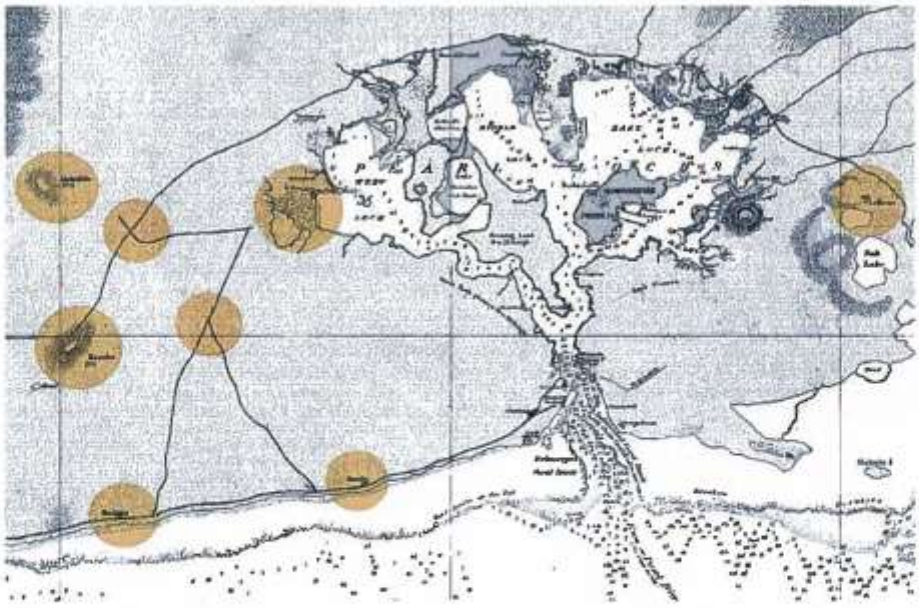
Parker and King (1990:9; emphasis added) elaborate on this by noting: Thus a property may be defined as a 'site' as long as it was the location of a significant event or activity, regardless of whether the event or activity left any evidence of its occurrence. A culturally significant natural landscape may be classified as a site, as may the specific location where significant traditional events, activities, or cultural observances have taken place...A concentration, linkage, or continuity of such sites or objects, or of structures comprising a culturally significant entity, may be classified as a district.

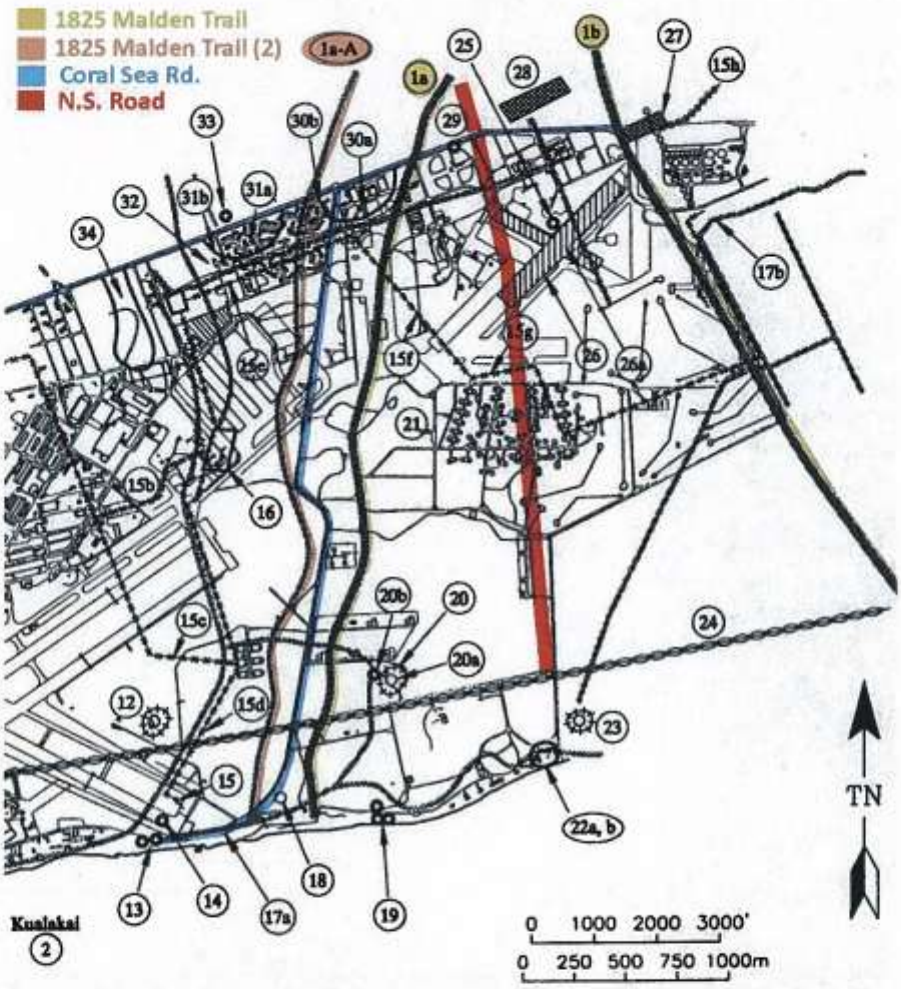
II.2.1.1. THE PLAIN OF KAUPE'A AND KÂNEHILI

A place of many pits with human bones describes most of the great expanse of the 'Ewa Plain, where limestone sinkholes were used for human interment over many centuries (including the post-contact period, see below). In many cases, human remains were placed on the floors of the sinkholes (not buried) with the bones thus visible when one looked into the pit, surely a setting to inspire association with spirits of the dead.

Each island had at least one place for wandering souls. For O'ahu, this place was the plain of Kaupe'a. Kamakau (1870 [1964:47], italics original) *writes that Kaupe'a was known as: …ao kuewa, the realm of homeless souls,…also called the ao 'auwana, the realm of wandering souls. When a man who had no rightful place in the 'aumakua realm died, his soul would wander about…*

Although the boundaries of the plain of Kaupe'a are not clearly defined, it certainly occupied a substantial portion of the 'Ewa Plain, including the area next to Pearl Harbor lagoon and the area of former NAS Barbers Point. Kamakau (1870 [1964:47-49]) describes the plain as "beside Pu'uloa," and as a place of wiliwili trees, which is a common tree on the dryland limestone of 'Ewa. In the tradition of Pele and Hi'iaka (Emerson 1915:167; Keonaona and S.L. Desha Sr. et al. 1927, in Maly Appendix B), the plain is described as extending from "the wiliwili trees…to Kanehili" (Ke Au Hou 1911, in Sterling and Summers 1978:44), and as back of Keahi and Pu'uloa (Pukui 1943:59).





Tuggles Map shows major trails leading through Kalaeloa to Oneula and Kualaka'i. In the beginning of WW-II the Navy and Marine bases were divided by a road that ran directly down between the westerly ancient Hawaiian Kualaka'i main trail that runs through parcel 13073-E.

ONELUA EWA BURIAL SITES DESTRUCTION CASE IS FILED

http://hawaiiindependent.net/story/letter-attack-on-royal-iwi-is-being-covered-up

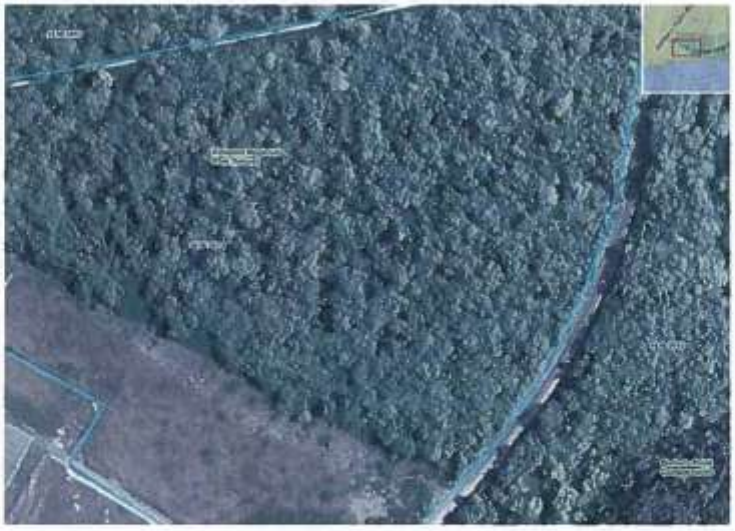
News Release: Legal papers delivered to Hawaii Attorney General, Dept. of Land & Natural Resources, Haseko-Ewa Inc., and Honolulu City/County Officials.

Armed with over "230 exhibits" that document many years of cover-ups, delayed meetings, and hidden agendas, by Hawaii's Dept. of Land and Natural Resources (DLNR), Haseko-Ewa Inc.

(subsidiary of Haseko -Japan), State Historical Preservation Division (SHPD), and City/County Parks Office, "final legal paperwork" has been filed with the State's Attorney General in Honolulu, Hawaii. Documents that were submitted define past and ongoing destruction of many ancient Hawaiian burial sites; the pilferage of sacred Hawaiian Royal-family heir-looms from the graves, and ongoing denials of Hawaiian citizen rights to preserve their culture by the developer - Haseko Ewa Inc., "with sanctions" from the DLNR, SHPD, and other City/County offices. (see attachments).

Mr. Mike K. Lee, a living descendent of Queen Kaomileika'ahumanu (a wife of King Kamehameha I, and true mother of King Kamehameha III) is a Hawaiian historian and "cultural preservation" expert, and in legal documents filed by him, it seeks to bring an "immediate closure" to the further destruction of his ancient Hawaiian Royal-family's burial site, as well as, stoppage of looting of ancient Hawaiian capes, rare wooden kii's (idols), and other Royal funerary objects taken from his Royal-family's grave by Haseko-Ewa, Inc, when they began dredging the Ewa marina in Onelua years ago. In addition, there are seven (7) other burial sites of the Kings of Oahu and Kauai that are threatened to be destroyed by Haseko-Ewa Inc.

This case (since 2000) has been discussed and documented with numerous Hawaii Government officials, land and recreation heads, the major principals in Haseko-Ewa Inc. and City/County representatives.. The evidence presented will prove that Mr. Lee's Hawaiian civil and legal rights have been violated, and that his Royal-family's burial site was destroyed and looted by the Oahu Japanese developer. Haseko-Ewa Inc.'s lack of due-diligence when digging the Ewa marina violates the Hawaii State Constitution (Article 12, section 7). It states and protects the rights of Hawaiian citizens to preserve and protect their ancient Hawaiian burial sites throughout the Hawaiian Islands.



13073-E as what was supposed to be Kalaeloa Regional Park according to Navy BRAC

APPENDIX H: MR. JOHN BOND'S, PRESIDENT OF KANEHILI CULTURAL HUI, TESTIMONY ON THE SOLAR PROJECT PRESENTED TO SCS AND TO THE HCDA BOARD MEMBERS

KANEHILI CULTURAL HUI
P.O. BOX 75578 KAPOLEI, HI. 96707

APRIL 12, 2017

TO:

Cathleen Dagher
Senior Archaeologist
Scientific Consultant Services, Inc. (SCS)

Hawaii Community Development Authority
State of Hawaii
Honolulu, Hawaii
HCDA Board Members:

TESTIMONY ON SOLAR PROJECT:

Aloha Solar Energy Fund II (ASEF II)/ECC Energy Solutions, LLC (ECC) to Develop a 5 Megawatt Photovoltaic Solar Farm (Project) on Parcel 13073-E, Tax Map Key (TMK) (1) 9-1-013: 070 at Kalaeloa, Oahu, Hawaii

The ASEF Kalaeloa Project can be described as consisting of two primary components: 1) a proposed 5 megawatt (MWac) utility installation for a renewable energy photovoltaic system; and 2) an approximate 1.78 mile long 12 kilovolt (kV) electrical distribution line to connect the utility installation to HECO. Details of each component are briefly summarized below.

The utility installation would be built on a parcel (TMK (1) 9-1-013:070) that is currently owned and managed by the Hawaii Community Development Authority (HCDA). The vacant and undeveloped parcel is comprised of approximately 44.28 acres situated within the traditional district (moku) of 'Ewa in the *ahupua'a* of Honouliuli. The parcel today is a part of the Kalaeloa Community Development District (KCDD). The proposed project would involve the installation of 900 elevated photovoltaic panel racks, which will be mounted above ground on a series of posts that align in a series of columns on approximately 22 acres of the 44.28. The utility installation would include a electrical transfer substation. Access to/from the parcel would be provided from Coral Sea Road that would lead to an internal network of paths to be primarily used for maintenance and inspection activities. The remaining parcel acreage would remain as a part of an archaeological preserve area to be established.

Aloha,

Kanehili Cultural Hui (KCH) would like to provide testimony on issues about this project parcel project: 5 Megawatt Photovoltaic Solar Farm (Project) on Parcel 13073-E.

KCH is very familiar with the site and has extensively documented in photos and video the parcel before and after the extensive damage that was done. It was an especially disturbing experience, having seen prior land surveys done, that the damage was so widespread and extensive using a large bulldozer(s) in a wildly uncontrolled manner. There were not "trails" cut but instead wide city streets bulldozed as if there had been a complete approval to begin PV installations. It was truly the most insane, careless damage we have ever seen. Who could have possibly allowed this to happen in the first place?

Most importantly, this site is one of the most culturally and historically rich sites KCH members have ever seen, by just walking a few yards in any direction off the bulldozed roads was massive evidence of an ancient Hawaiian cultural habitation of all kinds, including trails, heiaus, burial sites, etc.

The site is directly within the identified Leina a ka uhane boundary identified by Kepa Maly for the HART Rail project. See attached documents.

The Makakilo Kapolei Neighborhood Board passed a resolution about Coral Sea Road route in January 2014 supporting a completely underground energy corridor along this same project proposed route. They should be consulted and a presentation given to this board. The underground route was also supported by Councilwoman Kimberly Pine. See attached board reso.

The FFA Honolulu office informed me that the project needs to file FAA Form 7460-1, Notice of Proposed Construction for airspace analysis and also preparing a glint/glare analysis. https://share.sandia.gov/phlux

We have doubts about why the Kapolei Civic Club was hired when we had previously witnessed a very similar massive destruction of Ordy Pond under their apparent supervision, which we extensively documented in photos and videos, and in conjunction with local news organizations. The Ordy Pond area was extensively "nuked" by a huge overkill of heavy construction equipment which destroyed numerous historic and archeological features. Many previous known historic and cultural features at Ordy Pond were destroyed.

Both of these projects have similar links to Navy contractor companies that do UXO and powerline projects for the Navy and power companies, both located close to each other near the airport, and which have a demeanor of being completely careless of historic and cultural features while using their massive bulldozers, heavy trucks, etc to completely level and pulverize everything in the area.

Planned PV site destroyed important ancient Hawaiian trails and sites with D9 bulldozer, and where later iwi kupuna burials were found.

We witnessed what had happened at Ordy Pond and what happened at this project PV site. Both major damages were done around the same approximate time period.

Earlier we had witnessed how a Section 106 signed agreement between the Navy and community was completely violated where stipulations were agreed upon as to how the site development would be done, weight of trucks, vehicles, etc. ALL was totally violated and the largest trucks and bulldozers were brought in to totally pulverize the site, crushing sub-surface features, pouring concrete into sinkholes and karst caves. Once right of entry is granted and construction begins the contractors do everything possible to destroy all cultural features and damage as much as possible. Agreements mean NOTHING when the contractors come in and the consulting archeologist-practitioners are paid off.

When Iwi is found it does NOT get reported. Equipment operators will lose their jobs if they do.

On site archeologists are usually NOT on site, despite being paid and are just there hanging out in their car in the shade. We have seen that many times.

Bulldozers fall into karst caves and pits – this was well known to happen in this same area – MCAS Ewa and NAS Barbers Point quite often. An entire D-8 bulldozer fell into a major cave in 1942 while Ewa Field was being built. Bulldozers fell into caves while nearby Haseko lands were destroying cultural sites. None of this gets officially reported. There is NO INCENTIVE.

The Ewa Field Kalaeloa PV farm project where an extensive and detailed Programmatic Agreement was made and signed with Stipulations "insured" that only light vehicles and medium grubbing and grading equipment would be used, as soon as they had the signed entry agreement the contractors immediately brought in the largest heavy earthmoving equipment

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So we know now from there different experiences that these affiliated contractors have no regard at all for Hawaiian cultural sites and that once these companies get right of entry signed contract they will go about completely destroying every single cultural and historic feature they can using typical "nuke out" heavy equipment obliteration.

Tuggles Map-Malden Map show major trails connections

The Navy BRAC commissioned the Navy to do studies of former NAS Barbers Point, and while very extensive compared to anything done previously, the work of the Tuggles were a major landmark of archeological research and documentation of what later became or now known as "Kalaeloa." While still highly limited by available funding and the general Navy policy of removing "sensitive evidence" of historic and cultural sites from their contracted survey reports, a great deal of Hawaiian and historic sites were identified. Sites like the Ewa Field battlefield were just a small circle around where the original mooring mast had been. No attempt was made to elaborate on the December 7, 1941 attack until decades later in 2012.

One of the important studies that the Tuggles were able to get into the BRAC reports were the approximate locations of the major Hawaiian trails documented in 1825 by Lt. Malden, a surveyor who was as part of the HMS Blonde expedition of 1824-25. KCH has spent considerable effort following the map diagrams made by the Tuggles and there is clear evidence of Hawaiian habitation, agricultural and burial sites along the ancient trail that runs along the east side Coral Sea Road. And where the trail crosses over (or the roadway crosses over it) and runs right through the Kalaeloa Heritage Park and then on down to Kualaka'i village, later called Nimitz Beach. Of course the runway obliterates the last major segment of the trail near the coast.

However inside 13073-E there is extensive evidence of large communal habitation that allowed Hawaiian people to move in and out and on up to the mauka areas of Kanehili and Kaupe'a and the slopes of the Waianae volcano. It is also very likely that native Hawaiian *Opae Ula* freshwater shrimp can be found below the 13073-E surface in sinkholes and caves where they thrive in fresh water from underground streams and springs near the shoreline.

Flood Plain Tsunami Zone

This 13073-E parcel is located in a major tsunami hurricane storm surge inundation area and will be wiped out as shown by tsunami inundation maps and the many now FEMA and NOAA predicted major tsunamis from Alaska, California and the Pacific Northwest that are long overdue. A major West Coast FEMA exercise was conducted in 2016 that simulated a huge expected future tsunami. Having walked all through the area there is extensive evidence of

ocean sand and small coral rocks being washed inland for up to at least ¼ mile due to historic tsunamis and hurricane storm surge.

Site Construction will disturb subsurface contaminants from WW-II, Cold War

13073-E is directly linked to many atomic bomb projects and later major Pacific nuclear bomb test projects. The parcel has a "hot site" for loading and unloading nuclear weapons where were stored in nearby protected bunkers. Planes flying through major bomb tests that measured interior atomic clouds where often washed off in this area near the end of the runway. In the early bomb tests lots of materials were discarded in holes and trash pits.

Recent scientific research in Hawaii has now established submarine groundwater outflows that are contaminating near shore traditional fisheries, limu, etc. This destroys traditional cultural oceanic fishing rights and endangers seals, turtles and swimmers.

The 2011 Kalealoa Energy Corridor EA also states: *"Groundwater in Kalaeloa (generally) occurs near sea level. From published reports, groundwater is in unconfined conditions within the caprock and is in direct hydraulic contact with the ocean."*

The major cultural significance and value of below surface Karst streams, caves and sinkholes in Kalaeloa has only begun to be recently documented and better understood and basically not well documented at all in the 1990's. The below surface Karst water flows and runoff pollutants affect near shore marine habitats, fisheries and the stress the survival of once abundant limu which Ewa was widely known for.

Part of subsurface karst water flows from the large sinkhole pond near the center of the Kalaeloa airport runway and down to the Nimitz Beach shoreline. The evidence of this waterflow is clearly seen in aerial photos where it flows into the sea beneath the surface and into the adjacent White Plains beach area where many low sea level ponds exist behind the sand dune beach area.

Lots of bird nests, pueo, etc.

13073-E Parcel has many large older trees and we documented many types of bird nests and bird habitation areas. While not seen during our visits to this particular parcel, others have reported seeing Pueo owls in the area in the early morning and late afternoon. The parcel is an ideal hunting and nesting area, including for many other migratory birds and the Hawaiian bat.

Powerlines down Coral Sea Road?

Are these 12 kV or 46 kV power lines? For solar farm projects the powerlines would need to return to the HECO main distribution line by Roosevelt Avenue using a three wire 46 kV power line connection. The HCDA lease plan doesn't mention the 46 kV power line connection, only 12 kV which will not support a 5 megawatt solar farm.

So in reality the 46 kV powerline poles would have to be around 65 feet high placed at least 8-9 feet in the ground and run right along the glide path to the adjacent two (or more) active runways. The runway flight patterns depend on the wind direction. There is a long history of plane crashes at the threshhold of the NAS Barbers Point runways- meaning that power lines present a real possible hazard for helicopters and light planes.

Magnetic flux densities at ground level can range up to several μT. Electric field levels underneath power lines can be as high as 10 kV/m. However, the fields (both electric and magnetic) drop off with distance from the lines. At 50 m to 100 m distance the fields are normally at levels that are found in areas away from high voltage power lines.

Power lines can be blown down in wind storms, attract lightning strikes, chopped down by vandals, poles hit by cars and trucks, electrical lines can catch small planes and helicopters, which would impact all local residents and businesses with power outages. Downed power lines can cause fires, electrocute animals and people stepping into water puddles that electrical current has made hidden contact with. Power outages mean loss of hot water, spoiled food, business closure, no pumped gas, no ATM, etc. A HECO power pole corridor will require extensive maintenance over time and lead to sub-contractors using chemical pesticides to kill grassy areas and polluting the water table.

KCH testified about this several years ago and actually proposed that Coral Sea Road on the West side would be the best option for an "energy Corridor" and that the power lines should be placed into a five foot deep insulated trench with PV pipes insulating the power, telco and cable TV connections needed for the Coast Guard Air Station Barbers Point. This would be more expensive but much more survivable in the event of a major hurricane storm surge or tsunami.

Because the west side of the Coral Sea road route has no curbs, gutters, sidewalks, street lights or large trees to dig up, *trenching conditions for a five foot deep underground corridor in already disturbed ground coral are nearly ideal and would proceed very quickly.*

Here's how the 2011 Kalaeloa Energy Corridor EA justifies the UNDERGROUND choice:

"Overhead utility lines in lieu of underground duct lines were considered during the preliminary planning stages of the project. Although overhead utility lines are less expensive to install than underground ducts, ***the protective features of the new (underground) duct line makes this alternative more attractive."***

"Additionally, the underground location of the duct line would have real visual benefits to the community, as no unsightly overhead lines would occur along the main entry road of Kalaeloa."

And, *"The City and County of Honolulu General Plan has adopted land use policies and objectives that promote development that does not obstruct or interfere with existing vistas or view planes. The Revised Ordinances of Honolulu typically require electric and communication*

utilities to be installed underground... ...Furthermore, HCDA's Kalaeloa Community Development District Rules establishes similar underground requirements."

In the 1920s The Outdoor Circle (TOC), a highly influential environmental organization, succeeded in requiring new electric lines in urban Honolulu to be buried. TOC has advocated for underground wiring over the years and made many in-roads along the way (all federal highways must have underground lines, all new subdivisions must also).

The City of Honolulu adopted this underground utility policy in the 1960's and HCDA's Kalaeloa Master Plan ALSO adopted this as planning policy.

Coral Sea Road – Right Side going Makai would be ideal for underground powerline trench

The PV farm is only first development phase

These PV farms are just a phase development of the site where supposedly "careful" work is done to "preserve" historic and cultural features but actually they will largely be obliterated by bulldozers and heavy trucks, concrete pads, deep drilled holes for fencing, posts, transformers, etc, etc.

After the PV technology runs its course and some money is made the next phase is junking the old PV panels and then flattening of former PV site surface for buildings and strip malls near the White Plains beach. Because by then the original "historic integrity" will have been destroyed and the next environmental "study" will show there is "nothing there" except crushed coral and concrete pads with old fencing, poles, etc.

Conveyance is for "public benefit"

This 13073-E parcel shows as one of the original Navy BRAC City Park parcels in the 2008 map and was supposed to be used as open space park land. But then a quiet backroom deal was arranged to have the city release this parcel and a couple of other shoreline parcels to HCDA so they could apparently lease them commercially. It was all done so no one in the community was aware the BRAC promised Kalaeloa Regional Park was being chopped up and sold off for commercial development.

The original Navy BRAC and NPS transfer documents show that the City Park parcels including 13073-E were supposed to have had protective Historic Preservation Covenants and use as parkland for public benefit. It is hard to see how using the land for a commercial PV solar farm, after destroying its historic and cultural features, is in the benefit of the public.

Because nearly all HECO and related PV farms are all done on a large scale open area of land, developing this very complicated cultural site as a PV farm doesn't sound economically feasible but instead more like an agenda for phased land development for commercial buildings later.

The land title is clouded because of Allodial Title

The evidence of 13073-E going through the land court with Campbell Estate brings up the issue of who is the real owner of the land parcel and it wasn't actually the Navy or Campbell. The Navy acquired use of the lands under emergency access orders from President Roosevelt but never acquired true title ownership. The 13073-E land is actually Allodial and not owned by Campbell but instead to heirs of Mikahela Kekauonohi. After the Great Mahele in 1848, Kekauʻōnohi was given the second largest land allotments, seventy-seven ʻāina (land parcels), many in Ewa, Honouliuli apupuaʻa, making her the largest landholder after the King. HCDA needs to have a consultation with Mr. Lee about this 13073-E parcel.

Keahikuni Kekauʻōnohi (c. 1805–1851) was a Hawaiian high chiefess who was a member of the House of Kamehameha. She was granddaughter to King Kamehameha I and one of the wives of Kamehameha II. Mikahela Kekauonohi is Mike Lee's 5th great aunt and he as well as his cousin Routh Bolomet are heirs of her allodial title no. 11216 42,000 acres. ROYAL PATENT No. 11216 Apana 8 and 9, to Mikahela Kekauonohi on page 655 of Volume 9, Land Commission Awards [Series 288]. Board of Commission to Quiet Land titles.

http://www.hoakaleifoundation.org/documents/helu-11216-claim-mikahela-kekauonohi

The Royal Patent says Allodial are higher than Fee Hold or Fee Simple. US patents are different from Hawaiian Kingdom patents because they are based on French Common Law not English Common law. Kamehameha III used the French legal dictionary ," Bouvier "as the foundation of the enure / inure interest that resides in the Hawaiian Royal Patents, not the English BLACK's legal dictionary, but Bouvier's legal dictionary 1856 4th edition.

This land title issue was previously brought up by Michael Kumukauoha Lee in the Haseko Marina case and subsequent testimonies and meetings, that are still on going, with the HART rail project. Mike Lee, is also a living descendent of Queen Kaomileika'ahumanu (a wife of King Kamehameha I, and true mother of King Kamehameha III.)

Michael Kumukauoha Lee Testimony to HCDA August 16, 2012

Minutes of a Regular Meeting of the Members of the Hawaii Community Development Authority, State of Hawaii MEETING NO. 376, Thursday, August 16, 2012

Decision Making: Shall the Authority Authorize the Executive Director to Accept the Remediation Measures Proposed by Aloha Solar Energy/Sunetric to Address the Damages Resulting from Unauthorized Activities on Parcel 13073-E in the Kalaeloa Community Development District?

Public Testimony:

Mr. Michael Kumukauoha Lee stated that he was the only cultural descendent recognized by SHPD and OIBC April 14, 2010 for this area. Mr. Shad Kane and the Civic Club were not cultural descendants recognized under state law. He stated that he represented the iwi and was a lineal descendant recognized for this area. Mikahela Kekauonohi was his 4th great grand-aunt and holder of the royal patent of 42,000 acres in the area. John Meek was his 5th great grandfather and the Campbell Estate derived the lands after his death. The Meek Estate held the leases on Pu'uloa 'Ewa with the Wilcox family and he had all the deeds. He questioned under what rules or statutes could the civic club take precedence over him and wanted the Authority to be aware that the civic club was the wrong party.

Mr. Ching stated that the HCDA has the position of landowner and did not currently have zoning rules which would give any jurisdiction. In this particular case where there has been fault found by a prospective tenant, the HCDA has sought to investigate the impact to historical cultural resources. In the course of the investigation, the HCDA consulted with SHPD, who has more expertise in the particular area and conducted its own analysis and research. Recognizing Mr. Lee's comments as to the status of and appropriateness of the Civic Club and SHPD, he would take under advisement and involve other appropriate parties in the development of a remediation plan.

Mr. Oamilda replied that it was. The 106 process was concerned first with historical and then with cultural. He represented the community on the cultural and historical levels which go arm-in-arm together. For over a hundred years, the underground has not been mitigated and they were concerned with what was underground considering the sensitivity of the cultural aspect of the area. They recommend an EIS above ground and underground. He was from the area and knows the area.

State Environmental Policy

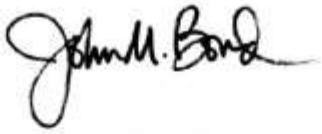
The State Environmental Policy under HRS Chapter 344 establishes an environmental policy that: (1) encourages productive and enjoyable harmony between people and their environment; (2) promotes efforts that will prevent or eliminate damage to the environment and biosphere; (3) stimulates the health and welfare of humanity; and (4) enriches the understanding of the ecological systems and natural resources important to the people of Hawaii.

Hawaiian Sacred Sites, Historic Trails

A Federally funded study for HART Rail produced with the work and research of Kepa Maly, KumuPono LLC, established that parcel 13073-E is in the designated *"Leina a ka 'uhane"* in the Ewa Plains area known in ancient times as *Kanehili* and *Kaupea*. This area today corresponds to a large area and includes the former MCAS Ewa, Barbers Point NAS which today still retains many relatively open and undeveloped areas that contain hundreds of sinkholes, caves, habitation sites, shrines, temples, ahus, trails, cairns and more that still evoke the special Traditional Cultural Property of the *Leina a ka Uhane*.

The Honolulu City Council passed unanimously in 2012 the Ewa Plain Trails resolution, advocating for the protection of the 1825 mapped Malden Trails (ancient Hawaiian trails) and Ewa Karst water system which fall within the former MCAS Ewa airbase.

Aloha,



John Bond, President
Kanehili Cultural Hui
P.O. Box 75578
Kapolei, Hi. 96707
Honouliuli, Moku of Ewa
Ewabond@gmail.com

SEE ADDENDUMS:

IDENTIFICATION OF NATIVE HAWAIIAN TRADITIONAL CULTURAL PROPERTIES

by H. David Tuggle, Ph.D. M.J. Tomonari-Tuggle, M.A. with the collaboration of Maria E. Ka'imipono Orr, Kepâ Maly Kumu Pono Associates, and Kalani Flores Mana 'o'i'o Principal Investigator: Thomas S. Dye, Ph.D.
International Archaeological Research Institute, Inc.
NavFac Engineering Command Pearl Harbor, Hawai'i March 2001

EXCERPTS:

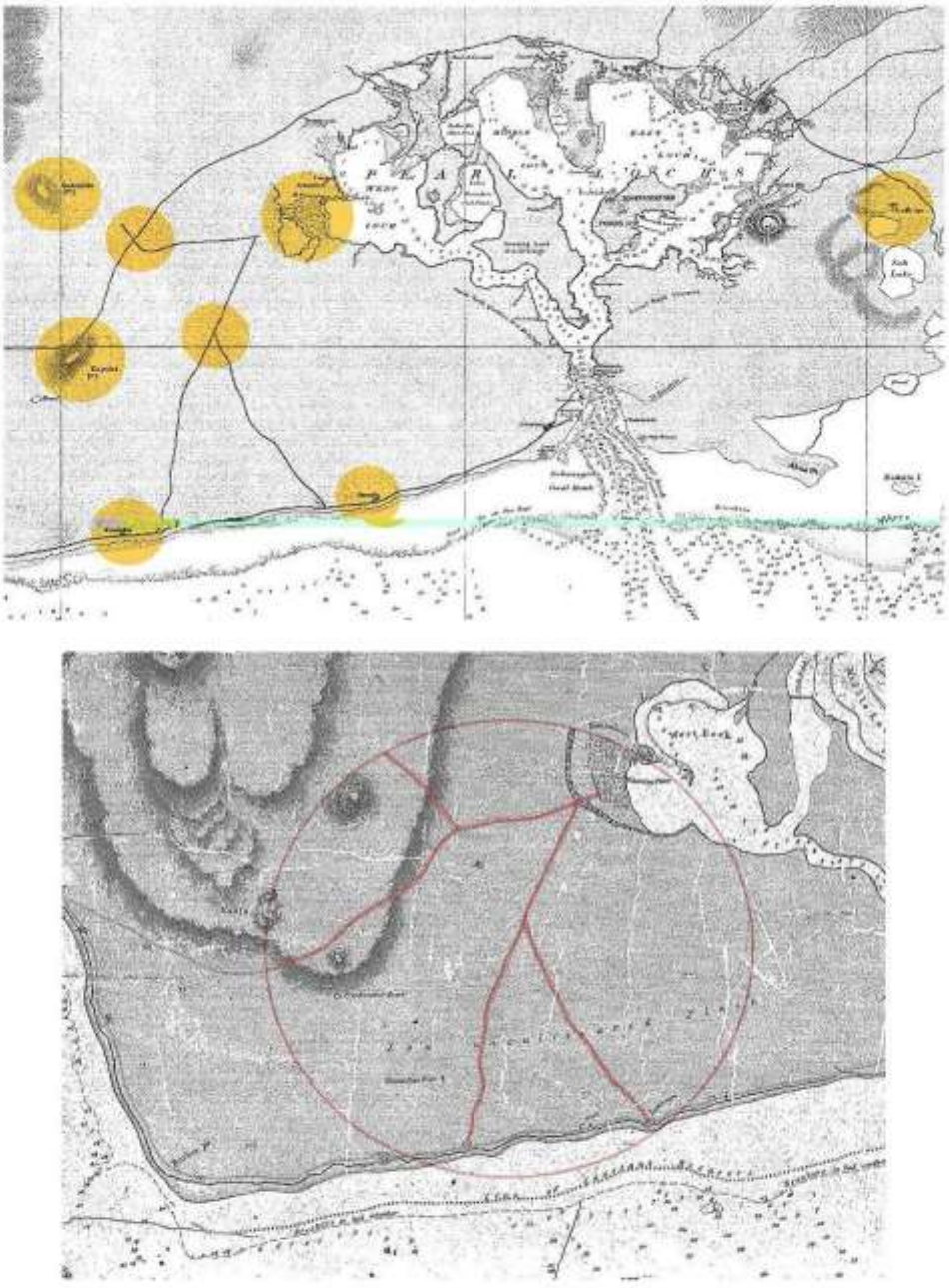
Parker and King (1990:9; emphasis added) elaborate on this by noting: Thus a property may be defined as a 'site' as long as it was the location of a significant event or activity, regardless of whether the event or activity left any evidence of its occurrence. A culturally significant natural landscape may be classified as a site, as may the specific location where significant traditional events, activities, or cultural observances have taken place…A concentration, linkage, or continuity of such sites or objects, or of structures comprising a culturally significant entity, may be classified as a district.

II.2.1.1. THE PLAIN OF KAUPE'A AND KÂNEHILI

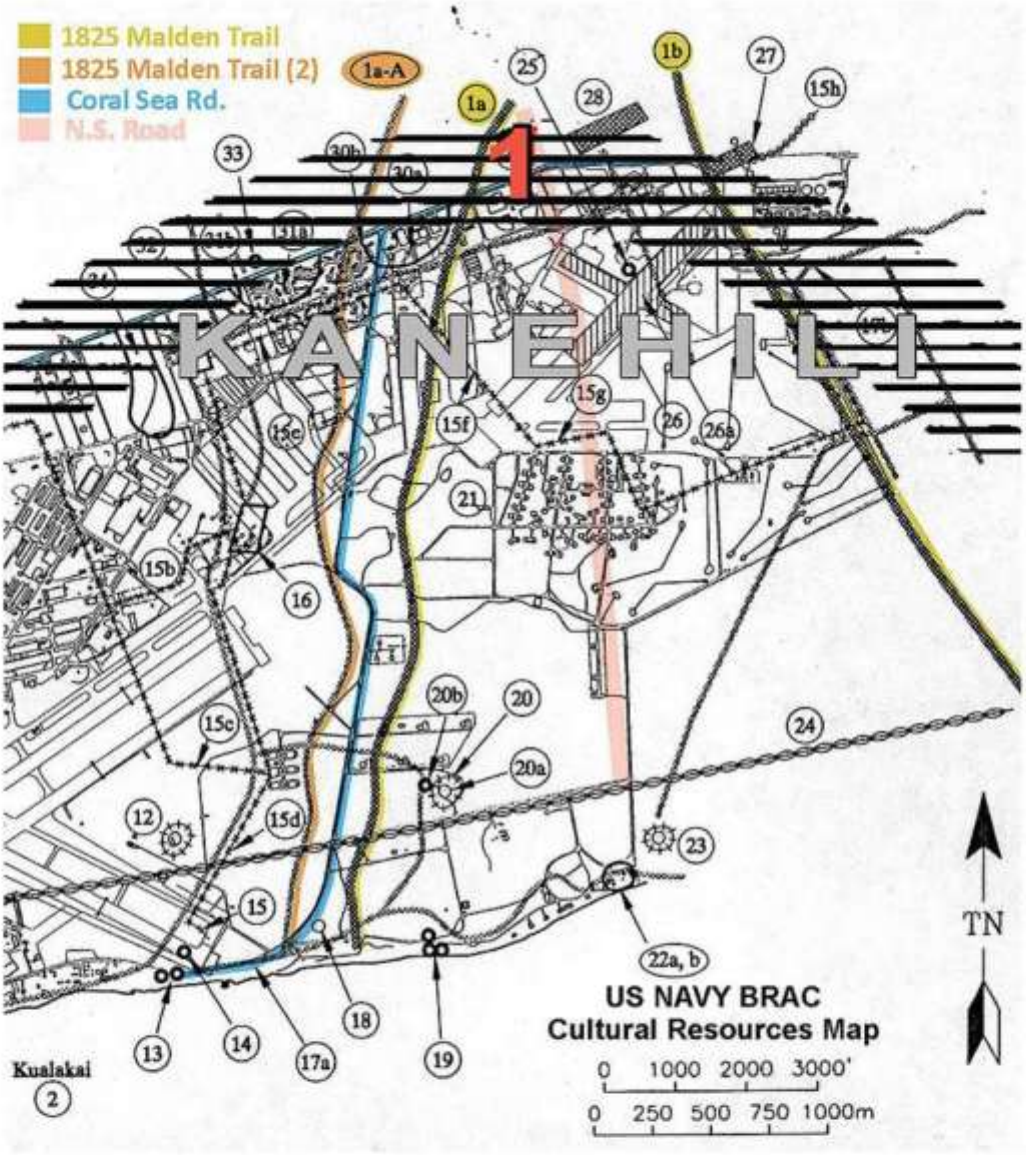
A place of many pits with human bones describes most of the great expanse of the 'Ewa Plain, where limestone sinkholes were used for human interment over many centuries (including the post-contact period, see below). In many cases, human remains were placed on the floors of the sinkholes (not buried) with the bones thus visible when one looked into the pit, surely a setting to inspire association with spirits of the dead.

Each island had at least one place for wandering souls. For O'ahu, this place was the plain of Kaupe'a. Kamakau (1870 [1964:47], italics original) *writes that Kaupe'a was known as: …ao kuewa, the realm of homeless souls,…also called the ao 'auwana, the realm of wandering souls. When a man who had no rightful place in the 'aumakua realm died, his soul would wander about…*

Although the boundaries of the plain of Kaupe'a are not clearly defined, it certainly occupied a substantial portion of the 'Ewa Plain, including the area next to Pearl Harbor lagoon and the area of former NAS Barbers Point. Kamakau (1870 [1964:47-49]) describes the plain as "beside Pu'uloa," and as a place of wiliwili trees, which is a common tree on the dryland limestone of 'Ewa. In the tradition of Pele and Hi'iaka (Emerson 1915:167; Keonaona and S.L. Desha Sr. et al. 1927, in Maly Appendix B), the plain is described as extending from "the wiliwili trees…to Kanehili" (Ke Au Hou 1911, in Sterling and Summers 1978:44), and as back of Keahi and Pu'uloa (Pukui 1943:59).



1825 Malden Hawaiian Trails – Kualaka'i (bottom left) runs directly through project site.



Tuggles Map shows major trails leading through Kalaeloa to Oneula and Kualaka'i. In the beginning of WW-II the Navy and Marine bases were divided by a road that ran directly down between the westerly ancient Hawaiian Kualaka'i main trail that runs through parcel 13073-E.

ONELUA EWA BURIAL SITES DESTRUCTION CASE IS FILED

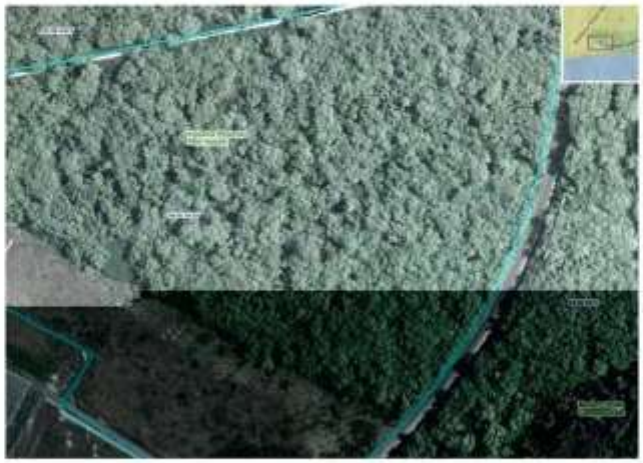
http://hawaiiindependent.net/story/letter-attack-on-royal-iwi-is-being-covered-up

News Release: Legal papers delivered to Hawaii Attorney General, Dept. of Land & Natural Resources, Haseko-Ewa Inc., and Honolulu City/County Officials.

Armed with over "230 exhibits" that document many years of cover-ups, delayed meetings, and hidden agendas, by Hawaii's Dept. of Land and Natural Resources (DLNR), Haseko-Ewa Inc. (subsidiary of Haseko -Japan), State Historical Preservation Division (SHPD), and City/County Parks Office, "final legal paperwork" has been filed with the State's Attorney General in Honolulu, Hawaii. Documents that were submitted define past and ongoing destruction of many ancient Hawaiian burial sites; the pilferage of sacred Hawaiian Royal-family heir-looms from the graves, and ongoing denials of Hawaiian citizen rights to preserve their culture by the developer - Haseko Ewa Inc., "with sanctions" from the DLNR, SHPD, and other City/County offices. (see attachments).

Mr. Mike K. Lee, a living descendent of Queen Kaomileika'ahumanu (a wife of King Kamehameha I, and true mother of King Kamehameha III) is a Hawaiian historian and "cultural preservation" expert, and in legal documents filed by him, it seeks to bring an "immediate closure" to the further destruction of his ancient Hawaiian Royal-family's burial site, as well as, stoppage of looting of ancient Hawaiian capes, rare wooden kii's (idols), and other Royal funerary objects taken from his Royal-family's grave by Haseko-Ewa, Inc, when they began dredging the Ewa marina in Onelua years ago. In addition, there are seven (7) other burial sites of the Kings of Oahu and Kauai that are threatened to be destroyed by Haseko-Ewa Inc.

This case (since 2000) has been discussed and documented with numerous Hawaii Government officials, land and recreation heads, the major principals in Haseko-Ewa Inc. and City/County representatives.. The evidence presented will prove that Mr. Lee's Hawaiian civil and legal rights have been violated, and that his Royal-family's burial site was destroyed and looted by the Oahu Japanese developer. Haseko-Ewa Inc.'s lack of due-diligence when digging the Ewa marina violates the Hawaii State Constitution (Article 12, section 7). It states and protects the rights of Hawaiian citizens to preserve and protect their ancient Hawaiian burial sites throughout the Hawaiian Islands.



"Agency inaction puts possible royal Hawaiian burial complex at risk"
Sep 22, 2010 by Samson Kaala Reiny, The Hawaii Independent

EXCERPTS FROM THE ARTICLE:

EWA—The site of what may be the most significant ancient Hawaiian burial complex discovered in recent times happens to be situated along a roughly mile-long stretch of shoreline where luxury resort developer Haseko plans to open up its marina to the ocean.

Lee also noted that, during a visit where he and Office of Hawaiian Affairs (OHA) staff marked the exact locations of the sites with a Global Positioning System (GPS), others there that day agreed with his claims.

But above all else, Lee says that an inadvertent discovery made in 2001 challenges his opponents' legitimacy. It was then, after a raging storm, that a "homeless" man found a skull jutting out from a sinkhole in front of the planned marina. The iwi, or bones, were undoubtedly those belonging to a high-ranking chiefess because she was holding a niho palaoa, or royal whalebone hook, in each hand. Previously, Haseko had stated that many sinkholes were tested but no burials were found. Also, *The Hawaii Independent* discovered that human remains were found in 1994 on the James Campbell Estate near Kapolei. A piece of heavy machinery fell into a sinkhole, exposing bones and a plank from a traditional canoe.

"He [Rosendahl] really minimized the number of important sites," said photographer and educator Jan Becket. "He claimed there were no ahu [shrines] in existence, even though areas were littered with these large upright stones."

According to Becket, there were over 400 sites, and Haseko preserved a total of six, which are "conveniently located in the corner out of the marina's way."

The timeliness of where they [SHPD] are with this issue is indicative," Kalu said. "It's not a coincidence that the State allots so few staff to juggle all these responsibilities."

These lands and parcels are home to endangered Pueos, Io's, and plants like the Akoko and Ewa Hinahina, as well as coral sinkholes and likely many more yet discovered Hawaiian burial sites.

13073-E was supposed to be Kalaeloa Regional Park

according to Navy BRAC maps

POWERLINES SHOULD ALL BE PLACED UNDERGROUND

Additional References:
Link to HCDA – Belt Collins Environmental Assessment

http://oeqc.doh.hawaii.gov/Shared%20Documents/EA_and_EIS_Online_Library/Oahu/2010s/2014-05-08-OA-DEA-5B-Kalaeloa-East-Energy-Corridor.pdf

All modern communities are designed with UNDERGROUND utilities. Kalaeloa was supposed to be the "Community of Excellence" YET- when it comes to an HCDA insider project they break their own rules and create massive physical and visual impacts!

Above Ground Power Line Negatives

Power lines can be blown down in wind storms, chopped down by vandals (which is a real problem in Kalaeloa), poles hit by cars and trucks, electrical lines hit by small planes and helicopters, which would impact all local residents and businesses with power outages. Power outages mean loss of hot water, spoiled food, business closure, no pumped gas, no ATM, etc.

The dry, hot summer climate condition along the HCDA Essex-Tripoli route contains large areas of grassy scrubland, and is susceptible to brush fires. The HCDA-HECO power pole corridor will require extensive maintenance over time and likely lead to sub-contractors using chemical pesticides to kill grassy corridor areas. (They always say they won't- but they will…)

The above ground power pole line route is approximately 20,700 feet long while the Coral Sea Road to the same end point at Tripoli Road would be approximately half the distance going underground with nearly zero maintenance.

The Essex-Tripoli route has numerous federally listed rare, threaten, or endangered species as well as hundreds of historic and cultural sites with known deep karst sinkholes and caves. The power lines by Ordy pond will be a direct threat to endangered nesting Hawaiian Stilts and other known endangered avian species. The 65 foot poles will attract lightning strikes which can blow out the entire line and electric current can be carried to the hand of a child if a kite were to land on the wires. Downed power lines can cause fires, electrocute pets and people stepping into nearby water puddles that electrical current has made hidden contact with.

Underground Power Line Positives

Underground power lines would be reliable, safe and secure 24/7 from storms, automobile and aircraft collisions.

It will cost more money to go underground but there would be major savings for home owners and businesses by receiving reliable power rather than having all

their utilities shut off for days after hurricane/wind storm damage with all of the major inconvenience that entails.

The West side of the Coral Sea roadway consist of previously bulldozed and ground coral stabilized grassed shoulders. There are no trees or endangered flora or fauna along the route. This route has the least amount of environmental problems.
The purpose of the East Kalaeloa power corridor has always been to serve the primary customer - the US Coast Guard, and secondarily future City beach parks. It is CLEAR that the Coral Sea Road route is the most DIRECT and logical route there.
The underground segment under Roosevelt to Coral Sea Rd has already been put in. ***The rest of the route to the US Coast Guard must be underground anyway- so why not do the entire project right in the first place ?!***

****

High power voltage lines near a home affects property value and resale value.

The above ground HCDA 65 ft high, 46 Kv power line project runs counter to the HCDA Master Plan and Honolulu Urban Design Plan that requires all NEW utility lines be installed five feet underground, as was done with the Enterprise Road project. Homes purchased in expensive Haseko properties expected underground power lines and not new 1940's era power lines next to their homes.
The HCDA-HECO 46,000 volt transmission line will impact the property values of every single home along the HCDA route. They put out very measurable Electro-Magnetic Fields, Directly beneath power lines the fields are much stronger. Magnetic flux densities at ground level can range up to several µT. Electric field levels underneath power lines can be as high as 10 kV/m. However, the fields (both electric and magnetic) drop off with distance from the lines. At 50 m to 100 m distance the fields are normally at levels that are found in areas away from high voltage power lines.

The HCDA Master plan calls for UNDERGROUND utility installations.
The Honolulu City codes call for UNDERGROUND utility installations.
The US Coast Guard segment must be UNDERGROUND.
The Coral Sea Road UNDERGROUND hookup to HECO has already been installed!
Link to HCDA – Belt Collins Environmental Assessment

All modern communities are designed with UNDERGROUND utilities. Kalaeloa was supposed to be the "Community of Excellence" YET- when it comes to an HCDA insider project they break their own rules and create massive physical and visual impacts!

HART TCP STUDY PUBLISHED IN 2012 IDENTIFIES VERY IMPORTANT TCP IN PROJECT AREA

LEINA A KA UHANE

This Federally funded study resulted in, among other sites, the documentation of the *"Leina a ka 'uhane"* in the Ewa Plains area known in ancient times as *Kanehili* and *Kaupea*. This area today corresponds to a large area and includes the former MCAS Ewa, which today still retains many relatively open and undeveloped areas that contain hundreds of sinkholes, caves, habitation sites, as well as shrines, temples, trails, cairns and more that still evoke the special Traditional Cultural Property of the *Leina a ka Uhane*.

Table 7 presents the Leina a ka 'uhane as a single sacred and storied place, identifying the applicable ahupua'a, theme, National Register criteria, and integrity of relationship and condition.

Table 7. Leina a ka 'Uhane with Associated Theme and National Register Eligibility Criteria.

Wahi Pana	Ahupua'a	Theme	National Register A	National Register B	Integrity of Relationships	Integrity of Condition
Leina a ka 'uhane	Hālawa Moanalua, Waiau, Waimano, Pu'uloa, Honouliuli	2	Associated with pattern of events – Leaping off place to the spirit world	Associated with the akua Kānehili, Leiolono, and Milu	TBD	TBD

In our opinion, each of the 26 individually identified wahi pana, as well as the Leina a ka 'uhane, likely has integrity of relationship. Wahi pana are sacred and storied places on the land and our archival research and informant interviews suggest that these storied places are important to the retention and or transmittal of knowledge and beliefs about the land and history of the Hawaiian People on O'ahu.

This area is eligible for the National Historic Register under categories A & B according to the Federally funded HART PA Stipulation II study.

TCPs are "places of religious and cultural significance" (NHPA Section 101 and NHPA regulations, Section 106). NHPA guidance (Parker and King 1990:1) defines a TCP as a property "... that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community." TCPs derive their importance from the practices or beliefs of a community because they are integral to the community's history and identity. The people who are best able to identify these places and their importance are the members of the community that understand their value. (They don't have to be of Hawaiian ancestry).

****

The Honolulu City Council passed unanimously in 2012 the Ewa Plain Trails resolution, advocating for the protection of the 1825 mapped Malden Trails

(ancient Hawaiian trails) and Ewa Karst water system which fall within the former MCAS Ewa airbase.

"Cumulative impacts" are defined as follows:
"Cumulative impact" means the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. HAR § 11-200-2.

Secondary and cumulative impact analysis occurs in three significant steps under the EIS Rules: (1) when applying for an exemption, (2) when preparing an EA, and (3) when preparing an EIS. If this analysis is missing or lacking, the permit granting authority must deny the requisite request by the applicant.

STATEMENT BY MICHAEL LEE

I, Michael Kumukauoha Lee, recognized Native Hawaiian cultural practitioner of limu, Papakilohoku and recognized cultural descendant of the ahupua'a of Honouliuli, is requesting under established Federal and State of Hawaii laws and as a consulting party to the Ewa Field Section 106 process that the rights of my Hawaiian cultural practice and my family iwi kupuna burials in this area be respected. There is cause of standing of imminent harm to my family's Hawaiian cultural resources and traditional burial areas and it is critically important that an Archeological Inventory Survey (AIS) be conducted before any site construction, drilling, boring or excavating is conducted.

Aside from my family's long standing documented cultural history in the ahupua'a of Honouliuli, I would like to bring to your attention the thoroughly researched, Federally funded Honolulu Area Rapid Transit (HART)Traditional Cultural Properties (TCP) study, published in April 2012, which extensively documented where the most sacred wahi pana, the Leina a ka Uhane, (Spirit Leaping Place) is located. This detailed cultural study produced by the SRI Foundation, Rio Rancho, New Mexico and Kumu Pono Associates of Hawaii places this very sacred TCP within the ancient Hawaiian area of Kanehili in the ahupua'a of Honouliuli, and shows this specifically on a map as directly at the area today known as Ewa Field, the former MCAS Ewa WW-II air base, which I have been a consulting party to.

Further, this is also an area where my family descendants used a trail network identified in a published 1825 Royal Navy survey as the Malden Trails. These ancient Hawaiian trails were used for many cultural and economic purposes as well as for special burial areas of iwi kupuna. Iwi kupuna burials in this Kanehili and Kaupea area is very well known and documented both in traditional Hawaiian accounts as well as in modern archeological documents and surveys.

I am frankly very offended by Section 106 Programmatic Agreement statements which refer to the Ewa Plain Kanehili Karst as something "some Hawaiian's believe in," and makes my native Hawaiian cultural limu practice and other well documented Ewa Plains historic and scientific facts as some type of half baked mythology. This in itself is really such great cultural arrogance and ignorance and a reason to have this entire poorly crafted Programmatic Agreement voided and re-written over. It does not reflect the truth and professes deep racial bias against Hawaiians. As the officially recognized cultural and lineal descendant of this area I am truly offended by how much this document reflects just the development objectives of the Navy's business client and so little of what the Hawaiian people care about – the aina and respect for it.

This PV construction activity is clearly an Adverse Effect under NHPA, Section 106 and an AIS and EIS was previously requested by the Section 106 community but never done and the request ignored despite the facts and contiguous nature of the Karst system and below surface water flows to the ocean documented by published City and State hydrology research. Why isn't Federal law and State law, which the United States Navy is supposed to be upholding and defending- not being followed?

Hawaii Chapter §341-1 states: "The legislature finds that the quality of the environment is as important to the welfare of the people of Hawaii as is the economy of the State."

Hawaii Chapter §343 states that "Significance can mean irrevocably committing a natural resource, curtailing the range of beneficial uses of the environment, or adversely affecting the economic welfare, social welfare, or cultural practices of the community and State. If impacts are expected to be significant, a full environmental impact statement (EIS) is required." Since this PV farm land area will be surrounded by high security fences for the next 20-25 years at a minimum, access to this traditional cultural place environment, burial area and ancient right of way Hawaiian trail network will be effectively lost and cut off for a lifetime.

§6E-43 "Prehistoric or historic burials associated with important individuals and events, or areas that are within a context of historic properties, or have known lineal descendants, shall receive greater consideration." Important Hawaiian royalty iwi burials are in fact associated with this same area.

[§6E-43.6] "Inadvertent discovery of burial sites." - It is completely impossible to "discover" burials if heavy machinery is drilling holes down into burial sites and grinding the bones up. Every single drilled hole would have to require work stoppage at every foot to determine if iwi has been hit. This will be impossible. The answer is a below ground scan of the intended pathways of fences and power poles to determine what is below before drilling starts. This is an absolute requirement for this project to proceed.

This PV farm plan states that security fence post holes will be going down at least 3 to 4 feet and HECO power poles going down at least nine feet deep. I want to remind you that many Hawaiian burials have been found in relatively shallow burials, often not more than three feet below the surface. My iwi kupuna ancestors were not placed at the bottom of Karst sinkholes and caves but rather in the more shallow interior shelves and lateral narrow cavities just a few feet down within

these ancient limestone formations which could easily be a dozen or more feet in depth before reaching a water flow depth. The family bones were hidden there to be forever safe and secure, not destroyed by mechanical bores and drills.

The building of the WW-II Ewa airfield was a process of continuously filling many Karst sinkholes and caves, often with sand from the nearby beach sand dunes. Therefore many of the likely burial sites were never dug up, just covered over with sand and coral rock. Putting in hundreds of deep 4 to 9 foot deep holes will penetrate and destroy my family's safe burial locations and fill them with steel rods and concrete, which will be a complete desecration to my family iwi kupuna. An AIS must be done to locate where these Karst cave burials are and the project must work around them, exactly as how the HART rail pylons are required to do. There is absolutely no difference in how these two projects must treat iwi kupuna burials.

I must rely upon vigilant protection of my religious, traditional and customary Native Hawaiian practices and cultural and natural resources or I will loose them forever. As the kahu, or keeper, of the iwi kupuna in this area, as recognized by the Oahu Island Burial Council and State of Hawaii Historic Preservation Division, it is my responsibility to ensure the protection and safety of all the bones and objects within my family's burial complexes in this area. There has been no below surface Archeological Inventory survey of this area ever conducted while clearly the archeological evidence has been demonstrated in base military photos, records and certainly in Hawaiian cultural history and now most recently in the Federally funded Leina a ka Uhane TCP research study which shows this same area as a very special sacred place of great reverence for my family and their sacred burials.

Also, as a long time kahunalapa'auokekaiolimu, or Native Hawaiian practitioner of limu medicine, disturbance in the fresh water source and water conditions in these interior below surface wetlands adversely affect my protected cultural limu practice. Fresh water flows through an extensive network of underground interconnected Karst caverns from the mountains to the sea and contains the nutrients that feed the foundation of our Ewa eco-system food chain. This PV farm site is in the area of my cultural practice and linked to the below surface Karst water transport system- as I have seen as evidence in nearby Karst sinkholes that water is still flowing through them.

I view this threat to my cultural practice and family iwi kupuna as significant and have the justification under the Hawaii State Constitution to protect my cultural rights in this area. The Hawaii State Constitution, Article XII, Section 7, provides protection for subsistence, cultural and religious purposes possessed by ahupua'a tenants. I am urging an immediate Archeological Inventory Survey because my cultural rights are being violated and important cultural resources are being damaged without adequate protection using a highly biased and racist Programmatic Agreement.

The Hawaii State Supreme Court handed down its unanimous decision in the Paulette Kaleikini Case arguing that Hawaii Revised Statutes require that an Archaeological Inventory Survey AIS) be completed prior to any approval or commencement of the project construction. Dana Hall recently won her case based upon this same Hawaii State Supreme Court ruling that allowing

construction activity to proceed without requiring an Archaeological Inventory Survey violated Hawaii's historic preservation law, Hawaii Revised Statutes (HRS) Chapter 6E, and its implementing rules. I would like to remind the Navy that I meet all of the same criteria as Paulette Kaleikini and Dana Hall, recognized by OIBC and SHPD as a cultural and also lineal descendant of this area (Kalaeloa, Kanehili, MCAS Ewa-NAS Barbers Point, etc.)

This PV project is receiving public fund tax credits on US Navy administered Federal property and must comply with the National Historic Preservation Act (NHPA), National Environmental Protection Act (NEPA), Chapter 6E of the Hawaii Revised Statutes, Naval environmental directives and NAGPRA. There should be performed an Archeological Inventory Survey and EIS not rely upon very outdated and unscientific hearsay advice before allowing heavy equipment use, construction and ground disturbing activity.

Because of the very real potential for subsurface historic and cultural deposits to exist, with likely even iwi kupuna burials, we the Kanehili Cultural Hui believe that an Archaeological Inventory Survey with a program of careful subsurface scanning, be conducted in the areas proposed for ground disturbance. The Archaeological Inventory Survey must be conducted prior to beginning any ground disturbance and a report of the findings submitted to the State Historic Preservation Division for review and approval as well as to the Section 106 consulting parties.

I have a long standing officially documented vested interest in this area as a recognized Kahuna Lapa'au La'au o Limu and have successfully challenged these culturally protected rights in court and obtained a favorable ruling from the First Circuit Court of the State of Hawaii. Due to the urgency of this construction activity and damage that may have already been done I am requesting your expeditious attention to this.

Aloha,

91-1200 Keauniu Drive, Unit 614,
Ewa Beach, Hawaii 96701
808-683-1954

The Hawaii Independent discovered that human remains were found in 1994 on the James Campbell Estate near Kapolei. A piece of heavy machinery fell into a sinkhole, exposing bones and a plank from a traditional canoe.

"He [Rosendahl] really minimized the number of important sites," said photographer and educator Jan Becket. "He claimed there were no ahu [shrines] in existence, even though areas were littered with these large upright stones."

According to Becket, there were over 400 sites, and Haseko preserved a total of six, which are "conveniently located in the corner out of the marina's way."

"The timeliness of where they [SHPD] are with this issue is indicative," Kalu said. "It's not a coincidence that the State allots so few staff to juggle all these responsibilities."

FULL STORY HERE:

http://www.thehawaiiindependent.com/story/haseko-development-moving-forward-despite-royal-hawaiian-burial-complex-cla

Oneula Burials: The Big Cover Up?

Protecting exposed and threatened ancient Hawaiian burial sites (maybe 400 in the One'ula area alone), and perpetuating other cultural practices endangered by rapid social and economic change, is a major issue, and demands immediate action by the State. The issuing of permits for any development is government' s responsibility, and allows Native Hawaiians an opportunity to put on evidence of traditional and customary practices affected by the proposed development. In this case, it has not been done, and today construction and dredging goes on by Haseko (Hawaii) Inc., as though nothing is wrong, and all is OK.

Haseko (Hawaii) Inc. was awarded the Ewa Marina dredge contract in 1994, and after that time, reports and findings of additional ancient Hawaiian burials, and skeletal remains were brought to their attention; to other proper State agencies as well.

In the sinkholes today along the Ewa coastline (East of One'ula Park to Barber's Point Naval Air Station) lie many ancient Hawaiian burials and skeletal remains of seven (7) ancient Hawaiian alii (chiefs), who once ruled Oahu in the late 1700's. I am not against progress, and I have promoted Hawaii as a major destination all my life. However, to continue to unearth and disrupt the dead, as though nothing is wrong, is illegal. Period!

Enter Mike K. Lee. He is the second son of Mr. Randy Lee, former COO & GM of the Halekulani Hotel (a person whom you have met). Randy Lee is my first cousin and after you review all the attachments with this email, please note that Randy Lee passed away a number of years ago, and Mike K. Lee is now "kahu or keeper" of family issues.

In November 2002 for example, Mike K. Lee found out that his "Fifth" Great Grandmother - Queen Kaomileika'ahumanu - was buried at the Waipouli cave in the One'ula area. She died on October 31, 1796, but was removed from her burial without approval from the State's OIBC.

Because Mike K. Lee has legal rights to his "Fifth Great Grandmother", he is immediately seeking to have all her remains returned to her "original" burial site in the One'ula area.

http://hawaiifreepress.com/ArticlesMain/tabid/56/articleType/ArticleView/articleId/4747/Oneula-Burials-The-Big-Cover-Up.aspx

HECO Power Corridor, roads through Kanehili Cultural Zone, With Storm Water Runoff Could Impacting Onelua Beach Limu Population and Coastal Fisheries

O'ahu is an island surrounded by ocean and the sea plays a major role in the traditional sources of food for the local population as well as being extremely important to Hawaiian cultural practices such as limu gathering for food and medicinal purposes.

The proposed Project is directly above the underground Karst watershed and will cause contaminants to be transported to the lower coastal area, impacting the struggling limu population and various aquatic species which provide a traditional source of food to the local community.

Scientists posed the hypothesis that nutrients from storm water runoff would affect the nutrition and relative abundance of native and non-native limu. To test this hypothesis, we studied intertidal limu communities at three locations in Ewa Beach, O'ahu. The study was multi-faceted, and involved measuring the following variables in intertidal communities at the three sites.

Throughout the Hawaiian archipelago, there is growing concern about the displacement of native seaweeds, known as limu in the Hawaiian language, by non-native species. Non-native invasive limu compete with and displace native limu species important to Hawaiians for food, medicine, and religious purposes (Abbott, 1984). Russell (1992) documented how non-native A. spicifera and H. musciformis displaced native populations of Laurencia nidifica and Hypnea cervicornis.

Increased urbanization of upland watersheds is a major mechanism increasing nutrient pollution of coastal waters which has been widely recognized as a common factor linking an array of problems, including harmful algal blooms, dead zones, seagrass and coral reef die-offs, declining fisheries, and marine mammal and seabird deaths. Blooms of the native invasive chlorophyte Dictyosphaeria cavernosa, which overgrew and killed corals in Kaneohe Bay, O'ahu, were also linked to nutrient enrichment from sewage.

Summary and conclusions

Our results showed that native limu species diversity and abundance decreased with proximity to stormwater discharges, whereas non-native limu increased. Nutrient availability is a major factor affecting competition among limu in tropical oligotrophic settings.

"Compelling evidence that cumulative impacts from episodic storm water discharges were the primary source of nutrient enrichment in the study area."

Acknowledgements

We would like to acknowledge the assistance of Dr. Phil McGillivary, Mike Lee, Henry Chang Wo, David Kimo Frankel, the Office of Hawaiian Affairs, Dr. Robert Richmond of the University of Hawaii, Manoa, and residents of Ewa Beach that provided access to their properties. This is contribution # 1817 from the Harbor Branch Oceanographic Institute at Florida Atlantic University, Ft. Pierce, FL.

Legal Challenge By 'Ewa Beach resident Michael Kumukauoha Lee

http://archives.starbulletin.com/2008/01/28/news/story04.html

'Ewa Beach resident Michael Kumukauoha Lee, through the Native Hawaiian Legal Corp., is challenging Haseko's application, contending that the widened channel would destroy native limu that he learned to gather and use as a medicinal remedy from descendants through the generations.

A study done by Brian Lapointe, a research professor at the Florida-based Center for Coastal Research at Harbor Ranch Oceanographic Institute at Florida Atlanta University, said that testing of existing storm-water discharges showed "significant effects on both the taxonomic and chemical composition of limu communities."

LaPointe concluded that increasing the amount of storm water into the area will add to the growth of invasive, non-native species and degrade native limu communities not only at the Kaloi Gulch, "but also at Oneula Beach Park and other locations to the east and west."

About a decade ago, Lee said, a variety of limu was found off Ewa Beach all year around. "Now it's all bare," he said.

Dovetailing the limu decline is a drop in sand crabs and fish, said fishermen Albert Lauro and Teo Tangjian. Marine scientist Brian Lapointe of Florida has said the cumulative impacts of the storm-water runoff at the proposed sites would likely cause the loss of limu species, coral and invertebrates such as sea urchins and anemones.

University of Hawaii water resource maps show the Kaloi Gulch watershed as including the Eastern side of MCAS Ewa, which means the area where the Hunt PV project is located.

Its from the Hawaii Watershed Atlas ...
http://www.wrrc.hawaii.edu/research/project_liu/kaloi.php

Mike Lee's testimony to the Hawaii land Use Commission regarding a large proposed development north of Ewa Field but within the Kaloi Gulch watershed which directly affects the Ewa - Onelua seacoast limu and fisheries.

As a life resident (65yrs) of Ewa Beach, Earl Arakaki agrees that developers have ruined sea life along the Ewa Beach shoreline.

"Many believe over harvesting of sea weed depleted limu growth in the area. Not so. Because even the "rubbish limu" which once flourished is no more. Notice the pile of seaweed depicted in this photo of the shore line fronting Oneula Place. It was like this from the Barbers Point fence to Puuloa firing range."

Project's impact on limu at issue

http://the.honoluluadvertiser.com/article/2008/Jun/16/ln/hawaii806160327.html

A study funded by the Native Hawaiian Legal Corp., which is representing a lifelong limu gatherer in the contested case hearing, contends that Haseko's $2 million Kaloi Gulch drainage way project at the eastern end of One'ula Beach Park could have serious adverse impacts on the native limu beds at the park, also known as Hau Bush, as well as oceanfront along the rest of the 'Ewa Beach coastline.
Ewa Beach resident Michael Kumukauoha Lee, through the Native Hawaiian Legal Corp., is challenging Haseko's application, contending that the widened channel would destroy native limu that he learned to gather and use as a medicinal remedy from descendants through the generations.

A study done by Brian Lapointe, a research professor at the Florida-based Center for Coastal Research at Harbor Ranch Oceanographic Institute at Florida Atlanta University, said that testing of existing storm-water discharges showed "significant effects on both the taxonomic and chemical composition of limu communities."

LaPointe concluded that increasing the amount of storm water into the area will add to the growth of invasive, non-native species and degrade native limu communities not only at the Kaloi Gulch, "but also at Oneula Beach Park and other locations to the east and west."

Stormwater nutrient inputs favor growth of non-native macroalgae (Rhodophyta) on O'ahu, Hawaiian Islands

Storm Water Effects On Native Macroalgae (limu)

Brian E. Lapointe *, Bradley J. Bedford
Center for Marine Ecosystem Health, Harbor Branch Oceanographic Institute at Florida Atlantic University, 5600 US 1 North, Ft. Pierce, FL 34946, United States

In Hawaii, blooms of native and non-native macroalgae (limu) have become increasingly problematic in recent decades. Although the role of human vectors in introducing non-native macroalgae is well documented, the ecological role of nutrient pollution in facilitating blooms of these species is not. This study assessed the effects of stormwater discharges on the diversity, abundance, and nutrient content (C, N, P and d15N) of native and non-native limu at three sites in the intertidal zone at Ewa Beach, O'ahu. The results showed that native limu species diversity and abundance decreased with proximity to a stormwater outfall (ASWO), whereas non-native species abundance increased. These results indicate that the spread of non-native macroalgae in oligotrophic coral reef regions can be facilitated by anthropogenic nutrients in stormwater runoff, thereby threatening native species and ecosystem services.

http://www.fau.edu/hboi/ProjectManagers/BrianLapointe/blhome.php
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Unsettled Spirits in Kanehili Are A Traditional Hawaiian Cultural Concern

The Environmental Assessment done for the nearby DHHL Ka Makana Ali`i shopping center project (directly across from Ewa Field) includes a Cultural Impact Assessment (CIA) By Pacific Legacy, which states: *"Furthermore, there is the concern (among local interviewees) about unsettled spirits that remain in the area causing unwanted paranormal activities to plague the new development or, conversely, surrounding localities being haunted by the displaced spirits."*

In fact, considerable Hawaiian cultural and oral history of the Ewa Plains and Kalaeloa speaks of the entire area as a location of unsettled spirits. Even current paranormal researchers who have brought in their own measuring devices claim the Ewa Field area and buildings like Quonset 1545 exhibit intensive and very strong recorded multi-spectrum paranormal activity.

Pacific Legacy states: *"Three of the four interviewees state that the general area of central 'Ewa Plains is the land of the "Wandering Spirits" and "Night Marchers." One interviewee claims that these restless spirits become a problem for many recent developments in the area."*

Furthermore, (says the CIA report) *"there is the concern about unsettled spirits that remain in the area causing unwanted paranormal activities to plague the new development or, conversely, surrounding localities being haunted by the displaced spirits. Some informants fear that archaeological sites and burials, also cultural resources, possibly contained in sinkholes and concealed by plantation era soils may be damaged or lost during ground disturbing activities related to the project's construction. It is a common belief that the disturbance of archaeological sites and burials can also upset spirits or cause bad fortune to befall those who have caused the disturbance."*

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USF&WS expressed concerns about BRAC transfer to HCDA

Concerns by the US Fish and Wildlife service expressed in their letter to the Navy about land transfer to HCDA also need to be taken very seriously as HCDA seems to be oriented to insider deals that benefit certain friends and developers rather than community interests for open space, conservation and historic preservation.

HCDA completely REJECTED the suggested amendments provided by attorney Brian Turner of the National Trust for Historic Preservation regarding poorly defined historic preservation guidelines in the draft Kalaeloa Master Plan which was reviewed for comments last year.

Traditional Cultural Places - From the National Park Service website:

"The Traditional Cultural Place (or Property) is one of the most powerful historic preservation designations."

TCPs and other sacred places can be very broadly defined. These resources can include such things as sacred sites, locations where traditional plants and other resources are collected, and some archaeological sites. "Traditional cultural places" (TCPs) are important for the roles they play in community cultural traditions, beliefs, and activities. They must be considered in planning under the National Environmental Policy Act, the National Historic Preservation Act, Executive Orders 12898 and 13007, and other preservation issues relating to NHPA, NEPA, CERCLA, ARPA, and NAGPRA.

Traditional cultural properties are NPS National Register eligible...

One kind of cultural significance a property may possess, and that may make it eligible for inclusion in the Register, is traditional cultural significance. "Traditional" in this context refers to those beliefs, customs, and practices of a living community of people that have been passed down through the generations, usually orally or through practice. The traditional cultural significance of a historic property, then, is significance derived from the role the property plays in a community's historically rooted beliefs, customs, and practices.

Sinkholes in the general area were utilized as natural planters for kalo (taro, dry-land variety), temporary shelters, storage features, and sources of water. The Kalaeloa lands were likely to have been planted in ʻulu (breadfruit), liliko'i (passion fruit), niu (coconut along the beach area), and two types of mai'a (banana). Additionally, birds (today extinct or nearly so) were trapped for feathers in or near to the area, including the ae'o (Himantopus mexicanus knudseni), i'iwi (Vestiaria coccinea), 'apapane (Himatione sanguine), and the mamo (Drepanis pacifica).

More contemporary cultural practices taking place in the area have included the gathering of 'uha loa (Waltheria indica) for traditional Hawaiian medicine and 'alae (red clay) for coloring salt, medicine, dye, and spiritual purification.

1825 Malden Hawaiian Trails

Hawaiian Trails as identified by Lt. C.R. Malden, R.N. in 1825. These trails pass through The Ewa Plains area known to Hawaiians as Kanehili, which later became MCAS Ewa and NAS Barbers Point.

This is the earliest known recorded map of the trail network in the Ewa Plains. Actually there were of course many additional trails that went to various important Hawaiian cultural and sacred sites as well as to water holes, fishing areas, limu gathering areas and burial sites.

"Ewa Oahu sinkholes yield extinct birds"
August 7, 2007 By Jan TenBruggencate Honolulu Advertiser Science Writer

The baking sun and thorny kiawe trees hide dense caches of history, relics from a time when the 'Ewa Plain was a dense forest alive with strange birds now long extinct.

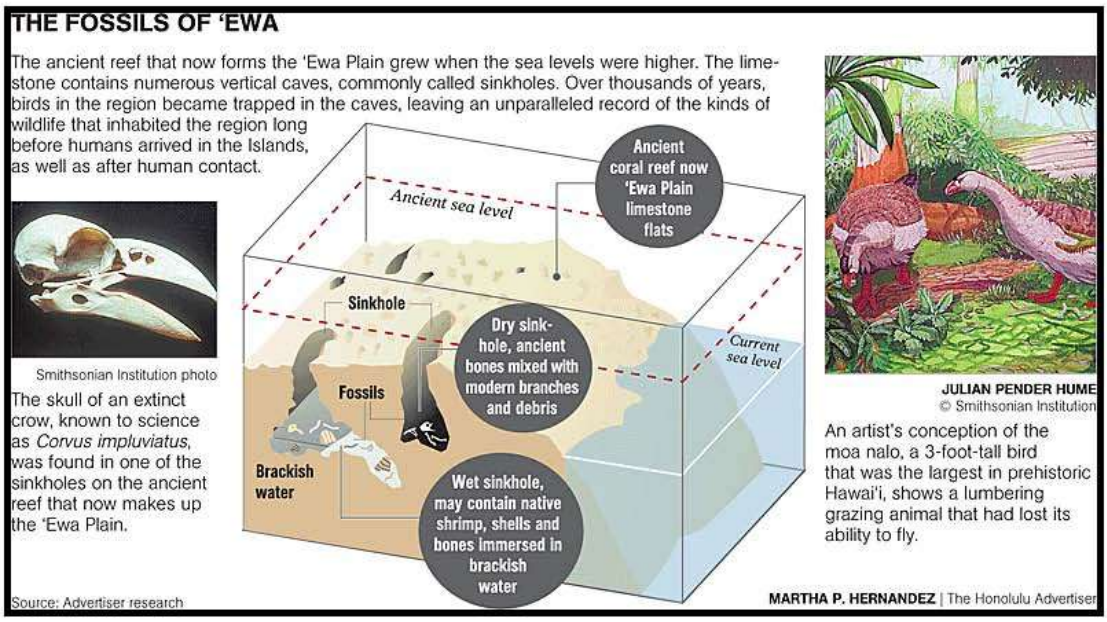
In those years, before the arrival of humans, the amazing moa nalo lumbered through the trees. It was a 3-foot-tall, flightless gooselike duck — the largest of the Native Hawaiian birds. Flightless rails and geese waddled around with it. Overhead flew a sea eagle, owls, crows, a hawk and bats. Finches and other perching birds flitted among the trees. Most of these birds have been extinct for hundreds of years.

But proof of their existence lies in the bottom of limestone "sinkholes" where they sometimes were trapped and died, leaving their bones and beaks behind. The shells of now-extinct tree snails, and the pollen from the plants that once forested this area are found in sediments with the bones.

The sinkholes are vertical caves in an ancient reef that grew during a period 120,000 years ago when sea levels were much higher. There once were thousands of sinkholes across the 'Ewa Plain — time traps that preserved evidence from Hawai'i's prehistory. Most have already been filled or covered by development.

"This is all we have left of a unique geological and biological setting in these Islands," said Helen James, a fossil bird expert at the Smithsonian Institution, who with her former husband, Storrs Olson, has taken the lead in identifying the ancient bones and beaks. "For future understanding and research of the Islands' natural history, we should preserve this."

The first person to find bird bones in sinkholes here was Jennie Peterson, now the environmental education program manager with the Hawai'i Nature Center. During the 1970s, she was an archaeologist with Bishop Museum, studying the area for an environmental impact statement on the then-proposed Deep Draft Harbor "I was digging in a large sinkhole when I found bones. They were so big that I thought they were mammal bones, but I knew they couldn't be because they were too light," she said.



'VANISHED FOWL'

No animal known to have lived in Hawai'i could have produced those bones, so she took them to Bishop Museum zoologist Alan Ziegler, Marjorie Ziegler's dad. He recognized they were the same class as extinct birds whose bones had been found in sand dune deposits on Moloka'i, and consulted with Olson, the Smithsonian Institution fossil bird expert, who happened to be conducting research on Maui.

It was a huge bird like nothing alive in the world today.

They called the group "vanished fowl," or moa nalo in Hawaiian. There are examples in the fossil record on all the major islands. The O'ahu moa nalo was given the scientific name of Thambetochen xanion.

Further digging in sinkholes — some of them dry, and some with pools so deep that scuba gear was needed — yielded the bones of dozens of species of flightless birds, land birds, sea birds and raptors. The most common bones came from the ua'u, or Hawaiian dark-rumped petrel. This seabird has never been reported from O'ahu in historic times, but the fossil evidence shows there was an immense number of the birds here at one time.

"There must have been a major colony here. The whole 'Ewa Plain was just covered in them," James said.

Today, people think of the arid Ewa area as former desert, but in pre-human times, it was forested. Researchers have found shells from extinct tree snails, and the pollen from the kinds of vegetation that probably once populated 'Ewa, including pritchardia palms, an acacia that was probably koai'a, and a critically endangered legume called kanaloa.

PUEO: Endangered Guardian Spirit

The Pueo - Hawaiian Owl (Asio flammeus sandwicensis) – is considered sacred by many Hawaiians. It is a widely recognized Hawaiian ancestral guardian known as `aumakua. These birds are believed to protect individuals from harm, and even death.

Unlike the other common Barn Owl, also found in Hawai'i, the *pueo* is diurnal, more active during daylight, and nests on the ground. The *pueo's* modern diet consists of introduced rodents, rats, mice, and small mongooses. Before rodents arrived, *pueo* is thought to have feasted on the small Hawaiian rail, a flightless bird that is now extinct. Even though the main diet of the *pueo* is mostly rodents and mongoose, the fact that the *pueo* is a ground nesting owl means the eggs and young, ironically, are often raided by rodents and mongoose. *Pueo* lays between 3 to 6 eggs over a span of several months resulting in babies being born at different times. A nest will often have all ages, baby to adult, in the nest at the same time. Owlets begin to fly at about 6 weeks of age.

Finding them today in greater numbers in Kalaeloa is largely due to being driven out of other nesting areas because of rapidly encroaching home construction in nearly all directions. The former MCAS Ewa area has been an excellent Pueo refuge since the base closed in 1952, but now developers aim to eliminate this last island of refuge on the Ewa Plain.

Kalaeloa Habitat Restoration - By Ken Foote, US Fish and Wildlife Service 2009

At first glance, the area resembles an African savanna, but one marked with invasive species such as mesquite (Prosopis spp.), Indian marsh fleabane (Pluchea indica), and bufflegrass (Cenchrus ciliaris) dominating the landscape. A closer inspection reveals an ancient raised limestone coral reef and remnants of the last remaining coastal dryland plant communities on the Hawaiian island of O'ahu.

This harsh, sun-drenched landscape is home to the Kalaeloa Unit of the Pearl Harbor National Wildlife Refuge. Located west of Honolulu on the 'Ewa Plain, Kalaeloa was part of the former Barbers Point Naval Air Station until it was added to the National Wildlife Refuge System to protect native plants, including two endangered species--an 'akoko (Chamaesyce skottsbergii var. kalaeloana) and the 'Ewa hinahina (Achyranthes splendens var. rotundata).

Although Kalaeloa has been heavily altered by agricultural, military, residential, and commercial activities, U.S. Fish and Wildlife Service biologists and land managers are working to restore the unique habitats native to this once pristine subtropical dry forest. Continuing habitat restoration activities include

the removal of invasive plant species and the propagation and out-planting of native dryland plants, including endangered and threatened species.

The 'opae 'ula (*Halocaridina rubra*) is a freshwater shrimp found only in Hawai'i.

(below): A completely filled in anchialine pool prior to restoration.

(opposite page): Initial cleaning of anchialine pool with heavy equipment.

In addition to subtropical dry forest restoration, the Service is restoring another unique and rare habitat known as anchialine pools. Anchialine pools are landlocked brackish ponds located close to the shoreline and connected to the ocean by subterranean tunnels. On O'ahu, anchialine pools are generally found in karst formations rather than lava fields like those found on Maui and the island of Hawai'i. Karst is the type of topography that forms when raised limestone reefs are subjected to the movement of groundwater over and through the reef. The weak carbonic acid found in ground water slowly dissolves the limestone, creating large holes, channels, and bumpy surfaces. One of the largest such formations on O'ahu is the 'Ewa karst.

The major threats to anchialine pools and the shrimp species that inhabit them are habitat degradation and destruction, nonnative invasive species, and over-collection of the shrimp for the aquarium trade. In the past, most of Kalaeloa's anchialine pools have been filled in with sediment and coral rubble.

Alexis Barry cleaning out anchialine pool with water and pump.

In 2005, Phase I of a project to restore anchialine pools within the Kalaeloa Unit rehabilitated an anchialine pool and led to the successful recruitment of two color phases of an anchialine pool shrimp known as 'opae 'ula (Halocaridina rubra), a species at risk. Found only in Hawai'i, 'opae 'ula can reach 10 to 15 years of age, an unusually long lifespan for a tiny crustacean. This species is approximately 0.5 inches (1.27 centimeters) in length and occurs in a range of colors--red, pink, white, light yellow/clear, and banded (red/clear). Kalaeloa is the only location in Hawai'i where two distinct genetic lineages of 'opae 'ula are found to coexist at the same site.

Based on the success of Phase I, Phase II sought to expand the number of restored pools at sites that would benefit both 'opae 'ula and another anchialine pool shrimp, Metabetaeus lohena, which is a candidate for Endangered Species Act protection. Restored pools were also targeted as potential translocation sites for the orangeblack Hawaiian damselfly (Megalagrion xanthomelas), another listing candidate.

In March 2008, Lorena Wada and Aaron Nadig, biologists with the Service's Pacific Islands Fish and Wildlife Office, and Jason Hanley, Invasive Species Strike Team Leader with the Hawai'i and Pacific Islands National Wildlife Refuge Complex, led the project to restore 12 anchialine pools. Personnel from the Service's Hawaiian Refuges and Ecological Services offices, the Hawai'i Division of Aquatic Resources, and the State Natural Area Reserve contributed over 800 hours of work during the first 6 months of the project.

Using heavy equipment, pumps, and hand tools, they removed coral rubble and soil blocking the pools. This work successfully restored natural tidal fluctuations in the pools, which allowed native anchialine pool shrimp to quickly recolonize the sites. In May 2008, the first 'opae 'ula were observed in one of the newly restored pools. 'Opae 'ula have now been seen in eight of the restored sites. As of September 1, 2009, 11 anchialine pools have been restored.

Future plans include monitoring 'opae 'ula, continuing data collection on water quality, evaluating the pools as potential reintroduction sites for the orangeblack damselfly, and evaluating future translocation sites for Metabetaeus lohena. The work being accomplished at anchialine pools also provides a unique opportunity for partnerships and educational outreach.

The restoration of anchialine pools at Kalaeloa uncovered some hidden treasures that are just beginning to open a window to the area's ancient past. While removing the debris, Service personnel found fossilized

bird bones, some from species never before seen. To date, scientists have uncovered fossilized bones of an extinct hawk (first time reported as a fossil on O'ahu), a long-legged owl, Hawaiian sea eagle, petrel, two species of crow, Hawaiian finches, Hawaiian honeyeaters, and the moa nalo (a turkey-sized, flightless gooselike duck- the largest native Hawaiian bird). Further work is needed to confirm the identification and age of each species. The Service is working with representatives from the Smithsonian Institution and Bernice P. Bishop Museum to properly clean, store, preserve, and identify the bones.

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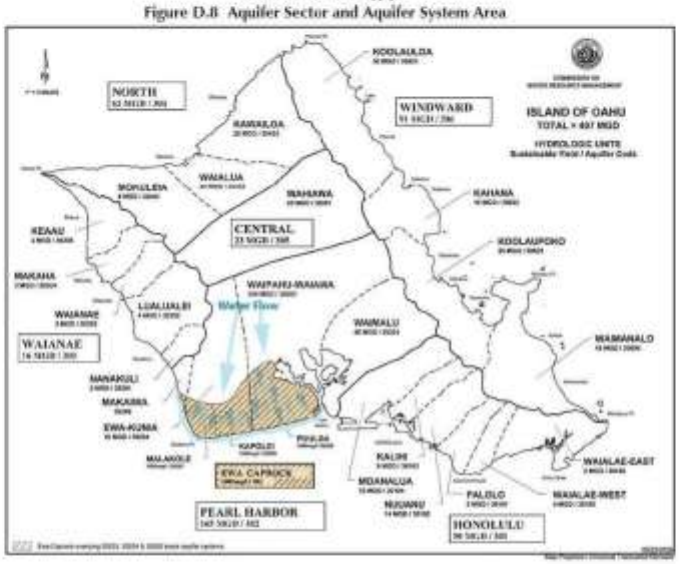
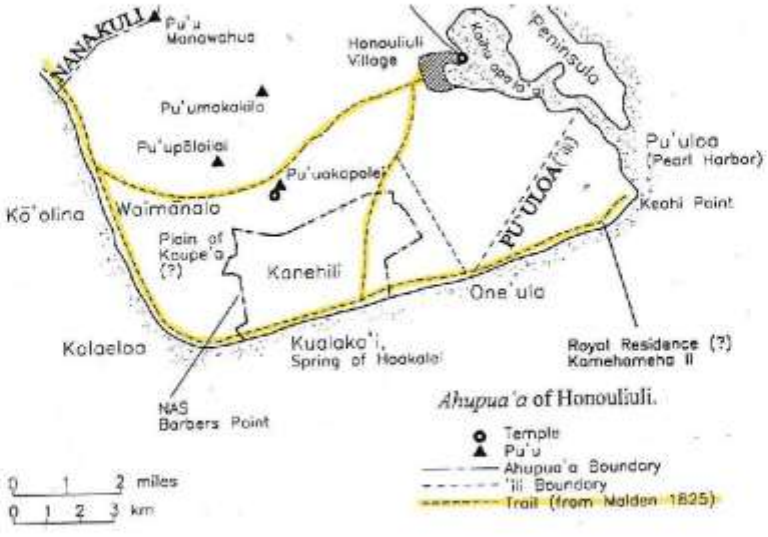
APPENDIX D – OVERVIEW OF O'AHU HYDROGEOLOGY

OVERVIEW OF O'AHU HYDROGEOLOGY
Oahu Board of Water Supply
Figure D.8 Aquifer Sector and Aquifer System Area



Ewa Plains – Kanehili –A Traditional Cultural Place

Hawaiian Trail Routes ran from the Ewa shore and connected important sites.
BELOW: Map used by HRTP-HART which cuts out the highly important trails to Kualaka'i and One'ula *which they never mention*- and makes possible the understanding of Kaupea, Kanehili, Leina a ka Uhane, etc. as a major Traditional Cultural Place (TCP) and wahi pana (sacred place) of the highest order.



The Project Site Contains Many Burials And Will Disturb Many Spirits

This will create very bad luck for all concerned

HUAKA'I-PO ~Night Marchers~ Juliette May Fraser 1950-1969

In Hawaiian legend, Nightmarchers (huaka'i pō or "Spirit Ranks," 'oi'o) are the ghosts of ancient Hawaiian warriors. On the nights of Kane, Ku, Lono, Akua, or on the nights of Kaloa they are said to come forth from their burial sites to march out to past battles or to other sacred places. They march at sunset and just before the sun rises. Anyone living near their path may hear chanting and marching, and must go inside to avoid notice. They might appear during the day if coming to escort a dying relative to the spirit world.

Anyone looking upon or seen by the marchers will die unless a relative is within the marcher's ranks- some people maintain that if you lie face down on the ground they will not see you. This is to show respect. Others say that this only works if you are naked, not true. However, if exiting the area is the fastest option, it is recommended. Still others say that you should be naked, lie face up and feign sleep, again not true, just lie face down and make no sound. Placing leaves of the ti (Cordyline sp.) around one's home is said to keep away all evil spirits, and will cause the huaka'i pō to avoid the area. Another thing is to always highly respect the night marchers which can result in great things.

The ceremony and conduct of the march is customized to the tastes of its honored leader. A chief known to be fond of music would be honored with much drumming and chanting. If the chief enjoyed peace and quiet, the march would be as silent as possible. If a chief did not like to walk around much, he would be carried in a sling. In old Hawaii, laws declared parts of a chief to be sacred, and not seen. The punishment for looking at these parts was death. If a chief's face was not supposed to be seen, he would lead. If his back was not to be looked upon, he would be in the back. However, for some chiefs, there was no part of them that was forbidden to look at. This chief would march among the other warriors in the group.

There are gods in some marches. The torches are said to burn brighter in these marches. The largest torches are carried at the front, back, with three within the group. The number five is key in Hawaiian mythology. In the march of gods, there are six gods, three male, three female. The Goddess named Hi`iaka-i-ka-poli-o-Pele, (commonly shortened to Hi'iaka), is often within the march. The marches are extremely varied.