CONSERVATION DISTRICT USE PERMIT APPLICATION
PAUL PASTOREK
MAKUʻU, PUNA
COUNTY OF HAWAIʻI, STATE OF HAWAIʻI
TMK: (3) 1-5-010:027

CONSERVATION DISTRICT USE APPLICATION (CDUA)

All permit applications shall be prepared pursuant to HAR 13-5-31

File No.:	
Acceptance Date:	180-Day Expiration Date:
Assigned Planner:	

for DLNR Use

PROJECT NAME Paul Pastorek Single-Family Residence

Conservation District Subzone: Resource

Identified Land Use: Single Family Residence (R-7)
(Identified Land Uses are found in Hawai'i Administrative Rules (HAR) §13-5-22 through §13-5-25)

Project Address: Old Government Road, Pahoa, HI 96749

Tax Map Key(s): (3) 1-5-010: 027

Ahupua'a: Popoki

County: Hawaii

Proposed Commencement Date: June 2025

Estimated Project Cost: $1,000,000

District: Puna

Island: Hawaii

Proposed Completion Date: March 2027

TYPE OF PERMIT SOUGHT ☒ **Board Permit** ☐ **Departmental Permit**

ATTACHMENTS

$ 2500 Application Fee. 2.5% of project cost for Board Permits, but no less than $250, up to a maximum of $2500; $250 for Departmental Permits (*ref §13-5-32 through 34)*.

$ _____ Public Hearing Fee *($250 plus publication costs; ref §13-5-40)*

☒ 20 copies of CDUA (*5 hard + 15 hard or digital copies)*

☒ Draft / Final Environmental Assessment (EA) *or* Draft / Final Environmental Impact Statement (EIS) *or* Statement of Exemption

☒ State Historic Preservation Division HRS 6E Submittal Form (dlnr.hawaii.gov/shpd/review-compliance/forms)

☐ Management Plan *or* Comprehensive Management Plan (*ref §13-5-39)* if required

☒ Special Management Area Determination *(ref Hawai'i Revised Statutes 205A)*

☒ Shoreline Certification (*ref §13-5-31(a)(8))* if land use is subject to coastal hazards.

☐ Kuleana documentation (*ref §13-5-31(f))* if applying for a non-conforming kuleana use.

☐ Boundary Determination *(ref §13-5-17)* if land use lies within 50 feet of a subzone boundary.

REQUIRED SIGNATURES

Applicant

Name: Paul Pastorek
Title; Agency:
Mailing Address: 9816 Debra Drive, River Ridge, LA 70123

Contact Person & Title: Ryan Pastorek
Phone: 310-623-2312
Email: rpastorek@hjth.com
Interest in Property: Landowner

Signature: Paul Pastorek **Date:** Jul 16 2024 16:25 PDT

Signed by an authorized officer if for a Corporation, Partnership, Agency or Organization

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Landowner (if different than the applicant)

Name:
Title; Agency:
Mailing Address:

Phone:
Email:

Signature: _____ **Date:** _____

For State and public lands, the State of Hawai`i or government entity with management control over the parcel shall sign as landowner.

Agent or Consultant

Agency: Land Planning Hawaii LLC
Contact Person & Title: John Pipan, Planning Administrator
Mailing Address: 194 Wiwoole Street
Hilo, HI 96720
Phone: (808) 333-3393
Email: john@landplanninghawaii.com

Signature: _____ **Date:** Jul 16 2024 18:59 PDT

For DLNR Managed Lands

State of Hawai`i
Chairperson, Board of Land and Natural Resources
State of Hawai'i
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawai'i 96809-0621

Signature: _____ **Date:** _____

CERTIFICATION

I hereby certify that I have read this completed application and that, to the best of my knowledge, the information in this application and all attachments and exhibits is complete and correct. I understand that the failure to provide any requested information or misstatements submitted in support of the application shall be grounds for either refusing to accept this application, for denying the permit, or for suspending or revoking a permit issued on the basis of such misrepresentations, or for seeking of such further relief as may seem proper to the Land Board.

I hereby authorize representatives of the Department of Land and Natural Resources to conduct site inspections on my property. Unless arranged otherwise, these site inspections shall take place between the hours of 8:00 a.m. and 4:30 p.m.

Signature of authorized agent(s) or if no agent, signature of applicant

AUTHORIZATION OF AGENT

I hereby authorize_____John Pipan_____to act as my representative and to bind me in all matters concerning this application.

Paul Pastorek

Signature of applicant(s)

TO WHOM IT MAY CONCERN:

As landowner and applicant of parcel identified by TMK: (3) 1-5-010: 027, I hereby consent and authorize Land Planning Hawaii LLC to file and process a Conservation District Use Application on my behalf.

By: Paul Pastorek Jul 16 2024 16:25 PDT

Paul Pastorek Date

Zoho Sign

Generated on Jul 16, 2024 18:59 PDT

Certificate of Completion

Summary

Document ID : 2A6681DB-TBMKXZLCDOWKPGGAQ4DGSM8QBR9UN1M6NPCHWILAWOW

Document Name : Pastorek - CDUA Form 027 & Letter of Authorization

Sent by : Katrina Kern <katrina@landplanninghawaii.com>

Organization : Land Planning Hawaii LLC
194 Wiwoole St.,Hilo,HI,United States 96720

Sent on : Jul 16, 2024 15:37 PDT

Completed on : Jul 16, 2024 18:59 PDT

Sign order : Random

No. of documents : 2

Signers : 2

Receives a copy : 1

Approvers : 0

Recipients

Signer

Paul Pastorek
paul@pastorekpartners.com

Signature

Emailed on : Jul 16, 2024 15:37 PDT

Viewed on : Jul 16, 2024 16:25 PDT

Terms agreed on : Jul 16, 2024 16:25 PDT

Signed on : Jul 16, 2024 16:25 PDT

Accessed from : 174.203.64.95

Device used : Mobile

Authentication type : None

Signer

John Pipan
john@landplanninghawaii.com

Signature

Emailed on : Jul 16, 2024 15:37 PDT

Viewed on : Jul 16, 2024 18:59 PDT

Terms agreed on : Jul 16, 2024 18:59 PDT

Signed on : Jul 16, 2024 18:59 PDT

Accessed from : 66.74.144.181

Device used : Mobile

Authentication type : None

Viewer

Ryan Pastorek
rpastorek@hjth.com

Emailed on : Jul 16, 2024 15:37 PDT

Viewed on : Jul 16, 2024 16:34 PDT

Authentication type : None

Accessed from : 209.170.244.253

Device used : Web

Legal Disclosure

ELECTRONIC RECORD AND SIGNATURE DISCLOSURE

Please read the following information carefully. By clicking the 'I agree' button, you agree that you have reviewed the following terms and conditions and consent to transact business electronically using Zoho Sign electronic signature system. If you do not agree to these terms, do not click the 'I agree' button.

Electronic documents

Please note that Land Planning Hawaii LLC ("we", "us" or "Company") will send all documents electronically to you to the email address that you have given us during the course of the business relationship unless you tell us otherwise in accordance with the procedure explained herein. Once you sign a document electronically, we will send a PDF version of the document to you.

Request for paper copies

You have the right to request paper copies of these documents sent to you electronically from info@landplanninghawaii.com. Alternatively, you also have the ability to download and print these documents sent to you electronically, and re-upload a scanned copy of the printed and physically signed documents. If you, however, wish to request paper copies of these documents sent to you electronically, you can write back to the sender.

Withdrawing your consent

At any point in time during the course of our business relationship, you have the right to withdraw your consent to receive documents in electronic format. If you wish to withdraw your consent, you can decline to sign a document that we have sent to you and send an email to info@landplanninghawaii.com informing us that you wish to receive documents only in paper format. Upon request from you, we will stop sending documents using Zoho Sign electronic signature system.

To advise Land Planning Hawaii LLC of your new email address

If you need to change the email address that you use to receive notices and disclosures from us, write to us at info@landplanninghawaii.com

System requirements

Compatible with recent versions of popular browsers such as Chrome, Firefox, Safari, and Internet Explorer. Zoho Sign is also available on iOS and Android devices.

Table of Contents

FIGURES

EXHIBITS

I. Project Description and Proposed Use

Total size/area of proposed use (indicate in acres or sq. ft.):
The subject property, TMK (3) 1-5-010: 027 (Parcel 027), is currently 3.0 acres. Under the proposed consolidation and re-subdivision, Parcel 027 would become 6.402 acres (the increased Parcel 027 is referred to herein as the Subject Property).

Please provide a detailed description of the proposed land use(s) in its entirety. Information should describe what the proposed use is; the need and purpose for the proposed use; the size of the proposed use (provide dimensions and quantities of materials); and how the work for the proposed use will be done (methodology). If there are multiple components to a project, please answer the above for each component. Also include information regarding secondary improvements including, but not limited to, grading, and grubbing, placement of accessory equipment, installation of utilities, roads, driveways, fences, landscaping, etc.

Attach any and all associated plans such as location map, site plan, floor plan, elevations, and landscaping plans drawn to scale (ref §13-5-31).

Project Location

The Subject Property is located *makai* of Government Beach Road in the Conservation District of Puna, Maku‘u, County of Hawai‘i. Access to the Subject Property is solely from Government Beach Road approximately 1.5 miles from the Maku‘u Drive and Government Beach Road intersection **(Figure 1**). The Subject Property is located between two large subdivisions in the area: Hawaiian Paradise Park (HPP) (population est. 13,314 (May 2024)) and Hawaiian Beaches (population est. 3,812 (2024)). The Subject Property is approximately one mile from HPP.

Purpose and Need; Environmental Review

Paul Pastorek (“**applicant**”) wishes to build one (1) single-family residence on the Subject Property, while respecting the essential character of the land. The proposed project would improve the stewardship of the land through preservation of the natural characteristics of the land and effective land management and contribute to the sense of community in the area by providing a much-needed caring presence in the area. In the past, there has been (and continues to be) illegal dumping on the Subject Property and along Government Beach Road, which lies between two of the fastest growing subdivisions on the island. Having a resident on the land will assist with the prevention and cleanup of such dumping, will promote long-term stewardship and assist with the protection and conservation of the land, not only on the Subject Property, but in other adjacent areas in the Conservation District.

On June 23, 2022, a Draft Environmental Assessment for the proposed project was published in *The Environmental Notice* (the "**Notice**"). On February 27, 2024, the Department of Land and Natural Resources approved the Final Environmental Assessment ("**FEA**") and issued a Finding of No Significant Impact for the proposed project, which was published in the Notice on March 8, 2024.

Location Map

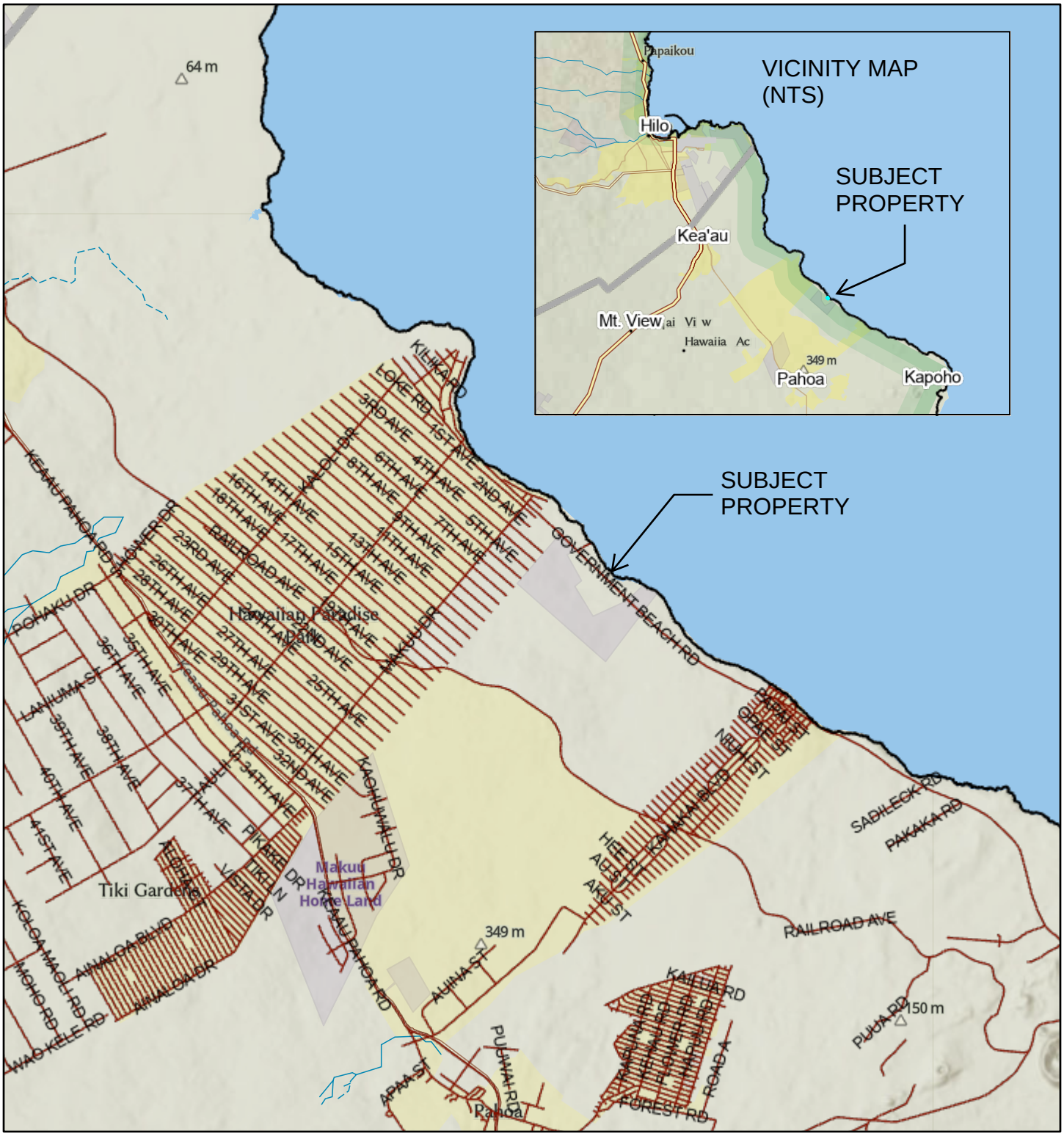


FIGURE 1

ArcGIS Web AppBuilder

Sources: Esri, USGS | Esri, NASA, NGA, USGS | Esri Community Maps Contributors, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, US Census Bureau, USDA,

Project Description

Paul Pastorek is seeking a Conservation District Use Permit (CDUP) to consolidate and re-subdivide Parcel 027, with his son's lot to the north, (3) 1-5-010: 026 (Parcel 026), and construct one (1) single family residence with supporting infrastructure on the Subject Property ("**proposed project**").

P-10 SUBDIVISION OR CONSOLIDATION OF PROPERTY
(C-1) Consolidation and resubdivision into an equal number of lots that does not result in increased density.

Mr. Ryan Pastorek (Paul Pastorek's son) owns the adjacent parcel to the north identified as Parcel 026. The applicant wishes to consolidate and re-subdivide the two legal lots of record, Parcel 026 and Parcel 027, moving the lot line to the north, resulting in no increase in density. This would change Parcel 026 from 7.45 acres to 4.048 acres, and Parcel 027 from 3 acres to 6.402 acres. **Figure 2** shows the proposed consolidation and re-subdivision map completed by Daniel Berg, Licensed Professional Land Surveyor No. 11245.

The applicants for Parcel 026 and Parcel 027 working together developed a plan to gradually (over a period of three years) convert the non-native forest to a native forest area (with native hala and other site specific appropriate native vegetation). Plans for invasive species removal and native species planting are detailed below. This would be a more conservative approach, would minimize impact to the land, flora and fauna, would allow an interconnected ecosystem to adjust and adapt over time and would align with the mission of conserving, protecting and preserving such resources within the District.

Consolidation and re-subdivision are being requested to allow for lesser impact on Parcel 027, which is the more heavily vegetated lot, and greater setbacks to the neighboring residence to the south to minimize potential impacts associated with scenic views, noise, and air quality. This action would avoid conversion of the dense wooded area to a homesite. Although the wooded area is mainly non-native trees, it is likely that construction within the wooded area on Parcel 027 would result in more adverse impact to potential native or endangered species such as the Hawaiian hoary bat (*Lasiurus cinereus semotus*), or the State listed and formerly Federally endangered Hawaiian hawk (*Buteo solitarius)* that may fly over, roost or utilize resources of Parcel 027 despite mitigating measures. Additionally, construction within the dense vegetation would require grading and grubbing of roughly 2-acres. Under the proposed action to consolidate and re-subdivide, minimal clearing would occur on the Subject Property, and only gradually, in association with conversion of the alien forest to native forest. This would avoid and mitigate impacts to flora, fauna, and coastal resources.

The applicant understands the DLNR Office of Conservation and Coastal Land (OCCL) may have reservations about the proposed consolidation and re-subdivision, however this is a permitted use in the Resource Subzone under HAR § 13-5-22(b) (P-10) (C-1) (consolidation and re-subdivision into an equal number of lots that does not result in increased density); 13-5-24(a) & (b)(R-7)(D-1) (a single family residence that conforms to design standards as outlined in this chapter), and would not cause a greater density or intensity of use of land, and it would not

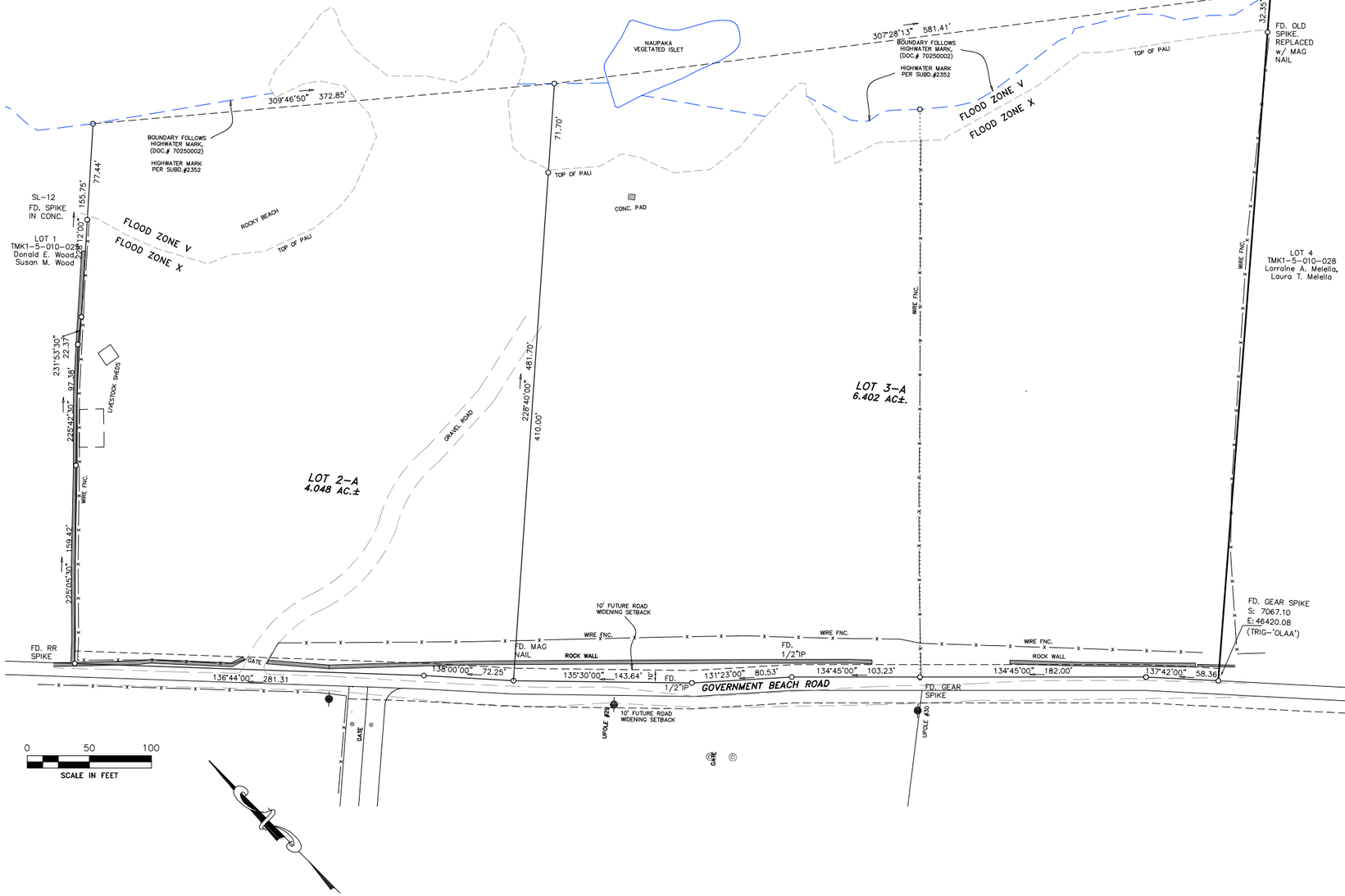
otherwise be detrimental to the land, or the public safety, health or welfare. The proposed project would not result in any change to the overall land area or density of the combined parcels. The consolidation and re-subdivision would actually reduce the intensity of use of the land by minimizing the relative footprint of the building layout on Parcel 027 and would promote conservation through the native plantings proposed by the applicants.

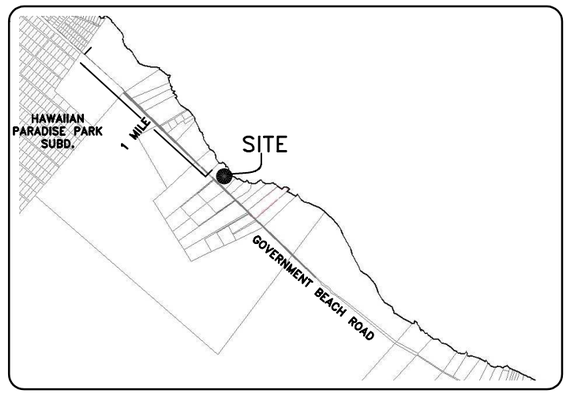
In addition, considering the relative dimensions of both Parcel 026 (wider) and Parcel 027 (narrow), building a residence closer to the boundary of Parcel 027 and the neighboring property to the south, may initiate more change to the characteristics of the immediate neighborhood rather than building a residence further to the north and maintaining a healthy distance from southern neighbor and continuing the less-dense feel of the neighborhood.

The proposed consolidation and re-subdivision would promote conservation by the gradual conversion of the dense wooded area on Parcel 027, which is currently comprised of primarily invasive species to a native coastal habitat. Without the consolidation and re-subdivision, non-native plants would be removed to allow for a residence, driveway and utilities, but it would also prevent a significant portion of the non-native forest from being converted to a native forest (to allow for a residence, driveway and utilities). Thus, the proposed consolidation and re-subdivision plan is clearly more in line with the mission of the District and promotes better conservation and stewardship of the land. To the extent any endangered species such as the Hawaiian hoary bat (*Lasiurus cinereus semotus*), or the State listed and formerly Federally endangered Hawaiian hawk (*Buteo solitarius*) utilize the current wooded area, the gradual replacement with native species would encourage continued use by such species without otherwise immediately destroying their existing habitat. Otherwise, it is likely that construction within the wooded area on Parcel 027 would result in more adverse impact to potential native or endangered species that may fly over, roost or utilize the resources of Parcel 027.

Preliminary Subdivision Map

A Consolidation of Lots 2 and 3.
Portions of Grant 1537 to Kapohano,
and Resubdivision into Lots 2-A and 3-A.
Situated at Halona and Popoki, Puna
Island and County of Hawaii, Hawaii
SUB-20-_____





VICINITY MAP
NO SCALE

Owner:
Opunaha, LLC
533 Fernwood Pacific Dr.
Topanga, CA. 90290

Situs:
TMK(3) 1-5-010-026
15-2193 Old Government Rd.
TMK(3) 1-5-010-027
(No address assigned.)

Land Use Zone:
Designation: A-1a

Flood Zone:
Zone VE and X,
as derived from FEMA Flood Insurance Rate Map
No 15516611185F , Effective Sept. 29, 2017

No drainage courses observed on site.
Field survey dated May 4,5, 2020

Boundary courses are record per subdivision approved
Dec. 17, 1965 by HCPTC as SUB# 2353.

Coordinates are referenced to "OLAA" .

DANIEL BERG
LICENSED PROFESSIONAL LAND SURVEYOR
No. 11245
HAWAII, U.S.A.

This work was prepared by me or under my direct supervision.

Daniel L. Berg
PLS 11245

dlb & Associates
LAND SURVEYING • MAPPING • CONSULTING
P.O.Box 49-2281 Kealakekua, HI. 96749
Ph.966-4206 Fx.82-6830
www.dlbandassoc.com

Preliminary Subd. Map
Date: May 26, 2020
Job: J2020-117

Drawing: J2020-117.dwg

Figure 2

36X24 sheet
32x20 border

P-4 REMOVAL OF INVASIVE SPECIES

(B-1) Removal of invasive species including chemical and mechanical control methods, in an area greater than one acre, in accordance with state and federal laws and regulations, for the purpose of protecting, preserving, or enhancing native species, native habitat or native ecosystem functions that results in no, or only minor ground disturbance. The department or board reserves the right to require departmental or board approval if it is determined that the proposed action may cause significant negative secondary impacts on natural and cultural resources, or the surrounding community. Any replanting shall be appropriate to the site location and shall give preference to plant materials that are endemic or indigenous to the State. For existing developed lots, compliance with section 13-5-23 (L-2) satisfies the requirements of this section.

Removal of invasive species on the Subject Property is planned to occur gradually over the course of 3 years. Invasive species removal will occur within the 3-acre existing alien forest area at a rate of approximately 1 acre per year. Invasive trees will also be removed along the street frontage (3 autograph trees as shown on the landscape plan) of the Subject Property in association with landscaping proposed there. Invasive trees will be cut with chainsaws and disposed of off-site at County green waste composting facilities. The proposed cutting and brush disposal will entail no or only very little ground disturbance from trucking out cut debris. Cut stumps of invasive trees will be treated with herbicide consistent with application regulations and label instructions during times when rain is not anticipated. Wood chip piles will not be left on the property as potential breeding grounds for the coconut rhinoceros beetle. Tree cutting will proceed in compliance with DOFAW protocols to prevent impacts to Hawaiian Hoary Bats and Hawaiian Hawks. Replanting plans are detailed further below and will include only native Hawaiian endemic and indigenous species.

P-13 LAND AND RESOURCE MANAGEMENT

(B-1) Basic land management, including routine weed control, clearing of understory, and tree pruning, utilizing chemical and mechanical control methods, which involves no grubbing or grading, in accordance with state and federal laws and regulations, in an area greater than one acre. The department or board reserves the right to require departmental or board approval if it is determined that the proposed action may cause significant negative secondary impacts on natural or cultural resources, or the surrounding community.

The applicant will maintain the Subject Property with basic land management practices, including mowing, weed control, and tree pruning, in accordance with state and federal laws, over an area greater than one (1) acre. Basic land management may occur on the entire 6.402-acre Subject Property that is clear and has historically been maintained as mostly pasture.

Basic land management practices would improve the stewardship of the land and contribute to the sense of community in the area. Routine weed control will help to prevent the establishment and spread of invasive species. Tree pruning will help to maintain the public right of way from encroaching vegetation from the Subject Property. Regular maintenance including weeding, tree pruning, and natural pest management techniques would also help to reduce any potential

impacts from the proposed landscaping. In the past, there has been (and continues to be) illegal dumping on the Subject Property and along Government Beach Road, which lies between two of the fastest growing subdivisions on the island. Having a resident living on the land will assist with the prevention and cleanup of such dumping, will promote long-term stewardship and assist with the protection and conservation of the land, not only on the Subject Property, but in other adjacent areas in the Conservation District.

(B-2) Planting of native and endemic plants and fence maintenance. New fence ex-closures for native plants of small native wildlife communities, in an area greater than one acre. The department of board reserves the right to require departmental or board approval if it is determined that the proposed action may cause significant negative secondary impacts on natural or cultural resources.

Planting of native, indigenous and endemic plants will occur on approximately 3 acres in conjunction with removal of invasive species on the Subject Property as described above. Over the course of approximately four years, following the removal of invasive trees and clean up of brush in each increment, native plantings will occur primarily in the cooler winter months. Native tree species proposed to be planted include but are not limited to: hala (*Pandanus tectorius*), hau (*Hibiscus tiliaceus*), hapu‘u (*Cibotium menziesii*), Milo (*Thespesia populnea*) and Kou (*Cordia subcordata*). Native shrubs and groundcovers proposed to be planted include: naupaka (*Scaevola taccada*), kokio keokeo (*Hibiscus arnottianus*), pohinahina (*Vitex rotundifolia*), pa‘u o hiiaka (*Jacquemontia sandwicensis*), and ulei (*Osteomeles anthyllidifolia*). No fencing is proposed in association with the native plantings.

L-2 LANDSCAPING

(D-1) *Landscaping (including clearing, grubbing, and tree removal), including chemical and mechanical control methods, in accordance with state and federal laws and regulations, in an area of or more than 10,000 square feet. Any replanting shall be appropriate to the site location and shall give preference to plant materials that are endemic or indigenous to Hawaii. The introduction of invasive plant species is prohibited.*

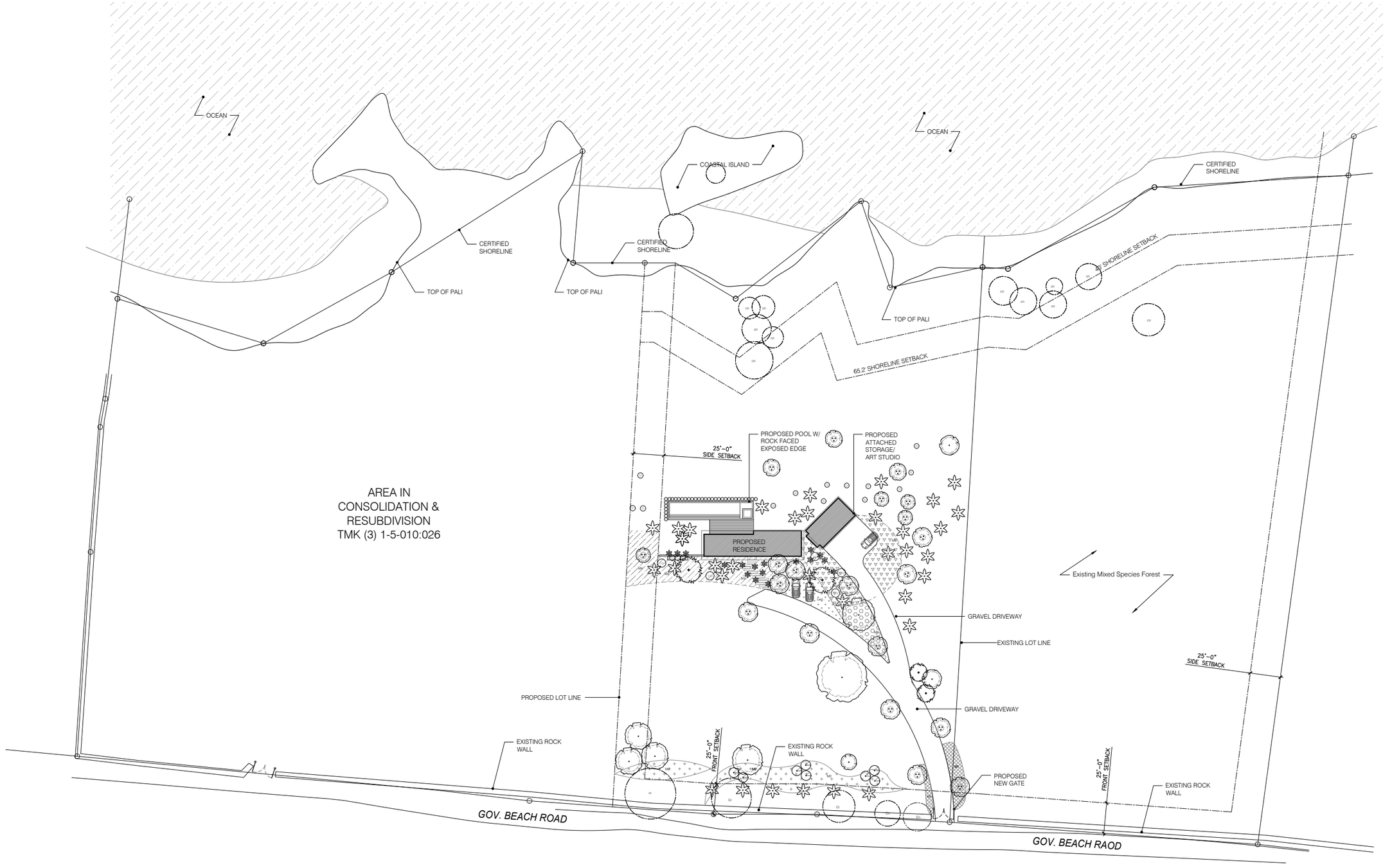
Landscaping plans include 11,980 square feet of primarily native, Polynesian introduced and fruit bearing/edible plants (**Figure 3**). No invasive species will be utilized in site landscaping. All non-native plants have been evaluated for potential invasiveness. Replanting will be appropriate to the site location and will utilize flora designated as “Pono Plants”, including Hala and Ulu. **Table 1**: ‘Proposed Fruit Trees/Shrubs’ lists the proposed fruit trees/shrub species and **Table 2**: ‘Proposed Flora for Landscaping’ summarizes the species chosen for landscaping purposes, where P.I. stands for Polynesian Introduced “canoe plants”.

Table 1: Proposed Fruit Trees/Shrubs

Fruit Trees/Shrubs		
Scientific Name	**Common Name**	**Status**
Musa acuminata	Banana	P.I.
Artocarpus altilis	Ulu - Breadfruit	P.I.
Syzygium malaccense	Mountain apple	P.I.
Diospyros kaki	Persimmon	Alien
Colocasia esculenta	Kalo	P.I.
Ananas comosus	Pineapple	Alien
Ipomoea batatas	‘Uala Sweet Potato	P.I.
Theobroma cacao	Cacao Tree	Alien
Cocos nucifera	Coconut Palm	P.I.
Cymbopogon sp.	Lemongrass	Alien
Allium spp.	Alliums	Alien
Passiflora edulis	Lilikoi	Alien
Citrus spp.	Meyer Lemon, Orange & Lime	Alien
Carica papaya	Papaya	Alien
Mangifera indica	Mango	Alien
Persea americana	Avocado	Alien
Litchi chinensis	Lychee	Alien
Nephelium lappaceum	Rambutan	Alien
Artocarpus heterophyllus	Jackfruit	Alien
Annona muricata	Soursop	Alien

Table 2: Proposed Flora for Landscaping

Ornamental Trees/Shrubs/Vines		
Scientific Name	**Common Name**	**Status**
Pandanus tectorius	Hala	Native
Hibiscus tiliaceus	Hau	Native
Pritchardia hillebrandii	Loulu Palm	Native
Cibotium menziesii	Hapu‘u Tree Fern	Native
Ohi‘a lehua	Ohi‘a	Native
Thespesia populnea	Milo	Native
Cordia subcordata	Kou	Native
Scaevola taccada	Naupaka	Native
Wikstroemia uva-ursi	Akia	Native
Vitex rotundifolia	Pohinahina	Native
Nephrolepis cordifolia	Kupukupu	Native
Hibiscus arnottianus	Kokio Keokeo	Native
Microlepia strigosa	Palapalai Fern	Native
Sida fallax	Ilima	Native
Jacquemontia sandwicensis	Pa‘u o Hiiaka	Native
Vitex rotundifolia	Pohinahina	Native
Gardenia brighamii	Nanu	Native
Hibiscus arnottianus	Hibiscus	Native
Heliconia rostrata	Heliconia	Alien
Zingiber zerumbet	Awapuhi-Soap Ginger	P.I.
Osteomeles anthyllidifolia	Ulei	Native
Bacopa monnieri	Ae‘ae	Native
Cyperus laevigatus	Makaloa	Native
Mariscus javanicus	Ahuawa	Native
Delonix regia	Royal poinciana	Alien
Beccariophoenix madagascariensis	Window Palm	Alien
Veitchia joannis	Joannis Palm	Alien
Phymatosorus scolopendria	Lauae Fern	Alien
Philodendron spp.	Philidendron	Alien
Monsterra deliciosa	Monsterra	Alien
Strelitzia reginae	Bird of Paradise	Alien
Spathoglottis unguiculata	Grape Scented Orchid	Alien
Neomarica gracilis	Walking Iris	Alien
Cordyline fruticosa	Green Ti	Alien
Crinum x amabile	Giant Spider Lily	Alien



LAND PLANNING HAWAII LLC

PARCEL 027 - PAUL PASTOREK SINGLE FAMILY RESIDENCE

Project

LA-1.0 LANDSCAPE SITE PLAN

Drawing No

PRELIMINARY: NOT FOR CONSTRUCTION

Parcel 027 - Area Takeoffs

Qty:	Type/Description	Notes:
38 lf	*Retaining Lava rock walls*	Not to exceed 30" tall
11,980 sf	*Total Landscape (softscape)*	

1 / LA–1.0 LANDSCAPE SITE PLAN
SCALE: 1" = 80'

TRUE NORTH / PLAN NORTH

Figure 3

Please note full size prints attached separately

Planting Schedule

Key	Qty	Botanical Name	Common Name	Native/P.I./ Alien	Pono Plant	Container Size		Spacing	Notes:
Trees									
Pt	3	*Pandanus tectorius*	Hala (screwpine)	Native	Yes	15 gal		Per plan layout	
Cn	14	*Cocos nucifera*	Coconut palm	P.I.	Yes	15 gal		Per plan layout	
Dr	1	*Delonix regia*	Royal poinciana	Alien	Yes	30 gal		Per plan layout	
Tc	1	*Theobroma cacao*	Cacao tree	Alien	Yes	15 gal		Per plan layout	
Ht	3	*Hibiscus tiliaceus*	Hau	Native	Yes	15 gal		Per plan layout	
Ph	12	*Pritchardia hillebrandii*	Loulu Palm	Native	Yes	15 gal		Per plan layout	
Bm	15	*Beccariophoenix madagascariensis*	Window Palm	Alien	Yes	15 gal		Per plan layout	
Vj	7	*Veitchia joannis +*	Joannis palm	Alien	Yes	15 gal		Per plan layout	
Cm	5	*Cibotium menziesii*	Hapu'u Tree fern	Native	Yes	15 gal		Per plan layout	
Ol	4	*Ohi'a lehua*	Ohia	Native	Yes	15 gal		Per plan layout	
Tp	3	*Thespesia populnea*	Milo	Native	Yes	15 gal		Per plan layout	
Cs	1	*Cordia subcordata*	Kou	Native & P.I.	Yes	15 gal		Per plan layout	
Css	2	*Citrus spp.*	Meyer Lemon, Orange & Lime	Alien	Yes	15 gal		Per plan layout	
Cp	3	*Carica papaya*	Papaya	Alien	Yes	15 gal		Per plan layout	
Mi	1	Mangifera indica	Mango	Alien	Yes	15 gal		Per plan layout	
Ma	6	*Musa acuminata*	Banana	P.I.	Yes	15 gal		Per plan layout	
Pa	2	Persea americana	Avocado	Alien	Yes	15 gal		Per plan layout	
Aa	0	*Artocarpus altilis*	Ulu - breadfruit	P.I.	Yes	15 gal		Per plan layout	
Lc	0	*Litchi chinensis*	Lychee	Alien	Yes	15 gal		Per plan layout	
Nl	0	*Nephelium lappaceum*	Rambutan	Alien	Yes	15 gal		Per plan layout	
Ah	0	*Artocarpus heterophyllus*	Jackfruit	Alien	Yes	15 gal		Per plan layout	
Am	1	*Annona muricata*	Soursop	Alien	Yes	15 gal		Per plan layout	
Sm	0	*Syzygium malaccense*	Mountain apple	P.I.	Yes	15 gal		Per plan layout	
Dk	0	*Diospyros kaki*	Persimmon	Alien	Yes	15 gal		Per plan layout	
Shrubs, Groundcovers, Vines and Grasses									
St	10	*Scaevola taccada*	Naupaka	Native	Yes	3 gal		Per plan layout	
Wu	0	*Wikstroemia uva-ursi*	Akia	Native	Yes	3 gal		Per plan layout	
Vr	3	*Vitex rotundifolia*	Pohinahina	Native	Yes	3 gal		Per plan layout	
Ha	5	*Hibiscus arnottianus*	kokio keokeo	Native	Yes	3 gal		Per plan layout	
Ce	3	*Colocasia esculenta*	Kalo	P.I.	Yes	3 gal		Per plan layout	
Ps	34	*Phymatosorus scolopendria*	Lauae fern	Alien	Yes	3 gal		Per plan layout	

Planting Mixes:

Key	Qty	Botanical Name	Common Name	Native/P.I./ Alien	Pono Plant	Container Size	
M1	Mix 1 (Front Entry): 790 sq ft						
	30%	*Sida fallax*	Ilima	Native	Yes	1 gal	
	10%	*Wikstroemia uva-ursi*	Akia	Native	Yes	1 gal	
	10%	*Jacquemontia sandwicensis*	pa'u o hiiaka	Native	Yes	1 gal	
M2	Mix 2 (Food Forest): 3,252 sq ft						
	30%	*Ananas comosus*	pineapple	Alien	Yes	1 gal	
	10%	*Colocasia esculenta*	Kalo	P.I.	Yes	1 gal	
	10%	*Ipomoea batatas*	'Uala Sweet potato	P.I.	Yes	1 gal	
	10%	*Cymbopogon sp.*	Lemongrass	Alien	Yes	1 gal	
	10%	*Allium spp.*	Alliums	Alien	Yes	1 gal	
	10%	*Passiflora edulis*	Lilikoi	Alien	Yes	1 gal	
M3	Mix 3 (Transition Planting): 1,168 sq ft.						
	30%	*Wikstroemia uva-ursi*	Akia	Native	Yes	1 gal	
	25%	*Vitex rotundifolia*	Pohinahina	Native	Yes	1 gal	
	15%	*Nephrolepis cordifolia*	Kupukupu	Native	Yes	1 gal	
	30%	*Scaevola taccada*	Naupaka	Native	Yes	1 gal	
M4	Mix 4 (Front Garden): 3,885 sq ft.						
	20%	*Sida fallax*	Ilima	Native	Yes	1 gal	
	20%	*Wikstroemia uva-ursi*	Akia	Native	Yes	1 gal	
	10%	*Jacquemontia sandwicensis*	pa'u o hiiaka	Native	Yes	1 gal	
	10%	*Microlepia strigosa*	Palapalai fern	Native	Yes	1 gal	
	20%	*Phymatosorus scolopendria*	Lauae fern	Alien	Yes	1 gal	
	10%	*Gardenia brighamii*	Nanu	Native	Yes	1 gal	
	10%	*Hibiscus arnottianus*	Hibiscus	Native	Yes	1 gal	
	10%	*Monsterra deliciosa*	Monsterra	Alien	Yes	1 gal	
	10%	*Heliconia rostrata*	Heliconia	Alien	Yes	1 gal	
	10%	*Zingiber zerumbet*	Awapuhi-soap ginger	P.I.	Yes	1 gal	
	10%	*Osteomeles anthyllidifolia*	Ulei	Native	Yes	1 gal	
	10%	*Strelitzia reginae*	Bird of paradise	Alien	Yes	1 gal	
M5	Mix 5 (Back Garden): 2,885 sq ft.						
	30%	*Sida fallax*	Ilima	Native	Yes	1 gal	
	10%	*Wikstroemia uva-ursi*	Akia	Native	Yes	1 gal	
	20%	*Jacquemontia sandwicensis*	pa'u o hiiaka	Native	Yes	1 gal	
	10%	*Nephrolepis cordifolia*	Kupukupu	Native	Yes	1 gal	
	10%	*Jacquemontia sandwicensis*	pa'u o hiiaka	Native	Yes	1 gal	
	10%	*Vitex rotundifolia*	Pohinahina	Native	Yes	1 gal	
	10%	*Spathoglottis unguiculata*	Grape scented orchid	Alien	Yes	1 gal	
	10%	*Neomarica gracilis*	Walking iris	Alien	Yes	1 gal	
	10%	*Cordyline fruticosa*	Green ti	Alien	Yes	1 gal	
	10%	*Crinum x amabile*	Giant Spider lily	Alien	Yes	1 gal	
	10%	*Zingiber zerumbet*	Awapuhi-soap ginger	P.I.	Yes	1 gal	

Existing Tree

cn	*Cocos nucifera*	Coconut Palm
cr	*Clusia rosea*	Autograph Tree
ha	*Heliotropium arboreum*	Beach heliotrope

LAND PLANNING HAWAII LLC

PARCEL 027 - PAUL PASTOREK SINGLE FAMILY RESIDENCE

Project

LA-1.1 PLANTING SCHEDULE

Drawing No

PRELIMINARY: NOT FOR CONSTRUCTION

Figure 3 Continued

Please note full size prints attached separately

R- 7 SINGLE FAMILY RESIDENCE

(D-1) *A single-family residence that conforms to design standards as outlined in this chapter*.

The project is proposed to include an approximately 2,750 square foot (under roof) home with two (2) bedrooms, two (2) bathrooms, a kitchen and living/dining room, and open-air lānai areas. Accessory areas include a hot tub, pool, wooden deck, and landing shown on the proposed site plan, totaling 1,340 square feet in area (**Figure 4**). Natural design features for this residence include stone walls, natural wood patina, dark windows, and natural colored roofing. An 893 square foot attached storage/art studio is also proposed. As a response to OCCL's request for a better alternative, the storage/art studio is now proposed to be connected to the house, which is consistent with Exhibit 4 of Hawai'i Administrative Rules (HAR) Chapter 13-5. All proposed improvements will be sited a minimum of 130 feet from the shoreline. Proposed floor plans and elevation drawings are provided as **Figures 5-9.**

Proposed infrastructure for this dwelling includes an approximately 400 linear foot (LF) gravel driveway at 15-feet wide, one (1) well for drinking water (or rain catchment as set forth in Section II(e) below), and an Individual Wastewater System (IWS) which will require approval by the Department of Health. Utility lines including power, water, and LP gas lines would also be installed to serve the residence. Solar panels are proposed for the purpose of electricity generation, including a battery storage system to increase the energy independence of the home and reduce impact to the grid. Minimum setbacks and height restrictions outlined in Hawai'i Administrative Rules (HAR) Chapter 13-5 will be complied with, along with the site Maximum Developable Area (MDA). The total residence area including the main area and accessory areas is proposed to be approximately 4,984 square feet, which complies with the 5,000 square foot MDA for the Subject Property. MDA calculations are provided for each structure on the area tabulation page attached as **Figure 9a**.

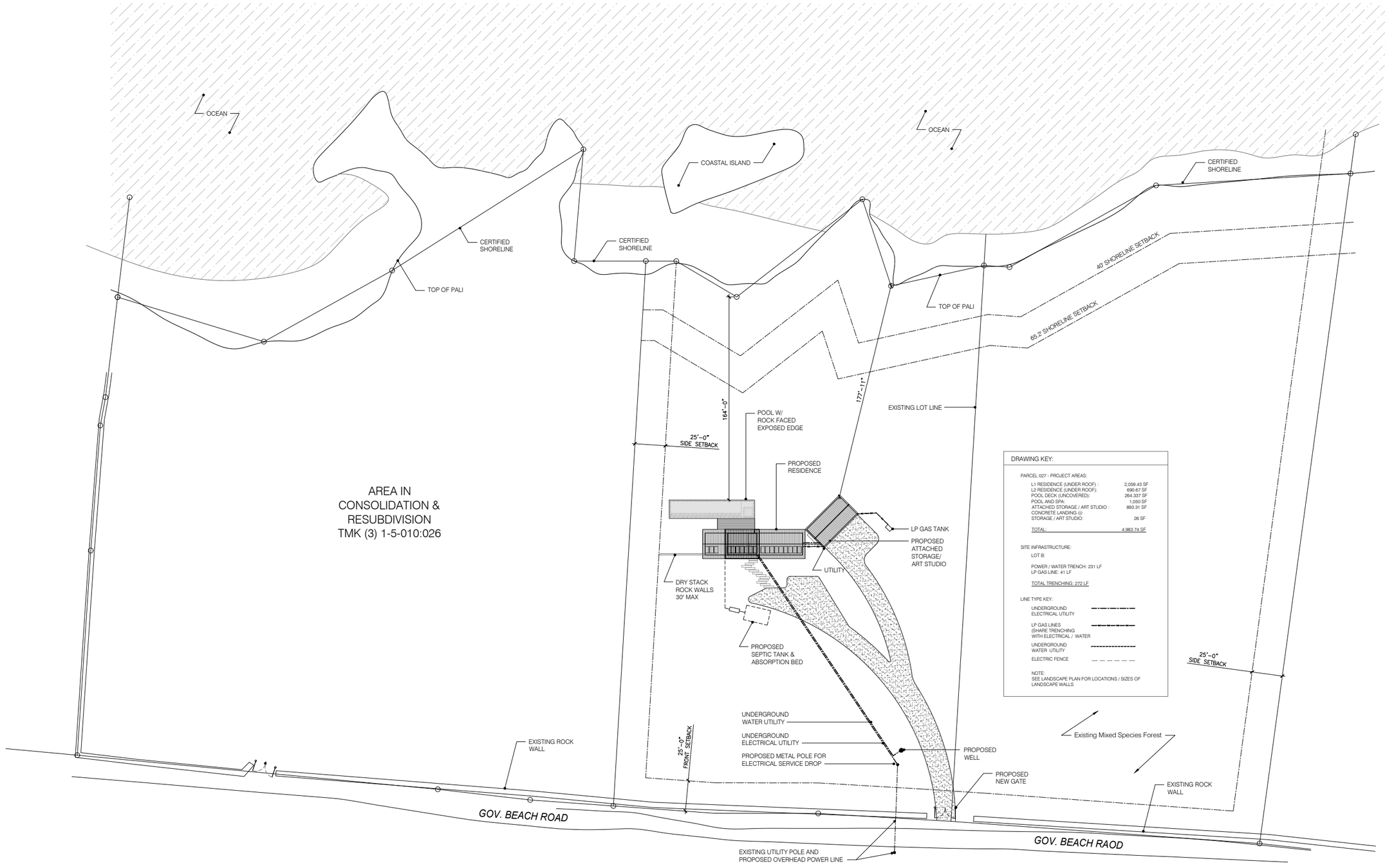
As noted above, the home is proposed to have a swimming pool. A pool is not specific to urban areas and is a typical accessory use to a home. Other pools have been approved and built on other properties in the Conservation District. In this case , the pool contributes to and is accommodated by the Maximum Developable Area. Furthermore, since there is no safe access to the ocean from the Subject Property and conditions of the Special Management Area Permit prohibit devices that would aid access to the ocean, the proposed pool is an important alternative source of water access and exercise for the applicant. Exercise in the pool is especially important for the applicant and his wife since the development of arthritis has left them unable to use treadmills or elliptical equipment for exercise. Thus, the proposed pool is essential for therapeutic use by the applicant and the applicant's wife.

Since an aquaculture pond is no longer proposed, an alternative source of water is necessary for fire suppression purposes. In the event the proposed well is completed, the rainwater catchment cistern would not be necessary, and the pool would be the sole source of fire suppression water storage. An approved fire department connection is proposed to be established to the pool so that the Fire Department may pump water from the pool in the unlikely event of a fire. While it hasn't been determined whether the pool water would be fresh or salt water, the pool would be maintained consistent with industry standards and proper storage of pool chemicals in the

storage/art studio. If the pool were ever in need of draining, a pump truck would be contracted to haul away the water for proper disposal.

A few non-significant alterations have been made to the plans for the residence since the FEA was published, these include:

- The proposed septic system was shifted to the mauka side of the proposed home to be sited farther from the shoreline and reduce potential impacts to the shoreline environment.
- The proposed well has been shifted to lie farther mauka on the property to be farther away from the proposed septic system and any potential effluent from that system. The new proposed well site makes use of trenching that was already proposed for power lines intended to serve the home, eliminating the need for additional trenching.
- The proposed storage/art studio structure has been shifted closer and connected to the residence to better comply with Conservation District Residential Standards. Consequently, the proposed LP gas tank had to be moved to the east side of the storage/art studio to comply with code requirements.
- The size of the storage/art studio, residence and pool deck have been slightly reduced to comply with Conservation District Residential Standards.
- The possibility for the addition of a 10,000 gallon rainwater catchment tank below the proposed pool deck was added in response to the request from OCCL for an alternative should inadequate well water be available for the residence. The catchment tank would only be necessary in the unlikely event adequate well water was not available and the tank would be sited beneath the proposed pool deck, eliminating the need to disturb additional areas.



DRAWING KEY:

PARCEL 027 - PROJECT AREAS:

L1 RESIDENCE (UNDER ROOF) :	2,059.43 SF
L2 RESIDENCE (UNDER ROOF):	690.67 SF
POOL DECK (UNCOVERED):	264.337 SF
POOL AND SPA:	1,050 SF
ATTACHED STORAGE / ART STUDIO :	893.31 SF
CONCRETE LANDING @ STORAGE / ART STUDIO:	26 SF
TOTAL:	4,983.74 SF

SITE INFRASTRUCTURE:

LOT B:

POWER / WATER TRENCH: 231 LF
LP GAS LINE: 41 LF

TOTAL TRENCHING: 272 LF

LINE TYPE KEY:

UNDERGROUND ELECTRICAL UTILITY

LP GAS LINES @SHARE TRENCHING WITH ELECTRICAL / WATER

UNDERGROUND WATER UTILITY

ELECTRIC FENCE

NOTE:
SEE LANDSCAPE PLAN FOR LOCATIONS / SIZES OF LANDSCAPE WALLS

LAND PLANNING HAWAII LLC

PARCEL 027 - PAUL PASTOREK SINGLE FAMILY RESIDENCE

Project

SITE PLAN

Drawing No

1 S-1.0 SITE PLAN / INDEPENDENT UTILITIES ALTERNATIVE

SCALE: 1" = 80'

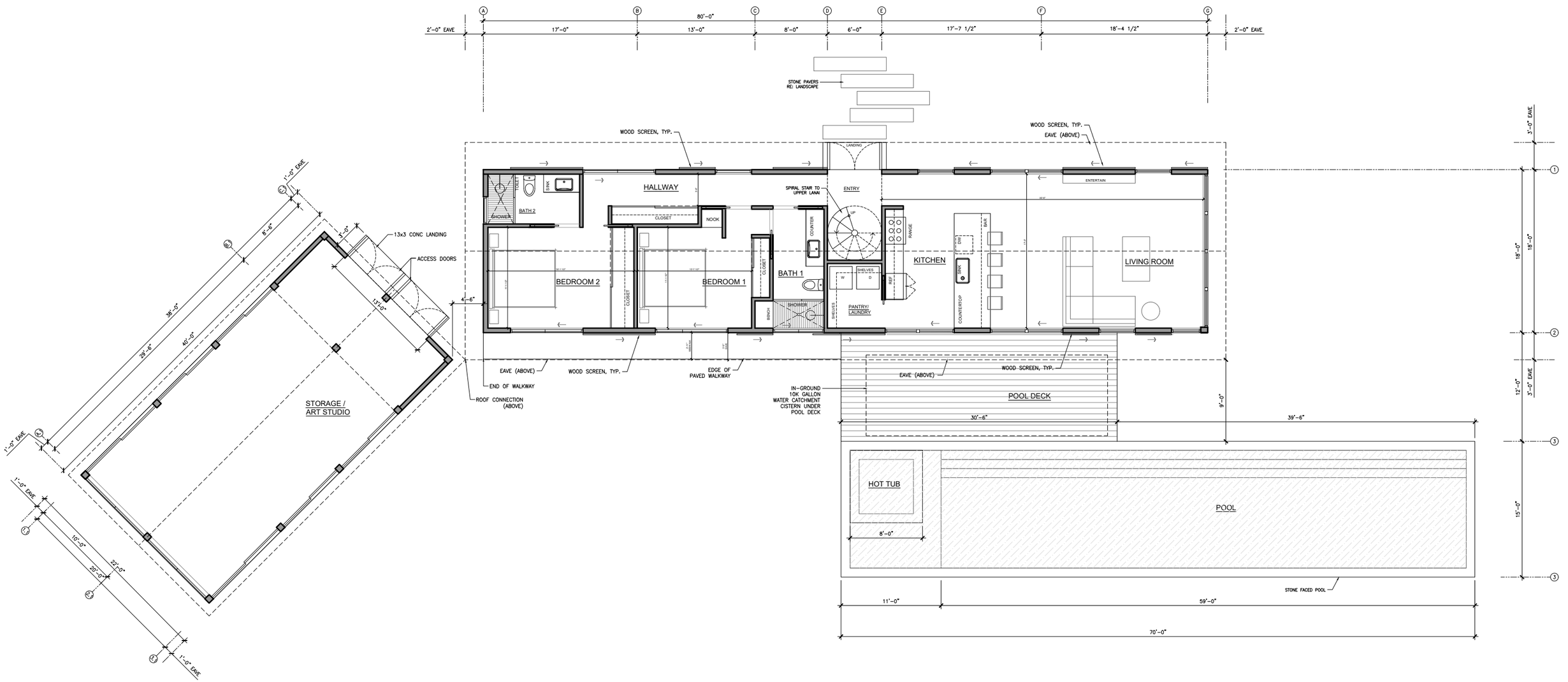
TRUE NORTH

PLAN NORTH

PRELIMINARY: NOT FOR CONSTRUCTION

Figure 4

Please note full size prints attached separately



1 A1.0 L1 FLOOR PLAN
SCALE: 3/32"=1'

PLAN NORTH
TRUE NORTH

LAND PLANNING HAWAII LLC

PARCEL 027 - PAUL PASTOREK SINGLE FAMILY RESIDENCE & STORAGE / ART STUDIO

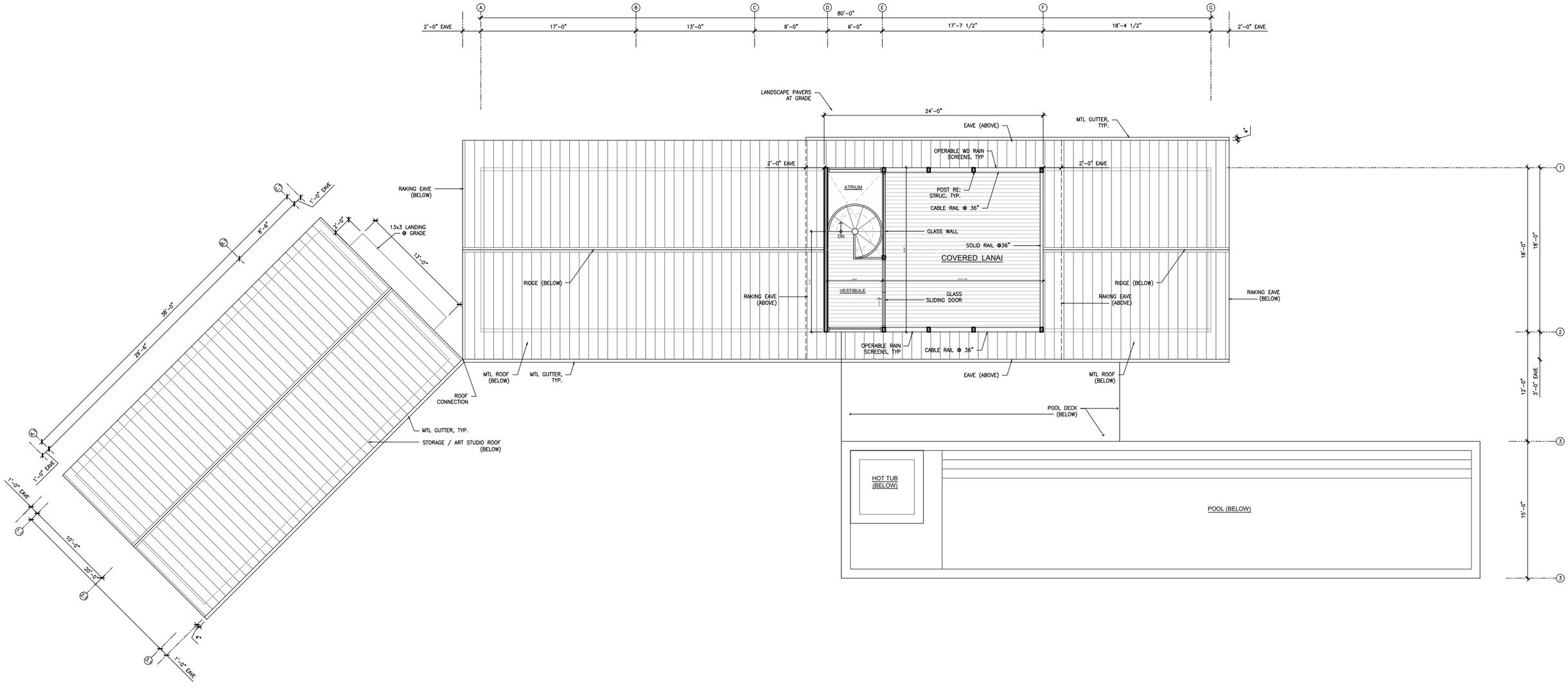
Project

A1.0 - L1 FLOOR PLAN

Drawing No

Figure 5

Please note full size prints attached separately



1 A1.1 L2 FLOOR PLAN & L1 ROOF PLAN

SCALE: 3/32"=1'

PLAN NORTH

TRUE NORTH

LAND PLANNING HAWAII LLC

PARCEL 027 - PAUL PASTOREK SINGLE FAMILY RESIDENCE & STORAGE / ART STUDIO

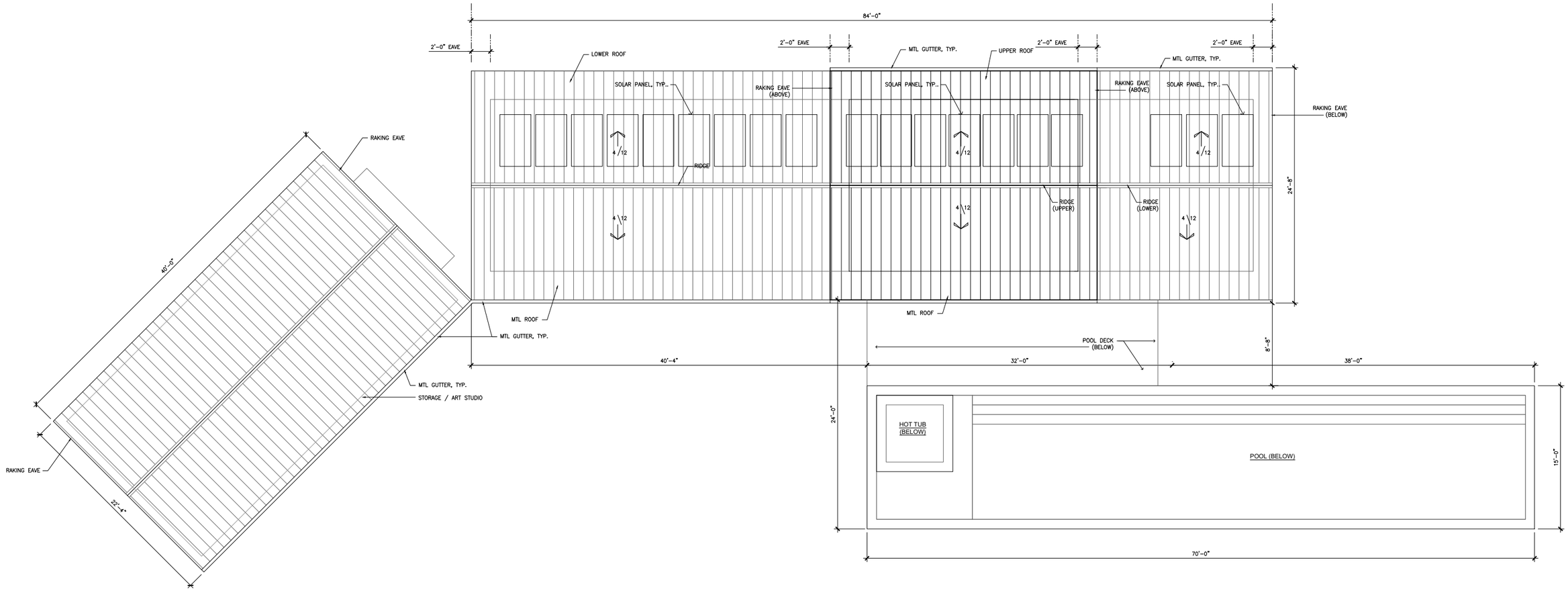
Project

A1.1 - L2 FLOOR PLAN & L1 ROOF PLAN

Drawing No

Figure 6

Please note full size prints attached separately



1 A1.2 ROOF PLAN
SCALE: 3/32"=1'

PLAN NORTH
TRUE NORTH

LAND PLANNING HAWAII LLC

PARCEL 027 - PAUL PASTOREK SINGLE FAMILY RESIDENCE & STORAGE / ART STUDIO

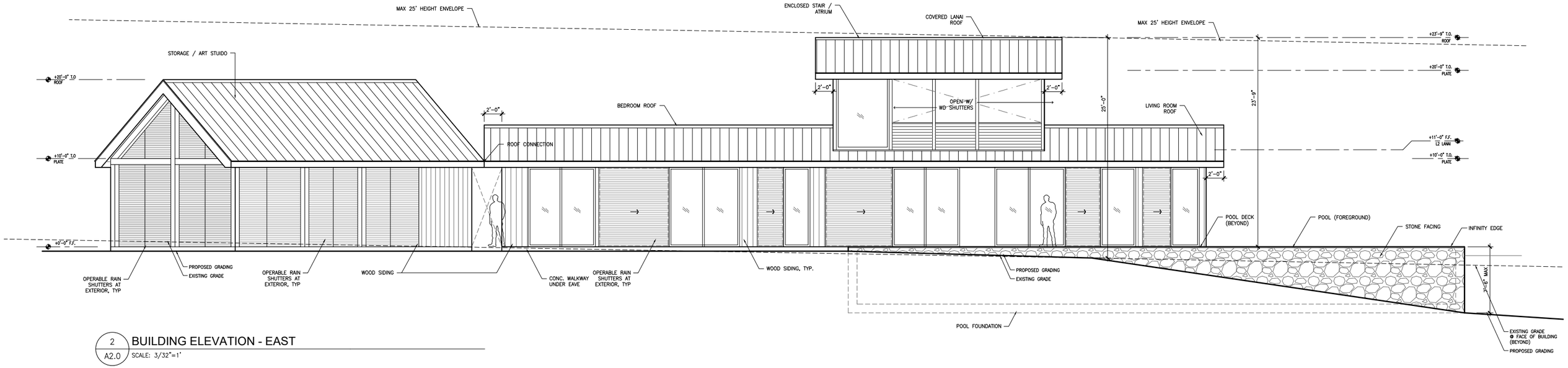
Project

A1.2 - ROOF PLAN

Drawing No

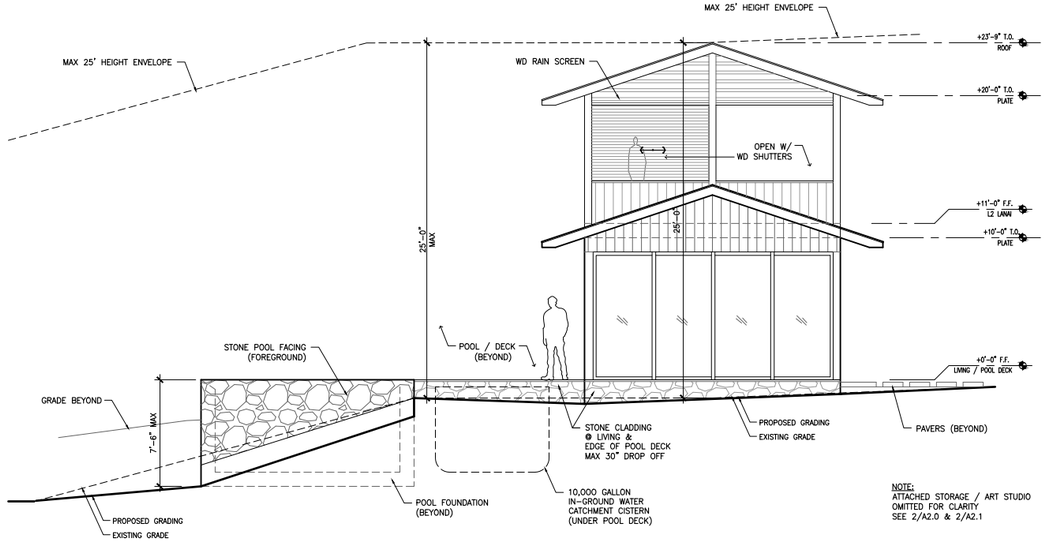
Figure 7

Please note full size prints attached separately



2 / A2.0 BUILDING ELEVATION - EAST

SCALE: 3/32"=1'



1 / A2.0 BUILDING ELEVATION - NORTH

SCALE: 3/32"=1'

LAND PLANNING HAWAII LLC

PARCEL 027 - PAUL PASTOREK SINGLE FAMILY RESIDENCE & STORAGE / ART STUDIO

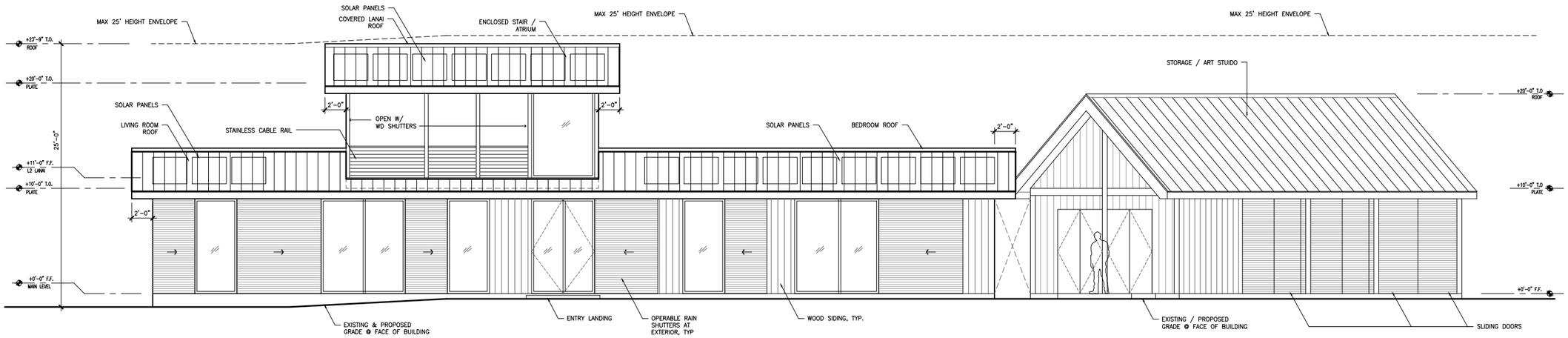
Project

A-2.0 - BUILDING ELEVATIONS

Drawing No

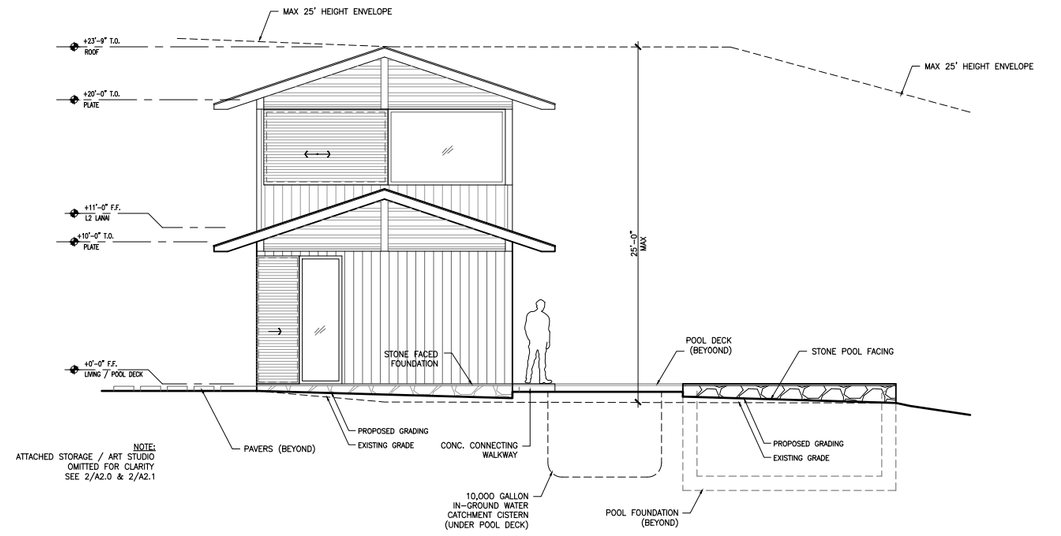
Figure 8

Please note full size prints attached separately



2 A2.1 BUILDING ELEVATION - WEST

SCALE: 3/32"=1'



1 A2.1 BUILDING ELEVATION - SOUTH

SCALE: 3/32"=1'

LAND PLANNING HAWAII LLC

PARCEL 027 - PAUL PASTOREK SINGLE FAMILY RESIDENCE & STORAGE / ART STUDIO

Project

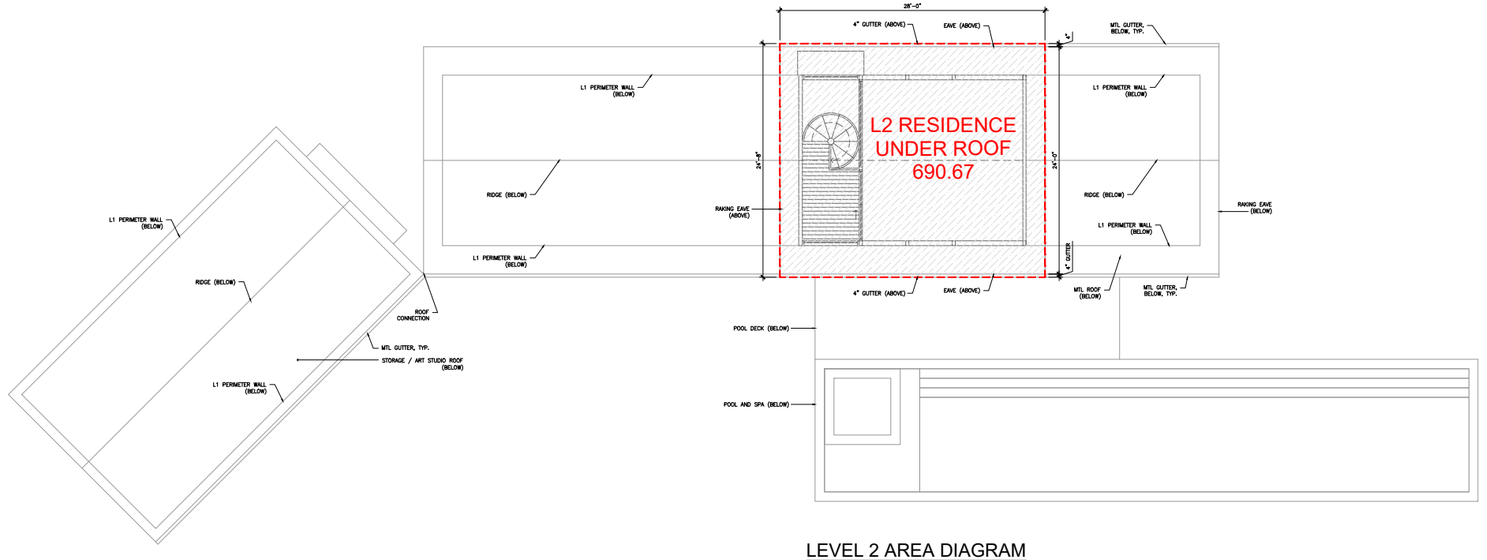
A-2.1 - BUILDING ELEVATIONS

Drawing No

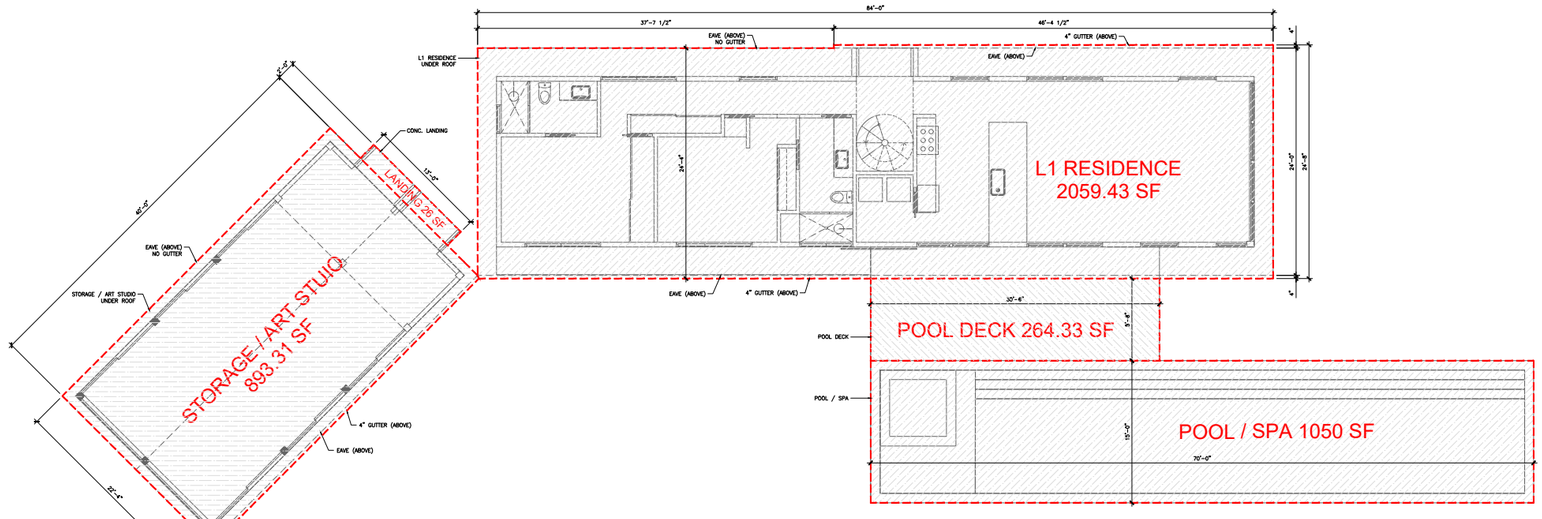
PRELIMINARY: NOT FOR CONSTRUCTION

Figure 9

Please note full size prints attached separately



LEVEL 2 AREA DIAGRAM



LEVEL 1 AREA DIAGRAM

LOT 027 - AREA KEY:

L1 RESIDENCE (UNDER ROOF) :	2,059.43 SF
L2 RESIDENCE (UNDER ROOF):	690.67 SF
POOL DECK (UNCOVERED):	264.33 SF
POOL AND SPA:	1,050 SF
ATTACHED STORAGE / ART STUDIO :	893.31 SF
CONC. LANDING @ STORAGE / ART STUDIO:	26 SF
TOTAL:	4,983.74 SF

LAND PLANNING HAWAII LLC

PARCEL 027 - PAUL PASTOREK SINGLE FAMILY RESIDENCE & STORAGE / ART STUDIO

Project

A1.3 - L1 & L2 AREA DIAGRAMS & KEY

Drawing No

1 / A1.3 AREA DIAGRAMS

SCALE: 1/16"=1'

PLAN NORTH / TRUE NORTH

Figure 9a

Please note full size prints attached separately

The site plans have been developed in accordance with design standards that prioritize harmonizing with the natural features of the site and promoting sustainability. Natural design features for this residence include stone walls, natural wood patina, dark windows, and natural colored roofing. The applicant intends to use local and sustainably sourced materials as much as possible in construction, including local hardwoods and stone, which reduces the project's environmental footprint.

Construction activities would occur on approximately 0.5 acres on the Subject Property with minor short-term impacts to noise, air, and water quality. Within this area, construction activities refer to all practices associated with the process of construction, such as materials and vehicle staging, along with access around the construction site for workers. The residence and all associated infrastructure will be constructed at least 130 feet from the shoreline to minimize the risks from erosion, storm surges, and sea level rise. The residence has been designed to follow the topography of the site, adapting and blending in with existing conditions without the need for large scale grading. Best Management Practices (BMPs) would be followed to mitigate any potential impacts. Earthwork and grading will conform to all laws, regulations and standards associated with Conservation Districts as outlined in HAR Chapter 13-5 and Chapter 10 Hawai'i County Code.

AQUACULTURE POND

Previously, an approximately 3,500 square foot aquaculture pond was proposed on the Subject Property to produce taro and tilapia for personal and family use. However, OCCL had expressed concerns relating to potential impacts from the aquaculture pond. In response the applicant has decided to remove the aquaculture pond from the plans.

Subject Property Existing Conditions

a. Existing Access to Site

The Subject Property lies entirely within the State Land Use Conservation District Resource Subzone and within the County Special Management Area. Access to the Subject Property is from Government Beach Road, approximately 1.5 miles from the Maku'u Drive and Government Beach Road intersection. The applicant is aware of the road in limbo status and is involved in maintenance. Nevertheless, in its current state, the road is sufficient for the proposed use.

b. Existing Buildings/Structures

There are no existing buildings or structures on the Subject Property.

c. Existing Utilities (electrical, communication, gas, drainage, water & wastewater)

Electrical power will be sourced using a combination of underground utility lines providing HELCO power and solar panels. In addition to solar energy, architectural

strategies such as cross ventilation and high ceilings would reduce the need for air conditioning, also reducing overall energy needs of the development. A water well is proposed for water supply and will include the installation of underground water lines. LP gas storage tanks and supply lines will also be required. An Individual Wastewater System (IWS) will be constructed to handle wastewater. The IWS will be sited approximately 250 feet from the shoreline to reduce any potential impacts to nearshore water quality.

Regarding the proposed well, The State Commission on Water Resource Management (CWRM) was consulted during the preparation of the EA, responding by letter (**Exhibit G**) February 17, 2021. CWRM comments indicated that well construction and pump installation permits would be required. The Subject Property is not located in a designated Water Management Area which would additionally require a water use permit with justification of the water withdrawal and uses.

In the event that the well does not produce adequate water or the applicant determines that a well is not feasible, the applicant would rely on rainwater catchment, in which case a 10,000-gallon water storage cistern would be sited beneath the proposed pool deck. Upon development of either the well or catchment system, water filtration and ultraviolet sterilization will be implemented to ensure safe and potable water. The water storage cistern would also function as an emergency fire suppression water source for Fire Department use with an approved Fire Department Connection.

d. Physiography (geology, topography, and soils)

The Subject Property is located on the *makai* side of Government Beach Road in the Conservation District of Maku‘u ahupua‘a, situated on the flank of Kīlauea volcano. The site is gently sloped, with the shoreline situated slightly higher than the south and western portions of the Subject Property. As a result, runoff is naturally directed to the southwest. The shoreline has two distinct coves and a partially eroded littoral cinder cone with various substrate, cobble berms, and undercutting caves. A Certified Shoreline Survey was completed for the Subject Property (**Figure 10**).

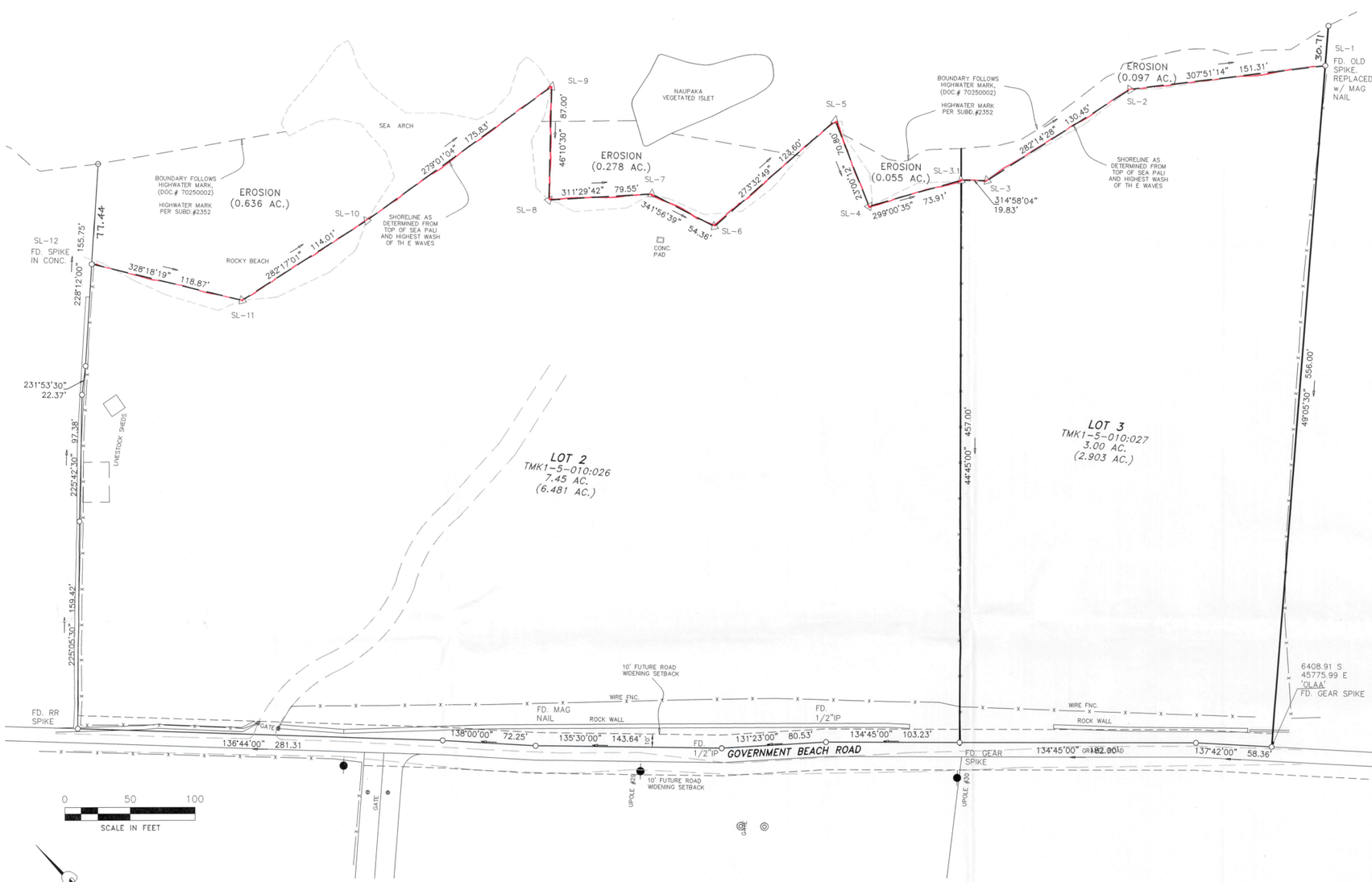
Several historical lava flows from Kīlauea have overlain the surrounding area in the last 1,500 years, most recently between 450 and 750 years ago. The oldest flow occurred in the area approximately 1,500 years ago and reached the sea. In the northwest corner of the neighboring property, Parcel 026, the lava flow formed a 50-foot littoral cone and widespread cinder deposits from the interaction of molten lava and seawater. Between 450 and 750 years ago, another sequence of lava flows surrounded the pu’u and covered the rest of the Subject Property.

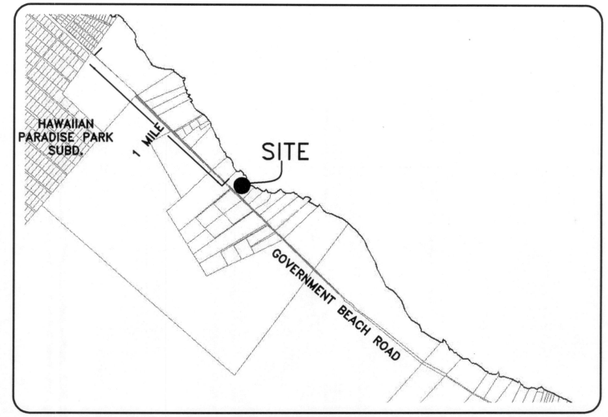
Soils on site are classified as ‘Opihikao series (*2kllp*), which is highly decomposed plant material over pāhoehoe lava flows. This soil type is well drained, has high runoff, and 2 to 20 percent slope. The subject site is unclassified according to the Agricultural Lands of Importance to the State of Hawai‘i (ALISH).

Shoreline Survey

Of Lots 2 and 3.
Portions of Grant 1537 to Kapohano,
Situated at Halona and Popoki, Puna
Island and County of Hawaii, Hawaii

TMK's(3) 1-5-010-026 & 027





VICINITY MAP
NO SCALE

Owner:
Opunaha, LLC
533 Fernwood Pacific Dr.
Topanga, CA. 90290

Situs:
TMK(3) 1-5-010-026
15-2193 Old Government Rd.
TMK(3) 1-5-010-027
(No address assigned.)

Notes:
1. Field Survey dated May 5 and August 21, 2020.
2. Boundary courses are record per: subdivision approved Dec. 17, 1965 by HCPTC as SUB# 2353. Coordinates are referenced to "OLAA" . Doc.# 70250002 (3/27/2019) Vesting deed, tmk026 Doc.# 72260053 (10/14/2019) Vesting deed, tmk027
3. Shoreline taken as top of sea pali, as access to wave wash is impractical. (HAR 13-222-16(b)(6).

Indicates property monument as described.
Indicates set nail spike at shoreline station unless noted otherwise.

The shoreline as delineated in red is hereby certified as the shoreline as of
APR 14 2021

Chairperson, Board of Land and Natural Resources

This work was prepared by me or under my direct supervision.
Daniel L. Berg
PLS 11245

DANIEL BERG
LICENSED PROFESSIONAL LAND SURVEYOR
No. 11245
HAWAII, U.S.A.

dlb & Associates
LAND SURVEYING • MAPPING • CONSULTING
P.O.Box 49-2281 Keaau, HI. 96749
Ph.966-4206 Fx.82-6830
www.dlbandassoc.com

Shoreline Survey-Sheet 1
Date: September 28, 2020
Job: J2020-117
Drawing: J2020-117SL.dwg

Figure 10

32X21 sheet

SURVEY OFFICE COPY

PHOTO 92

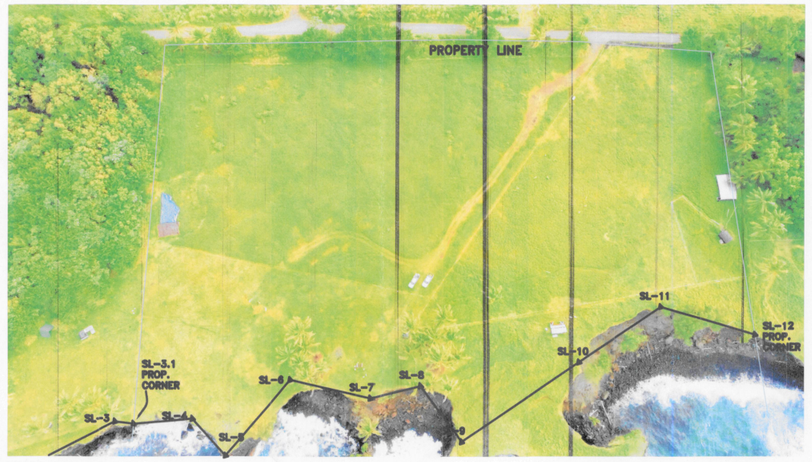
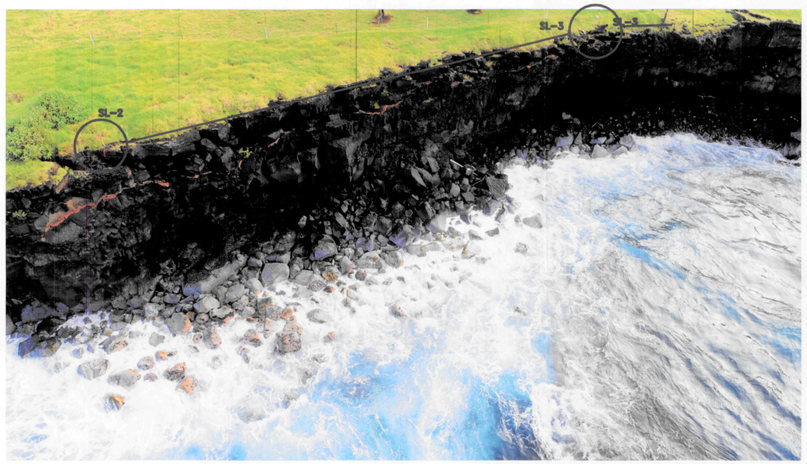


PHOTO 91



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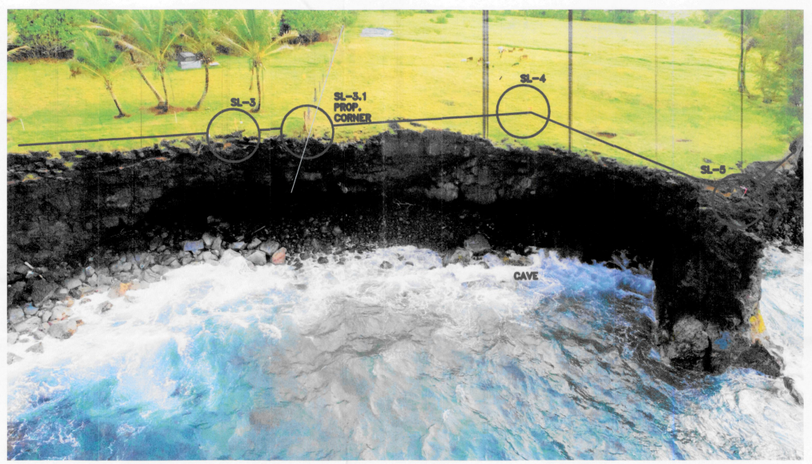

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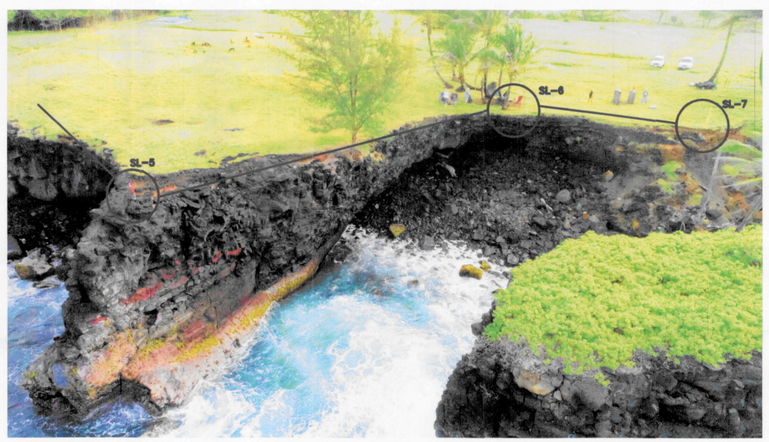
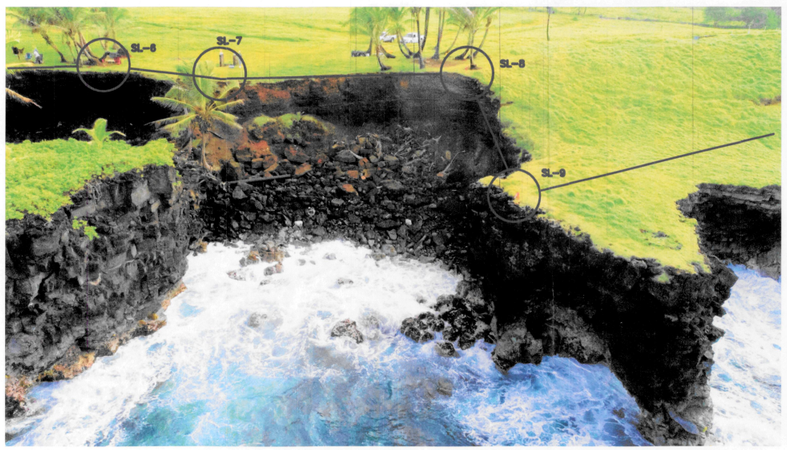


PHOTO 85



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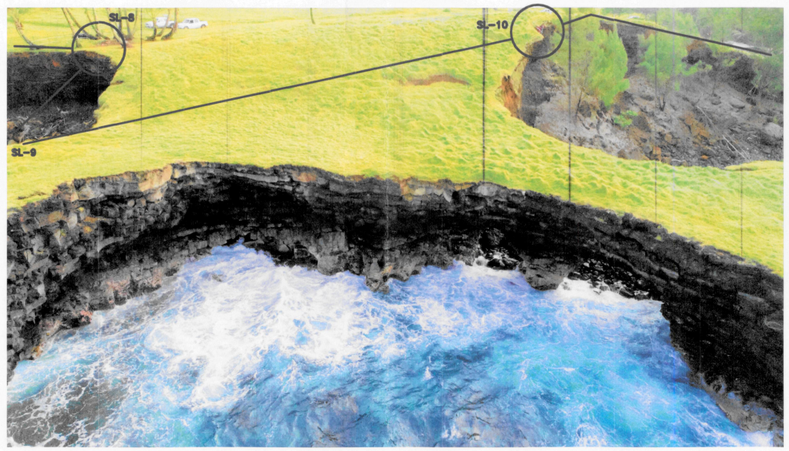


PHOTO 87

PHOTO 88

Shoreline Survey

Of Lots 2 and 3.
Portions of Grant 1537 to Kapohano,
Situated at Halona and Popoki, Puna
Island and County of Hawaii, Hawaii
TMK's(3) 1-5-010-026 & 027

DANIEL BERG
LICENSED PROFESSIONAL LAND SURVEYOR
No. 11245
HAWAII, U.S.A.

This work was prepared by me or under my direct supervision.

Daniel L. Berg
PLS 11245

Owner:
Opunaha, LLC
533 Fernwood Pacific Dr.
Topanga, CA. 90290

Situs:
TMK(3) 1-5-010-026
15-2193 Old Government Rd.
TMK(3) 1-5-010-027
(No address assigned.)

Notes:
Field Survey dated May 5. Photos dated August 21, 2020, 4:30-5:00 p.m..
See Sheet 1 for photo location and orientation.

Shoreline Survey-Sheet 2
Date: September 28, 2020
Job: J2020-117
32x21 sheet

Figure 10 cont.

dlb & Associates
LAND SURVEYING • MAPPING • CONSULTING
P.O.Box 49-2281 Keaau, HI. 96749
Ph.966-4206 Fx.82-6830
www.dlbandassoc.com

e. Hydrology (surface water, ground water, coastal waters, and wetlands)

The Subject Property is a shoreline parcel located along the Maku‘u pali, roughly 35 feet above sea level. Runoff naturally flows to the southwest, away from the shoreline and the proposed uses and percolates into the porous substrate. There are no known streams in the area that could contribute to surface water on site and no known wetlands occur in the area.

The Subject Property is located on the Pahoa groundwater aquifer which is not a designated Water Management Area by CWRM and has a sustainable yield of 432 Million Gallons per Day (MGD) (**Figure 12**). According to the 2019 update to the Water Resources Protection Plan (WRPP), reported ground water use as a percentage of sustainable yield for this aquifer in 2016 was between 0% and 9% (**Figure 13**). Also, the 2019 WRPP depicts existing wells on the Island of Hawaii and in the area of the Subject Property (**Figure 11**). The prevalence of wells in the area of the Subject Property combined with the very low percentage of use of the sustainable yield of this aquifer makes it reasonable to assume that sufficient quality and quantity of groundwater will be present at the Subject Property. However, in the unlikely event that the well does not produce adequate water, the applicant would rely on rainwater catchment for domestic water needs.

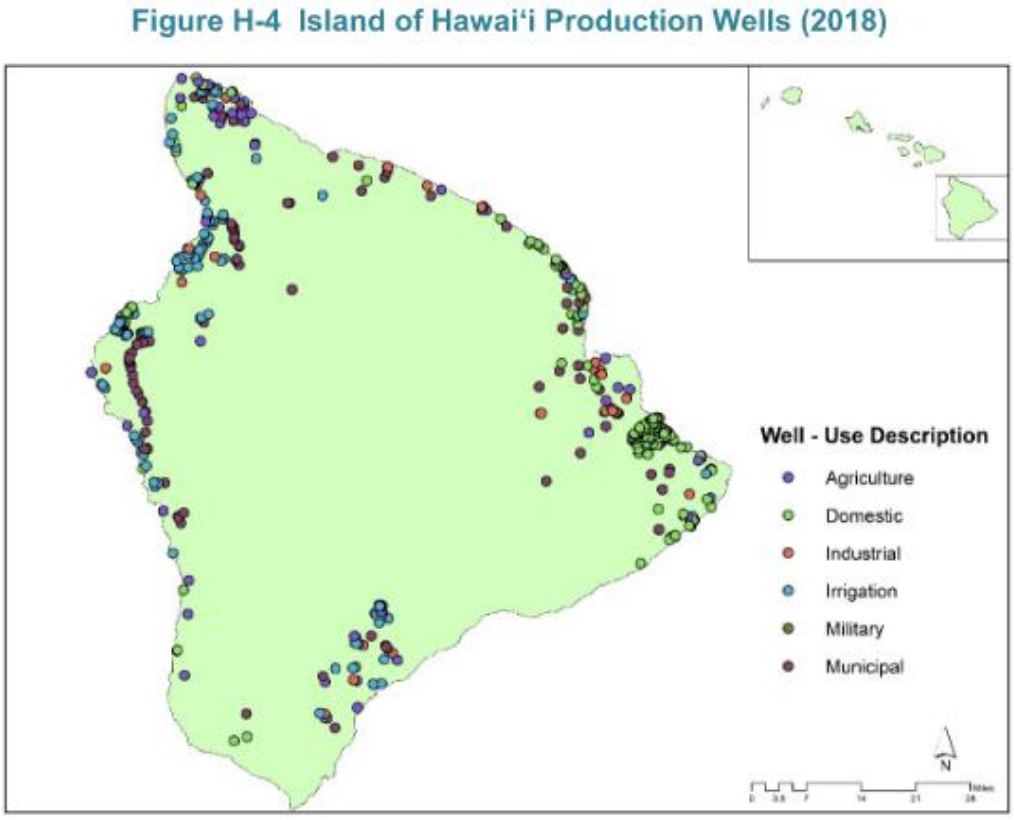


Figure 11 Island of Hawai‘i Production Wells

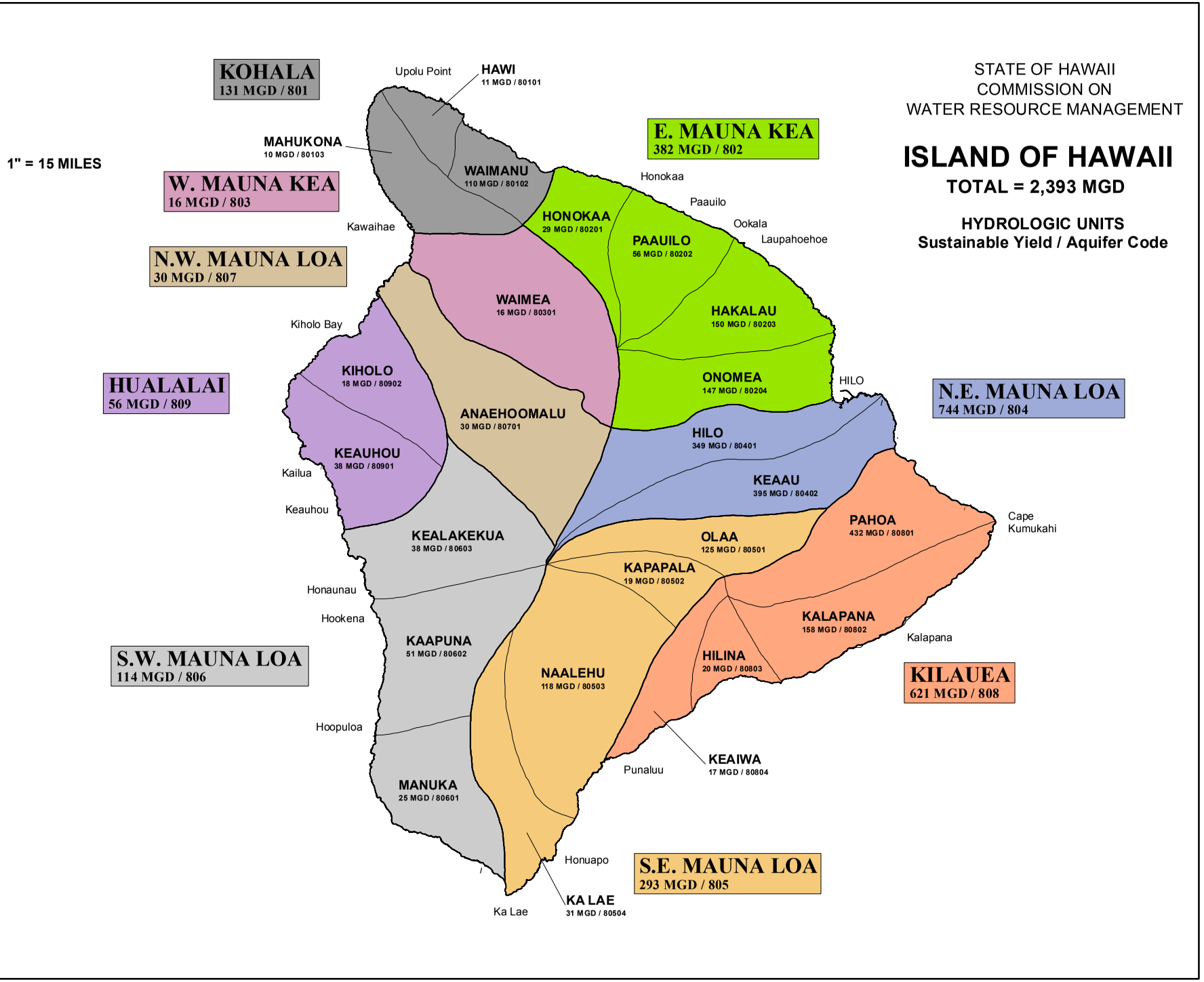


Figure 12

06/20/2018

Map Projection: Universal Transverse Mercator

Figure 2-1 2016 Reported Ground Water Use as a Percentage of Sustainable Yield

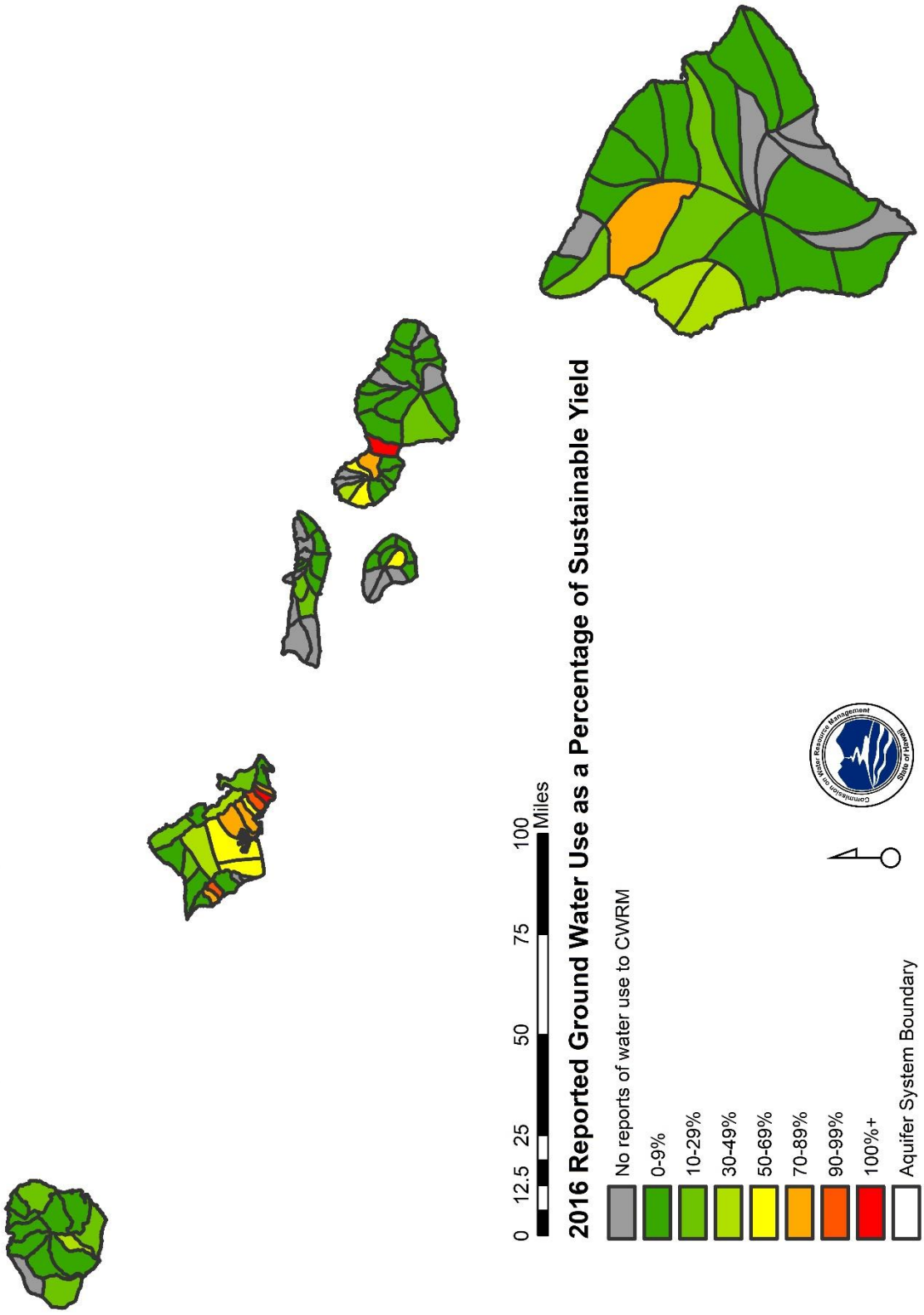


Figure 13

f. Flora and Fauna (indicate if rare or endangered plants and/or animals are present)

A biotic survey conducted on the Subject Property found no endangered plant or animal species on site. Many decades of grazing have left introduced pasture grasses including california grass (*Brachiara mutica*), bermuda grass (*Chrysopogon spp.*), honohono grass (*Commelina diffusa*) and pangola grass (*Digitaria spp*). A densely vegetated area is dominated by strawberry guava (*Psidium cattleyanum*), autograph tree (*Clusia rosea*), and bingabing (*Macaranga sp.*). Understory species include owi (*Stachytarpheta dichotoma*), princess flower (*Tibouchina urvilleana*) and sword fern (*Nephrolepis cordifolia*) and the indigenous fern moa (*Psilotium nudum*). Naupaka (*Scaevola taccada*), ironwood (*Casuarina equisetifolia*) and coconut palm *(Cocos nucifera)* are present near the shoreline pali. Table 3 provides a full list of plant species observed.

During the biotic survey, several common birds were also detected including common myna (*Acridotheres tristis*), northern cardinal (*Cardinalis cardinalis*), spotted dove (*Streptopelia chinensis*), Japanese white-eye (*Zosterops japonicus*) and house finch (*Carpodacus mexicanus*). The black noddy (*Anous minutus*) is a common seabird of the main Hawaiian Islands coastline. Their nesting habitat is commonly in crevices and caves in pāhoehoe lava sea cliffs, which are present on the coastal areas of this site. Black noddy's have been spotted offshore from the subject site but were not detected during the biotic survey. No nests were noted in sea cliffs in the vicinity of the Subject Property.

There are no suitable nesting trees or critical habitats on the Subject Property, however, five animals, which may fly over, roost or utilize resources of the Subject Property, are the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), the endangered Hawaiian petrel (*Pterodroma sandwichensis*), the endangered band-rumped storm petrel (*Oceanodroma castro*), the threatened Newell's shearwater (*Puffinus auricularis newelli*), and the Hawaiian hawk (*Buteo solitarius*).

No threatened or endangered native species were detected on the Subject Property. The only native plants on the Subject Property include common beach naupaka (*Scaevola taccada*) near the shoreline pali, kupukupu fern (*Nephrolepis cordifolia*) and moa (*Psilotium nudum*) in the understory of the heavily vegetated area.

Table 3: Plant Species Observed on Pastorek Properties

Scientific Name	**Family**	**Common Name**	**Type**	**Status**
Brachiara mutica	Poaceae	California grass	Grass	Alien
Chamaecrista nictitans	Fabaceae	Partridge pea	Grass	Alien
Christella dentata	Thelypteridaceae	Pai'iiha	Grass	Alien
Chrysopogon spp.	Poaceae	Bermuda Grass	Grass	Alien
Clidemia hirta	Melastomataceae	Koster's curse	Shrub	Alien

Clusia rosea	Clusiaceae	Autograph tree	Tree	Alien
Cocos nucifera	Arecaceae	Coconut palm	Tree	Polynesian Introduced
Commelina diffusa	Commelinaceae	Honohono grass	Grass	Alien
Digitaria spp.	Poaceae	Pangola grass	Grass	Alien
Falcataria moluccana	Fabaceae	Albizia	Tree	Alien
Lantana camara	Verbenaceae	Lantana	Shrub	Alien
Macaranga	Euphorbiaceae	Bingabing	Tree	Alien
Nephrolepis cordifolia	Nephrolepidaceae	Sword Fern	Grass	Alien
Oplismenus sp.	Poaceae	Basket grass	Grass	Alien
Panicum spp	Poaceae	Panic grass	Grass	Alien
Paspalum conjugatum	Poaceae	Hilo grass	Grass	Alien
Phymatosorus grossus (scolopendria)	Polypodiaceae	Lauae - maile scented fern	Grass	Alien
Psidium sp.	Myrtaceae	Guava	Tree	Alien
Psilotium nudum	Psilotaceae	Moa	Fern	Native
Scaevola sp.	Goodeniaceae	Naupaka	Shrub	Native
Setaria gracilis	Poaceae	Perennial foxtail	Grass	Alien
Stachytarpheta dichotoma	Verbenaceae	Owi	Shrub	Alien
Tibouchina urvilleana	Melastomataceae	Princess flower	Shrub	Alien
Trema orientalis	Cannabaceae	Gunpowder tree	Tree	Alien

Aside from birds, other introduced mammals are also likely to be found within the vicinity of the Subject Property including, cat (*Felis catus*), pig (*Sus scrofa*), Indian mongoose (*Herpestes a. auropunctatus*) and rat (*Rattus spp*.). Invasive coqui frogs (*Eleutherodactylus coqui*) are also likely to be present, consistent with most of lowland Puna, although none were detected at the time of the survey.

The State-listed waterbirds such as Hawaiian stilt (*Himantopus mexicanus knudseni),* Hawaiian coot (*Fulica ala*), Hawaiian Duck (*Anas wyvilliana*), and Hawaiian Goose (*Branta sandvicensis*) could potentially occur at or in the vicinity of the Subject Property. It is against State law to harm or harass these species. If any of these species are present during construction, then all activities within 100 feet (30 meters) should cease, and the bird or birds should not be approached. Work may continue after the bird or birds leave the area of their own accord. If a nest is discovered at any point, the Hawai‘i Island Branch of the Department of Land and Natural Resources (DLNR) Division of Forestry and Wildlife (DOFAW) Office will be contacted.

g. Natural Hazards (erosion, flooding, tsunamis, seismic, etc.)

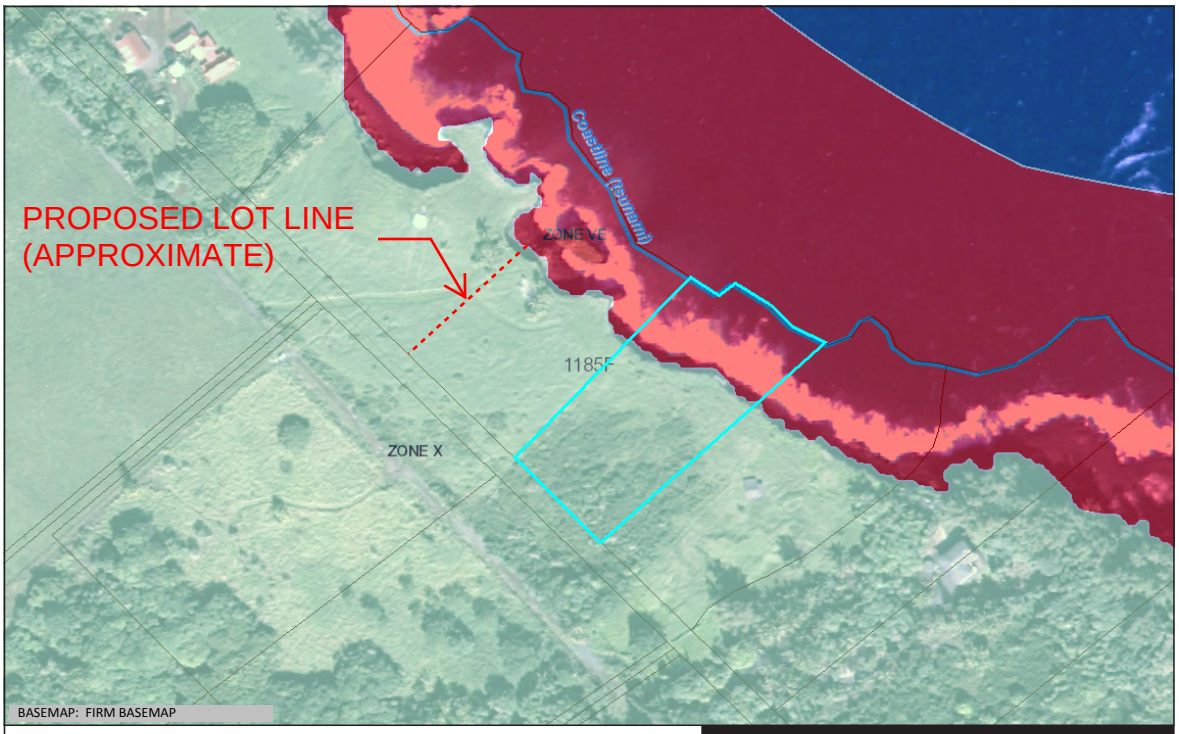
The Subject Property is a shoreline parcel, which may be subject to natural hazards such as erosion, flooding, tsunamis, sea level rise, high waves, and hurricanes.

The Federal Emergency Management Agency (FEMA), Flood Insurance Rate Map (FIRM) classifies the majority of the Subject Property to be in Flood Zone X, which is outside of the 500-year floodplain. The seaward portion of the parcel is in Flood Zone VE, which is within the 100-year coastal flood range (1% chance of occurring in any given year) with velocity hazard (wave action) (**Figure 14**). The Subject Property is also located within the Hawai‘i County Civil Defense Tsunami Evacuation Zone. The State of Hawai‘i Sea Level Rise Viewer shows the Subject Property is outside of the sea level rise exposure area (**Figure 15**).

A Coastal Erosion Study (CES) for Parcels 026 & 027 was conducted by T.E. Scheffler and J.P. Lockwood, which determined an Average Annual Erosion Rate (AAER) of 0.36 feet per year (**Exhibit A**). The shoreline setback is a minimum of 65.2 feet as determined by the AAER of 0.36 ft/year outlined in the CES. This erosion rate is not expected to cause significant impact to the proposed project as all structures are proposed to be sited at least 130 feet from the shoreline and 35 feet above sea level. Therefore, with the proposed mitigations, the proposed project will not be significantly impacted by coastal hazards, nor will it cause impacts to natural shoreline processes.

It is important to note that the coastline at the Subject Property is classified as a “hard” coastline (CES P.20) comprised of solid, less easily weathered substrates, unlike a “soft” coastline consisting of sands and related fine, easily transportable sediments. The CES also notes that the massive block shown below in Figure 21 that is in danger of failure is a good example of how stochastic (random) process characterize the erosion of these hard coasts. Features referenced in the CES and discussed below are shown in **Figure 16**.

Several erosive processes contribute to the current setting of the Subject Property including wave energy, drag, wind, and gravity. Of 5 embayments associated with Parcel 026 and Parcel 027, two embayments have undercutting between 26 and 46 feet deep. **Figures 17 & 18** show a profile/cross-section and photo of the first undercutting cave and **Figures 19 & 20** show the second.



Flood Hazard Assessment Report

www.hawaiinfip.org

FHAT Report

Property Information

COUNTY:	HAWAII
TMK NO:	(3) 1-5-010:027
WATERSHED:	KAAHAKINI
PARCEL ADDRESS:	ADDRESS NOT DETERMINED PAHOA, HI 96778

Notes:

Flood Hazard Information

FIRM INDEX DATE:	SEPTEMBER 29, 2017
LETTER OF MAP CHANGE(S):	NONE
FEMA FIRM PANEL:	1551661185F
PANEL EFFECTIVE DATE:	SEPTEMBER 29, 2017

THIS PROPERTY IS WITHIN A TSUNAMI EVACUTION ZONE: YES
FOR MORE INFO, VISIT: http://www.scd.hawaii.gov/

THIS PROPERTY IS WITHIN A DAM EVACUATION ZONE: NO
FOR MORE INFO, VISIT: http://dlnreng.hawaii.gov/dam/

0 200 400 ft

Disclaimer: The Hawaii Department of Land and Natural Resources (DLNR) assumes no responsibility arising from the use, accuracy, completeness, and timeliness of any information contained in this report. Viewers/Users are responsible for verifying the accuracy of the information and agree to indemnify the DLNR, its officers, and employees from any liability which may arise from its use of its data or information.

If this map has been identified as 'PRELIMINARY', please note that it is being provided for informational purposes and is not to be used for flood insurance rating. Contact your county floodplain manager for flood zone determinations to be used for compliance with local floodplain management regulations.

FLOOD HAZARD ASSESSMENT TOOL LAYER LEGEND
(*Note: legend does not correspond with NFHL)*

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD - The 1% annual chance flood (100-year), also know as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. SFHAs include Zone A, AE, AH, AO, V, and VE. The Base Flood Elevation (BFE) is the water surface elevation of the 1% annual chance flood. Mandatory flood insurance purchase applies in these zones:

	Zone A: No BFE determined.
	Zone AE: BFE determined.
	Zone AH: Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.
	Zone AO: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.
	Zone V: Coastal flood zone with velocity hazard (wave action); no BFE determined.
	Zone VE: Coastal flood zone with velocity hazard (wave action); BFE determined.
	Zone AEF: Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

NON-SPECIAL FLOOD HAZARD AREA - An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

	Zone XS (X shaded): Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
	Zone X: Areas determined to be outside the 0.2% annual chance floodplain.

OTHER FLOOD AREAS

	Zone D: Unstudied areas where flood hazards are undetermined, but flooding is possible. No mandatory flood insurance purchase apply, but coverage is available in participating communities.

Figure 14

Figure 15

3.2 Foot Sea Level Rise Exposure Map

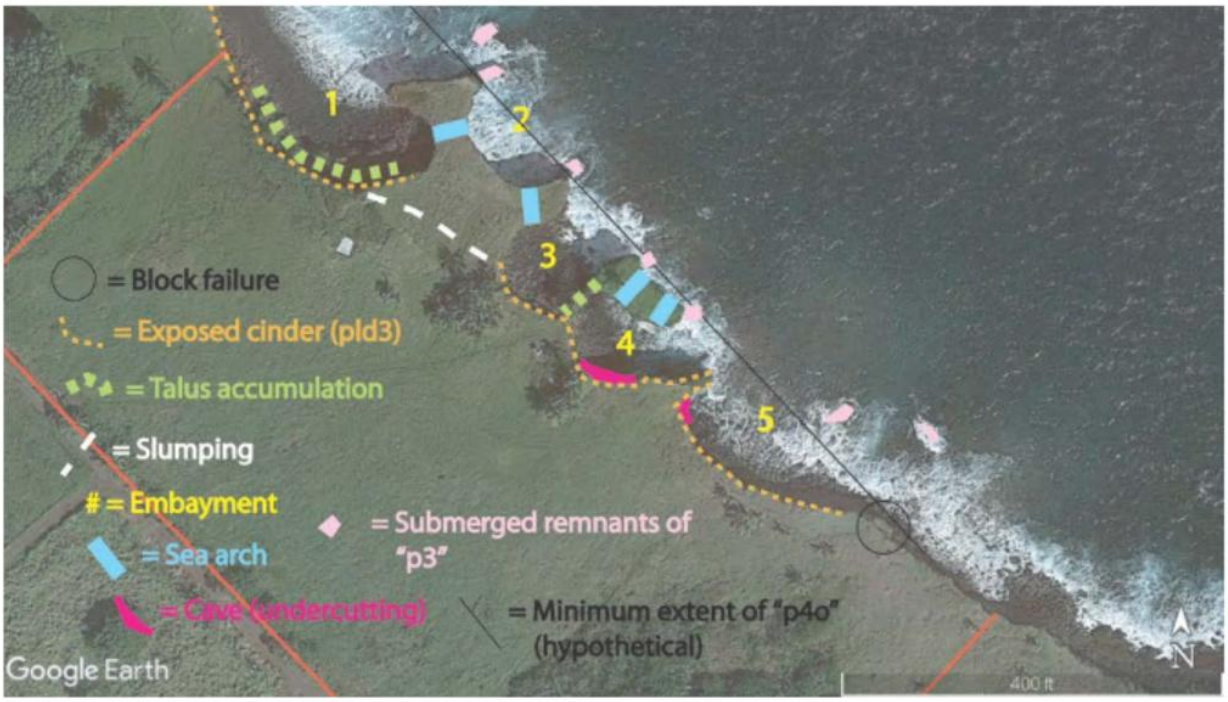


Figure 16 Coastline features referenced in Coastal Erosion Study

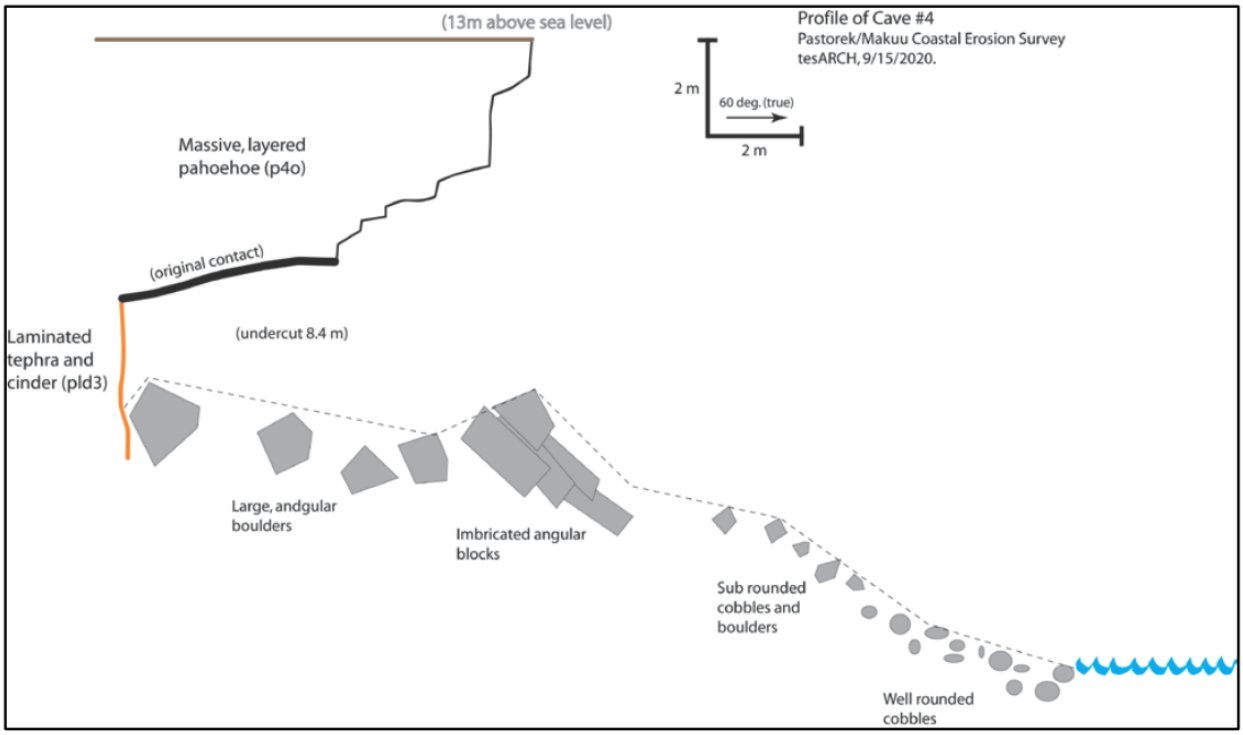


Figure 17: Profile and Cross-section of coastline at Embayment 4

Figure 18: Photo of Undercutting Cave in Embayment 4

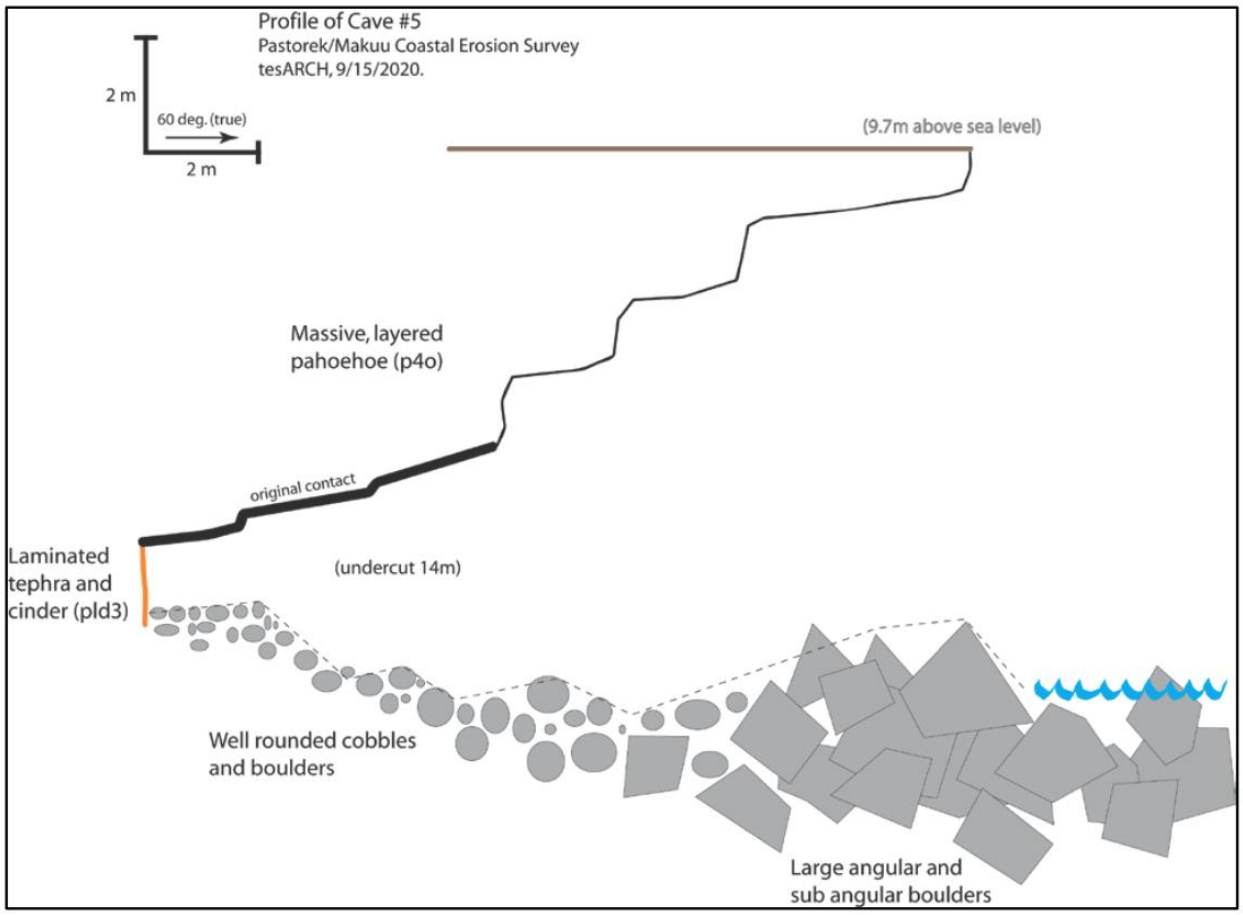


Figure 19: Profile and Cross-section of coastline in Embayment 5

Figure 20: Photo of Undercutting Cave in Embayment 5

Another notable feature of the site is the block failure, which is situated on the southern coastal portion of the Subject Property. This block is at risk of failure but is roughly 130 feet away from any proposed development (**Figure 22**).

Figure 21: Pāhoehoe Block, View to the Northwest

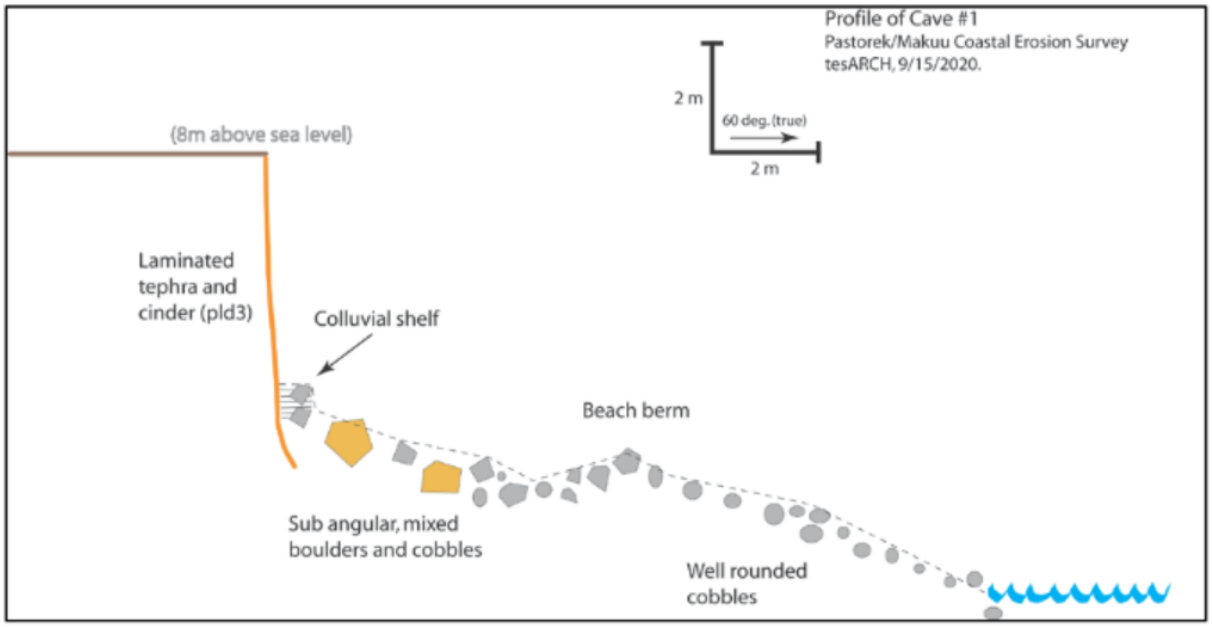


Figure 22 Profile and cross-section of coastline at Embayment 1

OCCL noted in their return letter dated September 3, 2024 that *Based on the submitted information, give (sic) the erosive nature of the embayment 1 that is 0.95-ft/yr., and embayment 3 at 0.46-ft/yr., siting improvements near "friable" land should be reconsidered.*

The CES notes on P.15 that at the sea cliff formed by the littoral cone, this area was not submerged by later lavas (as is the case with the rest of the Subject Property). The CES notes that the friable cinder sits well back and above the water line protected by both a broad cobble beach and berm and by its own colluvial talus that armors its base as shown in **Figure 23**. Nevertheless, if we conservatively use the highest erosion rate estimated along the coastline of 0.95-ft/yr based on Exhibit 4 of HAR 13-5 – Shoreline Setbacks, the required shoreline setback line would be 40 feet plus 70 times the average annual erosion rate (40 + 70 x 0.95 = 106.5 feet). The proposed structure setback from the shoreline on the entire Subject Property (130 feet) comfortably exceeds the most conservative setback by almost 20%, based on the highest estimated erosion rate (and is double the minimum required setback of 65.2 feet).

Additionally, by letter dated October 24, 2023 to OCCL, the applicant has acknowledged the remote location of the Subject Property and the lack of municipal services, including lengthy emergency response time, and assumes the risk associated with those characteristics of the Subject Property (**Exhibit D**). The rugged beauty of the area is the very reason why the applicant was drawn to the property and wishes to make his home there, maintaining the essential character of the land and promoting its conservation. The applicant hereby reaffirms his assumption of the risk of the remote site, and understands and acknowledges that the site is remote, there are no streetlights, access is via a road "in limbo" (which he and his neighbors have been maintaining and coordinating with county officials to help maintain), security and

services must be brought in, and he may have challenges in both implementing the project and living at the Subject Property. Even so, the Subject Property is located between two large subdivisions in the area, and other neighbors currently live on Government Beach Road between those subdivisions.

h. Historic and Cultural Resources

The Puna District was originally one of six chiefdoms or *moku* of the island of Hawai‘i. Puna was not a district that produced any great and powerful chiefs; the area was often controlled by chiefs and rulers from the Hilo District to the north, or the Ka‘u District to the south. Puna is historically known for its rich soils, high rainfall, frequent volcanic activity, and valuable products. Hogs, gray *kapa* cloth (*‘eleuli*), tapas made of *mamaki* bark, fine mats made of young pandanus blossoms (‘*ahuhinalo*), mats made of young pandanus (*Hala*) leaves (*‘ahuao*), and feathers of the *‘o‘o* and *mamo* birds were among the most valuable. Puna was also famous for its abundant *ulu* (breadfruit).

During the Great Māhele (Land Division), only 19 Land Commission awards were granted in the entire Puna District. Of these, 16 awards were made in large tracts to 10 chiefs who lived outside of Puna. The nearby ahupua‘a of Kea‘au was granted to William C. Lunalilo as part of Land Commission award (LCA) 8559-B. There were no LCA’s made in Pōpōkī Ahupua‘a, however three land grants (LG) were purchased along the coast of the Maku‘u, Pōpōkī, and Halona Ahupua‘a. The current project site is a northeastern portion of a 171-acre parcel land grant (LG 1537) that was purchased by Kapohana in 1855.

The old Puna Trail and Puna Trail (Ala Hele Puna)/Old Government Road are historic trails that connected the Hilo district to and throughout the Puna district. The old Puna trail began at the modern-day Lili‘uokalani Gardens in Hilo and ended at Ha‘ena. The old Puna foot trail ran along the eastern coast of the island and ran through various coastal villages. An additional trail called the Puna Trail (Ala Hele Puna), also known as Old Government Road, continued from the south end of the old Puna Trail, and continued south towards the district of Ka‘u. There are three historic trails that border the project area, two of them running mauka-makai and ending at Old Government/Beach Road, north of the project area. The third trail runs parallel to the ocean. However, there are no trails that run through the project area.

In 1881, the entire Kea‘au Ahupua‘a was purchased by William H. Shipman who operated cattle ranches across the island in places such as Kapoho, Waiakea, and Kea‘au. Portions of Kea‘au Ahupua‘a were leased to the Ola‘a Sugar Company in 1899. Shallow soils inhibited sugar cane from being grown on the Subject Property and surrounding land. The area remained largely undeveloped grasslands of invasive species until 1959 when the land north of the project area was purchased by David Watumull from W.H. Shipman Ltd. The land along the coast near the project area is partially developed with single-family residences. The Department of Hawaiian

Homelands (DHHL) and the State of Hawai‘i own much of the land *mauka* of Government Beach Road.

Archaeological Inventory Survey

An Archaeological Inventory Survey of Parcels 026 & 027 was conducted by Glenn G. Escott, M.A., and Thomas Dols, M.A of Scientific Consultant Services Inc (SCS) in November 2019 **(Exhibit B)**. The survey was conducted in accordance with HAR Chapter 13-284 and was performed in compliance with the Rules Governing Minimal Standards for Archaeological Inventory Surveys and Reports as outlined in HAR Chapter 13-276. According to the report by SCS, the investigation included the following procedures:

1. Conducted historical and archaeological archival research including a search of historic maps, aerial photos, written records, Land Commission Award documents, State and County Planning and Tax Records documents, and previous archaeological reports.
2. Conducted limited oral interviews with cultural informants.
3. Carried out a 100% pedestrian survey of the project area.
4. Documented all historic properties identified within the project areas.
5. Assessed all sites for significance and made recommendations for site disposition.

A previous AIS conducted by Glenn Escott in 2019 required consultation of this area by the Kamahele and Lui *‘ohana* at TMK: (3) 1-5-010:009. According to Escott, these interviews are pertinent to Subject Property given the close spatial connection. Consultation with Greg DeConte, Kenneth Ha, Richard Ha, June Ha, Shayne Kamahele, Puanani Mukai, and Darrell Pakele was conducted on Saturday, April 27, 2019. Glenn Escott also spoke with Sheldon Kamahele at an earlier date.

The Historical land-use information gained from the interviews was largely specific to the Kamahele Property (009). However, this information provides insight into historic habitation, farming, ranching, and fishing practices in the Puna District. According to their accounts, the Kamahele *‘ohana* grew citrus, bread fruit, taro, tomatoes, bananas, and watermelons. They also had pigs and cows on the Kamahele Property. Fishing and swimming occurred frequently along the shoreline, although none of the family members were aware of any cultural practices occurring on or near the Kamahele Property, aside from fishing.

The Lui ‘*ohana* including Ramon Lui, Agnes Lui and Nicole Lui was consulted on Wednesday October 30, 2019. The Lui family is descended from Kea, who first owned Land Grant 1014. This land grant was a 56.4-acre property purchased in 1852. Nicole Lui recalled cultural practices associated with Maku‘u Ahupua‘a including dark magic. Subsistence, small-scale commercial agriculture, ranching and fishing were also commonly practiced in the area. Hala was also abundant and used to weave mats.

Pedestrian Survey

A pedestrian survey was conducted by Escott and Dols (2020) by walking a series of northwest/southeast transects spaced two to three meters apart across the entire project area. Sites were plotted with a Garmin GPSMAP64 Global Positioning System (GPS) using Universal Transverse Mercator (UTM) projection (Zone 5 North) and WSGS84 datum. Drawings, photographs, and descriptions were created for all the archaeological sites identified; however, no test excavations were conducted as all features within the project area are rock walls.

Two archeological sites were identified including a rock wall (SIHP Site 50-10-45-18419) parallel to Government Beach Road and a property boundary rock wall (SIHP Site 50-10-45-31185). Rock wall Site #50-10-45-18419 was previously recorded in Charvet-Pond and Rosendahl (1993) and Dircks and Rechtman (2013) surveys.

Site 18419 is a pasture and property boundary wall. The newly recorded site (Site 31185) is a rock wall along the northwest boundary of Parcel 026. **Figure 22** displays the location of both sites. Both sites are Historic to Modern era agriculture and ranching structures and are significant under criterion "D." The "Significance Assessment and Recommendations" for how this was determined can be found in the AIS report in **Exhibit B**. The AIS also shows various portions of Sites 18149 & 31185 and includes profile drawings. Escott and Dols do not recommend any further work at either Site 18419 or 31185. They are confident the AIS is sufficient to warrant this recommendation.

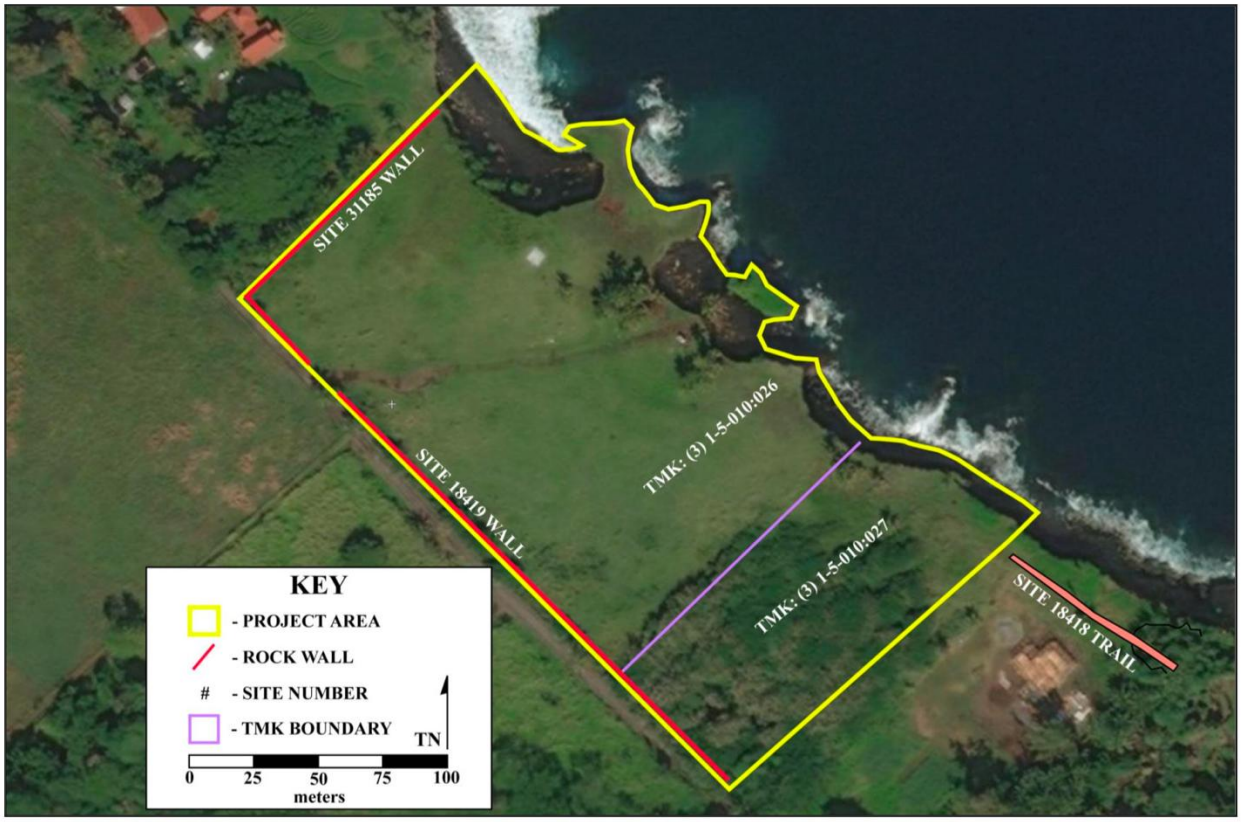


Figure 23: AIS Map Showing the Location of rock walls on Subject Property and trail on neighboring property

Extensive efforts went into searching for the lateral foot trail Site 18418 within the northeast quadrant of Parcel 027. The trail theoretically crosses from Parcel 027 and leads south into TMK 1-5-010: 028 (Parcel 028) to the south. However, the trail is not visible on Parcel 027. Escott and Dols mowed and raked the grass in the northeast quadrant of Parcel 027 where the trail should meet Parcel 028. The ground was level, which suggested the presence of steppingstones or a raised trail. Metal rods were used throughout a one-meter grid to locate possible steppingstones or other trail elements. No such elements were located.

The Nā Ala Hele Trails and Access Program was consulted regarding the pre-historical lateral foot trail paralleling the coast on the adjacent parcel to the south identified as Parcel 028. Although the archaeological review of Parcel 027 did not document any physical evidence of the trail within the Subject Property or Parcel 026, special care should be given along the coastal zone.

Nā Ala Hele acknowledges that while the trail likely crossed both Parcel 026 and Parcel 027, its status as public property cannot be affirmed without any physical, archaeological, or cartographic proof of its existence on the parcels today.

Nevertheless, Nā Ala Hele has requested that the applicant respect and preserve the general area and enable lateral access along the general alignment of where the trail

may be situated. Therefore, lateral access will be allowed across both Parcel 027 and Parcel 026 along the general alignment of where the trail may be. Additionally, no development is proposed within 130 feet of the shoreline, which the Nā Ala Hele program has deemed sufficient to prevent any potential impacts to the trail.

The rock mound identified during Ewart and Luscumb (1974) known as Site #50-10-45-18986 or formerly as Bishop Museum Site #HA-A3-15, was also not present within the project area during this survey.

The two rock walls identified on the Parcels 026 & 027 are similar to neighboring rock walls found during previous surveys. Some sites northwest and southwest of the project are larger complexes that have various agricultural and habitation features. It is evident that the subject Properties do not have the same diversity of features.

Cultural Impact Assessment

A Cultural Impact Assessment (CIA) **Exhibit C** was also prepared for Parcels 026 & 027 by Glenn Escott, M.A. and Thomas Dols, M.A of Scientific Consultant Services Inc. (SCS). Act 50 (H.B. 2895, Act 50, 200) requires an assessment of cultural practices to be included in Environmental Assessments and Environmental Impact Statements and to be taken into consideration during the planning process. According to Escott and Dols (2020), "this CIA evaluates the probability of impacts on identified cultural resources, including values, rights, beliefs, objects, records, properties and stories occurring within the project area and its vicinity." The CIA was prepared in accordance with the protocol provided in "Guidelines for Assessing Cultural Impacts" (OEQC, 1997).

<u>Consultation</u>

SCS used a combination of archival research and interviews. Interviews are conducted in accordance with applicable state laws and guidelines. According to SCS, "letters with maps and descriptions of the project area were sent to individuals and organizations whose jurisdiction includes knowledge of the area with an invitation for consultation." Consultation was sought from:

- Kamaile Puluole-Mitchell, Office of Hawaiian Affairs (OHA) East Hawai‘i Island Representative.
- Jordan Kea Calpito, SHPD Burial Sites Specialist.
- Sean Naleimaile, State Historic Preservation Division (SHPD) Hawai‘i Island Archaeologist.
- Kalena Blakemore, Hawai‘i Island Burial Council (HIBC) Member.
- Consultation was also conducted near the project area with members of the Kamahele and Lui families during the AIS discussed above.

In addition, public notices were published in Honolulu Star-Advertiser, the Hawai‘i Tribune Herald, and West Hawai‘i Today. These notices can be found in the

appendices of the CIA report. No public responses were collected from the public notices. **Table 4: Individual Responses to CIA Consultation Request** represents the individuals and organizations who were contacted directly for CIA consultation request. No additional information was collected outside of the recounts from the Kamahele and Lui families, which were discussed above.

Table 4: Individual Responses to CIA Consultation Request

Name	Affiliation	Responded	Has Knowledge	Cultural Practices
Kalena Blakemore	HIBC Representative	Yes	Some	No
Kamaile Puluole-Mitchell	OHA East Hawai‘i	No	–	–
Sean Naleimaile	SHPD Archaeologist	No	–	–
Jordan Kea Calpito	SHPD Burial Sites Specialist	Yes	No	–
Greg DeConte	Kamahele Family Member	Yes	Yes	Yes
Kenneth Ha	Kamahele Family Member	Yes	Yes	Yes
Richard Ha	Kamahele Family Member	Yes	Yes	Yes
June Ha	Kamahele Family Member	Yes	Yes	Yes
Shayne Kamahele	Kamahele Family Member	Yes	Yes	Yes
Darrell Pakele	Kamahele Family Member	Yes	Yes	Yes
Puanani Mukai	Kamahele's Caretaker	Yes	Yes	Yes
Ramon Lui	Kea Family Descendant	Yes	Yes	Yes
Agnes Lui	Kea Family Descendant	Yes	Yes	Yes
Nicole Lui	Kea Family Descendant	Yes	Yes	Yes

Consultation with the Kamahele and Lui families noted that fishing, collecting *‘opihi*, and collecting *hala* leaves for weaving mats were important practices in the larger Maku‘u region. No plants on the Subject Property were identified as traditionally collected by Hawaiian people. Fishing and ocean resources are accessible for traditional uses. Lateral access across the Subject Property along the shoreline will be available to the public.

The historical research and responses outlined in both the AIS and CIA identified no past or ongoing cultural practices on the Subject Property. However, cultural practices such as fishing and gathering of ocean resources continue to be an important practice in the wider Maku‘u region. Since the property owner will not prevent lateral shoreline access, traditional cultural practices within the project and wider area will

not be affected. Therefore, no direct adverse effect upon cultural resources, practices, or beliefs are anticipated.

III. Evaluation Criteria

The Department or board will evaluate the merits of a proposed land use based upon the following eight criteria (ref § 13-5-30(c)).

1. **The purpose of the Conservation District is to conserve, protect, and preserve the important natural and cultural resources of the State through appropriate management and use to promote their long-term sustainability and the public health, safety, and welfare (ref § 13-5-1). How is the proposed land use consistent with the purpose of the conservation district?**

   The proposed residential use of the Subject Property will allow the applicant to manage and maintain the property through preservation of the natural characteristics of the land and effective land management, control the spread of invasive species, protect costal resources, propagate and enhance native species and support open space characteristics of the Subject Property that are intrinsic to its natural beauty. In addition, allowing the applicant to build a home and use the Subject Property residentially will prevent the previous problems of vagrant use of the site and surrounding areas (including within the Conservation District) that led to despoiling the natural beauty of the land. The applicant's presence on the Subject Property will help discourage illegal dumping that has historically occurred (and continues to occur) along Government Beach Road and would consequently help maintain a cleaner and safer environment for the public. For these reasons the proposed use will be beneficial to the health, safety and welfare of the area.

   The proposed project will practice an overall conservation ethic by implementing mitigating measures and BMPs to prevent impacts to soil, water and air quality on the Subject Property and to the surrounding watershed. The proposed use will not have any impact on public access to coastal resources.

   Single-family residences must also conform to design standards as outlined in HAR § 13-5-24, R-7 Single Family Residence (D-1). The site plans have been thoughtfully developed in accordance with design standards that prioritize harmonizing with the natural features of the site and protecting natural resources. Natural design features for this residence include stone walls, natural wood patina, dark windows, and natural colored roofing. Furthermore, careful site selection and thoughtful design will minimize disruption to natural habitats, preserving the ecological integrity of the area. By orienting the home to maximize natural light and ventilation, the applicant can enhance energy efficiency while promoting a healthier living environment.

   No native, endangered, or threatened species were detected on the Subject Property, however, BMPs to protect any sensitive fauna will be strictly followed. The applicant intends to maintain and enhance the natural features of the site by planting native

flora and preserving native fauna habitat. Approximately 11,980 square feet will be used for landscaped areas using native plants and fruit trees that are consistent with HAR Chapter 13-5 rules and regulations. Landscaping activities will be done with minimal ground and soil disturbance. Best Management Practices and mitigating measures to prevent the spread of Rapid Ohi'a Death will be strictly followed.

Building one (1) single-family residence and supporting infrastructure on the Subject Property will not have a substantial adverse effect on public health or safety. While the area is rural and there is ample distance between neighboring homes, there are other residences nearby, including other homes built within (and under the rules of) the Conservation District. No other aspect of this development is expected to impact natural and cultural resources, public health, safety, or welfare.

The applicant is committed to managing the site to help conserve, protect and preserve the natural and cultural resources that may be present on or near the Subject Property. These natural and cultural resources associated with the area are coastal resources and lateral shoreline access for public use. The proposed use will not impact coastline natural resources or impact lateral shoreline access. In fact, stewardship of the Subject Property and area will help to avoid impacts to coastal resources that would occur through illegal dumping. Stewardship of the Subject Property will also preserve the seaward portion and prevent it from being overrun by invasive species. This, in turn, will preserve the public lateral shoreline access and scenic views along the shoreline fronting the Subject Property.

In fact, the proposed single-family residence would actually increase public health and safety and will advance the Conservation District objectives by exemplifying the responsible management of natural and cultural resources, through energy efficiency, use of sustainable materials, restoration of native flora, and community integration. Enhanced stewardship associated with residential use of the Subject Property will provide a much-needed presence in the community and will help to alleviate problems of illegal dumping, car fires and other illegal activities, which would be beneficial to the health, safety and welfare of the community. The applicant intends to play an active role in preserving the environment both on the Subject Property and in the surrounding neighborhood for future generations, ultimately enhancing public health, safety, and welfare.

This and the following evaluation criteria were also discussed in Section 3.6.3 of the Final Environmental Assessment for the proposed project.

2. How is the proposed land use consistent with the objectives of the subzone of the land on which the use will occur? (*ref §13-5-11 through §13-5-15*).

The Subject Property lies in the Resource Subzone. According to HAR § 13-5-13, the objective of the Resource Subzone is to "develop, with proper management, areas to ensure sustained use of the natural resources of those areas."

The proposed project is consistent with identified land uses in the Resource Subzone as outlined in § 13-5-22 through § 13-5-24 and discussed in the Project Description and Proposed Use (Section I).
Single family residences are an identified use in the Resource Subzone under HAR 13-5-24 R-8 (D-1) *A single family residence that conforms to the design standards outlined in this chapter.*

The design of the proposed single-family residence conforms to the design standards set forth in 13-5-41 and contained in Exhibit 4 entitled "Single Family Residential Standards: August 12, 2011". Conformance to these standards and adherence to the Best Management Practices outlined in Section V. g. below, will ensure the sustained use of the natural resources in the project area by mitigating potential impacts as described in this application and the attached Environmental Assessment. Further, construction of the applicant's residence on the Subject Property will allow for enhanced stewardship, monitoring and management of the land in a manner that is protective of the natural resources present.

The proposed residence will comply with the Maximum Developable Area of 5,000 square-feet and maximum height of 25-feet consistent with Exhibit 4. The minimum side front and shoreline setbacks will be complied with as well. The proposed shoreline setback of a minimum of 130-feet is approximately twice the required shoreline setback determined by the Coastal Erosion Study. Further, in conformance with the design standards, the proposed residence has been designed to be compatible with the surrounding environment by employing the following elements:

- Landscaping with primarily native species will help blend the residence with the surrounding environment while preserving open space and preventing blocking of views from Government Beach Road and neighboring properties.

- Using a previously cleared area and limiting the area of disturbance to only areas required for construction of the residence and supporting infrastructure, minimizes the impacts of the residence.

- Siting and design of the proposed residence has taken into consideration existing topography, minimizing the extent of grading required.

- The proposed residence will utilize a Department of Health approved Individual Wastewater System, minimizing potential impacts to water quality.

- The proposed residence will utilize earth tones for roof and building colors, and natural, locally-sourced, materials as much as possible.

- The project will conform with all applicable building and grading codes and setback requirements.

The proposed project is consistent with the objectives of the Resource Subzone since, with proper mitigating measures and management, and conformance to the Department's design standards for a single-family residence the project will not adversely affect the natural resources of the area.

3. Describe how the proposed land use complies with the provisions and guidelines contained in chapter 205A, Hawai'i Revised Statues (HRS), entitled "Coastal Zone Management" (*see 205A objectives on p. 9*).

The Subject Property is located along the shoreline and entirely within the Special Management Area (SMA). A Special Management Area Use Permit was approved for the proposed project by the Hawai'i County Windward Planning Commission on June 6, 2024. (**Exhibit E**)

The proposed project is consistent with pertinent policies and objectives of the State's Coastal Zone Management requirements under Chapter 205A, (HRS), discussed in section 3.6.2 of the Project FEA and as follows:

Recreational Resources: *Provides coastal recreational opportunities accessible to the public.*

Fishing and gathering of ocean resources is a significant practice in the wider Maku'u area. The shoreline at the end of Maku'u Drive is used frequently for fishing and gathering of ocean resources. This area is located over 1 mile from the Subject Property and will not be impacted by the proposed project. Although there are no sandy beaches or safe access to the ocean from the Subject Property, lateral shoreline access will not be impeded. Public Access and recreational resources are discussed in sections 3.2.2 and 3.6.2 of the Project FEA.

Historic Resources: *Protect, preserve, and where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.*

The development of one (1) single-family residence and supporting infrastructure on the Subject Property is unlikely to have adverse impact to historic, archaeological, or cultural resources. An AIS determined that there are rock walls bordering the Subject Property but recommended no further action to mitigate potential impacts to the walls, which would include a single breach for the proposed driveway access. Given the thorough documentation within the AIS, there would be no adverse effects to historic sites. Based on the CIA there would be no valuable cultural resources and practices such as shoreline access, fishing, gathering, hunting or access to ceremonial sites that would be adversely affected by the proposed project. Further in the unlikely event any other undocumented archaeological resources are discovered during construction, all work will halt in the vicinity of the find, and the State Historic Preservation Division will be

contacted immediately for appropriate action. Cultural and Historic resources are discussed in sections 3.2.2 and 3.6.2 of the Project FEA.

Scenic and Open Space Resources: *Protect, preserve, and where desirable, restore or improve the quality of coastal scenic and open space resources.*

The proposed project will have only minor and short-term impacts to scenic resources during the construction phase. After the proposed project is complete, no adverse impacts to scenic or open resources are expected to occur. The proposed use of a single-family residence is consistent with other residential development along this section of shoreline. The Subject Property has been impacted previously by clearing and grazing for some time. The proposed project aims to improve the overall character of the overgrown and un-managed land. The proposed project will not impact existing access along the shoreline and is designed to be sited a significant distance from the shoreline. The proposed landscape plans have been designed to strategically screen the proposed residence from view and lessen potential impacts to scenic resources and the natural flow of the Tradewinds. Scenic and Open Space resources are discussed in sections 3.6.1 and 3.6.2 of the Project FEA.

Coastal Ecosystems: *Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.*

The proposed house site is set back a minimum of 130 feet from the shoreline pali which will mitigate potential hazards associated with sea level rise and any further erosion along the shoreline. The proposed project, with the proposed mitigations and BMPs, would not produce adverse effects on the environment or the natural resources of the region. The proposed construction of one single-family dwelling on the Subject Property would be consistent with the use of neighboring parcels, which are residential and agricultural in nature. The dwelling would use a Department of Health approved Individual Wastewater System located approximately 250-feet back from the shoreline, protecting coastal ecosystems from potential impacts from wastewater. BMPs for erosion prevention and storm water control during construction will be strictly followed. Further, all environmental regulations and best management practices would be followed, further minimizing the potential environmental impact of the project. Coastal Ecosystems are discussed in sections 3.1.2, 3.1.3, 3.1.4, 3.6.1 and 3.6.2 of the Project FEA.

Economic Uses: *Provide public or private facilities and improvements important to the State's economy in suitable locations.*

The proposed project would provide temporary employment for local construction workers and would support the local economy through the purchase of local construction materials. This would provide opportunity for local businesses to thrive and gain income. Overall, the project would stimulate and support the

general economic stability and development of Hawai‘i Island and more specifically the Maku‘u community.

Coastal Hazards: *Reduce hazard to life and property from coastal hazards and, stream flooding.*

The Subject Property is a shoreline parcel, which may be subject to natural hazards such as erosion, flooding, tsunamis, sea level rise, high waves, and hurricanes.

The Federal Emergency Management Agency (FEMA), Flood Insurance Rate Map (FIRM) classifies the majority of the Subject Property to be in Flood Zone X, which is outside of the 500-year floodplain. The seaward portion of the parcel is in Flood Zone VE, which is within the 100-year coastal flood range (1% chance of occurring in any given year) with velocity hazard (wave action). The Subject Property is also located within the Hawai‘i County Civil Defense Tsunami Evacuation Zone. The State of Hawai‘i Sea Level Rise Viewer shows the Subject Property is outside of the sea level rise exposure area.

A Coastal Erosion Study (CES) for Parcels 026 & 027 was conducted by T.E. Scheffler and J.P. Lockwood, which determined an Average Annual Erosion Rate (AAER) of 0.36 feet per year (**Exhibit A**). The shoreline setback is a minimum of 65.2 feet as determined by the AAER of 0.36 ft/year outlined in the CES. This erosion rate is not expected to cause significant impact to the proposed project as all structures are proposed to be sited at least 130 feet from the shoreline and 35 feet above sea level. Therefore, with the proposed mitigations, the proposed project is very unlikely to be significantly impacted by coastal hazards, nor will it cause impacts to natural shoreline processes.

Due to the location of the proposed building site, the single-family residence and supporting infrastructure are not expected to be impacted by significant flooding or coastal hazards. All structures will be in Flood Zone X, or outside of the 500-year flood area. The applicant agrees that tsunami, storms, sea level rise and seismic/volcanic activity are uncontrollable. Coastal hazards are inherent along the Puna coastline and are shared by all property owners in the area, including the other adjacent residences in the Conservation District.

Coastal hazards can be reduced and mitigated when following the applicable and proper rules and regulations, which will be adhered to by the applicant and contractor. All structures will be set back at least 130 feet from the shoreline, which will reduce and mitigate many of the potential impacts, including erosion. Coastal Hazards are discussed in sections 3.1.2 and 3.6.1 of the Project FEA.

Managing Development: *Improve the development review process, communication, and public participation in the management of coastal resources and hazards.*

To date there have been two main opportunities for public participation in the review process, through the Environmental Assessment and Special Management Area Permitting processes. Comments from neighboring property owners that expressed concern about the potential impacts to scenic views and tradewind flow across the project area prompted a significant redesign of the proposed landscaping that resulted in the total landscaped areas being reduced by over 50%, the overall number of proposed landscaping species was reduced by 30%, several alien species were eliminated and replaced with native species chosen to have shorter potential heights. Additionally, immediate neighbors of the project expressed support for the proposed project (**Exhibit F).**

Public Participation: *Stimulate public awareness, education, and participation in coastal zone management.*

Again, to date there have been two main opportunities for public participation in the review process, through the Environmental Assessment and Special Management Area Permitting processes. Comments gathered through those processes have helped shape the conceptual development of the project as noted above.

Additional opportunity for public awareness and participation will occur through the public hearing conducted as part of the Conservation District Use Permit process.

Beach Protection: *Protect beaches and coastal dunes for public use and recreation; the benefit of coastal ecosystems; and use as natural buffers against coastal hazards.*

As there are no beaches or coastal dunes on or proximate to the Subject Property, there will be no feasible impacts on beach protection. Nevertheless, all proposed development will be sited over 130 feet from the shoreline and public access along the shoreline will not be affected.

Marine Resources: *Promote the protection, use, and development of marine and coastal resources to assure their sustainability.*

No adverse impacts to marine and coastal resources are expected due to mitigating measures and Best Management Practices including proper management of storm water runoff and erosion control. The proposed single-family residence would be served by an Individual Wastewater System in compliance with Department of Health regulations. Temporary and minor impacts to air and water quality are expected during the construction phase but will be mitigated according to all state and federal rules and regulations. All structures will be sited at least 130 feet from the shoreline, which will minimize any risk to coastal resources.

Again, a Special Management Area Use Permit was approved for the proposed project by the Hawai‘i County Windward Planning Commission on June 6, 2024. By complying with the conditions placed on the SMA Use Permit the project will be fully compliant with the provisions of Chapter 205A pertaining to Coastal Zone Management and Special Management Areas.

4. Describe how the proposed land use will not cause substantial adverse impact to existing natural resources within the surrounding area, community, or region.

The proposed land use will not cause substantial adverse impact to existing natural resources. The applicant intends to utilize a previously cleared portion of the land consisting only of introduced grasses, for residential purposes, which is consistent with permitted uses within the Resource Subzone and consistent with uses on neighboring properties. No trees, shrubs, and most importantly, no native species will otherwise be affected.

The proposed home has been designed to blend with the natural landscape, screened by primarily native landscaping, without the need for extensive grubbing and grading or tree removal. The proposed home has been sited to avoid sensitive areas near the shoreline and areas that may experience occasional ponding. The limited footprint of the dwelling, consistent with the Maximum Developable Area established in Exhibit 4 of HAR 13-5, ensures that the vast majority of the Subject Property remains in a natural state, preserving ecosystem functions.

The home is envisioned to incorporate locally sourced sustainable materials such as lava rock and locally milled hardwoods, reducing demands for non-renewable and imported resources. Construction waste will be minimized through careful planning, recycling, and reuse of materials where possible. The proposed permeable gravel driveway and rainwater harvesting system will be employed to manage stormwater and reduce runoff, thereby preventing soil erosion and protecting near shore water quality.

The proposed home will be built to high energy efficiency standards, incorporating solar power and solar hot water systems. This will reduce the environmental footprint of the home in terms of energy consumption and pollution over the long term.

The proposed project would significantly increase native vegetation on the Subject Property enhancing native ecosystem services and habitat. The proposed house site would utilize a previously cleared area, eliminating any impacts of new clearing. Proposed landscaping species have been screened for invasiveness and no invasive species will be planted. Construction activities will also be timed to avoid disruption to sensitive wildlife species, specifically:

- Construction will not disturb or remove shrubs or trees taller than 15 feet between June 1 and September 15, during which time Hawaiian hoary bats may be sensitive to disturbance

- If land clearing occurs between March and September (inclusive), a pre-construction hawk nest search will be conducted by a qualified ornithologist using standard methods. If Hawaiian hawk nests are present, no land clearing will be allowed until October, after hawk nestlings have fledged.

- Any exterior lighting will be shielded from shining into the sky to prevent possible disorientation of seabirds.

The proposed project will also strictly adhere to County, State and National environmental guidelines, ensuring that all mitigation measures are in place to prevent environmental impacts.

The planning process has included consultation with State and County agencies as well as area neighbors and other stakeholders to ensure the project aligns with conservation and community objectives. For example, the landscaping plans were significantly modified in response to concerns expressed by some neighbors with respect to view and trade wind flow impacts. This open communication and adjustment of the plans has helped to minimize concerns and ensure the project integrates harmoniously with the area.

The shoreline setback is a minimum of 65.2 feet as determined by the AAER of 0.36 ft/year outlined in the CES. All structures will be set back at least 130 feet from the certified shoreline. No work, activities, storage, or staging of materials will occur within the 65.2-foot minimum shoreline setback, including fencing, animal husbandry, or minor construction. No adverse impacts are anticipated on the coastal environment due to the physical and topographic separation between the proposed house site and the shoreline. The shoreline setback area will be protected and left undisturbed and proposed precautions will prevent soil runoff during construction.

The proposed land use is compatible with the locality and surrounding area, which supports residences. Other Conservation District Use Permits have been approved in the immediate and surrounding areas, other homes have been built nearby under the rules of the Conservation District, and immediate neighbors to the Subject Property have expressed their support for the project, demonstrating its compatibility with the area. The home will not have significant impact to water quality, scenic or other natural resources because mitigating measures and Best Management Practices will protect all existing flora and fauna, soil, and water resources. Further, the proposed project completed the Environmental Assessment and Special Management Area permitting processes, and both found that no significant primary, secondary or cumulative impacts are expected with the request. Therefore, with careful site planning and design of the residence along with the applicant's commitment to the conservation and responsible management of the Subject Property, the proposed use will effectively conserve, protect, and preserve the natural resources of the area.

5. **Describe how the proposed land use, including buildings, structures, and facilities, is compatible with the locality and surrounding areas, appropriate to the physical conditions and capabilities of the specific parcel or parcels.**

Presently, there are several farms, ranches, homesteads, and residences along Government Beach Road in the vicinity of the Subject Property. The proposed land use is residential and agricultural in nature and is consistent with other residential uses approved in the Conservation District in the area (including those immediately to the north and the south of the Subject Property). This land use is compatible with the locality and surrounding areas, which range from ranching to small scale agriculture and residences. While the area is rural and agricultural it is also home to large agricultural/residential subdivisions such as the Hawaiian Paradise Park (HPP) subdivision approximately 1 mile to the northwest and the Hawaiian Beaches subdivision approximately 2.3 miles to the southeast of the Subject Property. HPP contains approximately 8,800 lots and is one of the largest subdivisions in the State covering around 15,000 acres of land with lots generally ranging in size from one to three acres in size. The Hawaiian Beaches subdivision consists of approximately 3,500 lots with lot sizes typically around 7,500 to 9,000 square feet in area.

Figure 24 Aerial View of Surrounding Areas to Subject Property

This is not the first home in the area or on the street, and it complies with the Maximum Developable Area. In fact, shoreline parcels within the conservation district on either side of parcels 026 & 027 have been developed with single family

residences similar to the one proposed. Each of these neighbors have submitted supportive testimony for the proposed project attesting to the compatibility of the proposed project with the locality and surrounding area.

The proposed single-family residence conforms to all design standards outlined in HAR Chapter 13-5. Minimum setbacks and height restrictions will be met for the proposed single-family residence. The residence will be served by utilities including gas, electricity, and water lines. One (1) well is proposed to provide drinking water. Landscaping will be placed specifically to screen structures. Several features have been implemented into the site plans to conform to design standards that blend in with the natural features of the site and provide sustainable functions. Natural design features for this residence include stone walls, natural wood patina, dark windows, and natural colored roofing.

Landscaping plants have been carefully selected and are all considered "Pono Plants." Further, a landscape schedule will be followed to ensure conformity with HAR Chapter 13-5 guidelines. Therefore, the proposed project would allow for residential use of the Subject Property in a manner that is compatible with the character of the surrounding area and is appropriate to the physical conditions and capabilities of the Subject Property.

6. Describe how the existing physical and environmental aspects of the land, such as natural beauty and open space characteristics will be preserved or improved upon.

The proposed home has been designed to blend with the natural landscape, screened by primarily native landscaping, without the need for excessive grubbing and grading or tree removal. The proposed home has been sited to avoid sensitive areas near the shoreline and areas that may experience occasional ponding, as well as to eliminate the need for any clearing of vegetation. The limited footprint of the dwelling, consistent with the Maximum Developable Area established in Exhibit 4 of HAR 13-5, ensures that the vast majority of the Subject Property remains in a natural state, preserving ecosystem function, as well as the natural beauty of the land.

The home is envisioned to incorporate locally sourced sustainable materials such as lava rock and locally milled hardwoods, reducing demands for non-renewable resources and blending the residence with the surrounding environment.
The proposed landscaping will cover approximately 11,980 square feet and has been designed with the intention of preserving open space while screening views of the house from surrounding properties and the road. The proposed project would significantly increase native vegetation on the Subject Property enhancing native ecosystem services and habitat, but will also preserve the open space of the Subject Property, ensuring that most of the existing ocean views from Government Beach Road and ocean trade winds will remain. Proposed landscaping species have been screened for invasiveness and no invasive species will be planted. Vegetation along Government Beach Road will be maintained and will not encroach onto the road.

The planning process has included consultation with State and County agencies as well as area neighbors and other stakeholders to ensure the project aligns with conservation and community objectives. For example, the landscaping plans were significantly modified to accommodate concerns expressed by some neighbors with respect to ocean view and trade wind flow impacts. This open communication and adjustment of the plans has helped to minimize concerns and ensure the project integrates harmoniously with the area.

In addition, enhanced stewardship associated with residential use of the Subject Property will provide a much-needed caring presence in the community and will help to alleviate problems of illegal dumping, car fires and other illegal activities, the absence of which will enhance the natural beauty of the area. The applicant intends to play an active role in preserving the environment both on the Subject Property and in the surrounding neighborhood for future generations, ultimately enhancing public health, safety, and welfare.

7. If applicable, describe how subdivision of land will not be utilized to increase the intensity of land uses in the Conservation District.

The request to consolidate and re-subdivide will not be utilized to increase the density or intensity of land use allowed within the Conservation District on either Parcel 027 or Parcel 026, as both are legal lots of record, and both may be developed with single family residences with the proper permitting. The request to consolidate and re-subdivide will result in the same number of parcels currently existing.

The proposed consolidation and re-subdivision would promote conservation by the gradual conversion of the dense wooded area on Parcel 027, which is currently comprised of primarily invasive species to a native coastal habitat. Without the consolidation and re-subdivision, non-native plants would be removed to allow for a residence, driveway and utilities, but it would also prevent a significant portion of the non-native forest from being converted to a native forest (to allow for a residence, driveway and utilities). Thus, the proposed consolidation and re-subdivision plan is clearly more in line with the mission of the District and promotes better conservation and stewardship of the Subject Property. To the extent any endangered species such as the Hawaiian hoary bat (L*asiurus cinereus semotus*), or the State listed and formerly Federally endangered Hawaiian hawk (*Buteo solitarius)* utilize the current wooded area, the gradual replacement with native species would encourage continued use by such species without otherwise immediately destroying their existing habitat. Otherwise, it is likely that construction within the wooded area on Parcel 027 would result in more adverse impact to potential native or endangered species that may fly over, roost or utilize the resources of Parcel 027.

The applicant understands DLNR Office of Conservation and Coastal Land (OCCL) may have reservations about the proposed consolidation and re-subdivision, however this is a permitted use in the Resource Subzone in accordance with HAR § 13-5-22(b)

(P-10) (C-1) (consolidation and re-subdivision into an equal number of lots that does not result in increased density) and 13-5-24(a) & (b)(R-7)(D-1) (a single family residence that conforms to design standards as outlined in this chapter), and would not cause a greater density or intensity of use of land, and it would not otherwise be detrimental to the land, or the public safety, health or welfare. The parcels would start and end with the same total area (overall as between the two parcels) and same number of lots. The consolidation and re-subdivision would actually reduce the intensity of use of the land by minimizing the overall footprint of the building layout on Parcel 27.

In addition, considering the relative dimensions of both Parcel 26 (wider) and Parcel 27 (narrow), building a residence closer to the boundary of Parcel 27 and the neighboring property to the south, may initiate more change to the characteristics of the immediate neighborhood rather than building a residence further to the north and maintaining a healthy distance from southern neighbor and continuing the less-dense feel of the neighborhood.

Further, OCCL indicated that retaining the non-native forest does not promote conservation. The applicants for Parcel 026 and Parcel 027 are willing to work together to develop and implement a plan to gradually (over a period of three years) convert the non-native forest to a native forest area (with native hala and other site specific appropriate native vegetation) . Plans for invasive species removal and native species planting are detailed within this application. This would be a more conservative approach, would minimize impact to the land, flora and fauna, would allow an interconnected ecosystem to adjust and adapt over time and would align with the mission of conserving, protecting, preserving such resources within the District.

Based on the discussion above, the proposed consolidation and re-subdivision would not increase the intensity of land use in the Conservation District.

8. Describe how the proposed land use will not be materially detrimental to the public health, safety, and welfare.

Building one (1) single-family residence and supporting infrastructure on the Subject Property will not have an adverse effect on public health. As discussed, minimal and short-term impacts to air quality may occur during the construction phase, however, mitigating measures and Best Management Practices will be followed to minimize these impacts. The area is rural and there is ample distance between neighboring homes under this proposed action. No other aspect of the proposed use is expected to impact public health, safety, or welfare.

In fact, the proposed single-family residence would actually increase public health, safety and welfare and will advance the Conservation District objectives by exemplifying the responsible management of natural and cultural resources, through energy efficiency, use of sustainable materials, and community integration. A

residential presence and enhanced stewardship associated with residential use of the Subject Property will provide a much-needed presence in the community and will help to alleviate problems of illegal dumping, car fires and other illegal activities, all of which are beneficial to the health, safety and welfare of the community. The applicant intends to play an active role in preserving the environment both on the Subject Property and in the surrounding neighborhood for future generations, ultimately enhancing public health, safety, and welfare.

IV. Cultural Impacts

Articles IX and XII of the State Constitution, other state laws, and the courts of the State, required government agencies to promote and preserve cultural beliefs, practices, and resources of Native Hawaiians and other ethnic groups.

a. Please provide the identity and scope of cultural, historical, and natural resources in which traditional and customary native Hawaiian rights are exercised in the area.

The Subject Property does not contain any springs, land features, or caves that might be of cultural importance and an archaeological survey of the proposed construction site and surrounding area found no evidence of archaeological resources or features that might be of cultural significance. No gathering of plant material has been identified on the Subject Property. The small amount of native vegetation on the Subject Property will not be disturbed during the proposed project.

A Cultural Impact Assessment of the Subject Property and its history did not reveal any cultural resources or practices specifically associated with the Subject Property. The consulted individuals with ties to and history with the area could not identify any cultural practices associated with the Subject Property. The proposed use will not impact public uses along the shoreline.

b. Identify the extent to which those resources, including traditional and customary Native Hawaiian rights, will be affected or impaired by the proposed action.

As noted, based on the findings of the Archaeological Inventory Survey and Cultural Impact Assessment, no known traditional or customary Native Hawaiian rights will be affected or impaired by the proposed action. Given the proposed shoreline setbacks, lateral public access along the shoreline will not be impacted by the proposed use.

c. What feasible action, if any, could be taken by the Board of Land and Natural Resources regarding your application to reasonably protect Native Hawaii rights?

The Board of Land and Natural Resources (BLNR) can ensure that the approved work in no way affects or impairs Native Hawaiian rights through its permitting process for the Conservation District and through the applicant's agreement to comply with the requirements of the Conservation District Use Permit.

The applicant is aware that the exercise of traditional, customary or religious practices of native Hawaiians in the immediate area of the Subject Property is provided for by the State Constitution and State law, and expects that a condition ensuring that the protection of such practices will be codified within the Conservation District Use Permit.

V. Other Impacts

a. Does the proposed land use have an effect (positive/negative) on public access to and along the shoreline or along any public trail?

The Nā Ala Hele Trails and Access Program was consulted regarding the pre-historical lateral foot trail paralleling the coast on the adjacent parcel to the south identified as TMK (3) 1-5-010: 028. Although the archaeological review of Parcel 027 did not document any physical evidence of the trail within the Subject Property, special care should be given along the coastal zone.

Nā Ala Hele acknowledges that while the trail likely crossed both Parcel 027 and Parcel 026 to the north, its status as public property cannot be affirmed without any physical, archaeological, or cartographic proof of its existence on the parcels today.

Nevertheless, Nā Ala Hele has requested that the applicant respect and preserve the general area and enable lateral access along the general alignment of where the trail may be situated. Therefore, lateral access will be allowed across both the Subject Property and Parcel 026 along the general alignment of where the trail may be. Additionally, no development is proposed within 130 feet of the shoreline, which the Nā Ala Hele program has deemed sufficient to prevent any potential impacts to the trail.

There is no safe access to the water along the shoreline fronting the Subject Property due to treacherous cliffs. Although there are no sandy beaches or safe access to the ocean from the Subject Property, lateral shoreline access will not be impeded. Public Access and recreational resources are discussed in sections 3.2.2 and 3.6.2 of the Project FEA.

b. Does the proposed use have an effect (positive/negative) on beach processes?

The proposed house site is set back a minimum of 130 feet from the shoreline pali which will mitigate any effect on natural shoreline processes. Further, there are no

sandy beaches along the shoreline fronting the Subject Property, so no beaches would be impacted.

c. Will the proposed use cause increased sedimentation?

The applicant will perform various tasks to mitigate increased sedimentation. All runoff from impermeable surfaces will be retained on site and quickly absorbed into the generally porous ground. The applicant will also ensure that the grading and earthwork performed by the construction contractor is done in conformance with State and County regulations. Further, earth work for the house site will include practices to minimize the potential for sedimentation, erosion and pollution of coastal waters such as:

- Limiting the areas of disturbance solely to delineated construction work areas within the lot;
- Implementing erosion and sedimentation control measures so as not to allow any sediment to leave the site; and
- Replanting or otherwise stabilizing cleared areas as soon as possible.

Given the combination of the existing site conditions and protective measures that would be in place and followed in the course of construction, any threat of increased runoff or sedimentation from the Subject Property would thus be negligible. Sedimentation Best Management Practices are detailed further in section V. g. below. Sedimentation and Water Quality are also discussed in section 3.1.3 of the Project FEA.

d. Will the proposed use cause any visual impact on any individual or community?

The proposed single-family residence may be visible from Government Beach Road and adjacent properties; however, it has been planned and designed to minimize its visual impact and naturally integrate with the surrounding environment. Landscaping will be placed specifically to buffer structures. Several features have been implemented into the site plans to conform to design standards that blend in with the natural features of the site and provide sustainable functions. Natural design features for this residence include stone walls, natural wood patina, dark windows, and natural colored roofing.

Also, given the slope of the land upward toward the shoreline, the proposed construction should not impair ocean views for the surrounding property owners. Visual impacts to neighboring residences to the southeast are minimized by the proposed project design. Consolidation and re-subdivision would allow for greater setbacks from these existing houses and would maintain large, buffer areas. Scenic and Open Space resources are discussed in sections 3.6.1 and 3.6.2 of the Project FEA.

e. Please describe any sustainable design elements that will be incorporated into the land use (*e.g., the use of efficient ventilation and cooling systems; renewable energy generation; sustainable building materials; permeable paving materials; efficient energy and water systems; efficient waste management systems; etc.*).

The proposed single-family residence will incorporate many sustainable design elements into its proposed use. This will include solar photovoltaic electricity and hot water, and energy efficient appliances and lighting. Additionally, the solar energy will be accompanied by a battery storage system to help increase the energy independence of the home. Architectural strategies, such as cross ventilation and high ceilings, are included in the efforts to reduce the home's energy needs. The applicant intends to supply much of their fruit and vegetable needs with proposed fruit trees in landscaping.

f. If the project involves landscaping, please describe how the landscaping is appropriate to the Conservation District (*e.g., use of indigenous and endemic species; xeriscaping in dry areas; minimizing ground disturbance; maintenance of restoration of the canopy; removal of invasive species; habitat preservation and restoration, etc.*).

In compliance with the Conservation District rules, landscaping plans include approximately 11,980 square feet of native, Polynesian introduced (P.I.), or fruit bearing/edible plants. All non-native plants have been evaluated for potential invasiveness. **Table 5**: 'Proposed Fruit Trees/Shrubs' lists fruit trees/shrub species and **Table 6**: 'Proposed Flora for Landscaping' summarizes the ornamentals chosen for landscaping purposes. Approximately 4,000 square feet of the landscaped area is proposed for the planting of fruit bearing trees. Further, to replace invasive species that have grown along the roadside areas, various Polynesian, native and non-invasive trees and shrubs will be planted. Plans for the removal of invasive species and planting of native replacements are detailed above. This will result in the gradual conversion of the wooded area into a native forest area.

Table 5: Proposed Fruit Trees/Shrubs

Fruit Trees/Shrubs		
Scientific Name	**Common Name**	**Status**
Musa acuminata	Banana	P.I.
Artocarpus altilis	Ulu - Breadfruit	P.I.
Syzygium malaccense	Mountain apple	P.I.
Diospyros kaki	Persimmon	P.I.
Colocasia esculenta	Kalo	P.I.
Ananas comosus	Pineapple	Alien
Ipomoea batatas	'Uala Sweet Potato	P.I.
Theobroma cacao	Cacao Tree	P.I.

Cocos nucifera	Coconut Palm	P.I.
Cymbopogon sp.	Lemongrass	Alien
Allium spp.	Alliums	Alien
Passiflora edulis	Lilikoi	Alien
Citrus spp.	Meyer Lemon, Orange & Lime	Alien
Carica papaya	Papaya	Alien
Mangifera indica	Mango	Alien
Persea americana	Avocado	Alien
Litchi chinensis	Lychee	Alien
Nephelium lappaceum	Rambutan	Alien
Artocarpus heterophyllus	Jackfruit	Alien
Annona muricata	Soursop	Alien

Table 6: Proposed Flora for Landscaping

Ornamental Trees/Shrubs/Vines		
Scientific Name	**Common Name**	**Status**
Pandanus tectorius	Hala	Native
Hibiscus tiliaceus	Hau	Native
Pritchardia hillebrandii	Loulu Palm	Native
Cibotium menziesii	Hapu‘u Tree Fern	Native
Ohi‘a lehua	Ohi‘a	Native
Thespesia populnea	Milo	Native
Cordia subcordata	Kou	Native
Scaevola taccada	Naupaka	Native
Wikstroemia uva-ursi	Akia	Native
Vitex rotundifolia	Pohinahina	Native
Nephrolepis cordifolia	Kupukupu	Native
Hibiscus arnottianus	Kokio Keokeo	Native
Microlepia strigosa	Palapalai Fern	Native
Sida fallax	Ilima	Native
Jacquemontia sandwicensis	Pa‘u o Hiiaka	Native
Vitex rotundifolia	Pohinahina	Native
Gardenia brighamii	Nanu	Native
Hibiscus arnottianus	Hibiscus	Native
Heliconia rostrata	Heliconia	Alien
Zingiber zerumbet	Awapuhi-Soap Ginger	Native
Osteomeles anthyllidifolia	Ulei	Native
Bacopa monnieri	Ae‘ae	Native
Cyperus laevigatus	Makaloa	Native

Mariscus javanicus	Ahuawa	Native
Delonix regia	Royal poinciana	Alien
Beccariophoenix madagascariensis	Window Palm	Alien
Veitchia joannis	Joannis Palm	Alien
Phymatosorus scolopendria	Lauae Fern	Alien
Philodendron spp.	Philidendron	Alien
Monsterra deliciosa	Monsterra	Alien
Strelitzia reginae	Bird of Paradise	Alien
Spathoglottis unguiculata	Grape Scented Orchid	Alien
Neomarica gracilis	Walking Iris	Alien
Cordyline fruticosa	Green Ti	P.I.
Crinum x amabile	Giant Spider Lily	Alien

The full landscaping site plan can be found in **Figure 3**.

g. Please describe Best Management Practices that will be used during construction and implementation of the proposed land use.

Best Management Practices for construction activities will be strictly followed according to HAR Chapter 11-55, Appendix C. These include:

a. Clearing and grubbing shall be held to the minimum necessary for grading and equipment operation.
b. Construction shall be sequenced to minimize the exposure time of the cleared surface area.
c. Construction shall be staged or phased for large projects. Areas of one phase shall be stabilized before another phase is initiated. Stabilization shall be accomplished by temporarily or permanently protecting the disturbed soil surface from rainfall impacts and runoff.
d. Erosion and sediment control measures shall be in place and functional before earth moving operations begin. These measures shall be properly constructed and maintained throughout the construction period.
e. All control measures shall be checked and repaired as necessary, for example, weekly in dry periods and within twenty-four hours after any rainfall of 0.5 inches or greater within a 24-hour period. During prolonged rainfall, daily checking is necessary. Record of checks and repairs must be maintained.
f. Records of the duration and estimated volume of storm water discharge must be maintained.
g. A specific individual shall be designated to be responsible for erosion and sediment controls on the project site.

A list of Best Management Practices will be established to properly manage storm water runoff. These BMPs may include, but are not limited to:

- Minimizing soil loss and erosion by revegetating and stabilizing slopes and disturbed areas of soil.
- Minimizing sediment loss by placing structural controls including silt fences, gravel bags, sediment ponds, check dams, and other barriers.
- Applying sediment waddles and protective covers to soil and material stockpiles.
- Gravel check dams in gutters.
- Constructing and use of stabilized construction vehicle entrance, with designated vehicle wash area that discharges to a sediment pond.
- Washing of all vehicles in the designated wash area before leaving the project site.
- Use of drip pans beneath vehicles to trap vehicle fluid.
- Performing routine inspection and maintenance of structural BMPs by trained personnel.
- Properly cleaning significant leaks or spills and disposing at an approved site.

This proposed project would not impact air quality or noise levels in any significant way. Limited adverse effects would occur during construction. All noise restriction guidelines, outlined by the County Department of Health, will be followed. Dust during construction and standards for keeping air pollutants down will also be rigorously followed. The State of Hawai‘i Air Pollution Control Regulations outlined in HAR Chapter 11-60.1 on Fugitive Dust prohibit visible emissions of dust from construction activities at the property boundary. Reasonable measures to control airborne, visible fugitive dust from roadways are outlined in the Department of Health’s Clean Air Branch Standard Comments for Land Use Reviews. These measures include, but are not limited to:

- Planning the different phases of construction, focusing on minimizing the amount of airborne, visible fugitive dust-generated materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact.
- Providing adequate water source at the site prior to start-up of construction activities; Landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase.
- Minimizing airborne, visible fugitive dust from shoulders and access roads.
- Providing reasonable dust control measures during weekends, after hours, and prior to daily start-up of construction activities.
- Controlling airborne, visible fugitive dust from debris being hauled away from the project site.

Artificial outdoor lighting can cause disorientation to seabirds that may pass through the area at night. Collision or grounding of birds are potential adverse impacts if the proper mitigating measures are not taken. The applicant will follow Hawai‘i County Code Chapter 14-50 to minimize the potential for disorientation

of seabirds. All nighttime construction work that requires lighting should be avoided during the seabird fledging season between September 15 and December 15.

Light pollution is another important aspect of maintaining scenic resources, the visibility of the night sky, and the protection of seabirds that may utilize resources near the Subject Property. Therefore, the following guidelines to minimize light pollution will be adhered to:

1. Any outdoor lighting must conform to the standards established by DLNR DOFAW as discussed in Section 3.1.4, Hawai‘i Revised Statutes § 205A-7, and the Night Sky Protection Strategy outlined in HRS § 201-8.5.
2. The minimum possible amount of outdoor/exterior lighting should be used and should be turned off when not needed. Motion sensor activated lighting will be used wherever feasible.
3. All exterior lighting should be fully shielded. This means that all lighting fixtures must emit zero light above the horizontal plane.
4. Conformity to the Outdoor Lighting Ordinance also requires the use of blue-deficient exterior lighting. This means that exterior LED lighting must emit less than 2% of its total energy at wavelengths less than 500 nm. The best choice for this is either filtered LED lights, or amber LED lights.
5. White light should be avoided. Any white light used should have Correlated Color Temperature of 2700 K or below.

Construction activities with the potential to produce polluted runoff will be limited to periods of low rainfall and cleared areas will be replanted or otherwise stabilized as soon as possible.

Following the guidelines of State and County requirements, to minimize the possibility for spills and hazardous materials, the applicant proposes the following, which are expected to be imposed as conditions of the CDUP:

- Construction activities with the potential to produce polluted runoff will be limited to periods of low rainfall.
- During construction, emergency spill treatment, storage, and disposal of all hazardous materials, will be explicitly required to meet all State and County requirements, and the contractor will adhere to “Good Housekeeping” for all appropriate substances, with the following instructions:
    - Onsite storage to minimum practical quantity of hazardous materials necessary to complete the job;
    - Fuel storage and use will be conducted to prevent leaks, spills or fires;
    - Products will be kept in their original containers unless unresealable, and original labels and safety data will be retained;

- Disposal of surplus will follow manufacturer's recommendation and all regulations;
- Manufacturers' instructions for proper use and disposal will be strictly followed;
- Regular inspection by contractor to ensure proper use and disposal;
- Onsite vehicles and machinery will be monitored for leaks and receive regular maintenance;
- Construction materials, petroleum products, wastes, debris, and landscaping substances (herbicides, pesticides, and fertilizers) will be prevented from blowing, falling, flowing, washing, or leaching into the ocean; and
- All spills will be cleaned up and properly disposed of immediately after discovery.
- Unused materials and excess fill (if any) will be properly disposed of at an authorized waste disposal site.

The potential presence of native endangered birds and the sole native Hawaiian land mammal in the area will require mitigating measures. The State listed Hawaiian Hoary Bat or ʻŌpeʻapeʻa (*Lasiurus cinereus semotus*), may be sensitive to disturbance between June 1 and September 15, throughout which no shrubs or trees taller than 15 feet may be disturbed or removed. Although there are no suitable nesting trees for the Hawaiian hawk, or ʻIo (*Buteo solitarius*), if any tree cutting occurs between March and September, DOFAW must be consulted first. A pre-construction hawk nest search by a qualified ornithologist using standard methods must be conducted. If nests are found, no land clearing is permissible until October.

No new barbed wire will be used on the Subject Property to prevent bats becoming ensnared and killed by such fencing during flight.

Department of Health, Administrative Rule Title 11, Chapter 26, Vector Control Section 35, requires that:

a. No person, firm, or corporation shall demolish or clear any structure, site, or vacant lot without first ascertaining the presence or absence of rodents which may endanger the public health by dispersal from such premises.
b. Should such inspection reveal the presence of rodents, the person, firm, or corporation shall eradicate the rodents before demolishing or clearing the structure, site, or vacant lot.
c. The Department may conduct an independent inspection to monitor compliance or request a written report.

According to the Department of Health Clean Air Branch, "the purpose of this rule is to prevent rodents from dispersing into adjacent area from infested buildings or vacant lands during demolition or land clearing. Contractors may either hire a pest control firm or do the job themselves with a qualified employee.

Rodenticides must be inspected daily and replenished as necessary to provide a continuous supply for at least one week prior to the start of any work."

h. Please describe the measures that will be taken to mitigate the proposed land use's environmental and cultural impacts.

The proposed project will practice an overall conservation ethic by implementing mitigating measures and Best Management Practices to prevent impacts to flora and fauna, soil, water, and air quality. These BMPs are outlined in detail in Section V (g.).

The proposed project's small footprint and degree of physical disturbance combined with its location in an area of the Subject Property with no sensitive flora or fauna resources limits the biological impacts to negligible levels. No rare, threatened or endangered plant species are present. Although there are a few native plants on the Subject Property, the area of impact is dominated by non-natives. The applicant wishes to preserve and enhance the native vegetation through gradual planting of native tree and shrub species.

Fishing and gathering of ocean resources is a significant practice in the wider Maku'u area. Although there are no sandy beaches or safe access to the ocean from the Subject Property, lateral shoreline access will not be impeded. The CIA conducted on the Subject Property and the neighboring Parcel 026 found no evidence of current or past use for cultural gathering or traditional uses. Further, no historical trail was identified on the Subject Property. Therefore, no adverse impacts to recreational resources are expected to occur.

The development of one (1) single-family residence and supporting infrastructure on the Subject Property is unlikely to have adverse impact to archaeological, cultural, or historic resources. An AIS determined that there are rock walls bordering the Subject Property but recommended no further action and therefore there would be no adverse effects to historic sites. The CIA found that no cultural sites or practices would be adversely affected by the proposed project. In the event any other undiscovered archaeological or cultural resources are discovered during construction, all work will halt immediately, and the State Historic Preservation Division (SHPD) will be contacted immediately for appropriate action.

The proposed project will have minor and short-term impacts to scenic resources during the construction phase. After the proposed project is complete, no adverse impacts to scenic or open resources are expected to occur. All structures will include specific design features including earth tones, wood accents and rock walls to blend into the natural environment. Landscaping is proposed to screen views of the home from neighboring properties. The proposed placement of the structures also considered preservation of scenic and ocean views and will have little impact to existing views across the Subject Property.

No adverse impacts to coastal resources are expected due to mitigating measures and best management practices including proper management of storm water runoff and erosion control. The proposed single-family residence would be served by an Individual Wastewater System in compliance with Department of Health regulations. Temporary and minor impacts to air and water quality are expected during the construction phase but will be mitigated according to all state and federal rules and regulations. The single-family residence and supporting infrastructure is not expected to be impacted by significant flooding or coastal hazards. All structures will be in Flood Zone X, or outside of the 500-year flood area. Coastal hazards are inherent along the Puna coastline and are adopted by all property owners in the area. All structures will be sited a minimum of 130 feet from the shoreline, which will mitigate many of the potential impacts, including erosion. Coastal hazards are manageable when following the proper rules and regulations, which will be adhered to by the applicant and contractor. The applicant understands that there are some climatic and geologic hazards associated with homes in this area and has made the decision that a residence is not imprudent to construct or inhabit.

VI. Single Family Residential Standards

Single Family Residences must comply with the standards outlined in HAR §13-5, Exhibit 4. Please provide preliminary architectural renderings (e.g., building footprint, exterior plan view, elevation drawings; floor plan, etc.) drawn to scale.

	Existing	Proposed	Total
Proposed building footprint	0	4,984 sq. ft	4,984 sq. ft.
Paved areas/impermeable surface	0	0	0
Landscaped areas	0	11,890 sq. ft	11,890 sq. ft.
Unimproved areas	6.4 acres	5.9 acres	Approx. 0.5 acres of construction impacts

a. Setbacks

Front: Min = 25 ft., Proposed = 209 ft.

Side: Min = 25 ft.
Proposed = 31 ft to pool @ NW proposed property line, 360 ft @ SE property line

Back: (Shoreline) Min = 65.2 ft from CES, Proposed = 164 ft. to house

b. Shoreline Properties

Average Lot Depth (ALD): 485.6 ft. = (446 ft + 457 ft. +554 ft.) / 3

Minimum shoreline setback based on Exhibit 4: 40 ft + 70 x AAER = 65.2 ft.

Actual shoreline setback or proposed structure: 130 ft.

Average annual coastal erosion rate: 0.36 feet per year

c. Maximum Developable Area

The Maximum Developable Area includes all floor areas under roof, including first, second, and third stories, decks, pools, saunas, garage or carport, and other above ground structures.

Maximum Developable Area based on Exhibit 4: 5,000 square feet.

Actual Developable Area of Proposed Residence: 4,984 square feet

Actual height of the proposed building envelope as defined in Exhibit 4: 25'-0"

d. Compatibility

i. Provide justification for any proposed deviation from the established residential standards.

The proposed residence will be compliant with all established residential standards outlined in HAR Chapter 13-5 Exhibit 4.

Compatibility provisions require that: *All structures* (be) *connected, or best alternative.*

Previously plans sited the art studio and storage building detached, roughly 100 feet from the house. However, this building is now proposed to be connected to the house to be consistent with Exhibit 4 of HAR Chapter 13-5. Therefore, there are no proposed deviations from established residential standards.

ii. How is the design of the residence compatible with the surrounding area?

The immediate surrounding area of the Subject Property is rural and is made up of other single-family residences, State land, and vacant land. Shoreline Conservation District properties to the east and west are developed with single-family residences similar to what is proposed.

The proposed project has been strategically placed to minimize view and noise impacts to neighboring properties. The residence will be confined to the previously cleared portion of the Subject Property so as to minimize the potential impact to the scenic character and open space of the area. The development has also been designed

to preserve sight lines to the ocean from neighboring properties. Site appropriate, primarily native Hawaiian landscaping is proposed to screen views of structures. Natural materials and color palettes are proposed throughout the project. Further the home will contain a single kitchen and comply with all building, grading, wastewater disposal and shoreline setback provisions.

iii. If grading is proposed, include a grading plan which provides the amount of cut and fill. Has grading or contouring been kept to a minimum?

Grading is only proposed in the immediate area of the home, art studio, and along the proposed gravel driveway, and given the relatively level character of the site, grading is kept to a minimum. No large-scale grading or contouring is proposed. The development will conform to the natural topography of the site.

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COASTAL EROSION AND SHORELINE HAZARDS STUDY FOR THE "ŌPŪNAHĀ FARM" – PASTOREK PROPERTY

Maku`u Ahupua`a, Puna District, Island of Hawai`i
TMK: (3) 1-5-10:026 and 027.

Prepared by:
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Prepared for:
Ryan Pastorek

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194 Wiwoole St, Hilo, HI 96720

October 22, 2020

EXHIBIT A

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Executive Summary

A geological survey of the Ōpūnahā property was conducted in order to calculate a site-specific Average Annual Erosion Rate (AAER), identify any erosion prone areas, and evaluate the risk posed by other potential coastal hazards. This survey has been prepared in support of a Conservation District Use Permit Application (CDUA) and Environmental Assessment (EA) being prepared for the owner, Ryan Pastorek by John Pipan, Planning Administrator at Kern & Assoc. John P. Lockwood, Ph.D, Certified Professional Geologist (#9806), served as Principal Investigator. The owner intends to develop a single-family dwelling and barn and continue the farm uses on the property. The geological history of the prominent littoral cone at Maku`u and surrounding lava flows are explained. Historical photos of the coastline are evaluated for measureable changes. We conclude with an overall AAER of **0.36 feet/year** for the subject property. We emphasize this rates' variable nature over time and the influence of sea level rise on its intensity.

Contents

List of Figures

List of Photographs

List of Tables

Introduction

Hawaii Administrative Rules concerning Conservation Districts (Title 13, Subtitle 1, Chapter 5, adopted August 12, 2011) state that applicants for Single Family Residential construction in coastal Conservation Districts must consider rates of coastal erosion affecting their properties in order to determine minimum shoreline setbacks for permitting. DLNR established a requirement that the Average Annual Coastal Erosion Rate must be determined, based on formal "Coastal Erosion Studies" which are to be carried out following the guidelines in the Hawaii Coastal Hazard Mitigation Guidebook (Hwang 2005). This report satisfies these requirements.

This report documents the nature and rate of observable shoreline erosion at the Ōpūnahā Farm property. The subject property consists of two TMK's (3) 1-5-010: 26 and 27, a total of 10.45 acres with nearly 1,000 feet of ocean frontage (see Figure 1). The conclusions are based on quantitative measurements and observations obtained through field inspection, aerial photography, satellite imagery, and review of the geologic literature.

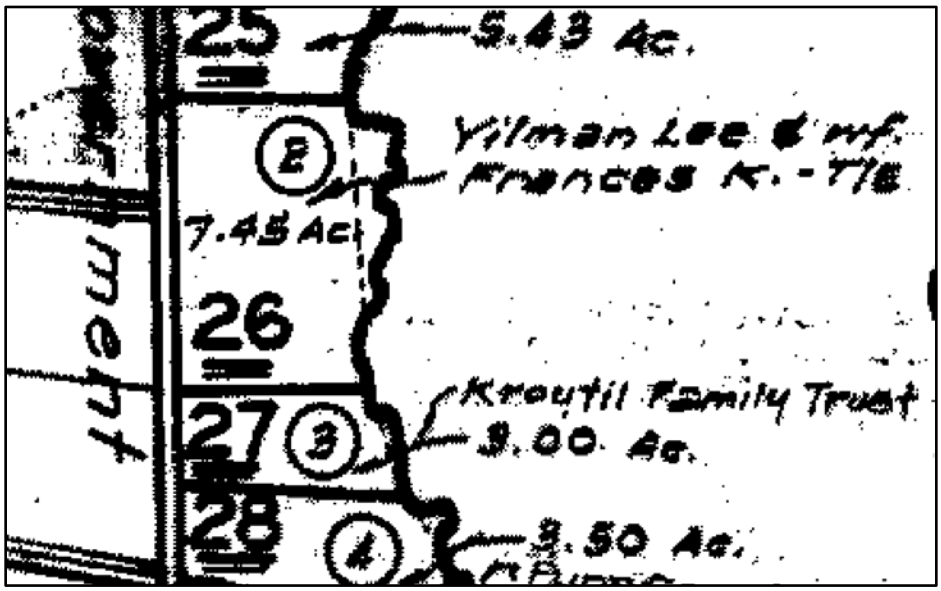

Figure 1 Subject properties, the "Ōpūnahā Farm" TMK (3) 1-5-10:026 and 027.

Changes in the coastline over time are the product of a complex and long-term interplay between powerful geological forces, particularly so in Hawai`i. The combined effects of volcanism, erosion, sedimentation, sea-level change, island subsidence, and even bio-genic (ie. reef-building) production over millennia will influence the nature and durability of the coast as we now see it. These processes of both construction and destruction must be accounted for in any evaluation of coastal dynamics (Ramalho, et al., 2013). Volcanic action, mostly new lava flows, build out the island, and then coastlines retreat as mass wasting, marine and fluvial erosion reshape the landscape. The Hawaiian Islands subside at variable rates as well, accelerating the process.

This is a very difficult process to quantify and summarize, especially on the younger of the Hawaiian Islands which, in their youth, may not yet have reached a long-term, stable

equilibrium. Thorne Abbott (2013) reviews several problematic aspects in determining the AAER for planning purposes. These difficulties in measuring erosion rates on lengths of coastline on Maui, apply directly to the Big Island. The difficulties include issues with irregular shaped properties and erosion in multiple directions but also the problematic nature of erosion-resistant hard coasts as opposed to soft linear beaches, where shorelines can suddenly change because of the movement of sand (Abbott 2013:17).

These estimates are best approached with longer term studies of a scope that extends beyond a single parcel. Ideally, regional monitoring studies would include highly accurate means of terrain mapping such as is available today with LiDAR technology (Rosser 2005).

Despite these drawbacks, it is possible to derive empirically based and quantitative estimates of erosion rates. This report also seeks to delineate any erosion-prone or otherwise hazardous areas along this small section of coastline as well. As used throughout this report, the "shoreline" denotes the highest wash of waves and is usually defined by the line of permanent vegetation, whereas, the "coastline" is a more general term used in this report for the most seaward edge of land at high tide.

Property Location and Physical Setting

The Ōpūnahā Farm Property is located between the "Old Government Beach Road" and the sea. It is near the ancient village of Maku`u in lower Puna District. The property is 1.2 miles south of Maku`u Drive (see Figure 2). A notable feature of the property is the high pu`u (hill) that fills the greater part of the northwest portion and parcel 26. The unique landform, a 50 foot tall, domed, "littoral cone" can be seen on the USGS topographic map (Figure 8),

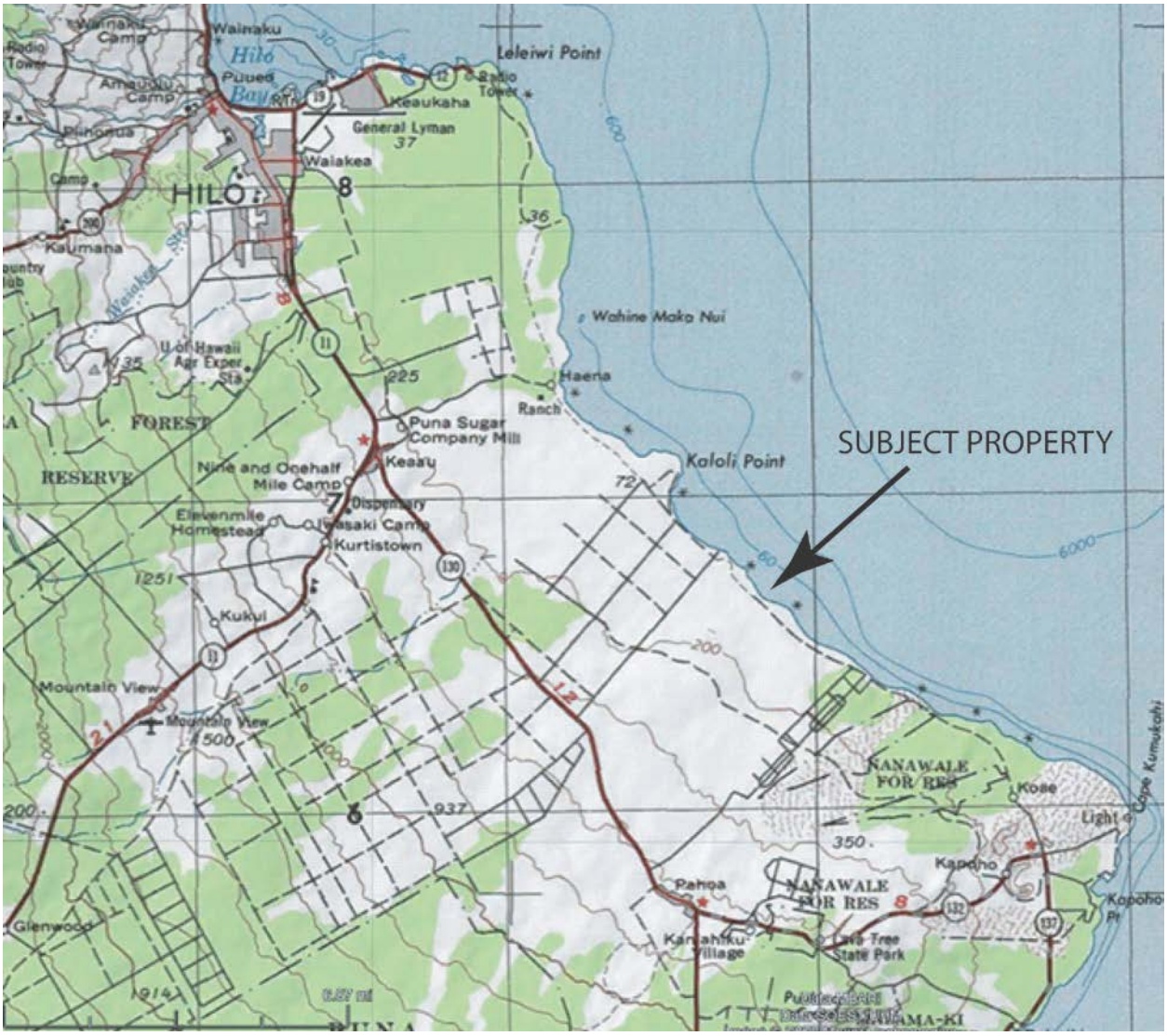

Figure 2 Portion of USGS 1:50,000 scale Big Island with property boundaries in red.

There are no perched sandy beaches above the high tide line. Instead the small scalloped series of embayments or coves are lined with narrow relatively steeply sloping cobble berms (see Photo 1). These embayments, containing sea caves and arches are the result of variation in substrate durability. In particular the tephra, ash and cinder material making up the pu`u is far more friable than surrounding pāhoehoe. These and other significant erosional features are itemized and detailed further below (see Figure 9 and Results section).

The cliff edges above these coves can be perilous. This contrasts with parcel 27. As one moves south away from the tephra deposits the coastline becomes more homogenous, forming a relatively linear 15 ft. high pali (cliff). These edges are also precipitous and while less friable, also prone to block failures and collapse.

Figure 3 Google image (January 21, 2013) with project area boundary in red.

Photo 1 Overview of coastline (Embayment 3), view northwest.

Geological Background

The geological units underlying the subject property are illustrated below in Figure 4. Understanding the sequence of geological events on site provides a fundamental framework from which inferences concerning erosion rates are based.

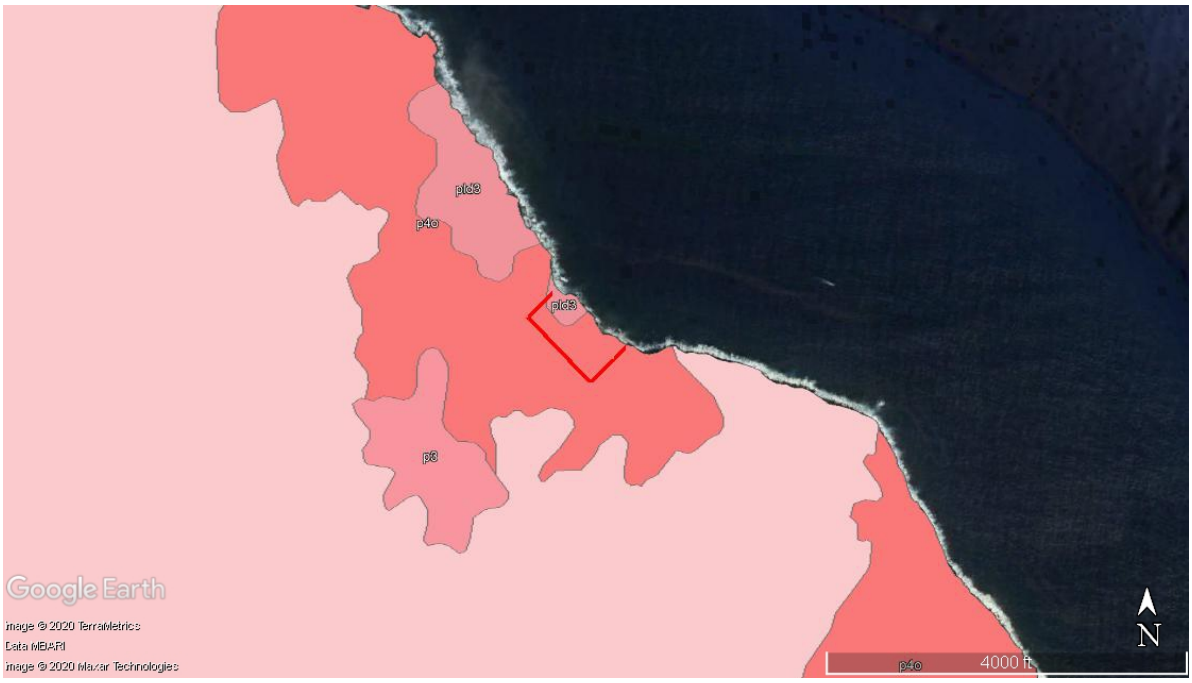

Figure 4 Portion of Geologic Map (Trusdell et al. 2006) with project area in red.

Lava Flows		Littoral Cones	Year B.P.
			200
p4	p4y		
			400
	p4o	pld4	
			750
p3		pld3	
			1500

Table 1 Ages of geological units discussed in the text (Trusdell et al. 2006).

The base of the sea cliffs and sea stacks are the oldest exposed lava on the property. The scale of the geological map in Figure 4 is too large show this unit, now exsposed only as a strip at low tide. This lava flow, "p3" is also exposed mauka (ie. landward) of the Property as an isolated kīpuka (a remnant patch of older flow surrounded by younger material). Where this flow reached the sea violent steam explosions formed a littoral cone and widespread cinder deposits *on top of it* (Unit "pld3") resulting from the interaction of molten lava with seawater (see Figure

13). Then between 450 and 750 years ago another sequence of lava flows surrounded the pu`u ("p4o") inundating its flanks. Most recently the properties low lying areas were again covered by the continued, and wide spread, `Aila'au lava flows with an estimated age of 200-350 years ago (Unit "p4").

The Unit "pld3" represents relatively rare littoral cone cinder deposit. It is one of few littoral cone formations on Kīlauea's coastline. Due to Kilauea's frequent activity in historic times, these formations are well described (Moore and Ault 1965). The process has also been described for the larger scale but similar littoral features of Mauna Loa volcano (Jurado-Chichay, Rowland and Walker 1996). Sand Hill in Nanawale is a similar feature formed in 1840, as are the 80 meter high Pu`u Hou (1868) at Ka Lae and Pu`u Mahana also at South Point giving rise to the famous "Green Sand Beach".

Photo 2 shows steam generated explosions of tephra on Kīlauea's south flank in 1996. In the first twelve years of the Pu`u O`o eruption now fewer than 11 littoral cones (none higher than ten meters) formed and met their demise in Kamoamoa. Note the pāhoehoe flows nearing the ocean seaward of the cone. The timing and volume of subsequent flows contribute to a dynamic interplay between rock and water.

Photo 2 An active littoral cone (Photo by Keszthelyi , L. -1996-02-23, USGS).

Marine Conditions and Wave Climate

The coast of this part of the Puna District faces the open ocean with no submerged barriers such as offshore reefs or sand bars. The submarine slope is approximately 1,300 feet/mile for a distance of roughly 6 miles, descending into the deep water Puna Canyon.

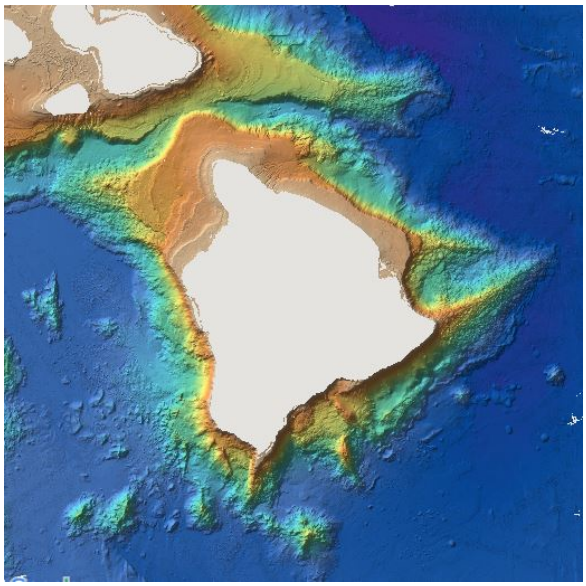

Figure 5 Bathymetric Map (SOEST)

The extremely long fetch of waves crossing the Pacific creates a situation where big, long period swells rising to significant heights slam into the island's flank. Large waves reaching the coast are predominantly related to trade wind conditions, though the coastline is also exposed directly to the largest North Pacific swells (Figure 5).

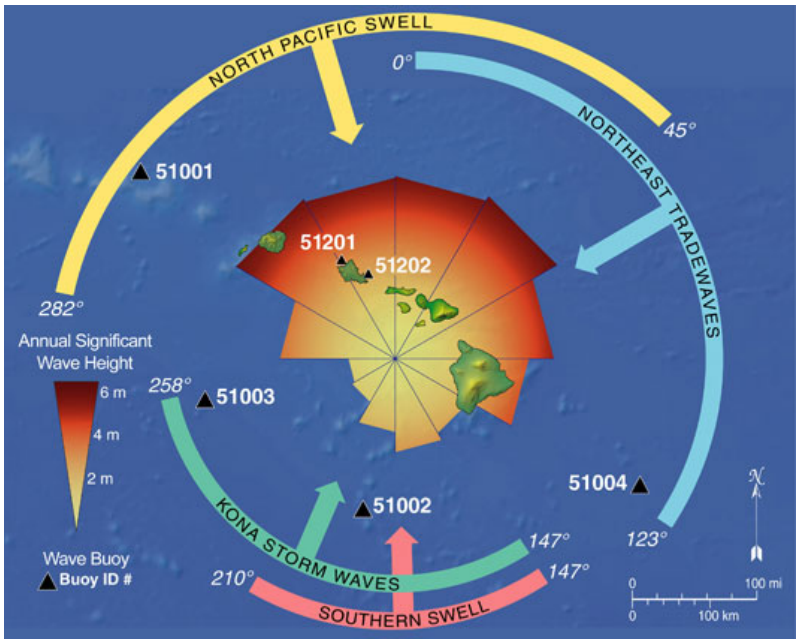

Figure 6 Frequency and magnitude of waves affecting Hawaii (www.soest.hawaii.edu).

The coastline at the Ōpūnahā property faces approximately 45 degrees east of true north. This is

significant relative to typical incoming waves. Note on Figure 6 that the largest waves of all come from the north-north-east, north or north-north-west direction. These North Pacific swells can reach significant heights of 20+ ft. and are a major contributor to coastal erosion and storm damage.

It is beyond the scope of this study to quantify changes in storminess or significantly higher wave heights due to climate change. A precise forecast of these positively contributing variables is impossible. However, their potential effects on erosion are considered in our conclusions below.

Rising sea surface temperatures in Hawaiian waters could, for example, influence hurricane storm tracks impacting the islands (Businger, 1998). The recurrence and intensity of wave energy focused on the coastline is obviously a critical factor in the discussion of erosion along any coast. Merrifield and Maltrud (2011) noted that trade winds have intensified across the Pacific gradually since the early 1990s, e.g. The intensification of trade winds and accompanying sea level rise is more pronounced in western Pacific waters, relative to other regions in the World Ocean, with some rates of rise as much as three times the global average. The probability and impact of sea level rise associated with climate change at the subject property is discussed in a separate section. For tropical waters, the incidence of "one-in-ten year" extreme waves impacting shorelines may double or triple as a consequence of the wind intensification described above (Wang et al. 2014). Substantial wave height increases—by as much as 40%-- have also been observed along some Pacific shores, though to what extent this relates to climate change or pulsating phenomena as the Pacific Decadal Oscillation is unclear (e.g.—Ruggiero and others, 2010). Hypothetically, the incidence of hurricanes in the eastern Pacific may actually *decrease* with warming climate, but the strongest storms will likely become even more intense (e.g.--Grinsted, 2012; Holland and Bruyére, 2013).

Tidal conditions for this part of the island are summarized in Figure 7. These are based upon data collected in nearby Hilo Bay, the closest continuously monitored tidal station to the property. The magnitudes of these relative elevations are an important reference for assessing the importance of any measured changes or, in particular their impacts outside the normal range.

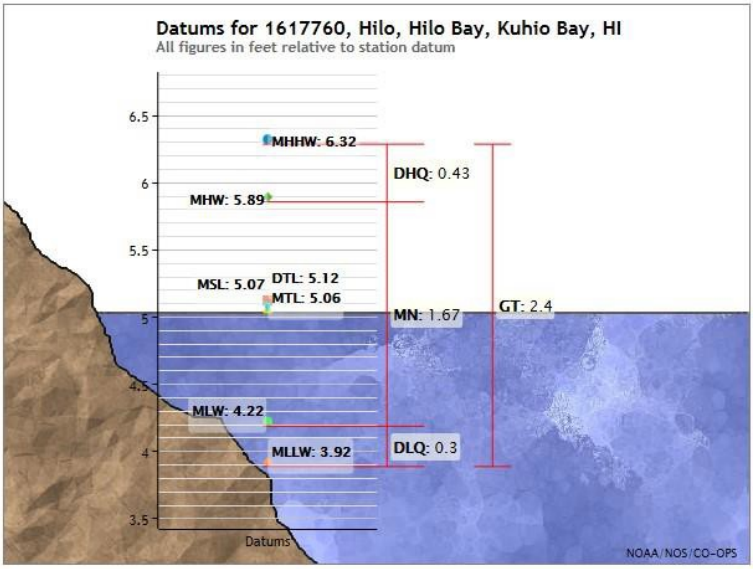

Figure 7 Tidal data for Hilo Bay (in ft.).

The mean range of tidal change (MN) is 1.67 ft. with a Great Diurnal Range (GT) of 2.4 ft. Tidal heights are given as positive and negative values relative to the Mean Lowest Low Water (3.92 ft.) and Mean Highest High Water (6.32 ft.). Understanding the tidal variation throughout the year is important as any instantaneous "snapshot" of the coastline at a given tide can be misleading on the whole. The effects of tides are dependent on beach slope. For example, 2.4 ft. of tide will move the tideline 24 ft. horizontally on a 10% slope. This can have dramatic effects, changing the location and breadth of active weathering.

Field Inspection Results

The shoreline is legally defined in Hawaii as "the upper reaches of the wash of the waves, other than storm and seismic waves, at high tide during the season of the year in which the highest wash of the waves occurs, usually evidenced by the edge of vegetation growth, or the upper limit of debris left by the wash of the waves, ..." (HAR §13-5-2).

Given the complexity of interacting volcanic and coastal formation processes, in order to assess the historical and prehistorical movement of the shoreline and identify areas prone to erosion, a simple sedimentary "facies" model was constructed (Figure 13). This is a recommended means of assessing complex geomorphic situations in Hawaii and the goal towards which our field methods were oriented. For example, Felton (2002) uses this method to distinguish storm derived and tsunami emplaced debris, describe the potential mobility of any beach deposits and their nature, account for isostatic changes and quantify other depositional processes.

At the Ōpūnahā Property, efforts were made to evaluate the grain size and roundness/sphericity of eroded materials, evaluate the matrix and macro-mineralogical composition of lava flows present, and evaluate geomorphology and the associated sedimentary structures (boulder beach, shoreline berm, reworked storm deposits, etc.) horizontally, within the project area and vertically at the shoreline.

Figure 9 illustrates the major features observed on the subject property relevant to these dynamic processes. Five embayments referred to in the text are labeled and other erosional structures discussed below are indicated in the key.

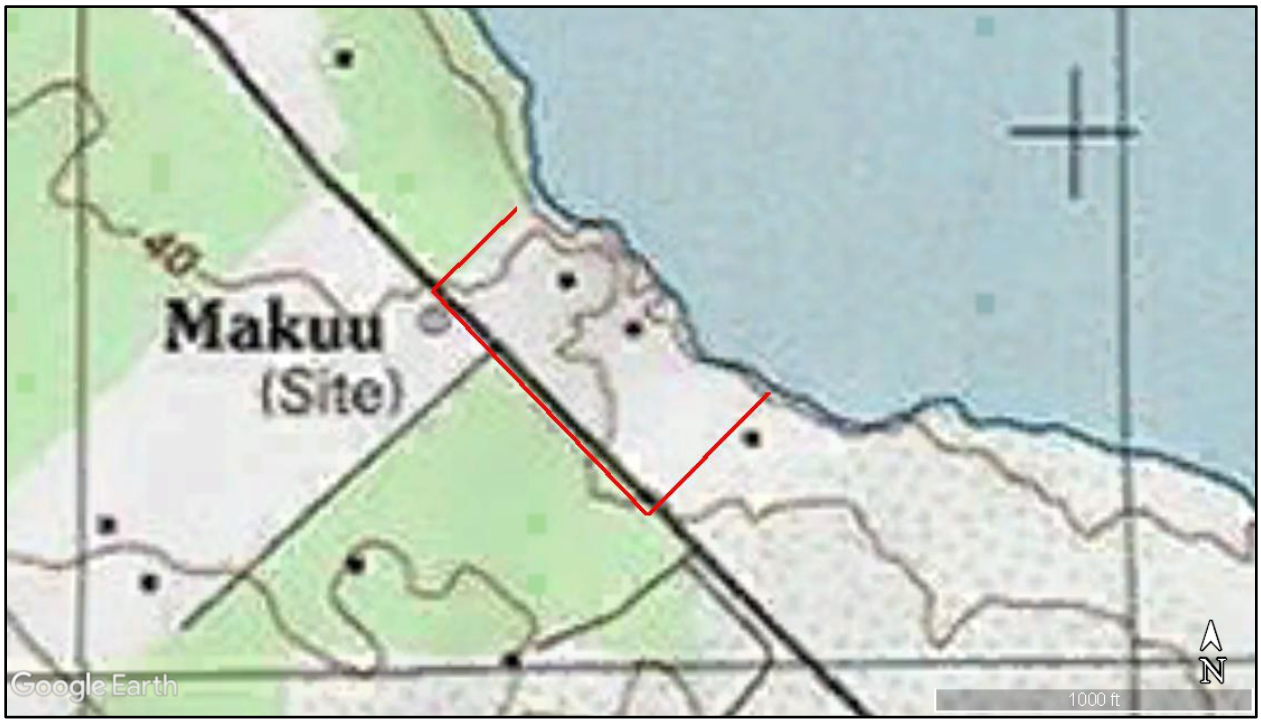

Figure 8 Portion of USGS 1:24,000 topographic map, project area in red.

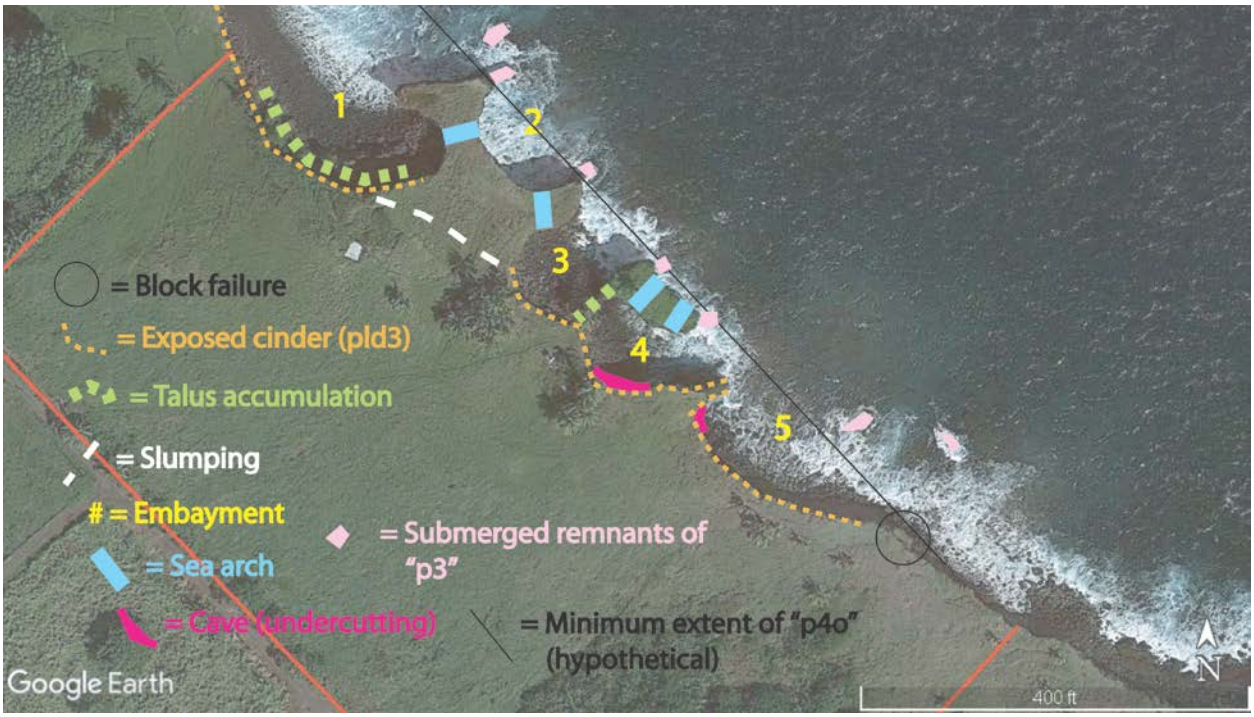

Figure 9 Ōpūnahā study area with features mentioned in text.

Photo 3 Embayment 1, view northeast (cf. Figure 10).

Photo 4 Sea arch between embayments 2 and 3, view southeast.

Photo 5 Sea stack within embayment 4, view northwest.

Photo 6 Embayment 5, view northwest (cf. Figure 12).

Lithology

Lava flows can often be distinguished by their mineralogy. The three main geological units described in the background above present themselves distinctly at the coast. Rock samples were collected of the flows that make up the mostly submerged pāhoehoe bench ("p3", visible as a toe at the base of the sea stack in Photo 5) and those that compose the younger higher sea cliff ("p4o") at the southeast. These were examined with low magnification hand-lens. The younger stacked layers of lava are typical fine, vesicular tholeiitic basalts, in this case almost devoid of olivine and containing abundant but very fine plagioclase crystals.

The formations (represented by "pld3") are typical of hydrovolcanic eruptions described for Kilauea volcano's littoral cones (Mattox and Mangan 1997). The nature of these deposits and those seaward, which are not illustrated on the geologic map are key to our interpretations. These rocks were also sampled for laboratory examination. Within the tephra matrix of cinder and ash, several angular inclusions were noted. These are fragments of rock torn from the "throat" of the vent and thrown up with the cinder and piled on top of itself.

Structure

These sedimentary analyses and textural comparisons are key to interpretation of the profile data and facies model presented below. The varied minerology, texture and type of rock from each geologic unit responds differently to erosive forces of wave action, abrasion, etc. These different capacities to withstand degradation create beautiful and instructive morphologies. To assess the extent and impact of these forces on the rock landscape, several scaled stratigraphic profiles were drawn (Figures 10, 11 and 12).

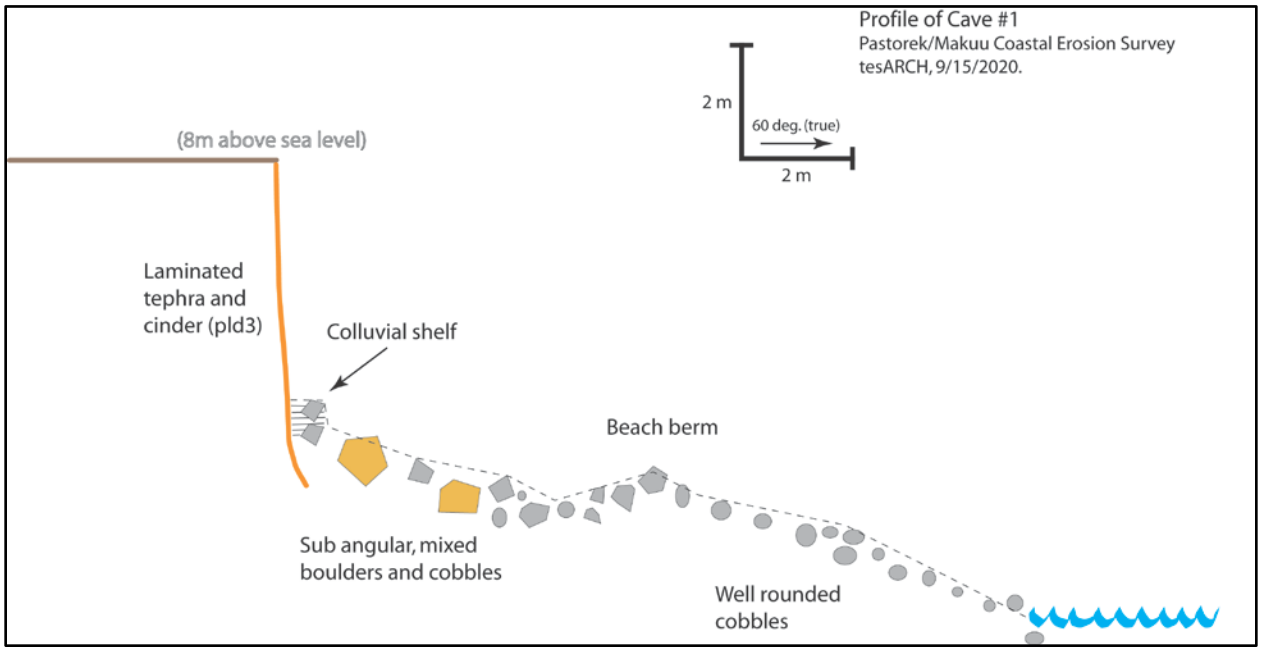

Figure 10 Profile and cross-section of coastline at Embayment 1.

Figure 10 is a profile of the sea cliff at the north end of the property. Here the cinder cone was not submerged by later lavas. The friable cinder sits well back and above the water line protected by both a broad cobble beach and berm and by its own colluvial talus that armors its base.

Figure 11, by contrast, shows major undercutting of the sea cliff. Embayment 4 suffers from deep scouring, back in excess of 8 meters. In this instance a tephra lens is buried under several meters of subsequent lava. The original contact between the top of the littoral cone and the bottom of the more recent flow is still visible on the roof of the cave and at its margins (see Photo 7). Wave action has created quite a steep cobble and boulder beach at this location. It is also clear from the large angular blocks that the ceiling is unstable.

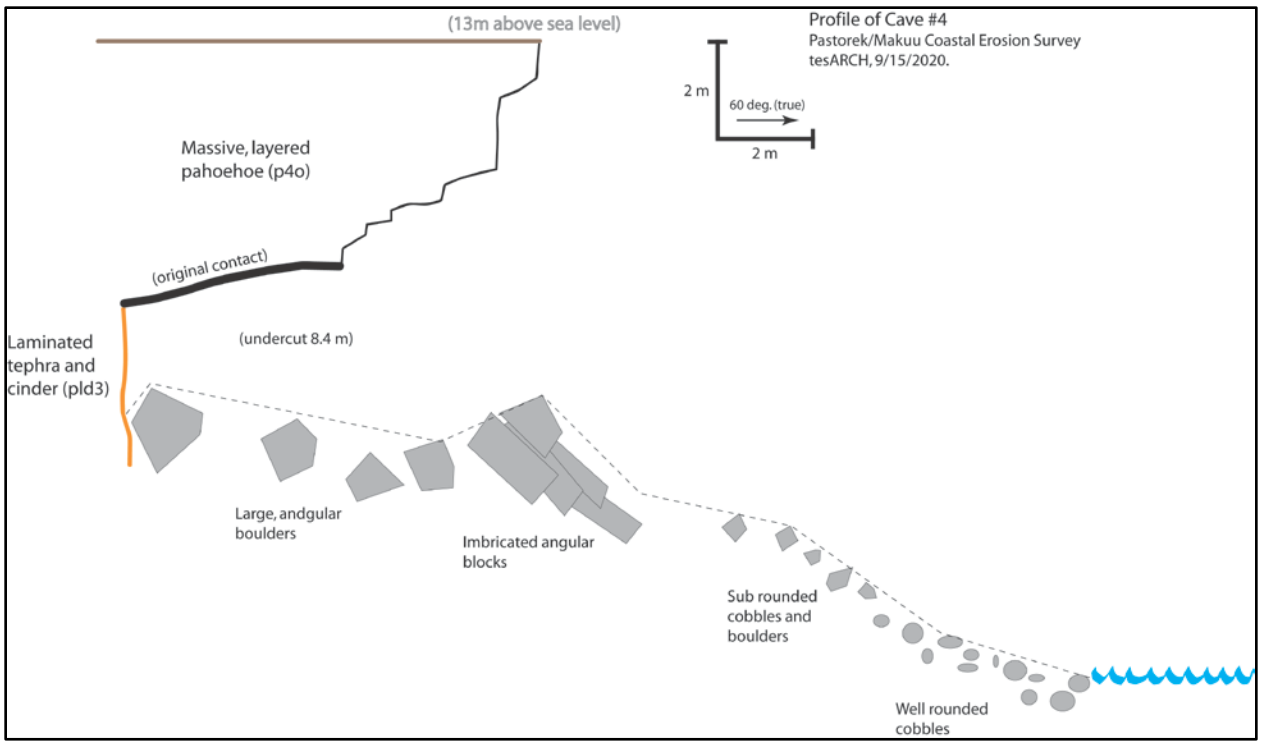

Figure 11 Profile and cross-section of coastline at Embayment 4.

Photo 7 Embayment 4; Contact between p4o (left, above) and pld3 (right) at rear of cave.

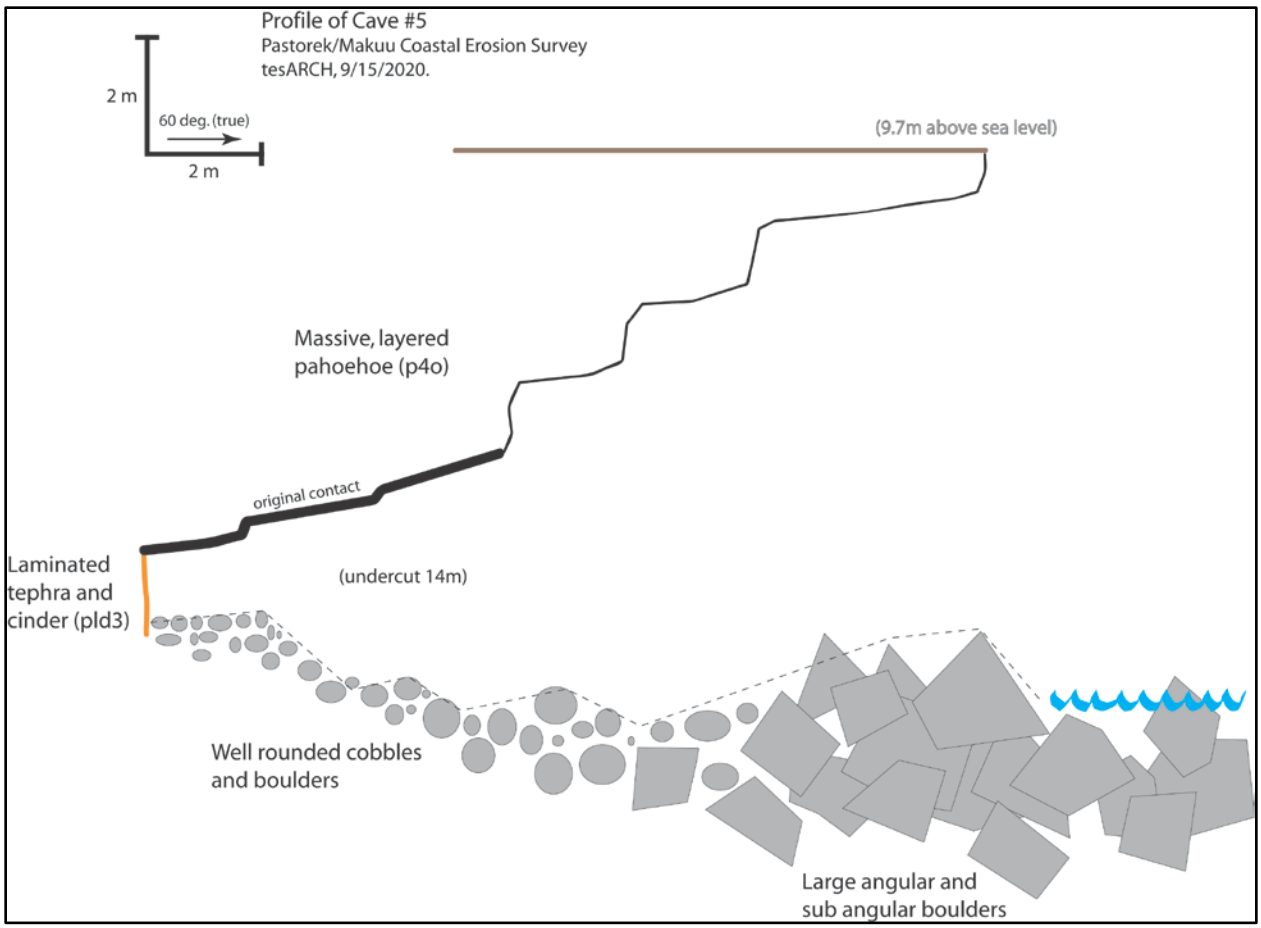

Figure 12 Profile and cross-section of coastline at Embayment 5.

Another example of the "sandwich effect" can be seen in Figure 12, a profile of the deepest sea cave at embayment 5. Again, the softer ash layer (pld3) is sandwiched between bedrock (p3) and a later lava flow (p4). In this case the undercutting is upwards of 14 meters. At embayment 5 the tephra lens is thinner and closer to sea level. Rounded cobbles inside the cave indicate frequent wave energy. Angular blocks accumulating at the mouth may dissipate some of this force, eventually, this entire shelf will fall.

The Evolution of the Ōpūnahā/Maku`u Coast

Based on the above examination of the structure and geometry of lava flows and distribution of other deposits across the site, the following model of the evolution of the Ōpūnahā coastline was constructed. This model and the events it chronicles, provides us with a necessary framework from which to make quantifiable estimates of overall erosion rates.

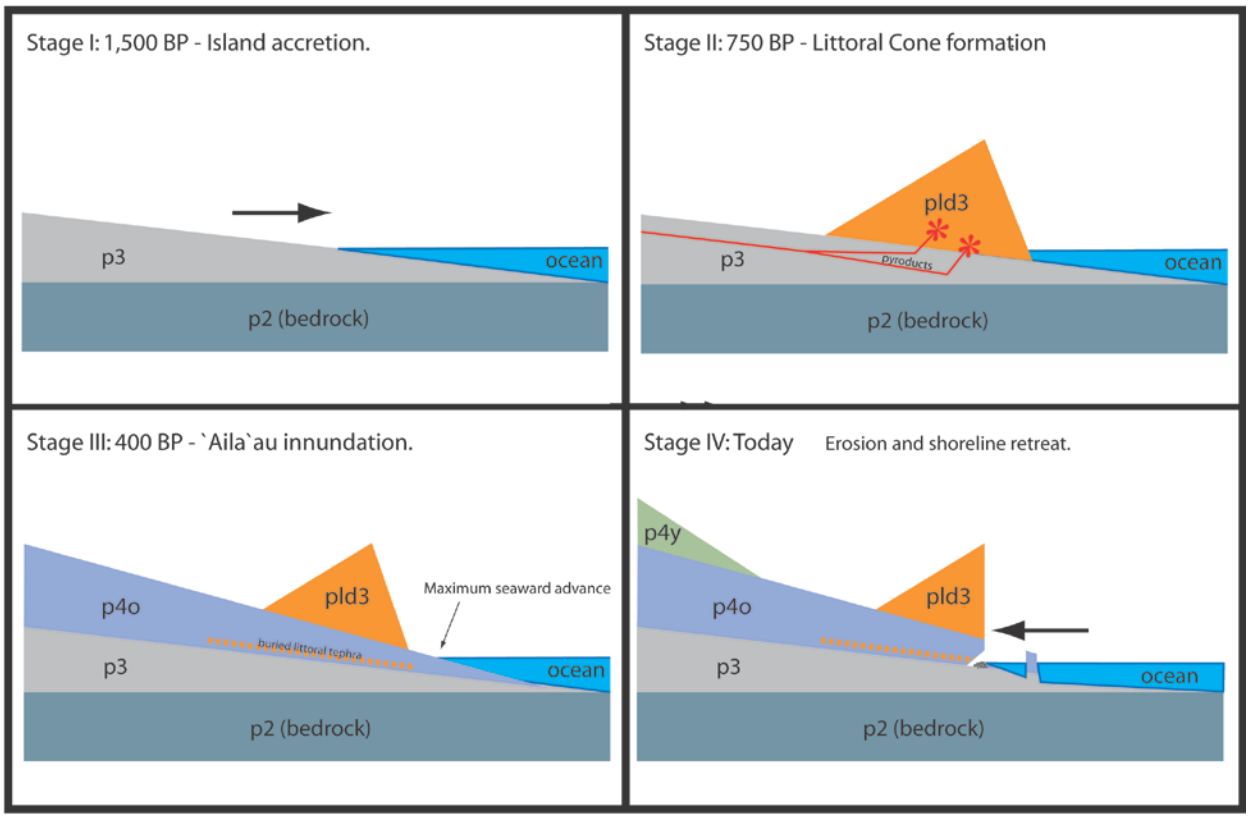

Figure 13 Geological evolution of the Maku`u coastline (vertically exaggerated, scale approximate).

Our hypothetical reconstruction of geological events is shown in Figure 13. The stage is set 1,500 years ago with a long lived and active "p3' flow into the sea. The island is accreting as lobes of pāhoehoe build out deltas, ponding on the gentle slope of the coast.

In Stage II, stable high volume production consolidates into a system of pyroducts, efficiently delivering hot magma directly to the water interface. This instigates the formation of the littoral cone, where the concentrated flow enters the sea. After formation of the cone, "pld3" and cessation of this flow, we propose there was a pause.

The littoral tuff cone was immediately subject to erosion by storm waves surging over the coastal bench and probably scouring any associated 'a'ā.

Photo 8 Internal morphology of the Maku`u tephra cone, view south-southeast.

Photo 8 is an important view that shows changes in internal tuff cone morphology. The explosive activity that formed the cone was initially dominated by coarse spatter and bombs that decrease rapidly in size southward, away from ocean entry (to north). The eruption then abruptly changed to production of steady fountaining that produced the upper well-bedded ash layers. That probably happened when a stable channel or pyroduct fed lava into the ocean

In stage III the emplacement of Kīlauea lavas ("p4o") is renewed. These older `Ai La'au flows were impounded by the littoral explosion berm along coast, but slowly filled in around the pu`u and again, built ponded coastal deltas. At the time (more than 1,000 years before the present), sea levels were much lower. We suggest that this is when the current "coastline" was at its furthest seaward extent. At this stage rising sea levels and subsidence of the island began to erode these shorelines back.

Stage IV represents the time since the younger `Aila'au flows ("p4y") reached the ocean southeast of the property. In this period wasting at the seaward edge of the cone causes slumping and faulting (indicated on Figure 9). Subsequent mechanical erosion has cut away more pāhoehoe and is also eating into the tuff cone. These processes are accelerated with sea level rise and coastal subsistence (these processes are not illustrated for simplicity). However this erosion gives rise to the current shoreline, leaving some more ridged remnants (sea stacks and arch supports) behind.

Erosion Processes

Coastlines can be classified, generally, into "soft" and "hard," depending upon whether they consist of sands and related fine, easily transportable sediments or of solid less easily weathered substrate. Almost all shoreline change studies focus on soft coasts, including quite recently within the Hawaiian Islands (e.g.—Anderson *et al.*, 2015). Available data for hard coastlines are otherwise scarce.

Several key processes are at work contributing to erosion of the subject property and all typical hard coasts. Wave energy impacting the bluff loosens masses of rock by compressing air within fractures, while the drag of moving water abrasively grinds smaller fragments at the shore. Wind and gravity can loosen free pieces of breccia as well. Storm seas timed with extreme tides can be especially erosive. There is no way to definitely quantify the relative contributions of these processes, though it is reasonable to say that the energy released by wave action is probably the main cause of shoreline retreat at this locality.

Different portions of the shoreline are more or less prone to erosion as a result of the volcanic forces that shaped them in combination with the marine conditions. In this case, the unique combination of physical forces creates a variety of erosional formations. These features are illustrated on Figure 9 and are described below.

Several critical erosional features have already been mentioned and described. An isolated but important one is shown in Photo 10. This massive block which is visible in Figure 9 as well, is in imminent danger of failure. It is a good example of how stochastic process characterize the erosion of these hard coasts.

These features together serve to qualify the extent, type and likelihood of both stochastic and gradual geologic processes. Next we turn to the attempt to quantify these processes and the speed at which they are at work.

Photo 9 Embayment 3, view to the southwest.

Photo 10 is a good view of the southern slope of the tuff cone, showing surface oxidation and weathering of upper tephra. The photo is of interest because it shows collapse of coherent upper tephra blocks after undermining of lower less indurated (black) tephra. The collapse must've been pretty sudden – the young coconut palms in the center might have been carried downslope with collapse. This collapse must have taken place relatively recently (past few decades?) because otherwise the palms (and those tephra blocks) would have been eroded away by storm waves (this conclusion was confirmed after examination of the 1954 aerial photo). Note how angular the pāhoehoe blocks are in the foreground. They haven't been moved around much since collapse of the pāhoehoe flow that used to protect cone from erosion – they've not been moved laterally along shore. In fact, now they serve as very good armor to dissipate incoming storm wave energy.

Photo 10 Large pāhoehoe block liable to failure, view to the northwest (noted in Figure 9).

Quantification of Erosion Rate

Historic Aerial Photos (Photogrammetric Analysis)

Aerial imagery was examined for evidence of major changes in coastal profile or shoreline movement during historic times. The oldest image found included one captured by the Navy in 1954 (#1756 23/35, on 12 November) of the Maku`u coastline. A 1965 photo (6270 EKL12cc-31 on 6 February) in a USDA series was also examined and both were compared to a 2013 Google Earth image.

The scale of the photos and the precision of even digital measurements presented some confounding factors. When enlarged to an appropriate scale for our analysis, each pixel on the 1965 photo was in excess of 10 ft. The larger scale 1954 image was even more "grainy" with pixels equivalent to 15 ft. or more. Both images were acquired at the highes resolution available, 600 dpi.

Shading and resolution differences can easily obscure important smaller-scale details such as the shifting of a boulder here or modest collapse of a ledge there.

Unknown differences in tidal level and surf conditions at the times individual photography was obtained also contribute to the lack of precision. The average diurnal range of tides is 1.67 ft.; on a beach with a slope of 30% (1:3) this translates to a change of approximately 5 ft. of horizontal distance, adding another confounding variable to our photogrammetric methods.

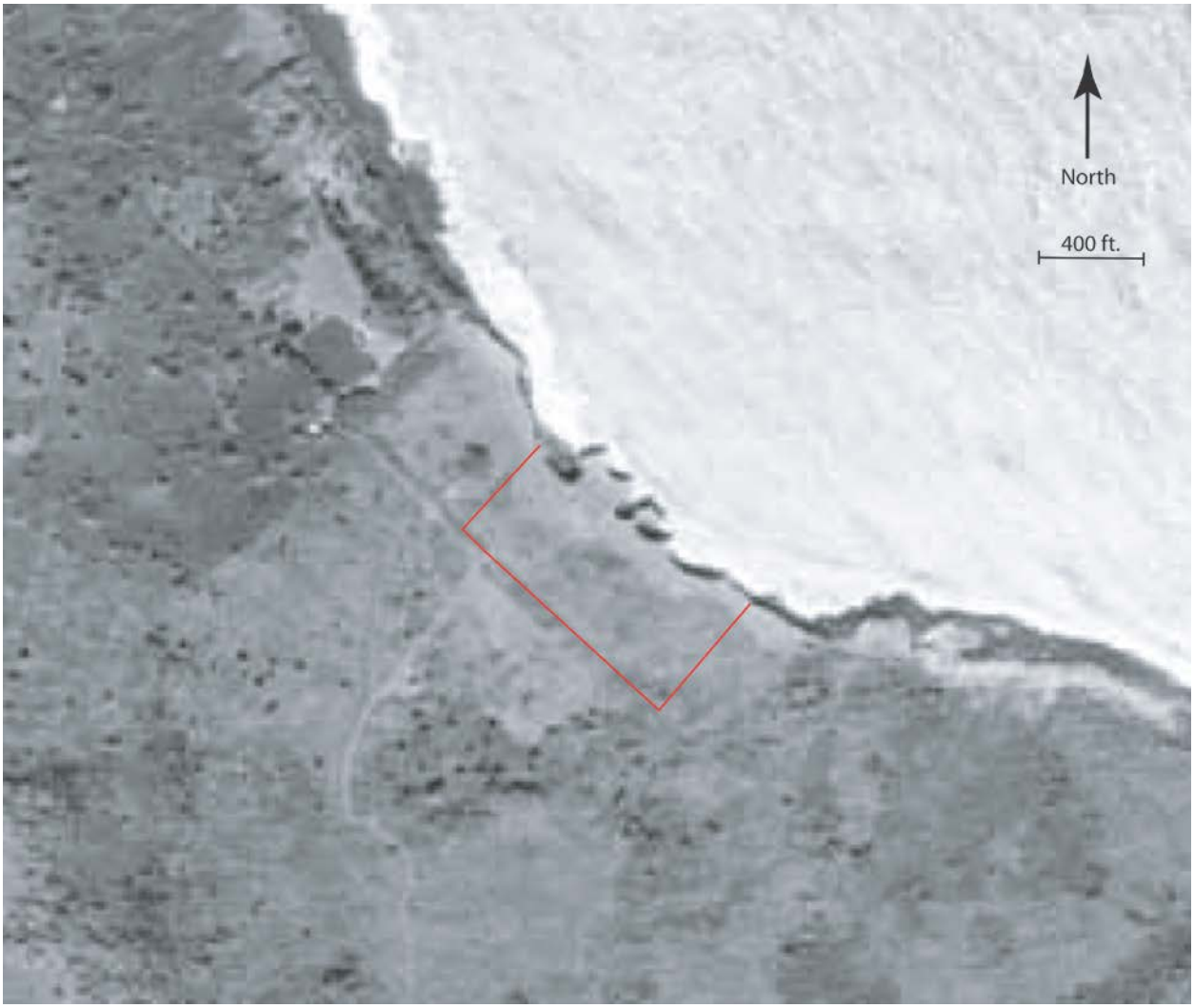

Figure 14 1954 aerial photo of the Ōpūnahā property (cf. with Figure 3).

Despite its limits, the available aerial photo data provides some basis for a minimum and a maximum range of shoreline regress. In addition, problems with orthographic projection and distortion were not corrected for. Imagery registered over this period of 63 years, however, shows measureable changes.

Digital photos were imported into a CAD program to allow for the detailed tracing of the shoreline. The CAD capacity was used to reference each photo geographically to one another. Each layer and the shoreline’s from 1954 and 2013 were then compared and differences measured (see Figure 15).

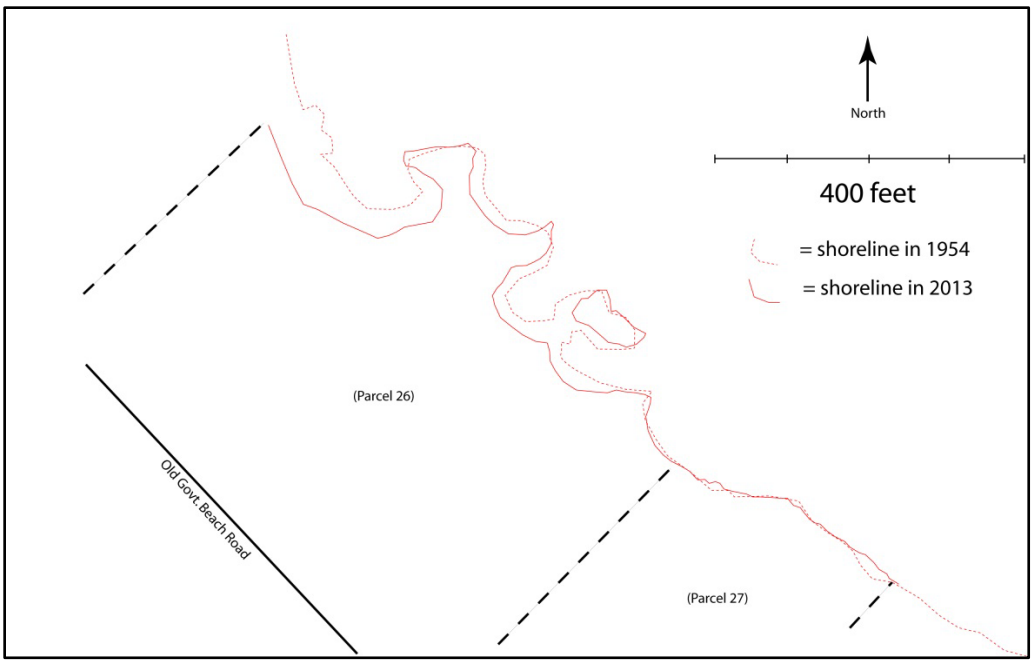

Figure 15 Comparison of Shorelines, 1954 and 2013.

A summary of the resulting measurements is provided in Table 1, below. Recall that a probably photogrammetric error of +/- 15 ft is likely.

The measurement of the difference in horizontal distance between the two shoreline tracings was estimated to the nearest .1mm. These measurements were taken according to a systematic-random sampling design. In this procedure distances were measured perpendicular to the coast (45 degree true) at an interval of every fifty feet across the subject property. This resulted in a sample of 22 measurements along the coastline of the project area form south (TMK 27) to north (TMK 26)..

Transect No.	Measured Retreat Distance (feet)
1	-4.3
2	15.05
3	-5.59
4	-4.3
5	8.6
6	-2.15
7	-6.45
8	4.3
9	6.45
10	6.88
11	21.5
12	18.49

13	34.4
14	19.78
15	19.35
16	19.35
17	32.25
18	45.15
19	43
20	58.05
21	79.55
22	55.9

Table 2 Summary of shoreline retreat measurements along twenty-two "transects".

Negative distances (at transects 1, 3, 4, 6, and 7) are a result of methodological error, the qualitative contributors of which are discussed above. The close match of the shoreline along the southeastern portion corroborates field observations indicating that erosion is minimal here, especially the southeastern most 200 ft. of parcel 27. If we assume the actual erosion along this segment in the last 59 years was negligible, or zero, we can refine the estimate of error to be between 2 and 6.5 ft.

Multiple Annual Average Erosion Rate's (AAER) can be produced by this method:

	Average Retreat Distance (feet)	AAERate (ft/yr)
Project Area (n=22)	21.1	**0.36**
Embayment 1 (n=5)	56.3	**0.95**
Embayment 2 (n=3)	23.7	**0.40**
Embayment 3 (n=2)	27.1	**0.46**
Embayment 4 (n=2)	20.0	**0.34**
Embayment 5 (n=5)	1.8	**0.03**

Table 3 Average Annual Erosion Rates

Inferential Methods

Using the evolutionary framework and developmental assumptions of the geological facies model presented above (Figure 13), a second, independent estimate of the AAER can be made. In order to do so, we rely on the accurate but imprecise dating of the lava flow events documented on site. While this method is a bit "gross", the results are informative.

Distances were measured digitally from the same (2013) aerial photos along the same sampling "transects". First we can assume, as our model indicates, that the maximum seaward extent of land was created by the most recent lava flow (p4o). We also observe remnant pieces of this flow "stranded" out at sea (the arches apices, the sea stacks, e.g.). If we project this ancient flow front by connecting the dots, so to speak, we can then estimate how far inland the shore has migrated since that time. The distance between p4o's most inland exposure and its furthest seaward

appearance over the time since that eruption should yield a plausible erosion rate. The projection of the ancient shore is shown on Figure 9 and resulting measurements are summarized in Table 4.

Transect No.	Feet of retreat
1	0
2	0
3	0
4	0
5	0
6	43
7	70.09
8	86
9	83.85
10	60.2
11	109.65
12	120.4
13	120.4
14	124.7
15	34.4
16	53.75
17	38.7
18	187.05
19	206.4
20	215
21	208.55
22	184.9

Table 4 Measurements based on the general inferential model.

A minimum of 0 ft. and a maximum change of 208 ft. were estimated for the retreat. The `Ailaau flow series (p4o to p4y) was a long lived and geographically widespread event and it's precise date at this locality of difficult to gauge. However, we can bracket the timespan between 750 and 400 years ago to arrive at a potential minimum and maximum figure.

400 year interval	AAER (ft/yr)
	0.22
750 year interval	AAER (ft/yr)
	0.12

Table 5 Results of the general inferential model.

This method results in an AAER of a minimum of .12 ft./year (over a 750 year interval); and a maximum of .22 ft./year (if "p4o" is in fact closer to 400 years old). The mid-point of this estimate yields a rate of .17 ft./year. While somewhat different than the previous estimate using historic photos, they do match in order of magnitude, thus reinforcing our confidence in the accuracy of each.

Discussion of AAER

These methods of erosion rate calculation are somewhat problematic because the actual rate is constantly changing with conditions. Over geologic time coastlines will go through periods of relative stability followed by rapid change, especially on a young dynamic coast like Kīlauea volcanos. In general Big Island coasts are characterized by rapid post-eruption evolution, slowing when new equilibria are reached only to be re-accelerated with the next volcanic episode. The situation can be described as one of punctuated equilibria. It is likely that the Ōpūnahā shoreline would be nearing a stable equilibrium, but for climate change. Sea levels rise will have dramatic consequences for future erosion rates. We turn to a discussion of the importance of this near-certainty, below.

Effects of Subsidence and Sea Level Rise (SLR) on Shoreline

Predicting Sea Level Rise (SLR) is a notoriously difficult task. Hwang *et al.* (2007) use a figure of 0.16 inches per year in their assessments of present-day SLR for Oahu, but an overall global rise in sea level of 40 inches by the end of the 21st century has been proposed by Fletcher (2010) and others, that translates in to almost one-half inch per year (0.44 in/yr over 90 years). SLR for any particular area depends heavily on local factors (water temperatures, ocean currents, salinity, etc. Anderson and others (2015) predict a doubling of current SLR rates for Hawaii within 30 years.

Sea level rises' effect on the erosion of sandy beaches has been predicted to be two orders of magnitude greater than the amount of rise. This general prediction is borne out by mathematical models of the interaction between sea level and sedimentary equilibria (Bruun 1962). In a confirmation of these theoretical effects based on the evaluation of continental scale historical data sets, Zhang et al. (2004) conclude that there is a "multiplicative association" between climate change, resultant sea level rises, and coastal erosion. Their modeling leads them to conclude that the effect of coastal erosion, already severe in the 20th C., will be much worse in the 21st. While their discussion focuses on sandy beaches, the theory holds for hard coasts as well – though the magnitude and response times would differ.

A "worst-case" eustatic sea-level rise estimate of 78 inches by the end of this century (.96 in/yr) is given by Pfeffer (2008). Solomon (2007) estimates the rise at 40 inches, a more conservative estimate and in-line with Fletcher's (2010) estimate above. The greatest rate of SLR will take place during the second half of this century according to recent modelling (e.g.--Cazenave and Le Cozannet, 2014).

Total sea level, of course, is a result of the combined changes in elevation of both water and land. Therefore, we must distinguish between eustatic and isostatic change. Eustatic changes

are due to a greater or lesser volume of water in the oceans globally which is affected by global warming. Isostatic changes are locally affected by crustal movements and land subsidence or accretion.

The Big Island of Hawaii is sinking into the Earth's mantle because of the gravitational isostatic load of its growing volcanoes. A subsidence rate of (0.08 - 0.12 inches per year) related to isostatic sinking has been determined by submersible studies of drowned reefs off west Hawaii (Moore and Fornari 1984). However, that rate must be higher for the Puna coastline, where volcanic loading activity is greater (Moore 1970).

Coastline subsidence can be accelerated by sudden events such as the 1975 Kalapana earthquake that caused land in Kapoho to suddenly drop 9.6 inches (based on Hawaii Volcano Observatory (USGS) data in Hwang and Brooks (2007). Such *episodic* seismic induced subsistence is impossible to anticipate or measure. On the basis of InSAR (Synthetic Aperture Radar Interferometry) remote sensing data, Hwang and Brooks (*ibid.*) state that the coastline at Kapoho may be subsiding at a *continuous* rate of between .31 – .67 in/yr. Rates of subsidence at the subject property, 5 miles to the north of the East Rift Zone, are necessarily much lower as a result of that distance from Kilauea's tectonically active rift.

The potential changes in eustatic SLR must be added to predicted isostatic changes in crustal subsidence rates for easternmost Puna. These changes are summarized in Table 6, below.

	MINIMUM (in/yr)	MAXIMUM (in/yr)
Land subsidence - positive isostatic change (Hwang and Brooks 2007).	0.31	0.67
Global Sea-level rise - positive eustatic change (Fletcher 2010, Solomon 2007 and Pfeffer 2008).	0.44	0.96
Sea-level rise (sum)	**0.75**	**1.63**

Table 6 Summary of potential sea level rise.

Future combined sea level change and land subsidence is likely to cause significant shoreline transgression in this area over the long term (100 years-scale). These changes will probably slowly and episodically increase the erosive action of storm waves over the next several decades.

Anderson and others (2015) studied this phenomenon in the context of low-lying "soft" coasts (beaches) throughout the Hawaiian Islands and concluded that average rates of shoreline recession would double by the year 2050, and increase to 2.5 times present and historically measured values by 2100, with shoreline retreats of as great as 190 ft. possible at some beaches. The relevancy of this study to "hard" substrates across the Big Island and in Puna is unclear. This is something to consider in planning. Army Corps models of SLR for the islands come to similar conclusions with at least a foot and possibly as many as 5.5 feet of SLR by the end of the 21st Century (see Figure 16).

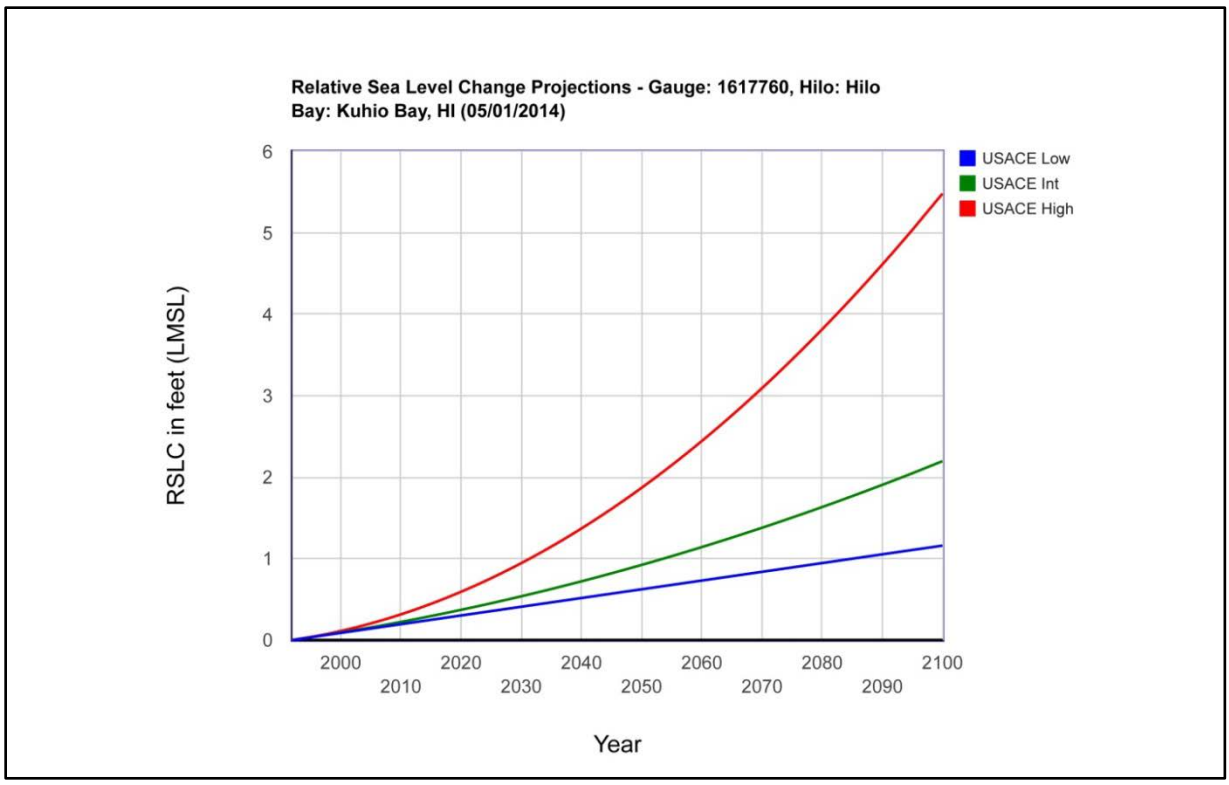

Figure 16 Projected sea-level rise for Hilo, HI (www.corpsclimate.us/ccaceslcurves.cfm).

General Coastal Zone Hazards

In a national assessment of coastal vulnerability conducted by Woods Hole for the United States Geological Survey, six variables were examined in the construction of an alternate, "Coastal Physical Vulnerability Index" or, CVI (Thieler Hammer-Klose 2000). These include mean tidal range, coastal slope, rate of relative sea-level rise, shoreline accretion and erosion rates, mean wave height and geomorphology. The geomorphology, calculated erosion rate, mean tidal range and coastal slope variables can be considered in this case as moderate, while two of the factors listed might cause some concern, sea-level rise and significant wave events. More to the point is the importance of a holistic treatment of coastal vulnerability.

Hwang (2005) recommends that all hazards facing coastal areas should be considered when planning for land-use zoning in Hawaii, and not just erosion. Fletcher *et al.* (2002:150) calculated island-wide hazards assessments for Hawaii's coastlines. These hazards are rated on an ascending scale from 1 (low) to 4 (high). The specific risk levels for this area of Puna and the Ōpūnahā property are shown below (see Table 7):

Hazard Type	Risk Level
Tsunami (1-4)	4
Stream Flooding (1-4)	3
High Waves (1-4)	3
Storms (1-4)	4
Erosion (1-4)	2
Sea Level Change (1-4)	4
Volcanic/Seismic (1-4)	4
Overall Hazard Assessment (1-7)	6

Table 7 Summary of coastal hazards present at the Ōpūnahā property.

Sea Level Rise has been discussed above at length, correspondingly the risk level at the property for future higher water is 4.

Elevated risks associated with "Volcanic/Seismic" hazard types are due to the Maku`u coast's susceptibility to lava flows and the periodic morphological changes caused by Kilauea's active East Rift Zone (ERZ). Kilauea's south flank has generated many historic earthquakes and despite a current pause in eruptive activity, it will feel them in the future as well. For example, three more recent earthquakes in 1954, 1975 and 1989 registered 6.5, 7.2 and 6.1 on the Richter scale of magnitude (not to mention the most recent M=5.4 and 6.9 pair of tremblors that hit May 4, 2018 - which was felt strongly in this area). A hazard intensity rank of 4 indicates "frequent" seismic activity and recommends for a UBC seismic zone factor of >/= 2 (Fletcher et al. 2002:3).

Other volcanic hazards include the threat of inundation by lava flows. The Ōpūnahā property lies in a USGS defined hazard Zone 3 (Wright *et al.* 1992). It is a fair distance from the active East Rift Zone or summit of Kilauea (Zone 1).

There is a possibility of tsunami (seismically generated "tidal"-waves) threatening this coastline. A hazard rank of 4 reflects this fact. The high rating is a result of the historical occurrence of

tsunami as well as the low slope of the coastline. Exceedingly large "tidal waves" generated by local or wide ranging Pacific-Rim volcanic movements can severely impact this region. Data are available for historic tsunami heights from Hilo as well as from Cape Kumukahi (the property lies approximately half-way between the two). In 1946 a tsunami reached 26 ft above normal sea level in Hilo and 19 ft. at Cape Kumukahi. In 1957, waves of 13 and 12 ft. (respectively) were recorded at these locations. One of the largest tsunami of modern time to hit the island came in 1960 when a 35 ft. high wall of water, focused by Hilo Bay, completely decimated the low-lying coastal areas of Hilo. The effects of a tsunami are highly variable, dependent on both local and extra-regional factors. For example, on the southeast shore this wave amounted to only 13 ft in height (Fletcher et al. 2002:7).

Sea cliff heights across the property range from 8 to 13 meters above sea level (26 – 43 feet).The coastal plain behind the pali has a slope of only 2% (a gradient of 1:50). Therefore, for every one foot of vertical wave height above the elevated cliff, wave run-up could be as much as 50 ft. horizontally. Recall that significant wave heights of 6 meters (20 feet) are not uncommon (see Figure 6). This does not account for additional surge and momentum. There is, however, no indication or historic recording of the 1960 tsunami or any previous one overrunning the property area. It is, however, for this reason that Fletcher's sea-level change risk rating is 3-4 for the reference area of Maku`u.

Fletcher et al. (*ibid.*) also rank the property relatively high in risk for high wave damage (3) and storm impacts (4). As discussed above, this portion of the Hawaiian island is subject to rapidly building swells of greater than 12 ft. in height that occur with seasonal frequency. The storm risk ranking of 4 indicates that over-wash of the shoreline should be expected. The 3 rating for stream flooding corresponds to the properties location in a watershed which can receive greater than 7.9 inches of rain per month and has few mitigation measure in place in the event of a flood (Fletcher et al. 2002:3). No evidence of past flooding was observed, although water can be expected to pond for short periods in low-lying areas.

This fact has implications for soil conservation. Terrestrial erosion is seen as a moderate concern in the project area, with a rank of 2. There is relatively little soil development on the property, given its geologic youth. Attention should be paid to the maintenance of ground cover and vegetation to conserve the thin topsoil as much as possible from occasional strong runoff events.

Overall, the Ōpūnahā property is in a relatively risky zone, with a myriad of hazards to contend with. Fletcher et al. rank this area with an overall hazard assessment (OHA) of "high" - 6 on a scale of 7.

Summary

The Ōpūnahā property, like all land on Kilauea volcano is unique in character due to the specific physical setting and historical impacts of volcanic activity molded over the eons by the action of the ocean.

As a hard rock coast, it is difficult to assess in the same terms used for the many beaches and soft sand shorelines of the older islands of Hawaii. Hard coastlines are at one extreme of a "sensitivity scale" in this regard - they are slow responding systems (Hansom 2001). Coastlines such as those at the Ōpūnahā Farm are susceptible to particular types of High Magnitude – Low Frequency (HMLF) events. For coasts on this end of the sensitivity scale "low frequency" needs to be better defined. Given the probability of significant sea level rise, the frequency can be expected to increase.

Two independently derived erosion rate estimates (min. and max.) were calculated based on historical and geological data. These were derived empirically and treated in as quantitative a manner as the data permitted.

We arrive at a final AAER for the Ōpūnahā Property of between 0.36 and 0.17 feet per year. This range represents the average annual rate based on estimated changes measured over large spans of time. The actual erosion rate for any given year may vary greatly based on extreme weather or geologic events that could impact the coastline at any given time. The annual erosion rate could change dramatically, especially in face of the changing climate conditions. The present shoreline is not entirely stable, in particular those portions above the undercut sea caves which may be particularly susceptible to unpredictable seismic events and increasing large wave events. For these reasons we recommend the larger figure (**AAER = 0.36 ft./year**) be used for setback determination.

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SCS Project Number 2420-1

AN ARCHAEOLOGICAL INVENTORY SURVEY REPORT FOR A 10.45-ACRE PROPERTY IN PŌPŌKĪ AHUPUA‘A, PUNA DISTRICT, HAWAI‘I ISLAND, HAWAI‘I [TMK: (3) 1-5-010:026 & 027]

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MAY 2020
DRAFT

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EXHIBIT B

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ABSTRACT

Under contract to property owner Opunaha, LLC, Scientific Consultant Services, Inc. (SCS) conducted an archaeological inventory survey (AIS) of 10.45 acres of land [TMK: (3) 1-5-010:026 & 027] located in Pōpōkī Ahupua‘a, Puna District, Island of Hawai‘i, Hawai‘i. The property address is 15-2193 Old Government/Beach Road. The property is bounded on the east by the Pacific Ocean, the west by Old Government/Beach Road, on the north and south by residential properties.

The property owner is proposing to build a single family dwelling on the property. The AIS study was conducted as supporting documentation for a Special Management Area (SMA) permit application and construction permit application.

Prior to fieldwork, a search of geological maps, aerial photos, historical maps, historical documents, and archaeological reports was conducted. Pedestrian survey and site recording was conducted in November, 2019 by SCS Senior Archaeologists Glenn Escott M.A. and Suzan Escott, B.A., and SCS Archaeologist Thomas Dols M.A.

Two archaeological sites were identified, including a rock wall SIHP Site 50-10-45-18419) parallel to Old Government/Beach Road and a property boundary rock wall (Site 50-10-45-31185). The sites are the remains of Historic to Modern era agriculture and ranching.

Both of the sites are significant under criterion "d" as they are likely to yield information important to history of ranching in the area. Information recorded at the sites during the current study has adequately ascertained the age and function of the sites and documentation contained in this report is sufficient to warrant no further work at both sites.

This report contains background information outlining the project area environmental and cultural contexts, a presentation of previous archaeological work within the study area and in the immediate vicinity, an assessment of expected archaeological patterns, an explanation of project methods, project findings, significance assessments, recommendations and the proposed project effect.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

INTRODUCTION

PROJECT AREA DESCRIPTION

Under contract to property owner Opunaha, LLC, Scientific Consultant Services, Inc. (SCS) conducted an archaeological inventory survey (AIS) of 10.45 acres of land [TMK: (3) 1-5-010:026 & 027] located in Pōpōkī Ahupua‘a, Puna District, Island of Hawai‘i, Hawai‘i (Figure 1 through Figure 4). The property address is 15-2193 Old Government/Beach Road. The project area is located approximately eight miles southeast of Kea‘au town and just south of Hawaiian Paradise Park (HPP) residential subdivision. The property is bounded on the east by the Pacific Ocean, the west by Old Government/Beach Road, on the north and south by residential properties.

The property owner is proposing to build a single family dwelling on the property. The AIS study was conducted as supporting documentation for a Special Management Area (SMA) permit application and construction permit application. The property owner’s point of contact for the project is Mr. Zendo Kern. Mr. Kern can be contacted by phone at (808)-333-3393 or by email at zendo@zendokern.com.

METHODS

The archaeological inventory survey was undertaken in accordance with Hawai‘i Administrative Rules 13§13-284 and was performed in compliance with the Rules Governing Minimal Standards for Archaeological Inventory Surveys and Reports contained in Hawai‘i Administrative Rules 13§13-276. The investigation included the following procedures:

1. SCS conducted historical and archaeological archival research including a search of historic maps, aerial photos, written records, Land Commission Award documents, State and County Planning and Tax Records documents, and previous archaeological reports.
2. SCS conducted limited oral interviews with cultural informants.
3. SCS carried out a 100% pedestrian survey of the project area.
4. SCS documented all historic properties identified within the project areas.
5. SCS assessed all sites for significance and made recommendations for site disposition.

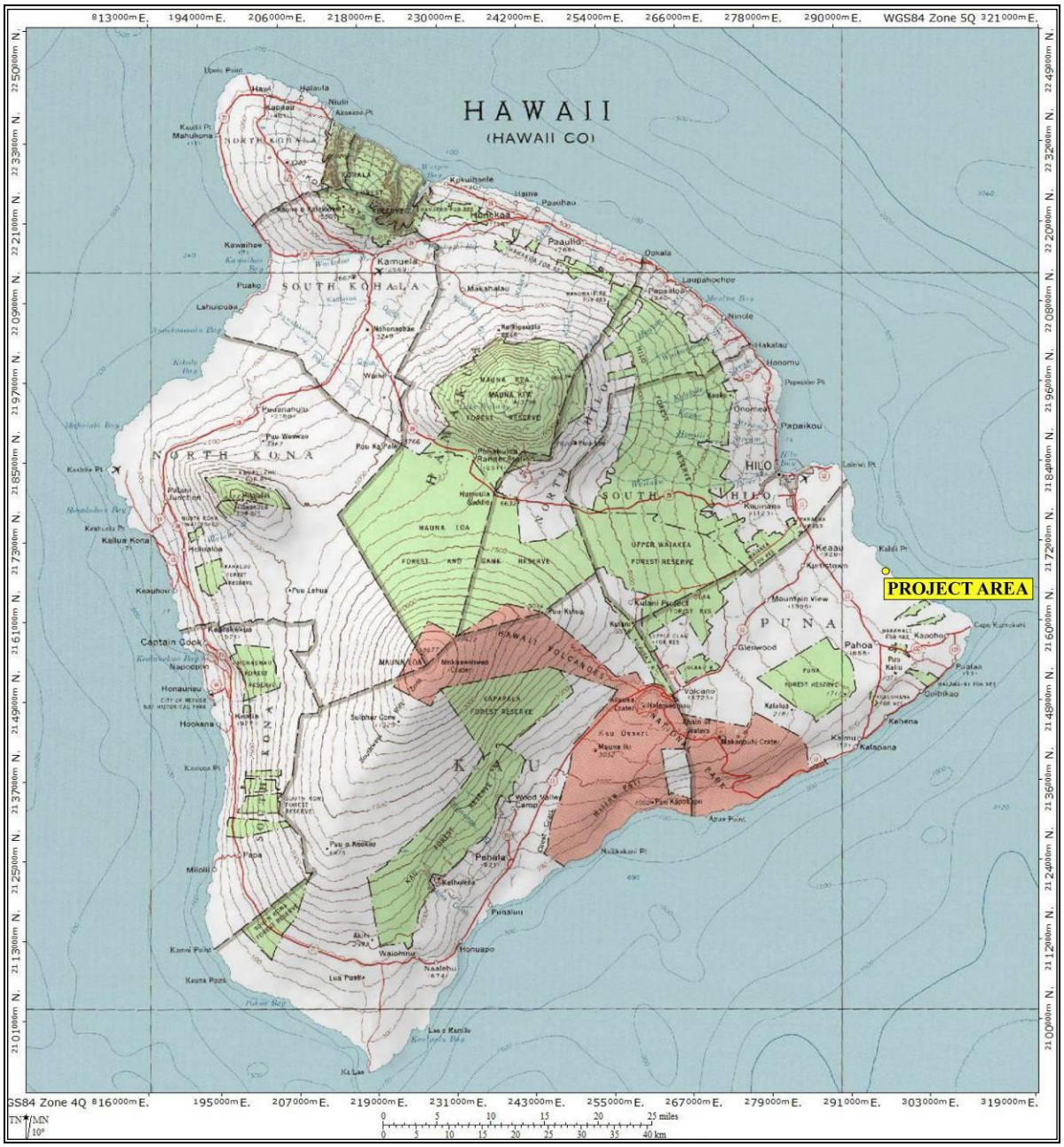

Figure 1: 5,500 K-Series Map of Hawai‘i Showing Location of Project Area (National Geographic Topo!, 2003. Data Sources: National Geographic Society, USGS).

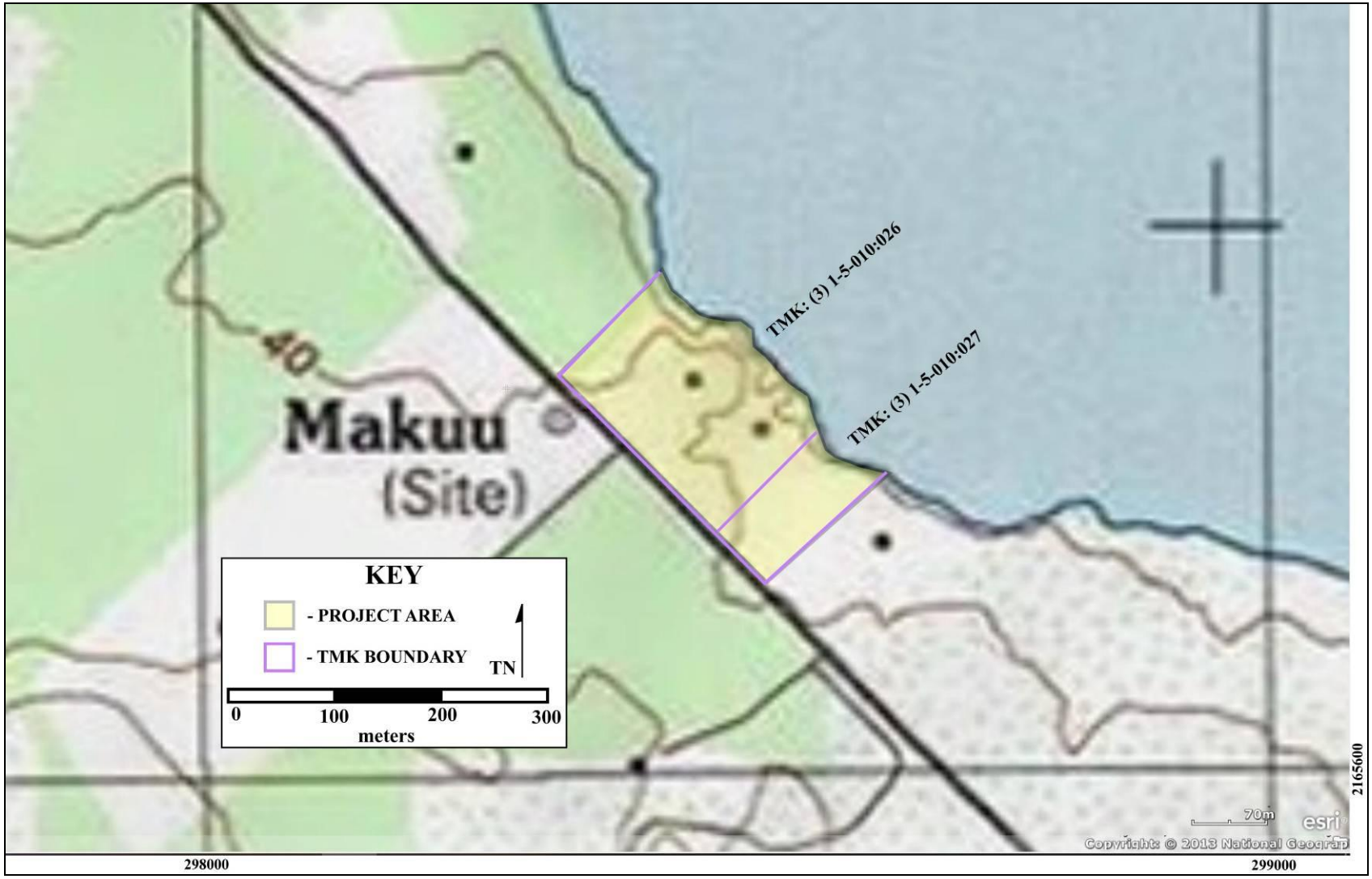

Figure 2: 7.5-Minute Series USGS Topographic Map Showing the Location of Project Area and TMK Parcels (Keaau Ranch Quadrangle. ESRI, 2013. Data Sources: National Geographic and County of Hawai‘i Planning Department, 2019).

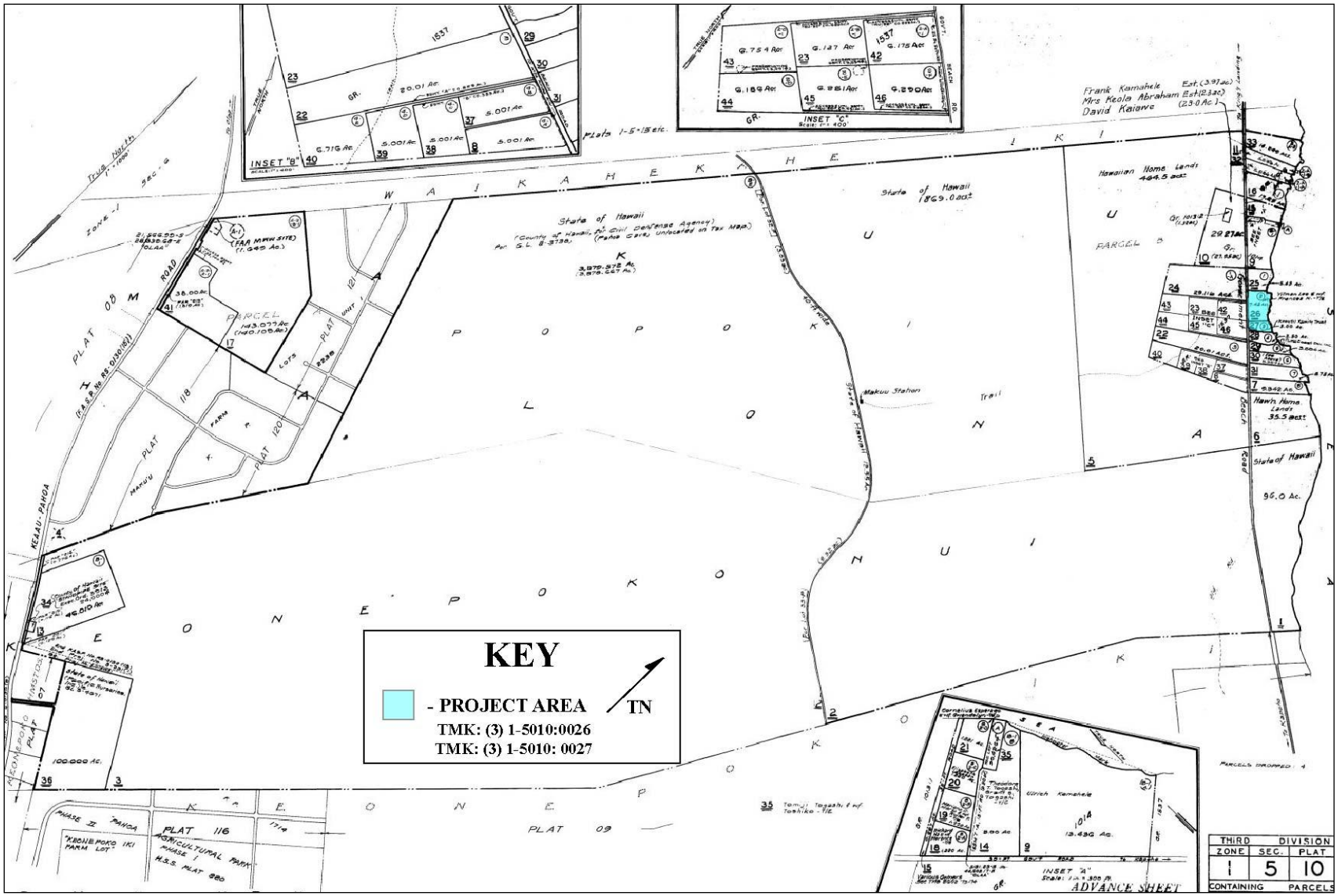

Figure 3: TMK: (3) 1-5-010 Map Showing Location of Project Area (County of Hawai‘i Planning Department, 2019).

Figure 4: Aerial Photograph Showing Project Area, Kea'au, HI, Zone 5 North. (ESRI, 2013 Image. Data Sources: Digital Globe, GeoEye, Earthstar, USDA, and USGS).

Prior to fieldwork, a search of geological maps, aerial photos, historical maps, historical documents, Hawai‘i County Planning records, and previous archaeological reports was conducted.

A pedestrian survey was conducted in November, 2019 by SCS Senior Archaeologists Glenn Escott, M.A. and Suzan Escott, B.A., and SCS Archaeologist Thomas Dols, M.A. The fieldwork took a total of 64 person-hours to complete. A series of northwest/southeast transects spaced two to three meters apart were walked across the entire project area. Ground cover consisted of grass, scattered trees and some low ferns and bushes. Ground visibility was good. Glenn Escott was the principal investigator and project director for the AIS study.

Sites were plotted with a Garmin GPSMAP64 Global Position System (GPS) using Universal Transverse Mercator (UTM) projection (Zone 5 North) and WSGS84 datum. Written descriptions, scale plan view drawings, and photographs were generated for all of the archaeological features identified. Color photographs were taken of individual site features using a 25 cm long north arrow scale divided into 10 cm black and white increments.

There were no subsurface test excavations conducted as the only archaeological features within the project area are rock walls.

CONSULTATION

Members of the Kamahele and Lui *‘ohana* were interviewed by SCS for an AIS study (Escott 2019) two properties northwest (150 meters) of the current project area. The interviews were conducted to document cultural and historical information pertinent to the Kamahele property as well as in the broader area. The content of the interviews is pertinent to the current study given the close spatial relationship between the Kamahele property (Parcel 009) and the current project area (Parcels 026 & 027].

This report contains background information outlining the project area environmental and cultural contexts, a presentation of previous archaeological work conducted nearby, current survey expectations based on the previous work, descriptions of all sites documented during the AIS field work, and significance assessments and recommendations.

ENVIRONMENTAL SETTING

The project area is situated on level to moderately sloping land at 0.0 to 50.0 feet (0.0-15.0 m) above mean sea level (amsl) (see Figure 2). The project area substrate is a Kīlauea lava flow dated between 750 and 1,500 years ago (Wolfe and Morris 1996). Soil in the project area is ʻOpihikao series (rOPE) extremely rocky muck overlaying pāhoehoe lava (Sato 1973:43). The soil is thin and well drained with 3% to 25% slopes. The seaward edge of the project area is 20 to 30 foot high cliffs (Figure 5 and Figure 6). There is no easy access to enter the ocean except by climbing down the cliff face.

There is a low littoral black cinder cone located along the sea cliff in the middle of Parcel 026 (see Figure 2 and Figure 4). The seaward side of the cone is eroded (Figure 7 and Figure 8). The cinder cone slopes gently to southwest and is covered by grass grazed by sheep and goats. The remainder of the project area is pāhoehoe coastal flats with grasses, low shrubs and scattered trees (Figure 9 and Figure 10). Tree species in the southeast portion of the project area (Parcel 027) include autograph (*Clusia rosea*), gunpowder (*Trema orientalis*), Moluccan albezia (*Falcataria moluccana*), bingabing (*Macaranga mappa*), and guava (*Psidium sp.*) (Starr 2013). There are also intermittent coconut palms (*Cocos nucifera*) along the coastline. Rainfall in the project area is between 120 and 200 inches per year. Natural drainage in the area runs from west to east.

Figure 5: Photograph of Sea Cliff at the Northeast Edge of the Project Area, Looking Northwest.

Figure 6: Photograph of Sea Cliff at Middle of the Project Area, Looking Southeast.

Figure 7: Photograph of Littoral Black Cinder Cone at Middle of the Project Area, Looking South.

Figure 8: Photograph of Littoral Black Cinder Cone at Middle of the Project Area, Looking South.

Figure 9: Photograph of Project Area Parcel 026 Grass in Foreground and Parcel 027 Trees at Background Left, Looking South.

Figure 10: Photograph of Project Area Parcel 026 Grass, Looking West Toward Government Beach Road.

HISTORICAL AND CULTURAL CONTEXTS

Many archaeologists believe that Hawai‘i Island was first settled around A.D. 1,000 by people sailing from the Marquesas (Athens et al. 2014; Dye 2011; Kahn et al. 2014; Kirch 2011; Kirch and McCoy 2007; Mulrooney et al. 2011; Reith et al. 2011; Wilmhurst et al. 2011a and 2011b). An article published in the Journal of Archaeological Science reviewing radiocarbon dates recovered at archaeological sites on the Island of Hawai‘i suggests that, by relying on only carbon samples from short-lived plant remains, the most reliable dates point to initial Polynesian colonization of Hawai‘i Island occurring between A.D. 1220 and 1261 (Rieth et al. 2011:2747). Hilo was, by most estimates, one of the first settlements on the Island of Hawai‘i.

The rich marine resources of Hilo Bay and the gently sloping forests of Mauna Loa and Mauna Kea provided abundant resources. Fresh water was available from the Wailoa and Wailuku rivers and smaller streams such as Waiākea, Waiolama, Pukihae, and ‘Alenaio. The current project area is located in Pōpōkī Ahupua‘a, Puna District, roughly twenty kilometers southeast of Hilo (Figure 11 and Figure 12). Pōpōkī Ahupua‘a is located between Waikahekahe and Keonepoko Ahupua‘a in Figure 11.

PRE-CONTACT ACCOUNTS OF SOUTH HILO AND PUNA DISRTICTS

The earliest account of Hilo appears in ‘Umi-a-Liloa’s (1600–1620) conquest of the Island of Hawai‘i, which establishes Hilo as a royal center by the sixteenth century. In the account, ‘Umi-a-Liloa began his conquest of the Island of Hawai‘i by defeating chief Kulukulu‘ā, who lived in Waiākea, and the other chiefs of Hilo (Kamakau 1992:16–17). ‘Umi-a-Liloa’s second son, Keawe-nui-a-‘Umi, ruled Hamākua, Hilo, and Puna from his residence at Hilo (*ibid*: 34). It was from Hilo that he waged war on the Kona chiefs and unified the island. Keawe-nui-a-‘Umi’s descendants single handedly continued rule for many generations from Hilo.

After the death of Keawe-nui-a-‘Umi the kingdom was divided into three parts and was established under warring chiefs; Hilo was ruled by Kumalae-nui-pu‘awa-lau and his son Makua *(ibid*: 45). It was during the period of time that Kamehameha I was born. Kalani‘ōpu‘u’s grandson, Keoua Kuahu‘ula and nephew Kamehameha vied for control over the six chiefdoms constituting the island kingdom and Keoua conquered Hilo chief Keawe-mau-hili and harvested the benefits for a short time only to be vanquished by Kamehameha I late in 1791.

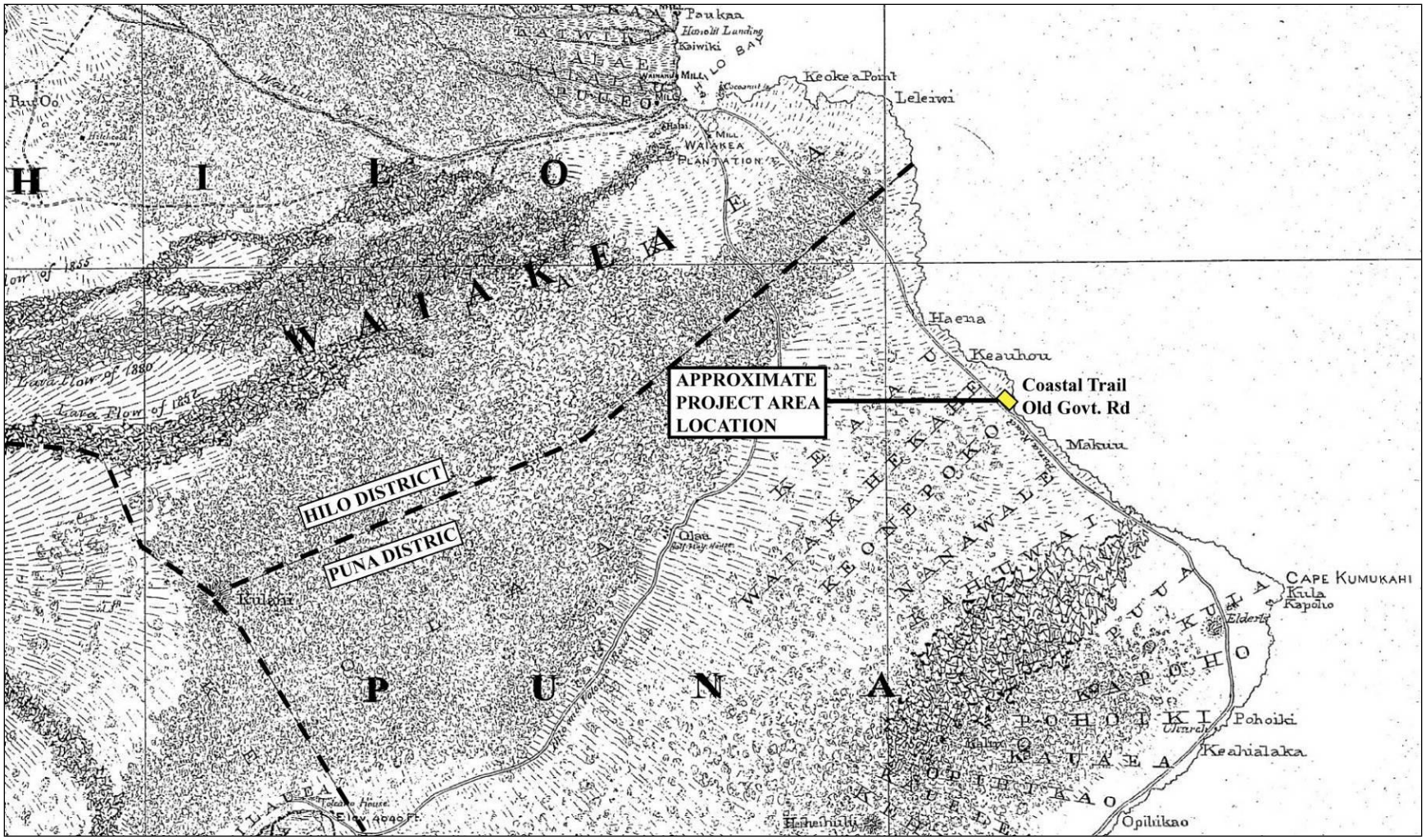

Figure 11: Portion of Map of the Island of Hawai‘i Showing the Locations of Project Area and Place Names (Wall 1886).

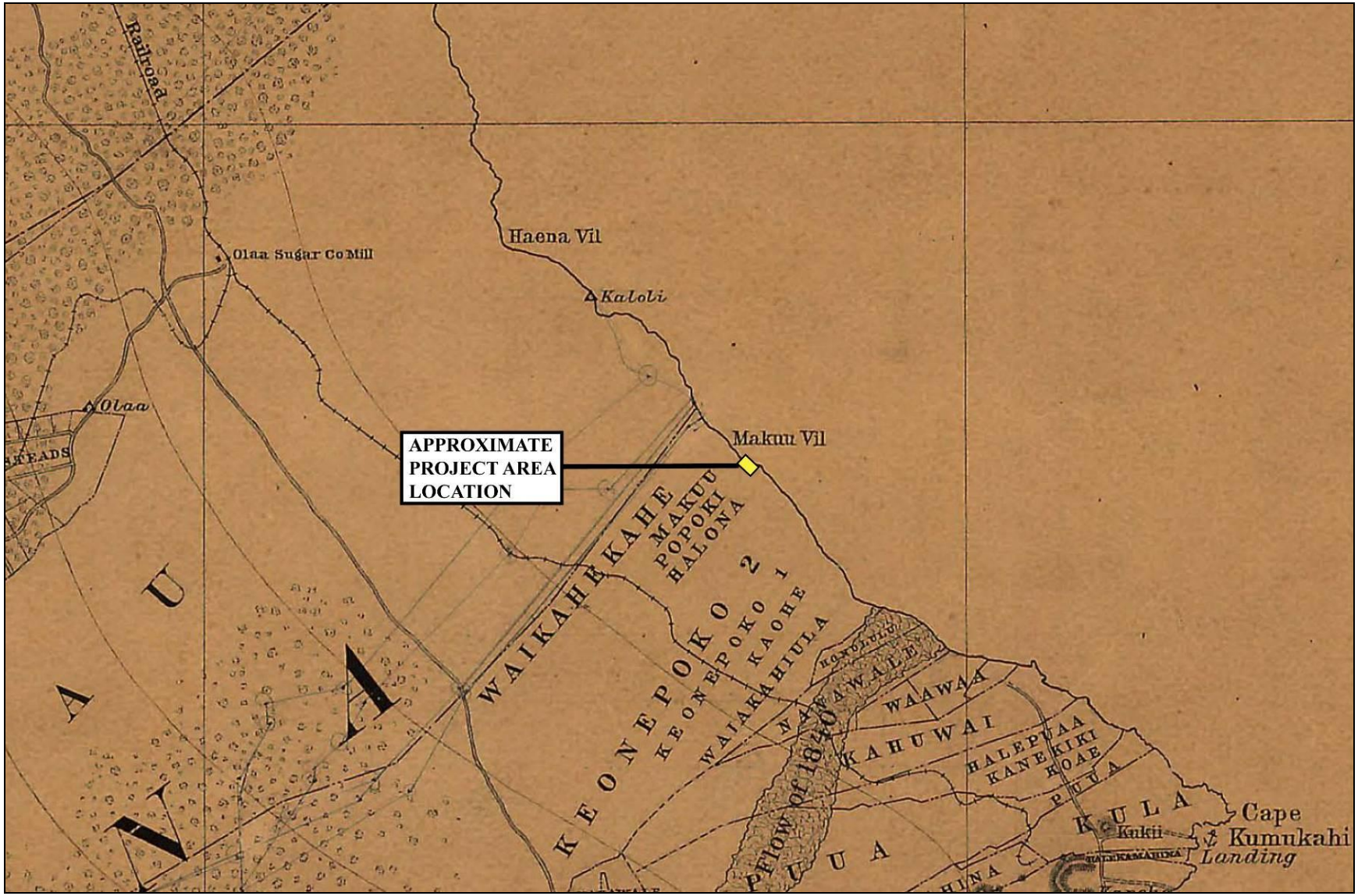

Figure 12: Portion of Map of Hawai‘I Showing Project Area and Surrounding Place Names (Donn 1901).

Kamehameha's son Liholiho was born in Hilo in November 1797 (Kamakau 1992:22). Waiākea was inherited by Lihiliho after Kamehameha's death. The *ʻili kūpono* of Piʻopiʻo and its royal fishpond were given to his favorite wife, Kaʻahumanu.

Situated along the windward coast of Hawaiʻi Island, Puna is a verdant and abundant district with good rainfall and rich soils (see Figure 11). However, it is also subject to volcanic eruptions and has been covered by new lava in many places over the last 1,000 years (Cordy 2000:17, and 22). Much of the district's coastal areas have thin soils, and there are no good deep water harbors. The ocean along the Puna coast is often rough and wind-blown.

As a result of these two factors, settlement patterns in Puna tend to be dispersed and without major population centers. Villages in Puna tend to be spread out over larger areas and often are inland, and away from the coast, where the soil is better for agriculture (*ibid*: 45). The lack of population centers also had an effect on the development of a hierarchy of district rulers. Puna was often not strongly tied together by a tight web of allegiances between *aliʻi* and *konohiki*. As a result, Puna was often conquered and ruled by stronger district leaders in Hilo or Kaʻū (Kamakau 1992:17 and 77).

Puna District was famous for its valuable products, including "hogs, gray *kapa* cloth (*ʻeleuli*), tapas made of *mamaki* bark, fine mats made of young pandanus blossoms (ʻ*ahuhinalo*), mats made of young pandanus leaves (*ʻahuao*), and feathers of the *ʻoʻo* and *mamo* birds" (*ibid*:106). Puna was also famous for its abundant *ulu* (breadfruit).

Keaʻau and neighboring ʻŌlaʻa Ahupuaʻa were well known for their valuable natural and hand-made products. Both *ahupuaʻa* were located along the southern boundary of South Hilo District (see Figure 11). The two *ahupuaʻa* were often the source of forest products for the Hilo's ruling elite. Moreover, Keaʻau cut ʻŌlaʻa off from the ocean, so that families living along the coast in Keaʻau often traded marine resources for upland forest products from family members living in small communities in upland ʻŌlaʻa.

Historical accounts pertaining to lands of the project area region are scarce but provide some information on traditional residence patterns, land-use, and subsistence. William Ellis passed through Pōpōkī Ahupuaʻa in 1823 while travelling along the coastal trail from Kilauea to Waiākea Ahupuaʻa, Hilo (see Figure 12). Ellis' journey took him along the coast past the project area. Ellis did not describe the region of Makuʻu or Pōpōkī Ahupuaʻa, but stopped in a small inland village in Honolulu Ahupuaʻa, and rested in the shade of a canoe house along the coast of Waiakahiula Ahupuaʻa (Ellis 1963:294-295), roughly 3.5 to 5.0 km southeast of Pōpōkī. Honolulu Village and a nearby village were inland and small, and the population was dispersed.

Ellis also described a village, likely Hāʻena, in Keaʻau Ahupuaʻa, north of Pōpōkī (see Figure 12). The village was large and populous with an abundance of taro, sweet potato and sugarcane gardens (Ellis 1963:296). He suggested the area was made more fertile by a flowing stream where he quenched his thirst.

TESTIMONY BEFORE THE COMMISSION TO QUIET LAND TITLES

With the Māhele of 1848 and the two Acts of 1850, authorizing the sale of land in fee simple to resident aliens and the award of *kuleana* lands to native tenants, land tenure in Hawaiʻi arrived at a significant turning point (Chinen 1961:13). The *ahupuaʻa* of Keaʻau was granted to William C. Lunalilo as part of Land Commission award (LCA) 8559-B.

There were no Land Commission awards made in Pōpōkī Ahupuaʻa. Three small Land Grants (LG) were purchased along the coast in Makuʻu, Pōpōkī, and Halona Ahupuaʻa (Figure 13). LG 1013 was purchased by D.W. Maiau, LG 1014 was purchased by Kea, and LG 1537 was purchased by Kapohana. The current project area is the northeast portion of 171.0 acres of land (LG 1537) purchased by Kapohana in 1855.

The littoral cone was used as a triangulation station by early western map makers, and is labeled Opunaha in Figure 13. Ōpūnahā is literally as "broken cluster" (Pukui et al. 1976:172) and likely refers to the eroded littoral cinder cone. There are two *mauka-makai* trails and one trail parallel to the ocean depicted in Figure 13. One of the *mauka-makai* trails ends at Old Government/Beach Road just mauka of the current project area. There are no trails depicted within the current project area.

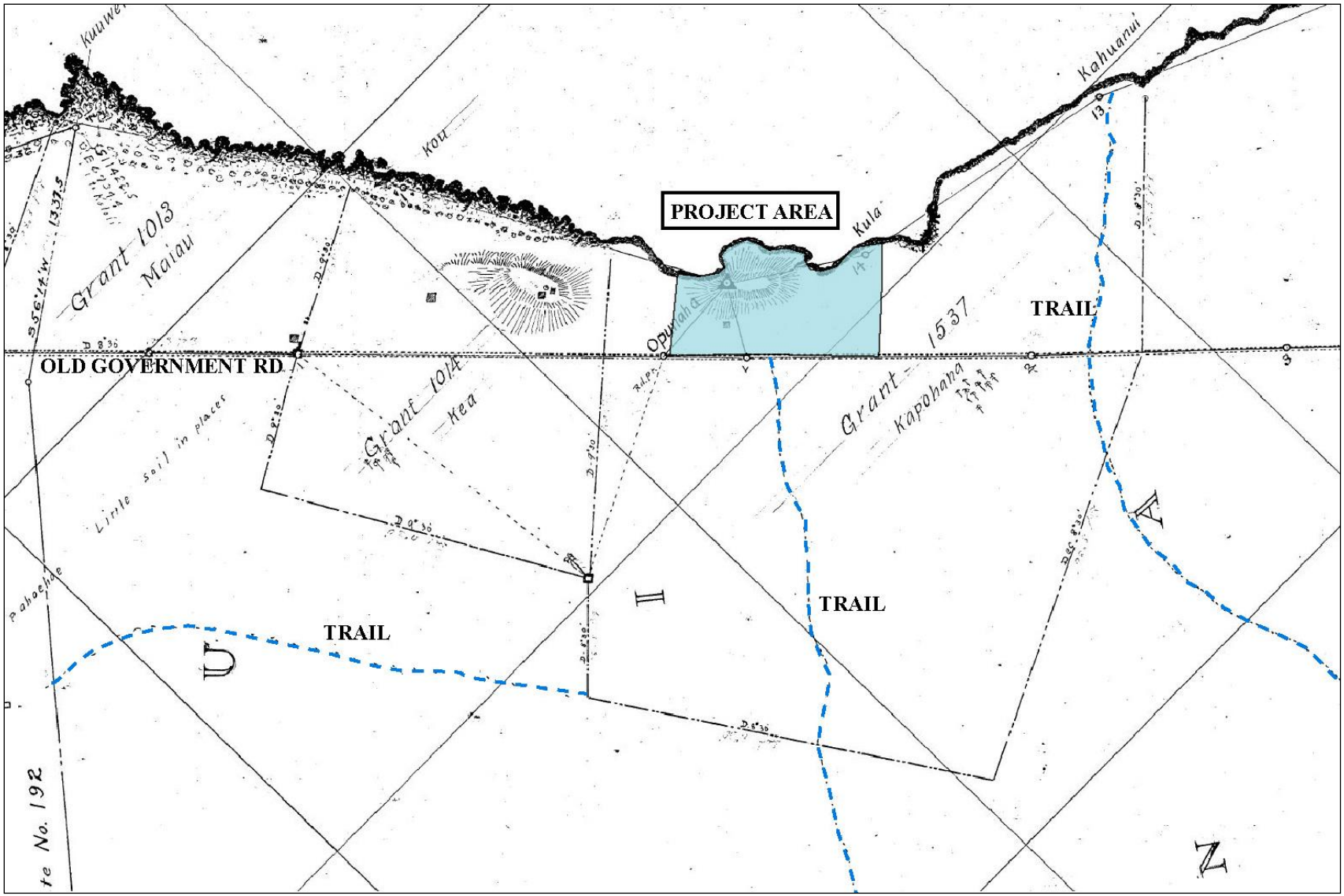

Figure 13: Portion of Map of Puna District Showing Locations of the Project Area and Land Grants (Moragne 1903).

CHANGING RESIDENTIAL AND LAND-USE PATTERNS (1845-1865)

Between 1845 and 1900, traditional land-use and residential patterns began to change drastically. In particular, the regular use of Hilo Bay by foreign vessels, the growth of tourism, the presence of the whaling industry, the establishment of missions in the Hilo area, the legalization of private land ownership, the introduction of cattle ranching, the introduction of sugar cane cultivation, and the construction of Government Roads and railroad lines all brought about changes in settlement patterns and long-established land-use patterns (Kelly *et al*. 1981). Much of the change in residential location and the growth of towns in Puna District were driven by the availability of arable land suited to commercial crops and the location of newly constructed roads.

The traditional travel route through Puna was along the coast (see Figure 11 and Figure 14). The trip was made along a foot trail that led through the coastal and near coastal villages. That trail lead from the modern day Lili‘uokalani Gardens area to Hā‘ena along the Puna coast. The trail is often called the old Puna Trail and/or Puna Road. There is an historic trail/cart road that is also called the Puna Trail (*Ala Hele* Puna) and/or the Old Government Road that continues from the south end of the Puna Trail through Waiakahiula Ahupua‘a heading to points south. Lass (1997) also refers to the entire route from Hilo to Ka‘ū as the Puna-Ka‘ū trail.

THE PUNA TRAIL AND OLD GOVERNMENT ROAD

There is an historic trail that leads from the modern day Lili‘uokalani Gardens in Waiākea to Hā‘ena along the Puna coast. The trail is often called the old Puna Trail and/or Puna Road. There is an historic trail/cart road that is also called the Puna Trail (*Ala Hele* Puna) and/or the Old Government Road that continues from the south end of the Puna Trail heading to points south. Lass (1997) also refers to the entire route from Hilo to Ka‘ū as the Puna-Ka‘ū trail.

Whatever name the trail/cart road alignment is called by, it likely incorporated segments of the traditional Hawaiian trail system often referred to as the *ala loa* or *ala hele* (Hudson 1932:247, Kuykendall 1966:23-25, Lass 1997:15, and Maly 1999:5). Lass suggests the fill length of the Puna Trail, or Old Government Road, might have been constructed or improved just before 1840 (Lass 1997:15). The trail was called the Old Government Road, or *Ala Nui Aupuni* (Maly 1999:5). The alignment was first mapped by the Wilkes Expedition of 1804-41 (see Figure 14).

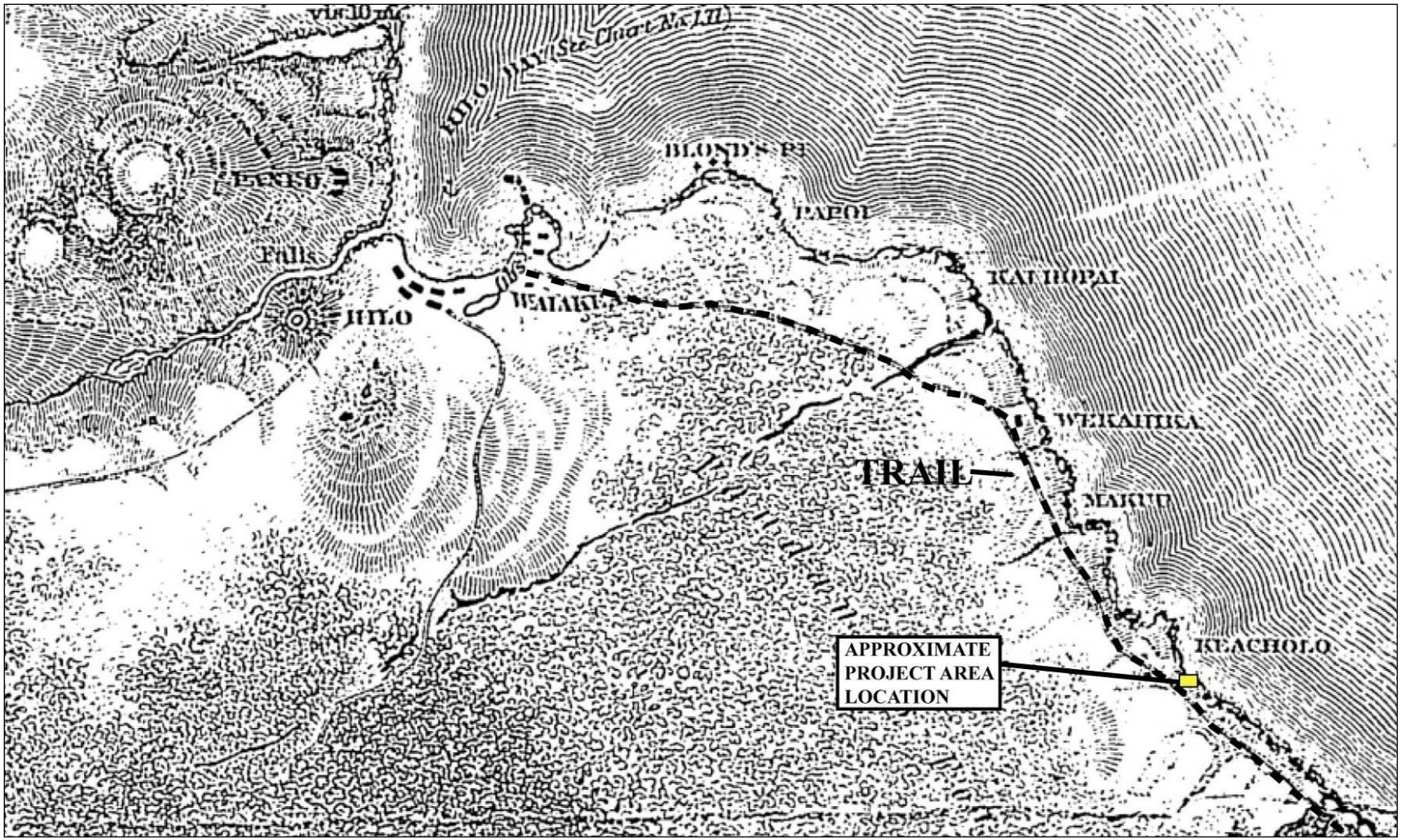

Figure 14: Location of Project Area and Old Government Road from Hilo Bay through Puna District on Portion of Registered Map 424 Drawn by the Wilkes Expedition of 1840-1841.

A general description of the area between the Old Government Road and the newer upper road from Hilo through Kea‘au to Pahoa was recorded in 1889 by the Surveyor General of the Hawaiian Government Survey. The description affords a glimpse into inland and coastal settlement patterns and land use.

> The first settlement met with after leaving Hilo by the sea coast road, is at Keaau, a distant 10 miles where there are less than a dozen inhabitants; the next is at Makuu, distant 14 miles where there are a few more, after which there is occasionally a stray hut or two, until Halepuaa and Koae are reached, 21 miles from Hilo, at which place there is quite a village; thence to Kaimu there are only a few scattered settlements here and there. A good many of those living along the lower road have their cultivating patches in the interior, along or within easy accessibility to the new road (Alexander 1891, cited in Maly 1999:107).

The 1889 description contrasts with Ellis' in which he described numerous villages just sixty-six years earlier. The 1889 description suggests depopulation along the majority of the Puna near-coastal area. In both descriptions, the people in this area appear to have lived somewhat inland, between the coast and the inland gardens. In 1889 people were cultivating small patches of *kalo*, ‘*awa*, and coffee as well as other food items in the inland gardens. The patches were placed in pockets of soil in holes amidst the lava flows. Additionally, sweet potatoes were grown on rock mounds. By 1889, it appears that very few people lived along the Old Government Road (Maly 1999:6). The Surveyor General stated,

> The old sea coast road cannot be kept in repair with the means now at its disposal and its condition each year is becoming more unsafe and ruinous, there is but little travel over it; it has been shown that there is little land capable of cultivation or development either side of it and whatever travel there is now over it would soon be entirely diverted to the upper road (Alexander 1891, cited in Maly 1999:107).

The new road being constructed from Hilo through Kea‘au to Pahoa was designed to allow access to the more arable inland areas. People who traditionally had lived along the Puna coast were moving toward Hilo and into the more fertile upland areas of Puna in

order to find paid work and to produce cash crops for local markets and for export. In particular, people began to work in the inland areas to grow sugarcane.

The same was true of the trail from Hilo, through Kea‘au, and on to Kīlauea Crater (Volcano Road). An improved Volcano Road was built from Hilo to Kīlauea between 1889 and 1893 partly to accommodate tourism, but also to increase access to forest products and agricultural land. Numerous small field parcels belonging to the ‘Ōla‘a Sugar Company and the ‘Ōla‘a Coffee Company were located along this route. The improved Volcano Road is Route 11, though it has been straightened and improved several times since its initial construction.

The modern history of land-use in Kea‘au Ahupua‘a is tied to the development of commercial agriculture and the construction of transportation routes. The potential to use Kea‘au's rich arable land for commercial prospects was recognized as early as the 1870s when it was leased for coffee growing and for cattle grazing. In 1881, the entire *ahupua‘a* was purchased at auction by Samuel Damon, William H. Shipman, and E. Elderts from trustees of the deceased William C. Lunalilo Estate. Shipman bought out the two partners within three years of purchasing the land.

William H. Shipman operated a cattle ranch in Kapoho Ahupua‘a and was the owner of the Waiākea Stock Ranch. Shipman was also co-owner of the Shipman Meat Market, later the Hilo Meat Company. Shipman leased portions of Kea‘au Ahupua‘a to the ‘Ōla‘a Sugar Company beginning in 1899. It was the development of ‘Ōla‘a Sugar Company fields, the construction of the sugar mill in Kea‘au, and the construction of the numerous sugar company camps, that created modern day Kea‘au town as a small commercial and residential center.

SUGARCANE, RAILROADS AND COMMERCE

The ‘Ōla‘a Sugar Company, established in 1899, became the largest sugarcane plantation and milling operation in Puna District. By the 1950s the ‘Ōla‘a Sugar Company was in debt and sugar production and sales were stagnant. The company stockholders changed the company name to the Puna Sugar Company, Ltd. and sold off land to invest in new equipment and upgrade their facilities. By 1966, the company was debt free and making a good profit. American Factors (AMFAC) bought out the minority shareholders in 1969 and Puna Sugar Company became a subsidiary of AMFAC.

AMFAC expanded sugarcane processing in the 1970s through new extraction facilities upgrades at the mill in Kea‘au (‘Ōla‘a Mill) and by building a 15KW bagasse and trash burning power plant next to the mill. Hilo Electric Light Company (HECO) agreed to purchase 12.5KW of power for their customers.

Puna Sugar Company, like many other sugar companies, struggled in the late 1970s and early 1980s due to changes in the sugar market that made sugar production less profitable. By the start of 1982, AMFAC had decided to close Puna Sugar Company. The work of selling off assets and preparing severance packages took three full years. The sugar mill was sold to Fiji Sugar Corporation in 1988 and the power plant operation taken over HECO.

MODERN LAND USE

The project area and surrounding lands were not used for growing sugarcane as the soil is too shallow. The area remained primarily unaltered and undeveloped grasslands with a large variety of introduced and invasive species. The land north of the current project area, 15.6 square miles in total, was purchased by David Watumull from W.H. Shipman, Ltd in 1959. The land was subdivided into nearly 8,800 lots within the newly created Hawaiian Paradise Park (HPP) subdivision.

Currently, the land along the coast near the project area is primarily privately owned. Some of the lots have homes on them and others are still undeveloped. Some of the lands further *mauka* of Old Government/Beach Road are owned by the Department of Hawaiian Homelands (DHHL) and the State of Hawai‘i. Parcel 026 has rock walls and barb, panel and electric wire fence, and has been used as pasture for sheep and goats for many years. Parcel 027 is undeveloped and is partially wooded.

PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

The majority of previous archaeological studies near the project area have been conducted on lands along the coast (Figure 15) and in Kea‘au Ahupua‘a, slightly inland, west of the project area.

There are six coastal Kea‘au archaeological studies conducted northeast of the current project area (Ewart and Luscomb 1974, Hammatt 1978, Hudson 1932, Lass 1997, Stokes 1919, and Thrum 1908). Two literature reviews, one with oral interviews, were also conducted for coastal Kea‘au Ahupua‘a (Maly 1999, McEldowney 1979a and 1979b). Thrum (1908) and Stokes (1919) were the first to record sites in Puna District. They recorded *heiau* in the Puna area but none near the Old Government Road (OGR) or the current project area.

Hudson (1932) conducted an archaeological suvery of the east Hawaiian coast. Eighty-five sites were recorded between Hilo and Cape Kumukahi. Hudson described the excellent condition of the portion of the OGR between Kea‘au and Kapoho. He documented several sites in Hā‘ena including a fishpond, a *ko‘a* (fishing shrine) with an upright stone, and another site with two upright stones. Clark (1985), in his book on Hawai‘i Island beaches noted that the site Hudson (1932) had recorded with two upright stones was still present, but that only one stone remained upright. The *ko‘a* recorded by Hudson could not be relocated during a more recent survey of the area (Lass 1997).

Ewart and Luscomb (1974) conducted an archaeological reconnaissance survey along a 16-mile proposed road corridor from the Hilo-Puna district boundary to the south edge of the Hawaiian Beaches subdivision (see Figure 15). The north half of the project corridor was approximately 0.5 to 1.0 mile inland from the coastal cliffs and ran parallel to the coast. The south half of the project corridor, from just south of Pākī Bay to the southern terminus, ran along the coast.

Figure 15: 7.5-Minute Series USGS Topographic Map (Kea'au Ranch Quad) Showing Location of Coastal Kea'au Ahupua'a Previous Archaeological Studies (National Geographic Topo!, 2003. Data Sources: National Geographic Society, USGS).

Thirty sites were documented in the Kea‘au Ahupua‘a portion of the survey corridor (Ewart and Luscomb 1974:14). The majority of sites documented in Kea‘au Ahupua‘a were clustered in the northern portion of the study corridor, and along the OGR south of Hā’ena. Site types included rock walls (n=10), complexes (n=9), enclosures (n=6), a platform (n=1), a rock shelter (n=1), a rock mound (n=1), and L-shape enclosure (n=1), and a modified outcrop (n=1). The age and function of sites was not determined during the brief reconnaissance survey.

The authors recommended a Phase I archaeological survey, suggesting that any future study should focus on variations in prehistoric settlement patterns as they relate to varying coastal topography (Ewart and Luscomb 1974:47). In particular, future study should focus on resources availability and settlement patterns. Resources determining settlement include ground water availability and ocean access for canoes.

Hammatt (1978) conducted an archaeological recconnaissance survey in the northeast corner of Kea‘au Ahupua‘a, approximately two miles north of the current project area (see Figure 15). Twenty seven archaeological and/or historical sites were documented along the coast (Hammatt 1978:3). Sites were classified as either stone structures including walls, platforms, enclosures, *heiau* and small shelters; cultural deposits, mainly midden and other habitation remains; or places of historical significance.

All of the stone structure sites, with the exception of two sites interpreted as *heia*u (Site 6475 and Site 6476), were assessed to be in poor condition and were not recommended for further study. Sites containing midden were recommended for preservation and the historically significant sites were recommended for preservation with interpretive signage. The report also recommended vegetation clearing and resurvey of the coastal portion of the project area to identify additional sites.

McEldowney (1979a and 1979b) conducted a literature review of east Hawai‘i that included the OGR. This work compiled known sites such as the Hā‘ena complex (50-HA-A1-65) and the fishpond at Hā‘ena (50-HA-A1-64). The OGR was referred to as the “Hilo to Puna trail” and was not given a site number. McEldowney noted it as Historic a Historic era site but suggested it likely was constructed from a pre-Contact era trail.

Barbara Lass (1997) conducted an archaeological reconnaissance survey along the OGR from Hā‘ena south (Figure 16 and Figure 17). The study corridor covered approximately three miles of coastline from Hā‘ena to Hawaiian Paradise Park (HPP) subdivison. The south end of the study corridor is located approximately ½ mile (0.8km) north of the end of Beach Road. The reconnaissance survey was conducted as part of a proposal to construct a public hiking trail along the OGR.

Lass documented 15 archaeological sites (Table 1), including the OGR (Site #50-10-36-21273). Several sites outside of the project area corridor were identified during the survey, including a *heiau* near Pākī Bay, a possible residential complex near Site #50-10-36-21266, and names scratched into pāhoehoe at Pākī Bay. Lass recommended that a hiking trail wold not negatively impact the archaeological sites along the OGR and could be a useful resource for educating the public about the history and archaeology of the area.

Lass's research determined the Old Government Road was under construction around 1868 and the portion within her project area was first referenced in 1869 when a Puna road supervisor planned to work on five miles between Waikahekahe (possibly referenced as Wekahika by Wilkes) and Hā‘ena. From researching the road construction documents, Lass states:

> After 1881 when the new Puna road was completed, the section of Old Government Road between Hilo and Ha‘ena was probably used less often and perhaps even largely abandoned except for casual or local use. The section of Old Government Road within the project area and to the south, however, was not only apparently still used but was probably an important transportation route; otherwise, the new connecting road between the Volcano Road and Kea‘au would presumably not have been built (Lass 1997:22).

The majority of the sites documented along the OGR by Lass were interpreted as agricultural features and later military features. Lass concluded Site #50-10-36-21264 may correspond with Site A1-27 as documented by Ewart and Luscomb (1974) and Site A1-17(Ewart and Luscomb 1974) may correspond to either/all of Site #50-10-36-21259, 21260, and/or 21261.

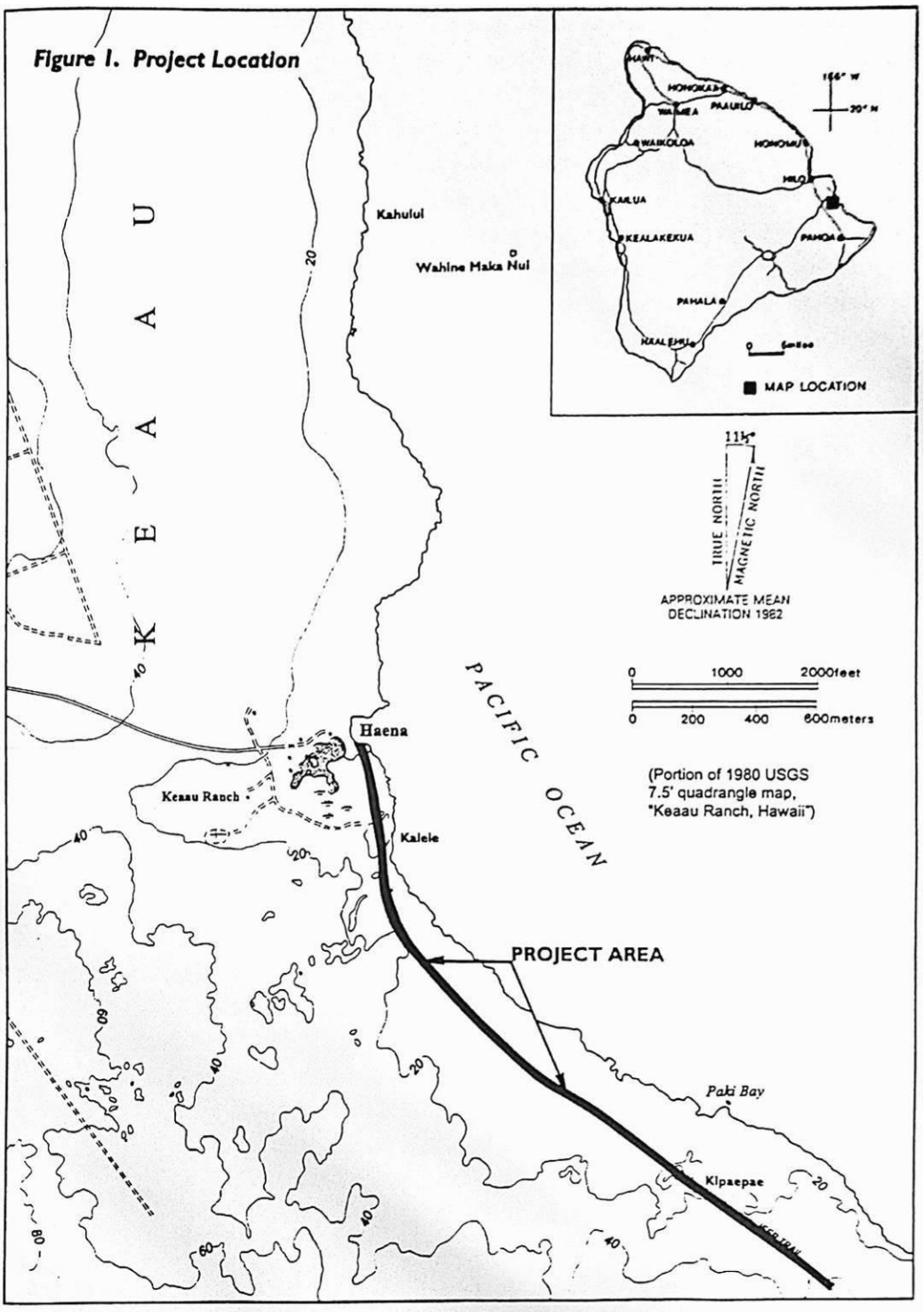

Figure 16: Map of Lass (1997) Project Area Location.

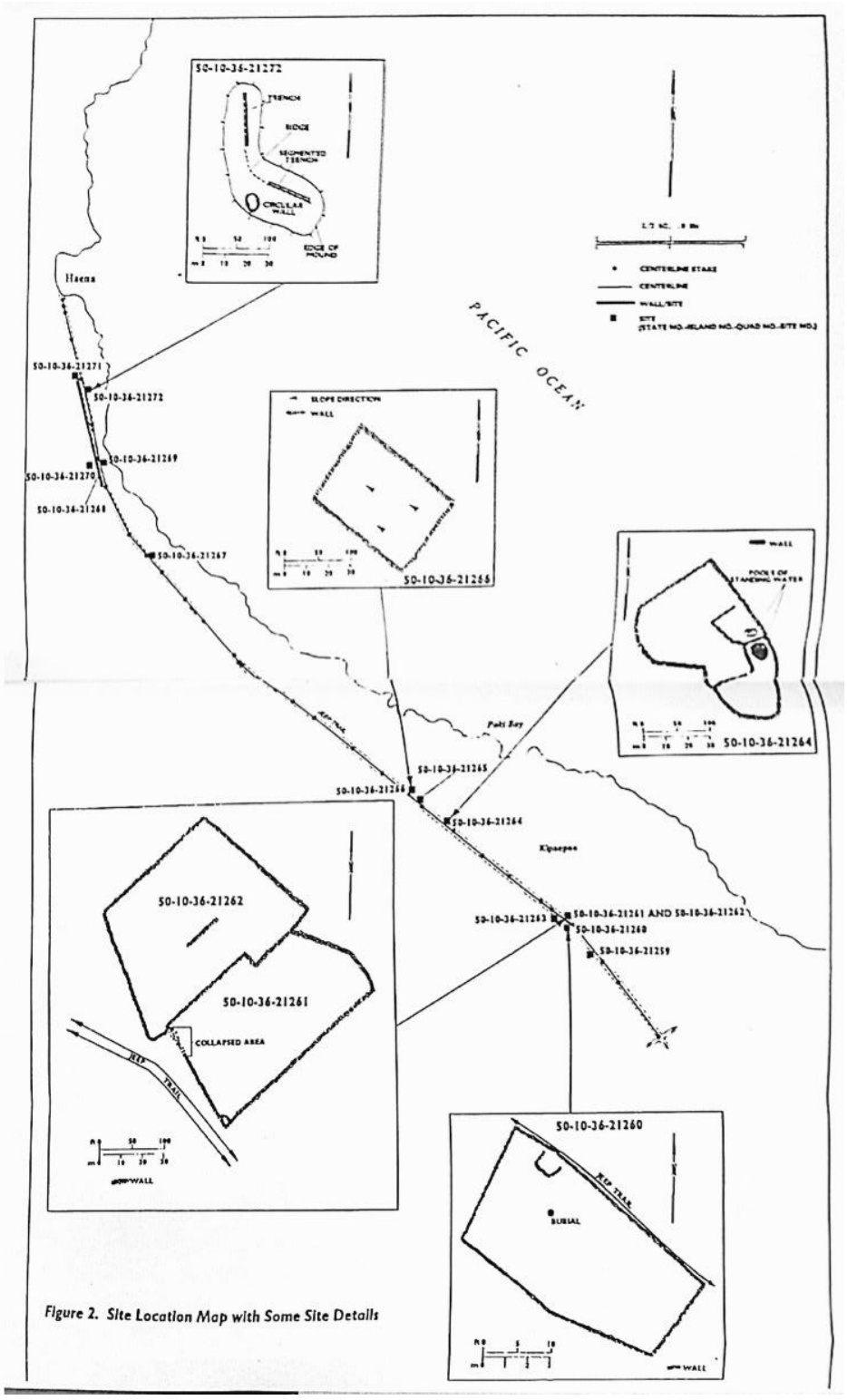

Figure 17: Map of Lass (1997) Project Area Site Locations and Site Plan View Drawings.

Table 1: Site Summaries of Barbara Lass (1997) Archaeological Reconnaissance Survey.

SIHP# 50-10-36:	Site Type	Age	Size	Description
21273	Old Government Road-Puna Trail	Pre-Contact toHistoric	-	The main road used by the Puna district in the nineteenth century.The OGR was likely constructed over a pre-Contact/early post-Contact pedestrian trail. The road consists of cobblestone pavement, raised and/filled areas, waterworn rocks (ʻiliʻili), wall sides and curbstone. It is still in good condition.
21259	Rock Wall	Historic	29 m long, 0.6 m wide, and appox. 0.9-0.7 m in height	This wall is adjacent and parallel to the *mauka* side of the Old Government Road. The wall stands over a meter taller than the OGR on the mauka side indicating the possible function of preventing soil errosion.
21260	Rock wall enclosure with various features	Historic	109 m long on the side near the road, 102 m long on the opposite side, 47 m long on the north end, 37 m long on the south end. 0.5 m wide and 0.8-0.9 m tall.	The features include a rock pile, a smaller walled enclosure, a small segment of retaining wall and a burial platform. It was probably used for horticulture.
21261	Connected (to 21262) rock wall enclosure	Historic	69 m long on the north end, 87 m long on the south end, 50 m long on remaining sides.	These walls are roughly rectangular and run perpendular to the OGR. Portions of the walls have collapse. The stones were piled. It contains horticultural characteristics
21262	Connected (to 21261) rock wall enclosure	Historic	60 m long on the north end, 73 m long on the south end (shared with 21261), 56 m on the side adjacent to the OGR, 63 m on last side	These walls are roughly rectangular and run perpendular to the OGR. Portions of the walls have collapse. The stones were piled and appears to have been used for horticulture.
21263	Rock wall	Unknown	16 m long, 0.6 m wide, and 8 m in height	This rock wall is parallel to the OGR.
21264	Rock wall enclosure	Unkown	Approximately 90 m long (parallel to the OGR), 50 m across, 0.5m wide and 0.8-0.9 m in height.	This roughly oval enclosure is on the ocean side of the OGR. Several walls divide the interior of the enclosure into smaller sections. The marshy conditions would allow for the cultivation of taro and other crops.
21265	L-shaped wall	Unknown	10 m long (parallel to the OGR) and 5 m (perpendicular to the OGR), 0.5 m wide and 1 m in height	This site is located 5 m from the OGR on the makai side.

SIHP# 50-10-36:	Site Type	Age	Size	Description
21266	Rock wall enclosure	Historic	50 m long (2 sides parallel to the OGR), 36 m long on one end, and 33 m long on othe other, 0.5 m wide, and 1-1.2 m in height.	This site contains, soil, ti plants and piled rocks. It is located on the makai side of the OGR. Portions of the wall have collapsed. It is interpreted as being used for agriculture.
21267	Modified depression or Kīpuka	Unknown	11 m long, 9.5 m in width, and 1.5 m in depth	The long axis is parallel to the OGR. Parts of the interior are lined with rock. A pedestrian rock entrance is located at the north end. It appears to be agricultural in function.
21268	Rock wall		425 m long, 1.2-1.8 m in height and 0.8 m wide.	This wall is parallel and adjacent to the road. It is on the mauka side. A portion of the wall is breached at 165 m from South end. It leads to Shipman properties including the Shipman cemetery.
21269	Rock wall	Unknown	12.2 m in length (mauka end), 7.6 m of collapse, 15.3 m gap and a large rock on the makai end. It is 1.1 m tall and 1.0 m wide.	Portions of the wall are collapsed. The wall damage is probably due to the high surf.
21270	Concrete trough	Historic,WWII, Modern	2.2 m in lengh, 2.6 m in width and 1.0 m in height	It is likely the trough was constructed on site due to visible cement layers. The middle of the trough has a raised central platform. Twentieth century debris was present. It was either used for ranching or the military.
21271	Concrete bunker	Historic, WWII	3.5 m on each side in length, 1.9 m from ground to overhang roof.	It is located adjacent to the road. It conatins metal platforms for either gun mounts or obseration instruments. It resembles WWII bunkers seen in Hawai‘i.
21272	Modified trenches	Historic/WWII	North trench: 14.2m long, 2.0 m wide, 1.0 m deep. South trench: 14.5 m long, 1.4 m wide and 1.0 m deep.	Located on the makai side of the OGR. This site is two constructed trenches located on a hill along the coastline which indicates they were for WWII defense or surveillance.

Kepa Maly (1999) conducted historical and archival research, previous archaeological research and collected oral interviews for Kea‘au Ahupua‘a and the Kea‘au portion of the Puna Trail (the Old Government Road), specifically TMK: (3) 1-6-001. Maly determined the agricultural sites reported by Lass (1997) were probably constructed during the pre-Contact era and modified in the 1800s when cattle began to damage gardens and house gardens.

Maly argued that the types of sites present in the overall area, such as habitation, enclosures, near-by *heiau*, possible burials and agriculture, suggest the coastal area surrounding the OGR are the remains of coastal settlements. The oral history component of his study supported this conclusion. He concured with Lass that the use of the OGR as a public hiking trail would help foster a better historical understanding of coastal Kea‘au Ahupua‘a. Maly recommended preservation treatments for the trail, including not paving the OGR, making the public aware it is illawful to damage or disrespect archaeological and cultural sites, an ongoing effort to consult with lineal and cultural descendents concerning future preservation treatments and access.

Maly’s study also added to Lass’s archaeological work through interviews and research to present a deeper understanding of the previously recorded archaeological sites. Maly determined that Site 21267 is one of two early Historic era schools in Kea‘au Ahupua‘a (School Grant 4, Lot 18). Schools at that time were enclosed by rock walls to keep animals out of the school yard where students cultivated gardens (Maly 1999 citing an 1865 letter from Hitchcock to Bishop).

According to interviews collected by Maly, rock wall Site 21269 was used as both a boundary between the Shipman and Fisher’s properties and for ranching purposes. There was once a gate in the wall that crossed the OGR corridor. The wall continued to the ocean.

Oral interviews indicated that Site 21270 was part of the Fisher’s chicken farm complex (1923-1942). The feature may have been part of processing activities. It was located under one of the long chicken houses. Maly’s interviews stated that Site 21272 was used during WWII primarily as a camp site and Roy Blackshear noted outhouses were possibly built over them. John Ka‘iewe stated that, when he was younger, the site was used as a shelter by fishermen. The flat area on the *makai* side of Site 21272 contains stones which may be remnants of a previous site.

Ewart and Luscomb (1974) recorded 22 archaeological sites along the coast of Waikahekahe, Mukuʻu, Pōpōkī, and Hālona Ahupuaʻa (Figure 18 and Table 2). Sites identified in Pōpōkī and Hālona Ahupuaʻa to the south were documented in Makuʻu Ahupuaʻa in the report. Sites were clustered on either side of Beach Road and consisted of agricultural and habitation complexes. Sites included rock walls, small enclosures and agricultural rock clearing mounds.

Coastal Waikahekahe and Makuʻu archaeological sites were primarily agricultural and habitation complexes containing rock walls, agricultural crock clearing mounds, rock walls, enclosures, pavements, platforms, rock lined wells, and burial features. The sites appear to be primarily pre-Contact to Historic in age. Site 18975 is a possible *heiau* complex (see Figure 18 and Figure 19).

The site concentrations recorded south and west of the current project area are primarily walls, enclosures, terraces and rock mounds. The archaeological features are associated with pre-Contact to Historic era habitation and agriculture.

A single site was identified within the current project area during the Ewart and Luscomb (1974) survey. The site was first recorded as Bishop Museum Site #Ha-A3-15, and was likely designated SIHP #50-1-45-18986. The site appears to be a rock mound though neither Ewart and Luscomb (1974) nor the SHPD SIHP database contain any descriptive information about the site. There were no other archaeological sites or features identified on the current project area.

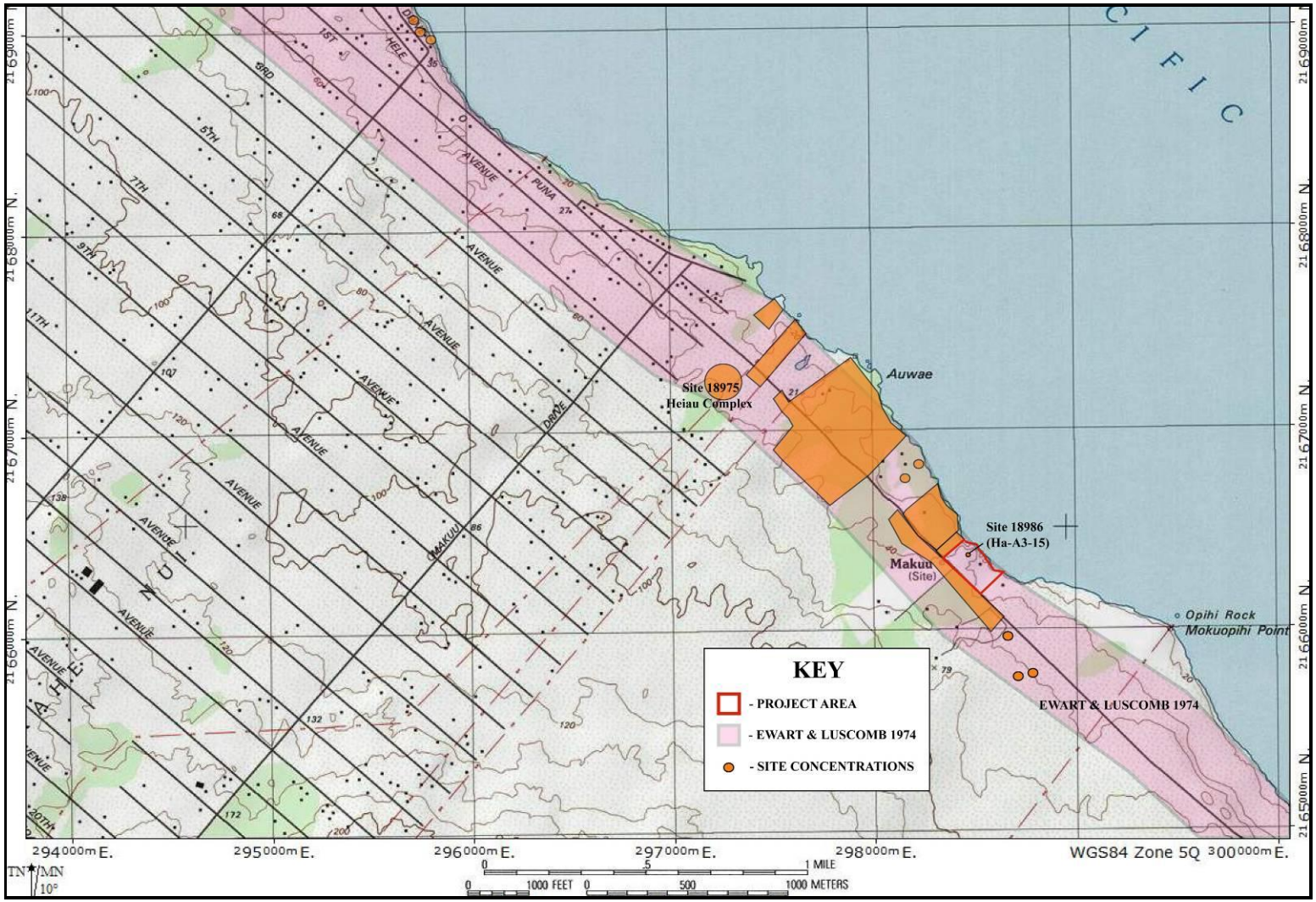

Figure 18: 7.5-Minute Series USGS Topographic Map (Kea‘au Ranch Quad) Showing Location of Coastal Sites Recorded in Ewart and Luscomb (1974) (National Geographic Topo!, 2003. Data Sources: National Geographic Society, USGS).

Table 2: Inventory of Waikahekahe and Maku‘u Ahupua‘a Archaeological Sites (Ewart and Luscomb 1974).

SIHP# 50-10-45:	Site Type	Ahupua‘a	Description	Research Potential
18973	Complex	Waikahekahe	Rock walls, retaining walls, walled depressions, and possible platforms	Good
18974	Complex (Agriculture and Habitation)	Waikahekahe	Rock walls, retaining walls, walled depressions, possible pavements, and platforms	Good
18975	Complex	Waikahekahe	Rock walls, retaining walls, platforms, rock mounds, and possible *hieau*	Excellent
18976	Complex (Agricultural)	Maku‘u	Free-standing and retaining walls and small mounds	Good
18977	Wall	Maku‘u	Wall	N/A
18978	Complex	Maku‘u	Free-standing and retaining walls, a mound, a possible *kuleana* wall, and an enclosure	Mediocre
18979	Wall & Enclosure	Maku‘u	Rock wall and enclosure	Some
18980	Complex (Agriculture)	Maku‘u	Rock walls and rock mounds	Good
18981	Petroglyphs	Maku‘u	Modern petroglyphs	N/A
18982	Complex	Maku‘u	Walls, faced areas, a mound with an upright stone, and a rock-lined well	Negligible
18984	Complex (Agriculture and Habitation)	Maku‘u	Trails, several enclosures, and terraces	Excellent
18985	Wall	Maku‘u	Rock wall	Some
18987	Burials	Maku‘u	Historic grave yard	N/A
18987	Complex (Agriculture and Habitation)	Maku‘u	Walls, enclosures, mounds, depressions, and platforms	Good
18988	Complex (Agriculture and Habitation)	Maku‘u	Walls and platforms	No Longer Present
18989	Petroglyph Field	Maku‘u	Petroglyphs	Good
18990	Possible Burial	Maku‘u	Rock mound	N/A
18991	Enclosure	Maku‘u	Rock lined depression	N/A
19005	Possible Burial	Maku‘u	Rock mound	N/A
20598	Trail	Maku‘u	Coastal trail	Good
4222	Petroglyph Field	Maku‘u	Petroglyphs	Good
7476	Kamahele House	Maku‘u	Historic house	No Longer Present

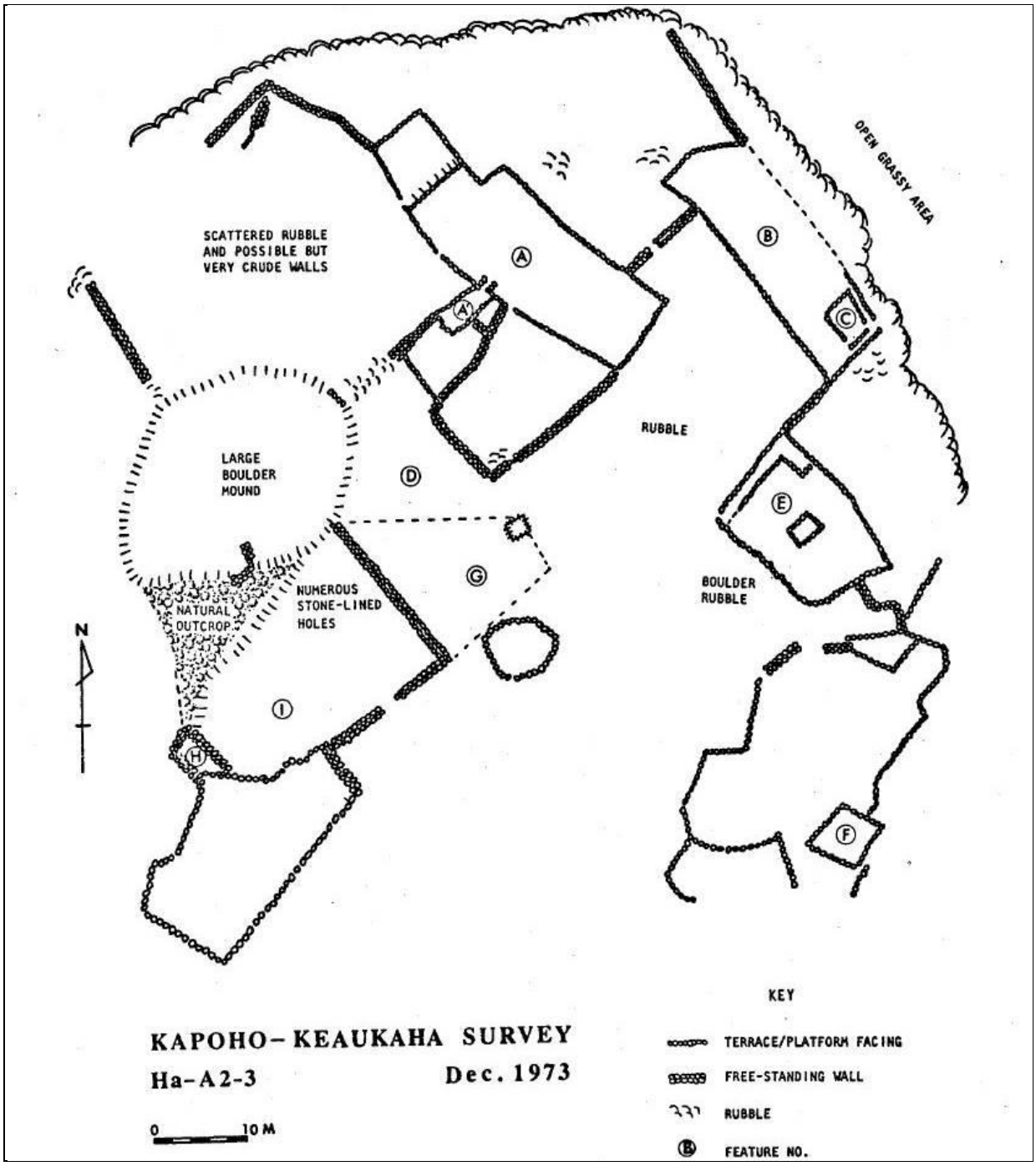

Figure 19: Site 18975 Plan View Map (Ewart and Luscomb 1974:24).

RECENT STUDIES IN PŌPŌKĪ AND SURROUNDING AHUPUA‘A

Nineteen archaeological studies have been conducted in Maku‘u, Pōpōkī and Halona Ahupua‘a (Table 3 and Figure 20). The studies were conducted in the upland and coastal regions surrounding the current project area and shed light on pre-Contact to Historic land use. The most striking feature of the studies is the low distribution of archaeological sites documented in the upland project areas. Aside from lava tubes containing pre-Contact era habitation features and burials, only three archaeological features were documented in the upland project areas. Upland features included a possible ceremonial complex (enclosure, platform, rock wall, and rock wall), a rock mound and an agricultural terrace. The lack of sites in the uplands is consistent with early written accounts documenting traditional habitation areas along the coast to a little over one mile inland.

Table 3: Previous Archaeological Studies in Maku‘u, Pōpōki and Halona Ahupua‘a.

Author/Date	Type of Study	Ahupua‘a
Barrera & Lerer 1990	Archaeological Inventory Survey	Maku‘u
Bordner 1977	Reconnaissance Survey	Maku‘u
Chaffee & Spear 1993	Burial Testing	Maku‘u
Clark et al. 2007	Archaeological Inventory Survey	Pōpōkī
Clark et al. 2008	Archaeological Inventory Survey	Maku‘u
Charvet-Pond & Rosendahl 1993	Archaeological Inventory Survey	Maku‘u, Hālona, Pōpōkī
Conte et al. 1994	Archaeological Inventory Survey	Maku‘u, Hālona, Pōpōkī
Desilets & Rechtman 2004	Archaeological Inventory Survey	Maku‘u, Hālona, Pōpōkī
Dirks Ah Sam & Rechtman 2013	Archaeological Inventory Survey	Pōpōkī
Hudson 1932	Archaeological Survey	Various
Ewart & Luscomb 1974	Reconnaissance Survey	Various
Komori & Peterson 1987	Cultural & Biological Resource Survey	Various
McEldowney & Stone 1991	Archaeological/Environmental Survey	Various
Yent 1983	Archaeological Survey	Maku‘u
Rechtman 2003	Archaeological Assessment	Maku‘u, Hālona
Rosendahl 1989	Field Inspection	Maku‘u, Hālona, Pōpōkī
Spear et al. 1995	Data Recovery	Maku‘u
Dircks & Rechtman 2013	Archaeological Inventory Survey	Pōpōkī
Escott 2019	Archaeological Inventory Survey	Maku‘u

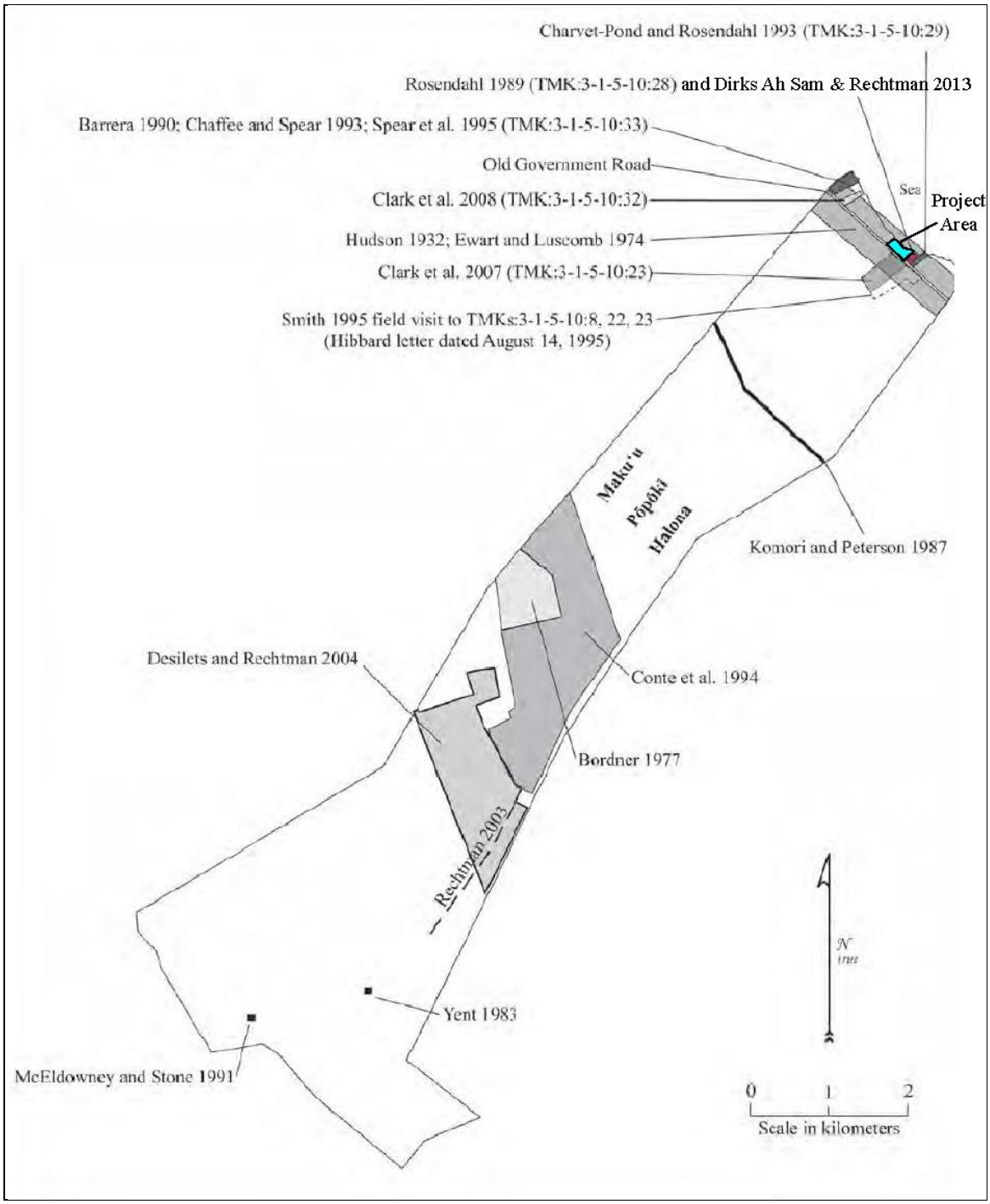

Figure 20: Map Showing Recent Previous Archaeological Studies in Maku‘u and Surrounding Ahupua‘a (Adapted from Dirks Ah Sam and Rechtman 2013:11).

Komori and Peterson (1987) conducted a cultural and biological resources survey along a corridor roughly 2.5 to 3.0 kilometers (1.55 to 1.86 miles) from the coastline. Five agricultural complexes, habitation and burial platforms, burial and refuge caves, and petroglyphs were documented within the project area. All of the sites are pre-Contact to early post-Contact era in age.

Dircks Ah Sam and Rechtman (2013) conducted an archaeological inventory survey directly southeast of the current project area (Figure 21) in Pōpōkī and Hālona Ahupuaʻa [TMK: (3) 1-5-010:028]. This study yielded the recordation of a pre-Contact coastal trail segment (Site 18418) and a Historic rock wall (Site 18419). The rock wall (Site 18419) was interpreted as a pasture boundary and continues into the current project area. The trail (Site 18418) was initially recorded in Parcel 029 by Charvet-Pond and Rosendahl (1993), who noted that the trail continued northwest along the coastline and into Parcel 028. Dircks and Rechtman (2013) recorded a 10.0 m segment of the elevated coastal trail in the southeast portion of Parcel 028. No other trail remnant was observed possibly due to high density ground vegetation and modern disturbance. Site 18418 was recommended for preservation.

Escott (2019a) recorded five archaeological sites on a project area 150 meters northwest of the current project area (Table 4 and Figure 22). Site #50-10-45-7476, 18980 and 18987 were previously recorded in Ewart and Luscomb (1974). The three previously identified sites include a cement foundation at the Kamahele House (Site 7476), an agricultural complex (Site 18980) and the family burial plot (Site 18987). Two newly recorded sites include the rock wall along the boundary of Parcel 009 (Site 31111) and a short rock wall segment (Site 31112) in the southeast corner of the project area. Site 18981 recorded in Ewart and Luscomb (1974) is two modern petroglyphs and is not a historic property.

Table 4: Inventory of Archaeological Sites Identified Within the Project Area.

SIHP #50-10-45:	SITE TYPE	SITE FUNCTION	SITE AGE
7476	Kamahele House	Habitation	Historic era
18980	Complex (Agriculture)	Rock walls and rock mounds	Pre-Contact to early post-Contact era
18987	Burials	Historic graves	Historic era
31111	Rock Wall	Property Boundary	Historic era
31112	Rock Wall	Road edge	Historic era

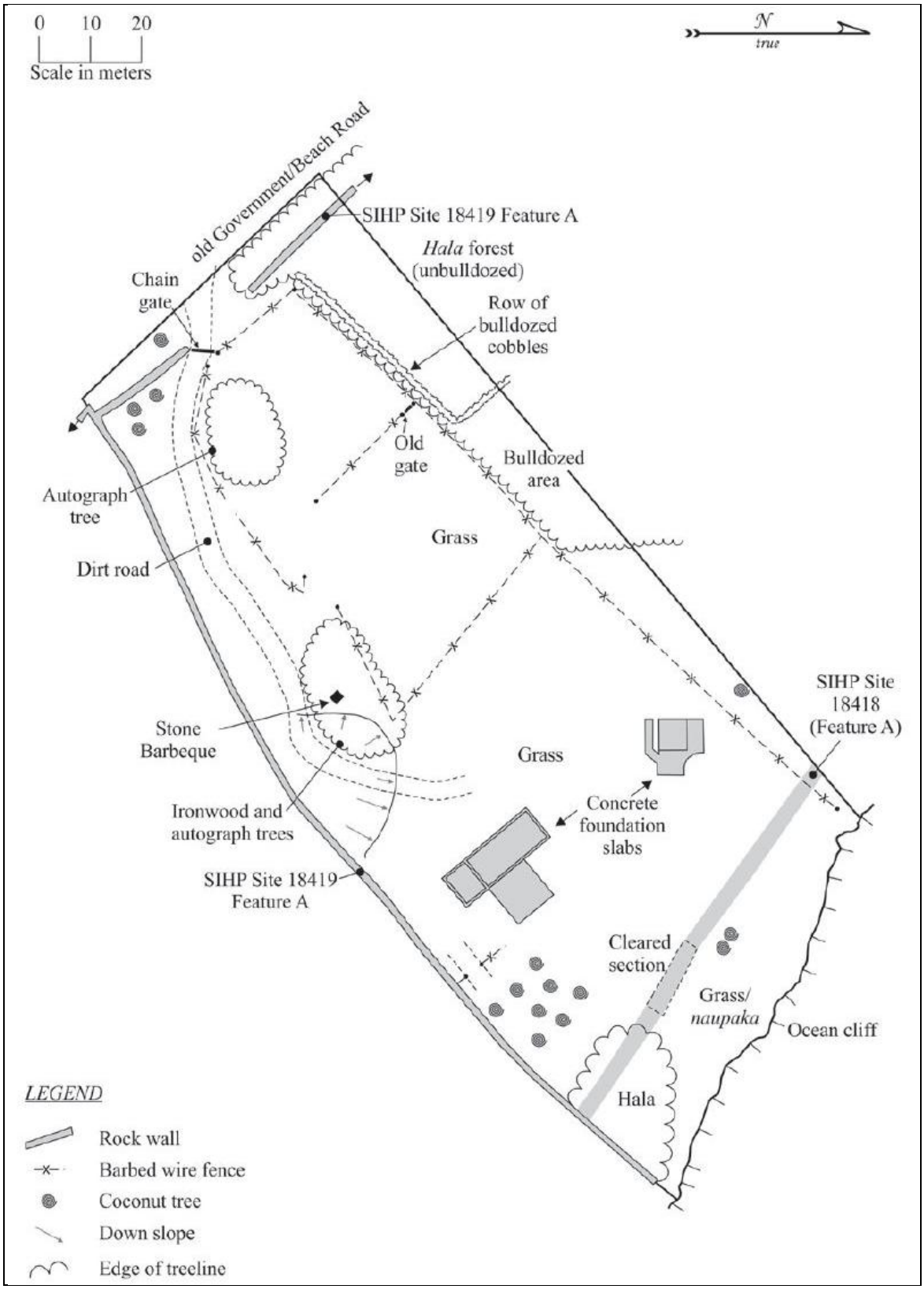

Figure 21: Archaeological Site Plan Map Showing Sites Recorded in Dirks Ah Sam and Rechtman (2013).

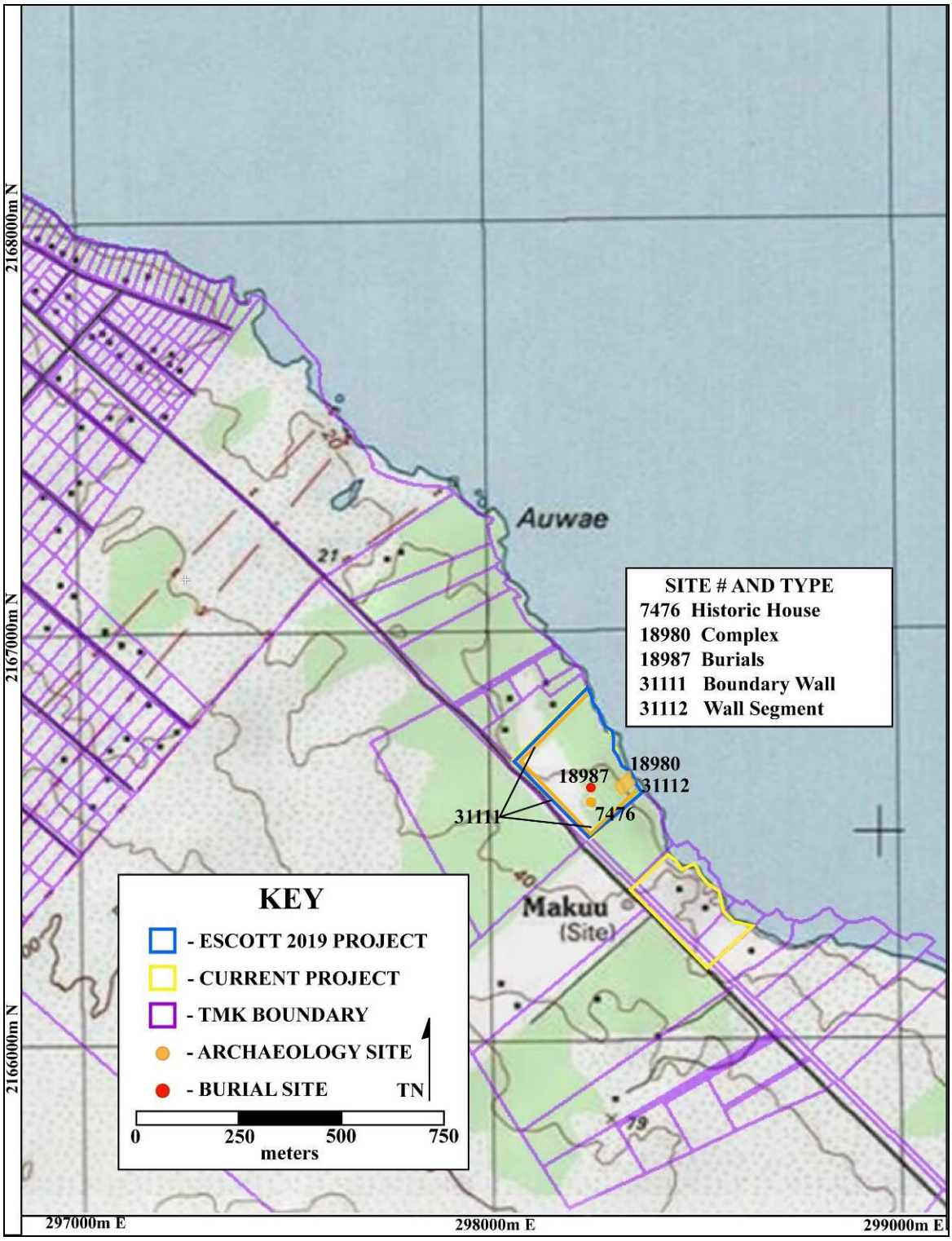

Figure 22: 7.5-Minute Series USGS Topographic Map Showing the Location of Archaeological Sites Documented in Escott (2019) (Kea‘au Ranch Quadrangle. ESRI, 2013. Data Sources: National Geographic and Hawai‘i County Planning Department, 2013).

In general, archaeological studies conducted along the coastline in this region documented clusters of pre-Contact to early Historic habitation and agricultural sites including enclosures, platforms, rock walls, rock mounds, burials, petroglyphs, rock lined springs and water catchments, and remnant trail segments.

CONSULTATION

Members of the Kamahele and Lui *'ohana* were interviewed by SCS for an AIS study (Escott 2019) two properties northwest (150 meters) of the current project area. The interviews were conducted to document cultural and historical information pertinent to the Kamahele property as well as in the broader area. The content of the interviews is pertinent to the current study given the close spatial relationship between the Kamahele property (Parcel 009) and the current project area (Parcels 026 & 027].

Consultation with the Kamahele *'ohana* was conducted at the property on Saturday April 27, 2019. Seven individuals, including Greg DeConte, Kenneth Ha, Richard Ha, June Ha, Shayne Kamahele, Puanani Mukai, and Darrell Pakele attended and were interviewed. In addition, SCS Senior Archaeologist Glenn Escott spoke to Sheldon Kamahele at an earlier date on the property.

The Historical land-use information gained from the interviews was largely specific to the Kamahele property at [TMK: (3) 1-5-010: 009]. However, this information provides some insight into Historic era habitation, farming, ranching, and fishing practices in the Puna District. The Kamahele *'ohana* grew citrus, bread fruit, taro, tomatoes, bananas, and watermelons on Parcel 009. The Kamahele *'ohana* also kept pigs and cows on the property.

Family members remembered most fondly fishing and swimming along the shoreline. They remembered that there was a shallow spring along the northwest edge of the property that was dug out to make a shallow well with a pump. None of the family members were aware of any cultural practices, other than fishing, that occurred on the property or near Parcel 009.

Consultation with the Lui family was conducted at the property on Wednesday October 30, 2019. Mr. Ramon Lui, his wife Agnes and daughter Nicole were present. The Lui family is descended from Kea who first owned L.G. 1014. L.G. 1014 was a 56.4 acre property purchased in 1852. Parcel 009 is the southeast corner of the land grant.

Nicole Lui spoke briefly about well-known cultural practices associated with Makuʻu Ahupuaʻa, dark magic in particular. The people that lived in Mukuʻu were known to be accomplished practitioners of the "dark arts".

Members of both families pointed out that Makuʻu and Pōpōkī Ahupuaʻa are very far from Historic and Modern era population centers. It always seemed to take a long time driving along unpaved roads through the woods to arrive and that added to the feeling of being somewhere remote. Subsistence and some small scale commercial agriculture, ranching and fishing were commonly practiced in the area. Hala was abundant and was used to weave mats. The farm and ocean provided good subsistence and other necessary items could be purchased in town, either Pāhoa or Keaʻau.

EXPECTED ARCHAEOLOGICAL PATTERNS

Based on previous archaeological studies, historical research and previous consultation it is expected that pre-Contact to early Historic habitation, agricultural and ranching features will be located on the current project area. The features will likely include rock walls, rock clearing mounds, and possible enclosures. It is also possible that coastal trail Site 18418 might continue onto the current project area.

RESULTS OF FIELDWORK

Two archaeological sites (Site #50-10-45-18419 and Site 31185) were identified in the project area (Table 5, Figure 23 and Figure 24). Rock wall Site #50-10-45-18419 was previously recorded in Charvet-Pond and Rosendahl (1993) and Dircks and Rechtman (2013). Site 18419 is a possible pasture and property boundary wall. The newly recorded site (Site 31185) is a rock wall along the northwest boundary of Parcel 026.

Table 5: Inventory of Archaeological Sites Identified Within the Project Area.

SIHP #50-10-45:	SITE TYPE	SITE FUNCTION	SITE AGE
18419	Rock Wall	Possible Pasture Boundary	Historic
31185	Rock Wall	Property Boundary	Historic

SITE 18419 **ROCK WALL**

FUNCTION: Pasture and Property Boundary

AGE: Historic

DIMENSIONS: 204.0 m Long NW/SE by 1.0 m wide by 1.1 m high

CONDITION: Moderate

INTEGRITY: Retains integrity of location, setting, materials, and workmanship

SURFACE ARTIFACTS: None

EXCAVATION: None

DESCRIPTION: Site 18419 is a pasture and property boundary wall located between 40 and 50 ft (12-15 m) amsl along the southwest boundary of the project area (see Figure 23 and Figure 24). The rock wall is oriented northwest/southeast, parallel to Old Government/Beach Road. The wall was previously recorded by Charvet-Pond and Rosendahl (1993) as Site 18419 Feature A. Dircks and Rechtman (2013) recorded the portion of the wall that existed on Parcel 028 which has been largely obliterated by modern development activities.

The wall is constructed of angular and subangular cobbles and small boulders stacked five to seven courses high and two courses wide (Figure 25 through Figure 28). The wall is 204.0 m long (NW/SE) by 1.0 m wide with a maximum height of 1.1 m. The minimum wall width is 0.84 m and the minimum wall height is 0.9 m. Site 18419 is faced on its northeast and southwest sides and is core-filled. The wall is moderately weathered with some intermittent collapse and tumble along its southwest side. A few loose cobbles from the wall are on the ground approximately 0.35 to 0.45 m from the wall's base.

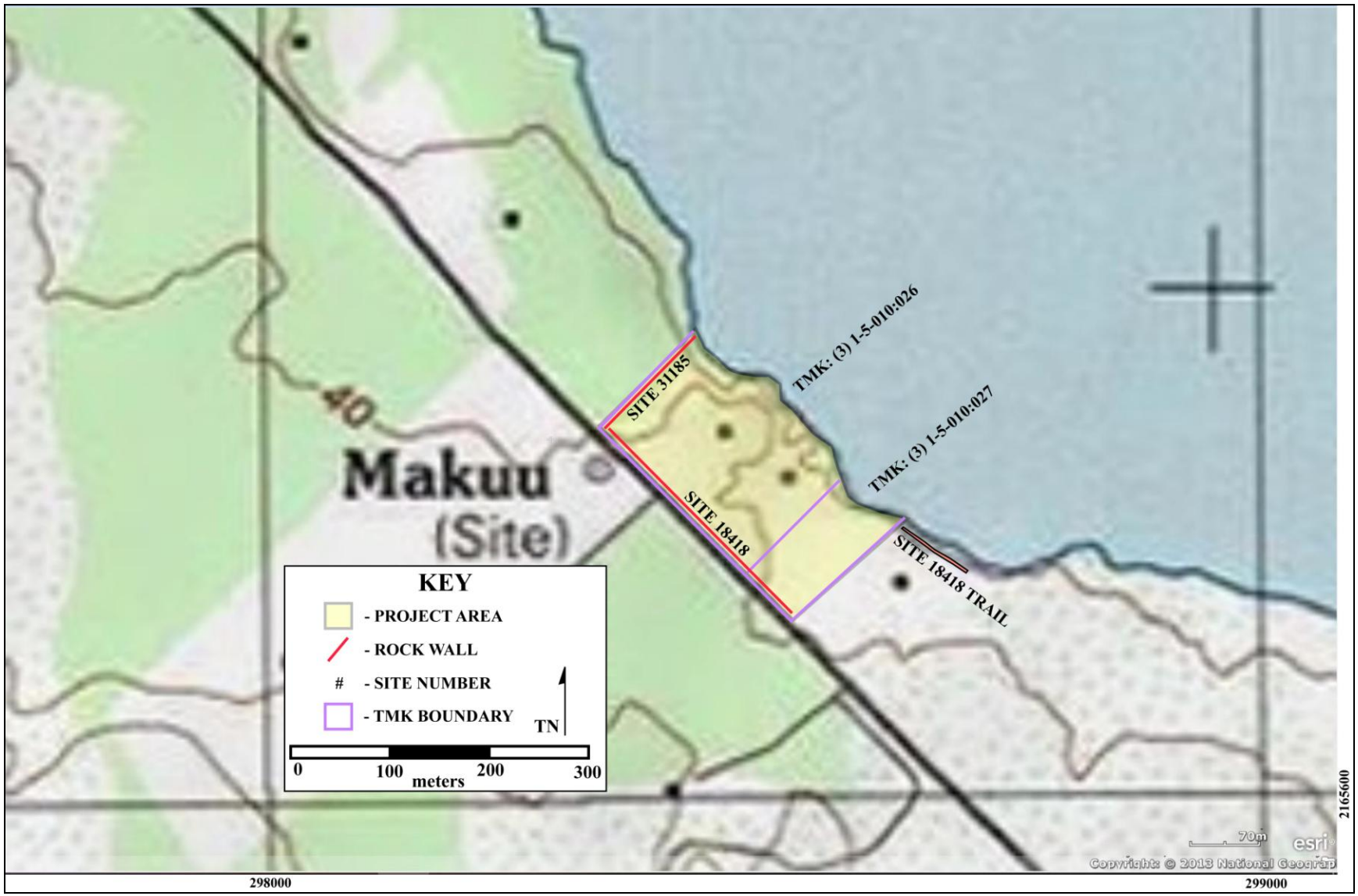

Figure 23: 7.5-Minute Series USGS Topographic Map Showing the Location of Archaeological Sites (Kea‘au Ranch Quadrangle. ESRI, 2013. Data Sources: National Geographic and Hawai‘i County Planning Department, 2013).

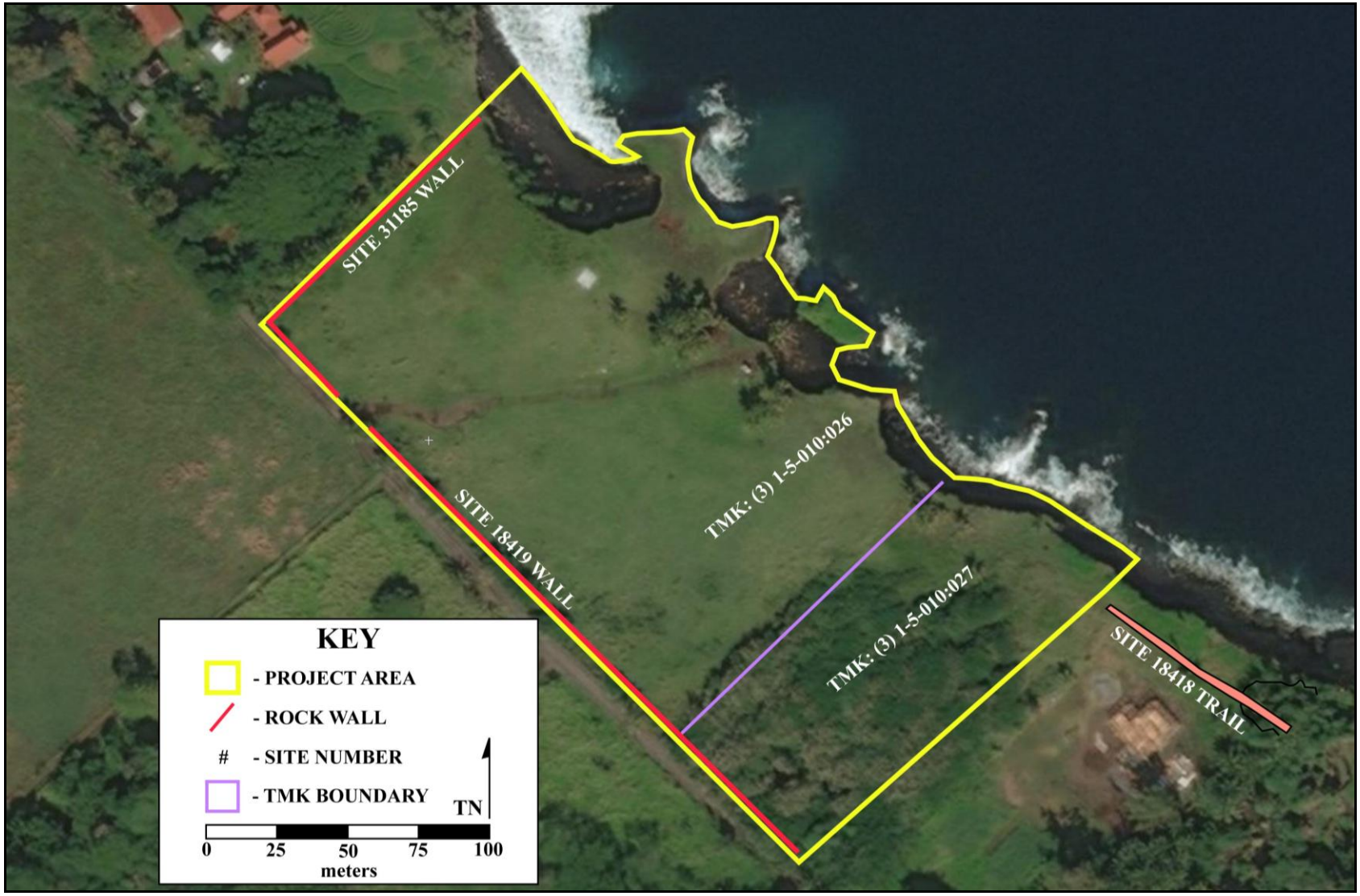

Figure 24: 7.5-Minute Series USGS Topographic Map Showing the Location of Archaeological Sites (Kea‘au Ranch Quadrangle. ESRI, 2013. Data Sources: National Geographic and Hawai‘i County Planning Department, 2013).

Figure 25: Photograph of Site 18419 in the Southeast Portion of the Project Area, Looking Southwest.

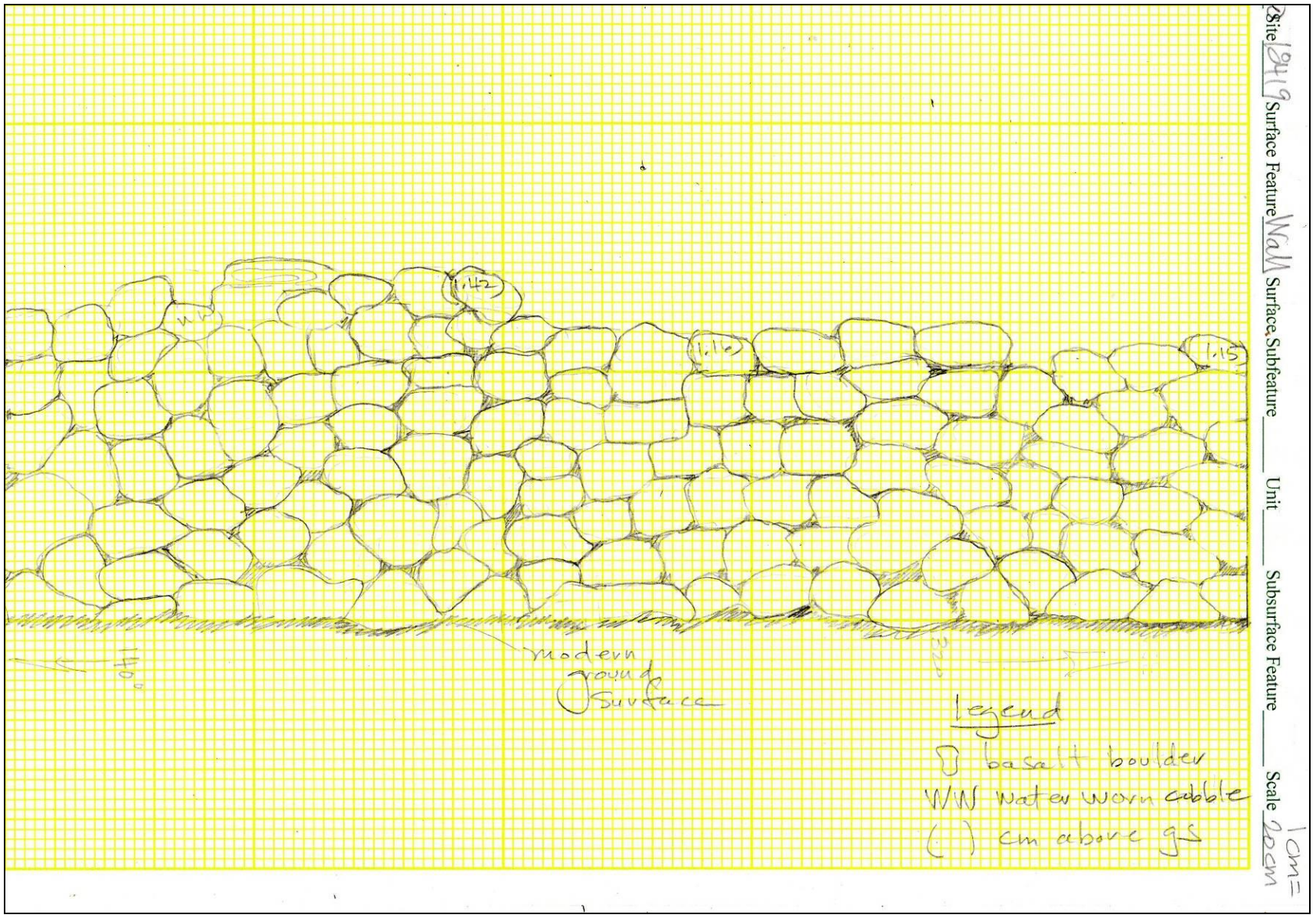

Figure 26: Site 18419 Wall Southwest Profile at Middle of Project Area.

Figure 27: Photograph of Site 18419 in the Northwest Portion of the Project Areal Looking Southwest.

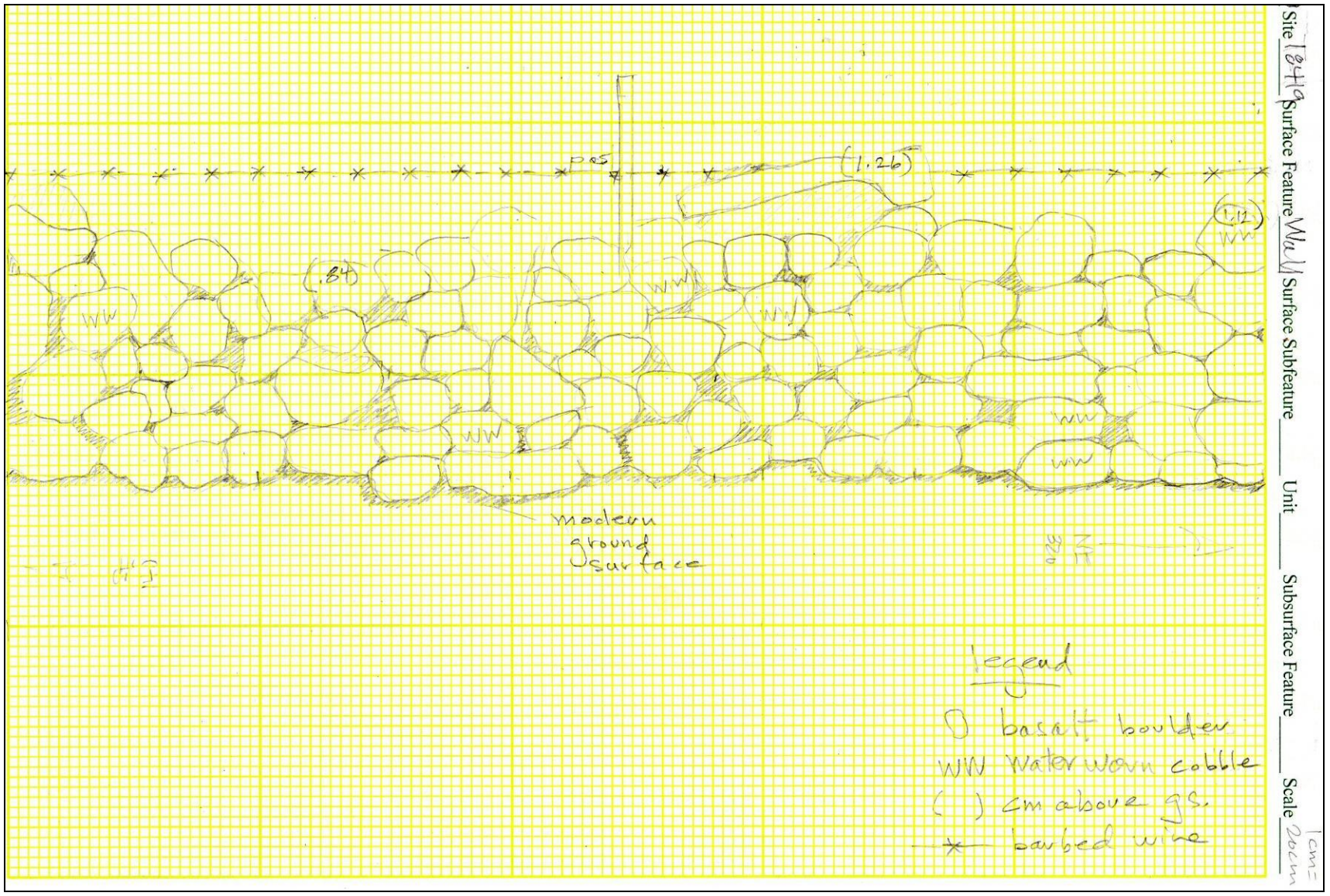

Figure 28: Site 18419 Wall Southwest Profile at Northwest Portion of the Project Area.

There is a 4.3 m wide opening in the wall towards its northwest terminus that functions as a gated driveway to Opunaha Ranch (Figure 29). Wall Site 18419 continues northwest along Old Government/Beach Road. The southwest terminus of wall Site 31185 abuts the northeast face of Site 18419 at the west corner of the project area. Site 18419 is a Historic era wall constructed along Old Government/Beach Road. It likely functioned to keep farm animals off of the road. Site 18419 is only slightly altered and is in good condition. No further work is recommended at Site 18419.

SITE 31185	**ROCK WALL**
FUNCTION:	Property Boundary
AGE:	Historic to Modern
DIMENSIONS:	92.0 m Long NE/SW by 1.0 m wide by 1.28 max. height
CONDITION:	Good
INTEGRITY:	Retains integrity of location, setting, materials, and workmanship
SURFACE ARTIFACTS:	None
EXCAVATION:	None

DESCRIPTION: Site 31185 is a rock wall (NE/SW) located between 20 and 40 ft (6-12 m) amsl along the northwest boundary of Parcel 0026 (see Figure 23 and Figure 24). The wall begins at the edge of Old Government/Beach Road and extends northeast to the edge of a sea cliff. The northeast third of the wall, closest to the sea cliff, is shorter (0.4 m) in height and thinner (1.0 m) in width. Site 31185 is 92.0 m wide (NE/SW) by 1.1 m wide and has a maximum height of 1.28 m.

The wall is constructed of subangular large cobbles and angular small boulders stacked four to seven courses high and two courses wide (Figure 30 though Figure 32). The wall is cobble core-filled, bi-faced and is fairly perpendicular (minimal slant toward wall centerline) to the ground surface. There is a modern panel wire fence constructed along the inside (SE side) of the wall to prevent sheep from making contact with the wall. Site 31185 has very minimal collapse, appears to be unaltered and is in good condition. Site 31185 is a property boundary marker, likely built in the Historic or Modern era. No further work is recommended at Site 31185.

Figure 29: Photograph of Site 18419 at Opunaha Ranch Gate, Looking Northeast.

Figure 30: Photograph of Site 31185 Southwest Portion of Wall Looking Northwest.

Figure 31: Photograph of Site 31185 Middle Portion of Wall Looking Northwest.

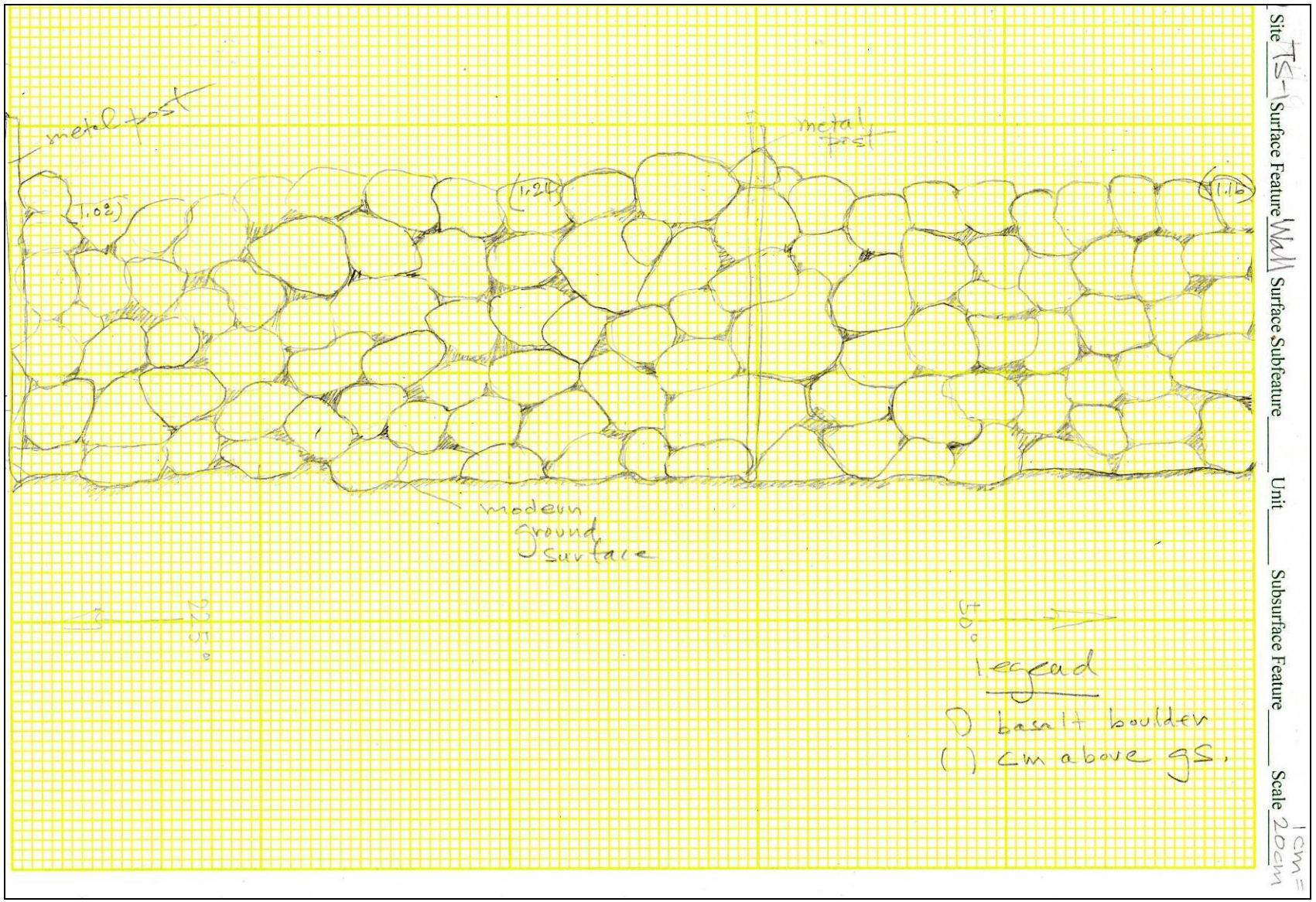

Figure 32: Site 31185 Wall Northwest Profile at Middle of Wall.

CONCLUSION

A concerted effort was made to search for *mauka-makai* trail Site 18418 within the northeast quadrant of Parcel 027. The trail crosses Parcel 028 near the level flat above the coastal cliff (see Figure 23 and Figure 24). The trail alignment is not visible on the ground surface toward the northwest property boundary where it meets the southwest boundary of the project area (Parcel 027). SCS mowed and raked off the grass in the northeast quadrant of Parcel 027 where it meets Parcel 028 (Figure 33). The ground surface there was level and without deformation to suggest the presence of a raised trail or stepping stones below the ground surface.

SCS then used metal rods to probe beneath the ground surface in an effort to locate possible stepping stones or constructed trail elements. The probes were used in a one meter grid pattern within the northeast quadrant of Parcel 027. Soil in this portion of the project area was thin (5-10 cm thickness) and overlay pāhoehoe bedrock. There were no stepping stones or constructed trail elements located on Parcel 027. It is possible the trail continued across Parcel 027 on the ground surface without the need to construct a formal trail surface or corridor.

Site #50-10-45-18986 (Bishop Museum Site #Ha-A3-15), a rock mound identified during the Ewart and Luscumb (1974) archaeological survey was not present within the project area during the current survey. There is a small rectangular concrete slab in the area where Site 18986 was identified. The foundation is a modern slab with a tarp frame constructed on it. There is also a fire pit and an electric fence corral at the same location, near the northeast terminus of the modern driveway.

Two archaeological sites were identified in the project area (Site #50-10-45-18419 and Site #50-10-45-31185). Rock wall Site #50-10-45-18419 was previously recorded in Charvet-Pond and Rosendahl (1993) and Dircks and Rechtman (2013) and is a Historic era rock wall that originates in Parcel 0028 and extends into the current project area parallel to Old Government/Beach Road. Site 18419 likely functioned as a pasture and property boundary wall. Historically, the area in and around Pōpōkī Ahupua‘a was used by ranches as grazing lands. The wall’s core-filled architecture is consistent with Historic ranch wall construction methods (Dircks and Rechtman 2013).

Figure 33: Photograph of Mown/Cut Grass in Northeast Quadrant of Parcel 027 near Trail Site 18418, Looking Northeast.

The newly recorded site (Site #50-10-45-31185) is a property boundary rock wall along the northwest boundary of the project area. The wall tracks ne/sw and separates Parcel 0025 from Parcel 0026. Site 31185 and Site 18419 are both characteristically Historic core-filled boundary walls. The sites identified in this study represent early to mid 19th Century ranching features. Both rock walls kept cattle safely in-pasture and off of neighboring properties and the public road.

The two walls recorded within the project area are similar to rock walls recorded on neighboring properties. Previous archaeological studies have recorded dispersed clusters of habitation and agricultural sites along either side of the Old Government/Beach Road (see Figure 18). Some of the sites recorded northwest and southwest of the project area are larger complexes that include numerous habitation and agricultural features. There are not as many or the diversity of features within the current project area.

SIGNIFICANCE ASSESSMENT & RECOMMENDATIONS

The two archaeological sites (Sites 18419 and T1) identified during the AIS study were assessed for significance as outlined in Hawai‘i Administrative Rules §13-284-6. To be significant, a historic property shall possess integrity of location, design, setting, materials, workmanship, feeling, and association and shall meet one or more of the following criteria [§13-284-6(b)]:

(a) It must be associated with events that have made a significant contribution to the broad patterns of our history, or be considered a traditional cultural property [§13-284-6(b)(1)].

(b) It must be associated with the lives of persons significant in the past property [§13- 284-6(b)(2)].

(c) It must embody distinctive characteristics of a type, period, or method of construction, or represent a significant and distinguishable entity whose components may lack individual distinction property [§13-284-6(b)(3)].

(d) It must have yielded or may be likely to yield, information important in prehistory or history property [§13-284-6(b)(4)].

(e) Have an important value to native Hawaiian people or to another ethnic group of the State due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events, oral accounts--these associations being important to the group's history and cultural identity property [§13-284-6(b)(5)].

Both sites (Site 18419 and Site 31185) are significant under criterion "d" as they are likely to yield, or have yielded, information important to history (Table 6). All of the sites have yielded information important to understanding early Historic to early Modern era agricultural and ranching practices along the coast in Puna District. The rock walls contain information regarding the construction of ranching and property boundary walls.

Table 6: Site Significance and Recommended Treatments.

SIHP #50-10-45:	TYPE	FUNCTION	AGE	CRITERIA	TREATMENT
18419	Rock Wall	Ranching	Historic	d	No Further Work
31185	Rock Wall	Property Boundary	Historic	d	No Further Work

No further work is recommended at Sites 18419 and 31185. Information collected during the AIS study and recorded in this AIS report is sufficient to warrant no further work.

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A CULTURAL IMPACT ASSESSMENT FOR A 10.45-ACRE PROPERTY IN KEA‘AU, PŌPŌKĪ AHUPUA‘A, PUNA DISTRICT, HAWAI‘I ISLAND, HAWAI‘I [TMK: (3) 1-5-010:0026] & [TMK: (3) 1-5-010:0027]

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APRIL 2020
DRAFT

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EXHIBIT C

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

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INTRODUCTION

Under contract to property owner(s) Opunaha, LLC, Scientific Consultant Services, Inc. (SCS) conducted a Cultural Impact Assessment (CIA) for the lands of TMK: (3) 1-5-010:026 and 027 located in Pōpōkī Ahupua'a, Puna District, Island of Hawai'i, Hawai'i (Figure 1 through Figure 4). The property address is 15-2193 Old Government/Beach Road. The project area is located approximately eight miles southeast of Kea'au town and just south of Hawaiian Paradise Park (HPP) residential subdivision. The property is bounded on the east by the Pacific Ocean, the west by Old Government/Beach Road, on the north and south by residential properties.

The property owner is proposing to build a single family dwelling on the property. The AIS study was conducted as supporting documentation for a Special Management Area (SMA) permit application and construction permit application. The property owner's point of contact for the project is Mr. Zendo Kern. Mr. Kern can be contacted by phone at (808)-333-3393 or by email at zendo@zendokern.com.

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 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" (2000). In spite of the establishment of the foreign concept of private ownership and western-style government, 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 Hawaiian *ahupua'a* tenants to gather specific natural resources for customary uses from undeveloped private property and waterways under the Hawai'i 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).

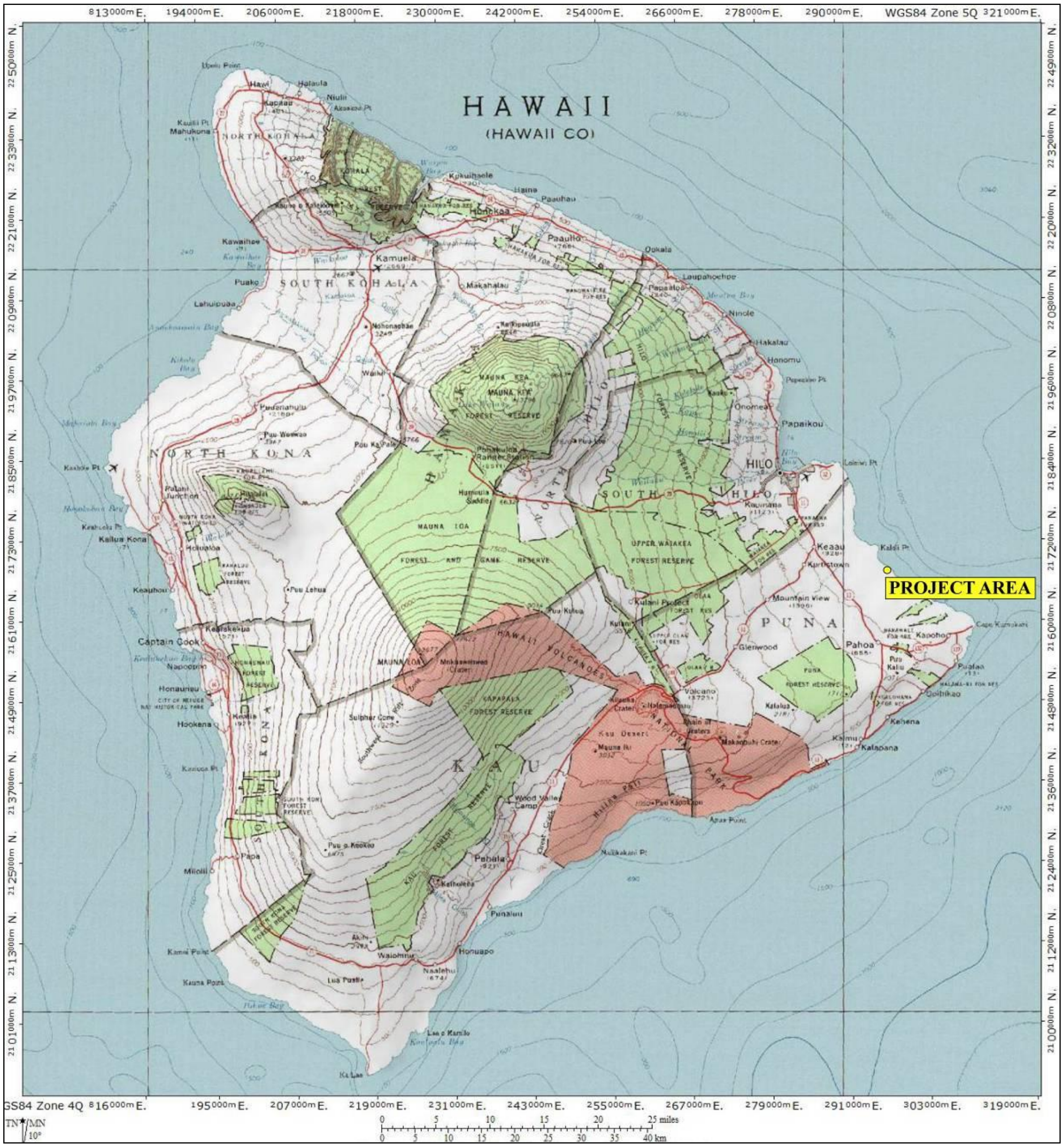

Figure 1: 5,500 K-Series Map of Hawai'i Showing Location of Project Area (National Geographic Topo!, 2003. Data Sources: National Geographic Society, USGS).

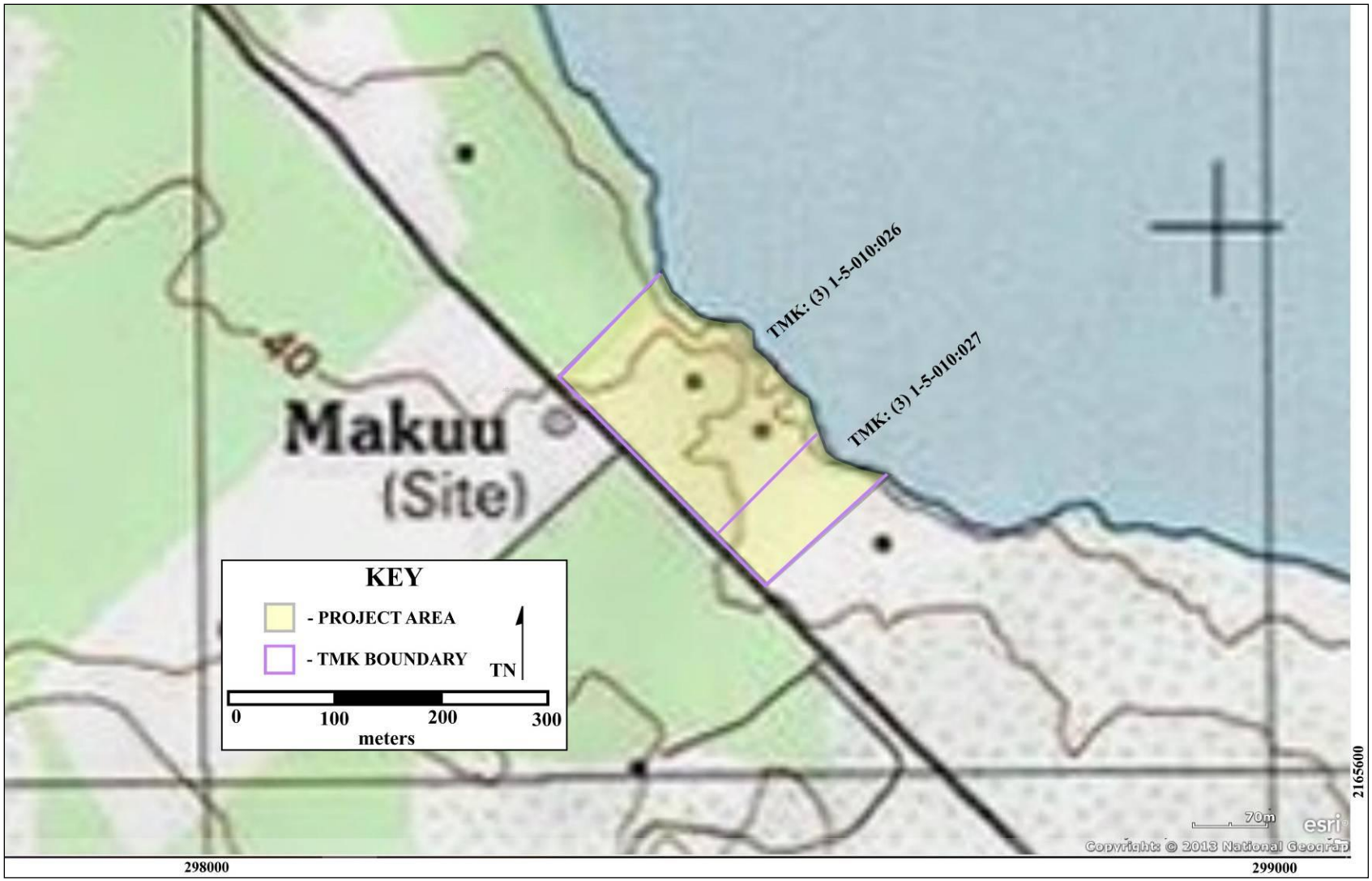

Figure 2: 7.5-Minute Series USGS Topographic Map Showing the Location of Project Areas and TMK Parcels (Keaau Ranch Quadrangle. ESRI, 2013. Data Sources: National Geographic and County of Hawai‘i Planning Department, 2019).

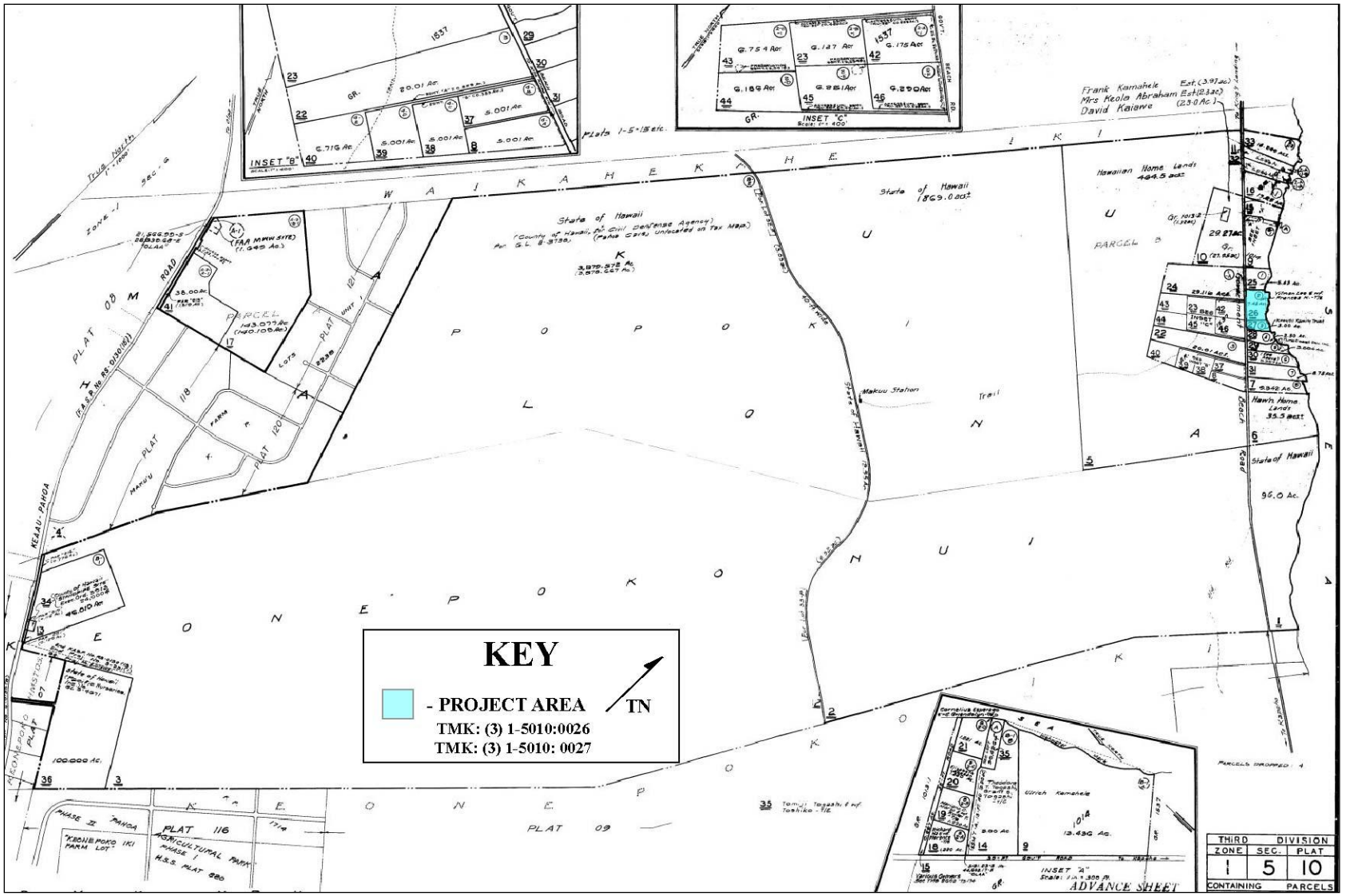

Figure 3: TMK: (3) 1-5-010 Map Showing Location of Project Area (County of Hawai‘i Planning Department, 2019).

Figure 4: Aerial Photograph Showing Project Areas, Kea'au, HI, Zone 5 North, 298310 m E, 2166660 m N. (Google Earth, 2013 Image. Data Sources: Digital Globe, GeoEye, Earthstar, USDA, and USGS).

Act 50, enacted by the Legislature of the State of Hawaii (2000) with House Bill 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 Hawai‘i’s culture, and traditional and customary rights… [H.B. NO. 2895].

Act 50 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 environmental review process (2001).

Its purpose has broadened, “to promote and protect cultural beliefs, practices and resources of native Hawaiians [and] other ethnic groups, and it also amends the definition of ‘significant effect’ to be re-defined as “the sum of effects on the quality of the environment including actions 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” (H.B. 2895, Act 50, 2000).

Thus, Act 50 requires an assessment of cultural practices to be included in the Environmental Assessments and the Environmental Impact Statements, and to be taken into consideration during the planning process. The concept of geographical expansion is recognized by using, as an example, “the broad geographical area, e.g. district or *ahupua‘a*” (OEQC 1997). It was decided that the process should identify ‘anthropological’ cultural practices, rather than ‘social’ cultural practices. For example, *limu* (edible seaweed) gathering would be considered an anthropological cultural practice, while a modern-day marathon would be considered a social cultural practice. According to the Guidelines for Assessing Cultural Impacts established by the Hawaii State Office of Environmental Quality Control:

> 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 manmade and natural, which support such cultural beliefs (OEQC 1997).

This Cultural Impact Assessment involves evaluating the probability of impacts on identified cultural resources, including values, rights, beliefs, objects, records, properties, and stories occurring within the project area and its vicinity (H.B. 2895, Act 50, 2000).

METHODOLOGY

This Cultural Impact Assessment was prepared in accordance with the methodology and content protocol provided in the Guidelines for Assessing Cultural Impacts (OEQC 1997). In outlining the "Cultural Impact Assessment Methodology", the OEQC states: …information may be obtained through scoping, community meetings, ethnographic interviews and oral histories… (1997).

The report contains archival and documentary research, as well as communication with organizations having knowledge of the project area, its cultural resources, and its practices and beliefs. This Cultural Impact Assessment was prepared in accordance with the methodology and content protocol provided in the Guidelines for Assessing Cultural Impacts (OEQC 1997). The assessment concerning cultural impacts should address, but not be limited to, the following matters:

(1) a discussion of the methods applied and results of consultation with individuals and organizations identified by the preparer as being familiar with cultural practices and features associated with the project area, including any constraints of limitations with might have affected the quality of the information obtained;

(2) a 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) a discussion concerning historical and cultural source materials consulted, the institutions and repositories searched, and the level of effort undertaken, as well as the particular perspective of the authors, if appropriate, any opposing views,

and any other relevant constraints, limitations or biases;

(6) a discussion concerning the cultural resources, practices and beliefs identified, and for the 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) a 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) an explanation of confidential information that has been withheld from public disclosure in the assessment;

(9) a discussion concerning any conflicting information in regard to identified cultural resources, practices and beliefs;

(10) an 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, and;

(11) the inclusion of bibliography of references, and attached records of interviews, which were allowed to be disclosed.

Based on the inclusion of the above information, assessments of the potential effects on cultural resources in the project area and recommendations for mitigation of these effects can be proposed.

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 and land records such as Land Commission Awards, Royal Patent Grants, and Boundary Commission records; historic accounts, and previous archaeological project reports.

INTERVIEW METHODOLOGY

Interviews are conducted in accordance with applicable state laws and guidelines. Individuals and/or groups who have knowledge of traditional practices and beliefs associated with a project area or who know of historical properties within a project area are sought for consultation. 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. Often people are recommended for their expertise, and indeed, organizations, such as Hawaiian Civic Clubs, the Island Branch of Office of Hawaiian Affairs, 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.

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 information available for this study. When telephone interviews occur, a summary of the information is often sent for correction and approval, or dictated by the informant and then incorporated into the document. Key topics discussed with the interviewees vary from project to project, but usually include: personal association to the *ahupua'a*, land use in the project's vicinity; knowledge of traditional trails, gathering areas, water sources, religious sites; place names and their meanings; stories that were handed down concerning special places or events in the vicinity of the project area; evidence of previous activities identified while in the project vicinity.

In this case, letters with maps and descriptions of the project area were sent to individuals and organizations whose jurisdiction includes knowledge of the area with an invitation for consultation. Consultation was sought from Kamaile Puluole-Mitchell, Office of Hawaiian Affairs (OHA) East Hawai'i Island Representative; Jordan Kea Calpito, SHPD Burial Sites Specialist; Sean Naleimaile, State Historic Preservation Division (SHPD) Hawai'i Island Archaeologist; and Kalena Blakemore, Hawai'i Island Burial Council (HIBC) Member. Consultation was also conducted near the project area with members of the Kamahele and Lui families.

If cultural resources are identified based on the information received from these organizations and/or additional informants, an assessment of the potential effects on the identified cultural resources in the project area and recommendations for mitigation of these effects can be proposed. Public notices (Appendix A) were published in the Honolulu Star-Advertiser, the Hawai'i Tribune Herald, and West Hawai'i Today.

ENVIRONMENTAL SETTING

The project area is situated on level to moderately sloping land at 0.0 to 50.0 feet (0.0-15.0 m) above mean sea level (amsl) (see Figure 2). The project area substrate is a Kīlauea lava flow dated between 750 and 1,500 years ago (Wolfe and Morris 1996). Soil in the project area is ʻOpihikao series (rOPE) extremely rocky muck overlaying pāhoehoe lava (Sato 1973:43). The soil is thin and well drained with 3% to 25% slopes. The seaward edge of the project area is 20 to 30 foot high cliffs (Figure 5 and Figure 6). There is no easy access to enter the ocean except by climbing down the cliff face.

There is a low littoral black cinder cone located along the sea cliff in the middle of Parcel 026 (see Figure 2 and Figure 4). The seaward side of the cone is eroded (Figure 7 and Figure 8). The cinder cone slopes gently to southwest and is covered by grass grazed by sheep and goats. The remainder of the project area is pāhoehoe coastal flats with grasses, low shrubs and scattered trees (Figure 9 and Figure 10). Tree species in the southeast portion of the project area (Parcel 027) include autograph (*Clusia rosea*), gunpowder (*Trema orientalis*), Moluccan albezia (*Falcataria moluccana*), bingabing (*Macaranga mappa*), and guava (*Psidium sp.*) (Starr 2013). There are also intermittent coconut palms (*Cocos nucifera*) along the coastline. Rainfall in the project area is between 120 and 200 inches per year. Natural drainage in the area runs from west to east.

Figure 5: Photograph of Sea Cliff at the Northeast Edge of the Project Area, Looking Northwest.

Figure 6: Photograph of Sea Cliff at Middle of the Project Area, Looking Southeast.

Figure 7: Photograph of Littoral Black Cinder Cone at Middle of the Project Area, Looking South.

Figure 8: Photograph of Littoral Black Cinder Cone at Middle of the Project Area, Looking South.

Figure 9: Photograph of Project Area Parcel 026 Grass in Foreground and Parcel 027 Trees at Background Left, Looking South.

Figure 10: Photograph of Project Area Parcel 026 Grass, Looking West Toward Government Beach Road.

HISTORICAL AND CULTURAL CONTEXTS

Many archaeologists believe that Hawai‘i Island was first settled around A.D. 1,000 by people sailing from the Marquesas (Athens et al. 2014; Dye 2011; Kahn et al. 2014; Kirch 2011; Kirch and McCoy 2007; Mulrooney et al. 2011; Reith et al. 2011; Wilmhurst et al. 2011a and 2011b). An article published in the Journal of Archaeological Science reviewing radiocarbon dates recovered at archaeological sites on the Island of Hawai‘i suggests that, by relying on only carbon samples from short-lived plant remains, the most reliable dates point to initial Polynesian colonization of Hawai‘i Island occurring between A.D. 1220 and 1261 (Rieth et al. 2011:2747). Hilo was, by most estimates, one of the first settlements on the Island of Hawai‘i.

The rich marine resources of Hilo Bay and the gently sloping forests of Mauna Loa and Mauna Kea provided abundant resources. Fresh water was available from the Wailoa and Wailuku rivers and smaller streams such as Waiākea, Waiolama, Pukihae, and ‘Alenaio. The current project area is located in Pōpōkī Ahupua‘a, Puna District, roughly twenty kilometers southeast of Hilo (Figure 11 and Figure 12). Pōpōkī Ahupua‘a is located between Waikahekahe and Keonepoko Ahupua‘a in Figure 11.

PRE-CONTACT ACCOUNTS OF SOUTH HILO AND PUNA DISRTICTS

The earliest account of Hilo appears in ‘Umi-a-Liloa’s (1600–1620) conquest of the Island of Hawai‘i, which establishes Hilo as a royal center by the sixteenth century. In the account, ‘Umi-a-Liloa began his conquest of the Island of Hawai‘i by defeating chief Kulukulu‘ā, who lived in Waiākea, and the other chiefs of Hilo (Kamakau 1992:16–17). ‘Umi-a-Liloa’s second son, Keawe-nui-a-‘Umi, ruled Hamākua, Hilo, and Puna from his residence at Hilo (*ibid*: 34). It was from Hilo that he waged war on the Kona chiefs and unified the island. Keawe-nui-a-‘Umi’s descendants single handedly continued rule for many generations from Hilo.

After the death of Keawe-nui-a-‘Umi the kingdom was divided into three parts and was established under warring chiefs; Hilo was ruled by Kumalae-nui-pu‘awa-lau and his son Makua *(ibid*: 45). It was during the period of time that Kamehameha I was born. Kalani‘ōpu‘u’s grandson, Keoua Kuahu‘ula and nephew Kamehameha vied for control over the six chiefdoms constituting the island kingdom and Keoua conquered Hilo chief Keawe-mau-hili and harvested the benefits for a short time only to be vanquished by Kamehameha I late in 1791.

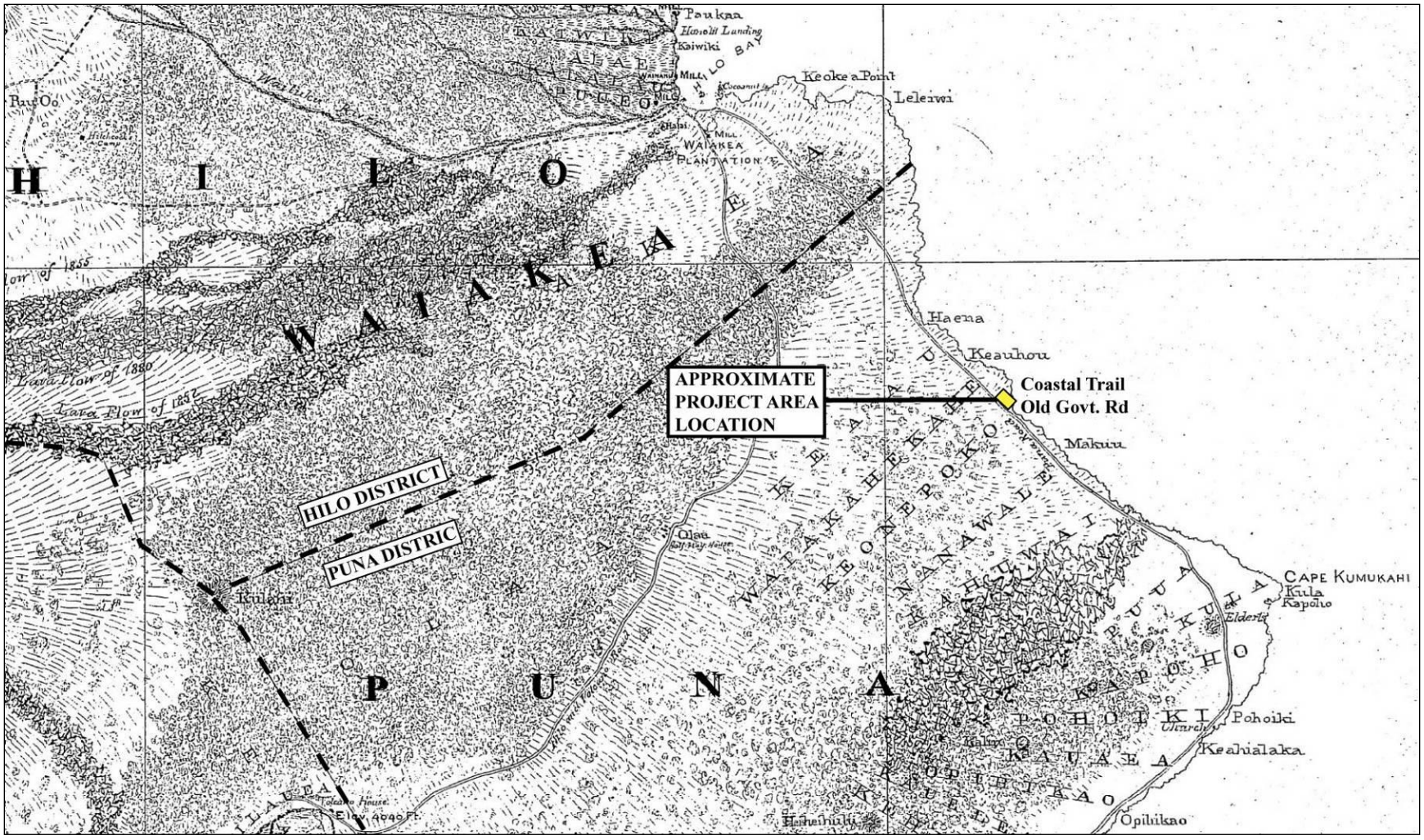

Figure 11: Portion of Map of the Island of Hawai‘i Showing the Locations of Project Area and Place Names (Wall 1886).

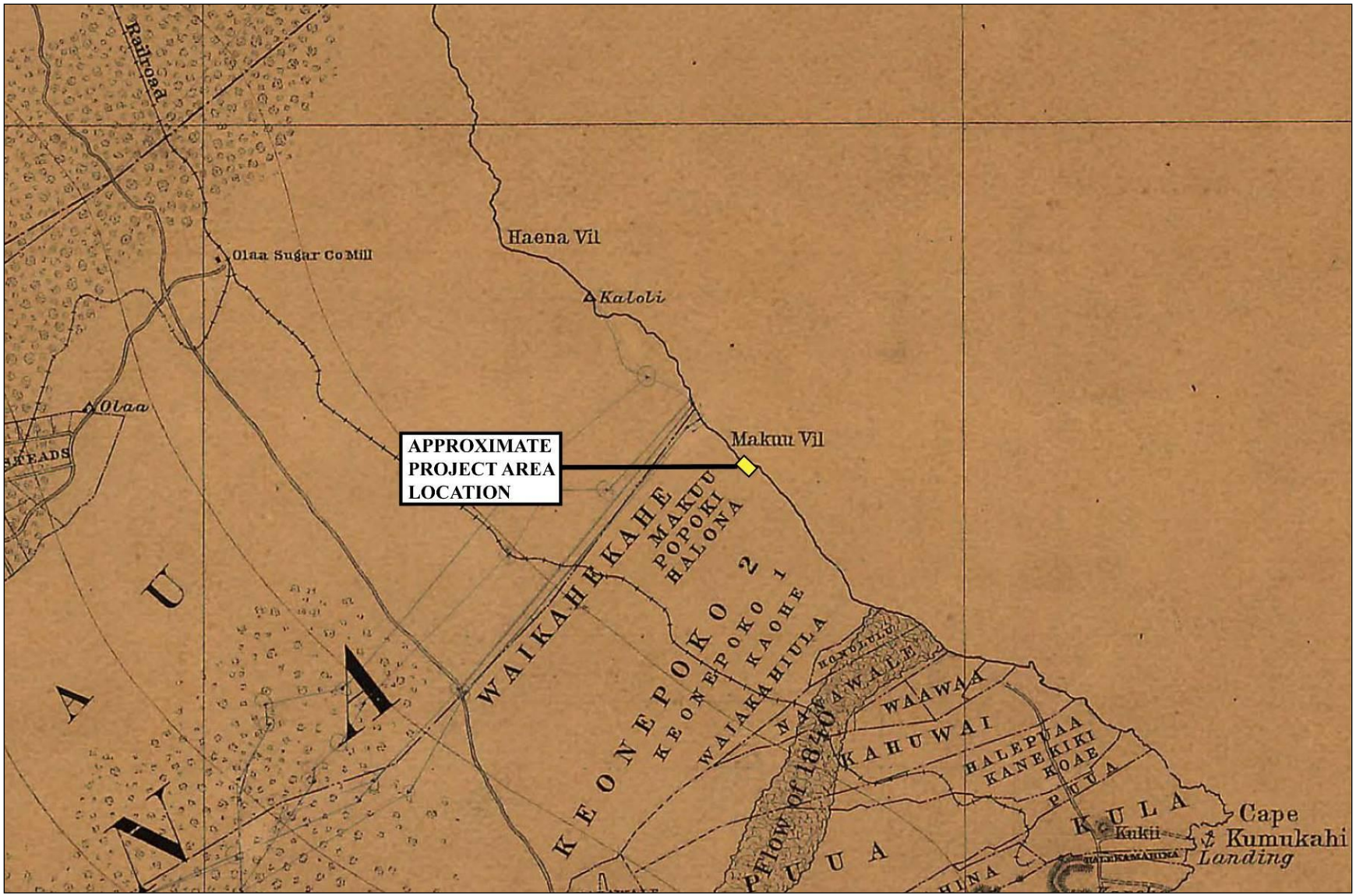

Figure 12: Portion of Map of Hawai‘I Showing Project Area and Surrounding Place Names (Donn 1901).

Kamehameha's son Liholiho was born in Hilo in November 1797 (Kamakau 1992:22). Waiākea was inherited by Lihiliho after Kamehameha's death. The *ʻili kūpono* of Piʻopiʻo and its royal fishpond were given to his favorite wife, Kaʻahumanu.

Situated along the windward coast of Hawaiʻi Island, Puna is a verdant and abundant district with good rainfall and rich soils (see Figure 11). However, it is also subject to volcanic eruptions and has been covered by new lava in many places over the last 1,000 years (Cordy 2000:17, and 22). Much of the district's coastal areas have thin soils, and there are no good deep water harbors. The ocean along the Puna coast is often rough and wind-blown.

As a result of these two factors, settlement patterns in Puna tend to be dispersed and without major population centers. Villages in Puna tend to be spread out over larger areas and often are inland, and away from the coast, where the soil is better for agriculture (*ibid*: 45). The lack of population centers also had an effect on the development of a hierarchy of district rulers. Puna was often not strongly tied together by a tight web of allegiances between *aliʻi* and *konohiki*. As a result, Puna was often conquered and ruled by stronger district leaders in Hilo or Kaʻū (Kamakau 1992:17 and 77).

Puna District was famous for its valuable products, including "hogs, gray *kapa* cloth (*ʻeleuli*), tapas made of *mamaki* bark, fine mats made of young pandanus blossoms (ʻ*ahuhinalo*), mats made of young pandanus leaves (*ʻahuao*), and feathers of the *ʻoʻo* and *mamo* birds" (*ibid*:106). Puna was also famous for its abundant *ulu* (breadfruit).

Keaʻau and neighboring ʻŌlaʻa Ahupuaʻa were well known for their valuable natural and hand-made products. Both *ahupuaʻa* were located along the southern boundary of South Hilo District (see Figure 11). The two *ahupuaʻa* were often the source of forest products for the Hilo's ruling elite. Moreover, Keaʻau cut ʻŌlaʻa off from the ocean, so that families living along the coast in Keaʻau often traded marine resources for upland forest products from family members living in small communities in upland ʻŌlaʻa.

Historical accounts pertaining to lands of the project area region are scarce but provide some information on traditional residence patterns, land-use, and subsistence. William Ellis passed through Pōpōkī Ahupua‘a in 1823 while travelling along the coastal trail from Kilauea to Waiākea Ahupua‘a, Hilo (see Figure 12). Ellis’ journey took him along the coast past the project area. Ellis did not describe the region of Maku‘u or Pōpōkī Ahupua‘a, but stopped in a small inland village in Honolulu Ahupua‘a, and rested in the shade of a canoe house along the coast of Waiakahiula Ahupua‘a (Ellis 1963:294-295), roughly 3.5 to 5.0 km southeast of Pōpōkī. Honolulu Village and a nearby village were inland and small, and the population was dispersed.

Ellis also described a village, likely Hā‘ena, in Kea‘au Ahupua‘a, north of Pōpōkī (see Figure 12). The village was large and populous with an abundance of taro, sweet potato and sugarcane gardens (Ellis 1963:296). He suggested the area was made more fertile by a flowing stream where he quenched his thirst.

TESTIMONY BEFORE THE COMMISSION TO QUIET LAND TITLES

With the Māhele of 1848 and the two Acts of 1850, authorizing the sale of land in fee simple to resident aliens and the award of *kuleana* lands to native tenants, land tenure in Hawai‘i arrived at a significant turning point (Chinen 1961:13). The *ahupua‘a* of Kea‘au was granted to William C. Lunalilo as part of Land Commission award (LCA) 8559-B.

There were no Land Commission awards made in Pōpōkī Ahupua‘a. Three small Land Grants (LG) were purchased along the coast in Maku‘u, Pōpōkī, and Halona Ahupua‘a (Figure 13). LG 1013 was purchased by D.W. Maiau, LG 1014 was purchased by Kea, and LG 1537 was purchased by Kapohana. The current project area is the northeast portion of 171.0 acres of land (LG 1537) purchased by Kapohana in 1855.

The littoral cone was used as a triangulation station by early western map makers, and is labeled Opunaha in Figure 13. Ōpūnahā is literally as “broken cluster” (Pukui et al. 1976:172) and likely refers to the eroded littoral cinder cone. There are two *mauka-makai* trails and one trail parallel to the ocean depicted in Figure 13. One of the *mauka-makai* trails ends at Old Government/Beach Road just mauka of the current project area. There are no trails depicted within the current project area.

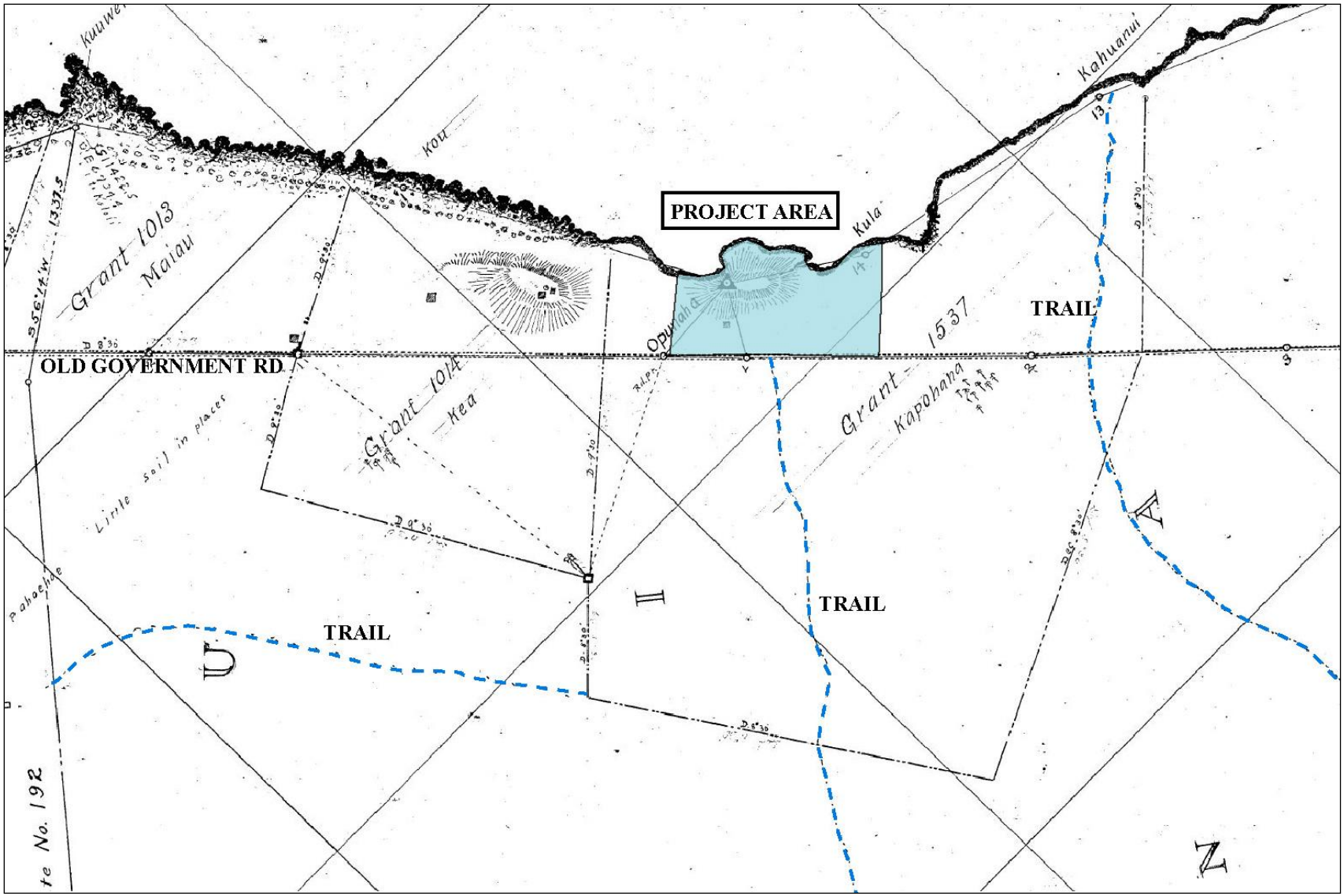

Figure 13: Portion of Map of Puna District Showing Locations of the Project Area and Land Grants (Moragne 1903).

CHANGING RESIDENTIAL AND LAND-USE PATTERNS (1845-1865)

Between 1845 and 1900, traditional land-use and residential patterns began to change drastically. In particular, the regular use of Hilo Bay by foreign vessels, the growth of tourism, the presence of the whaling industry, the establishment of missions in the Hilo area, the legalization of private land ownership, the introduction of cattle ranching, the introduction of sugar cane cultivation, and the construction of Government Roads and railroad lines all brought about changes in settlement patterns and long-established land-use patterns (Kelly *et al*. 1981). Much of the change in residential location and the growth of towns in Puna District were driven by the availability of arable land suited to commercial crops and the location of newly constructed roads.

The traditional travel route through Puna was along the coast (see Figure 11 and Figure 14). The trip was made along a foot trail that led through the coastal and near coastal villages. That trail lead from the modern day Lili‘uokalani Gardens area to Hā‘ena along the Puna coast. The trail is often called the old Puna Trail and/or Puna Road. There is an historic trail/cart road that is also called the Puna Trail (*Ala Hele* Puna) and/or the Old Government Road that continues from the south end of the Puna Trail through Waiakahiula Ahupua‘a heading to points south. Lass (1997) also refers to the entire route from Hilo to Ka‘ū as the Puna-Ka‘ū trail.

THE PUNA TRAIL AND OLD GOVERNMENT ROAD

There is an historic trail that leads from the modern day Lili‘uokalani Gardens in Waiākea to Hā‘ena along the Puna coast. The trail is often called the old Puna Trail and/or Puna Road. There is an historic trail/cart road that is also called the Puna Trail (*Ala Hele* Puna) and/or the Old Government Road that continues from the south end of the Puna Trail heading to points south. Lass (1997) also refers to the entire route from Hilo to Ka‘ū as the Puna-Ka‘ū trail.

Whatever name the trail/cart road alignment is called by, it likely incorporated segments of the traditional Hawaiian trail system often referred to as the *ala loa* or *ala hele* (Hudson 1932:247, Kuykendall 1966:23-25, Lass 1997:15, and Maly 1999:5). Lass suggests the fill length of the Puna Trail, or Old Government Road, might have been constructed or improved just before 1840 (Lass 1997:15). The trail was called the Old Government Road, or *Ala Nui Aupuni* (Maly 1999:5). The alignment was first mapped by the Wilkes Expedition of 1804-41 (see Figure 14).

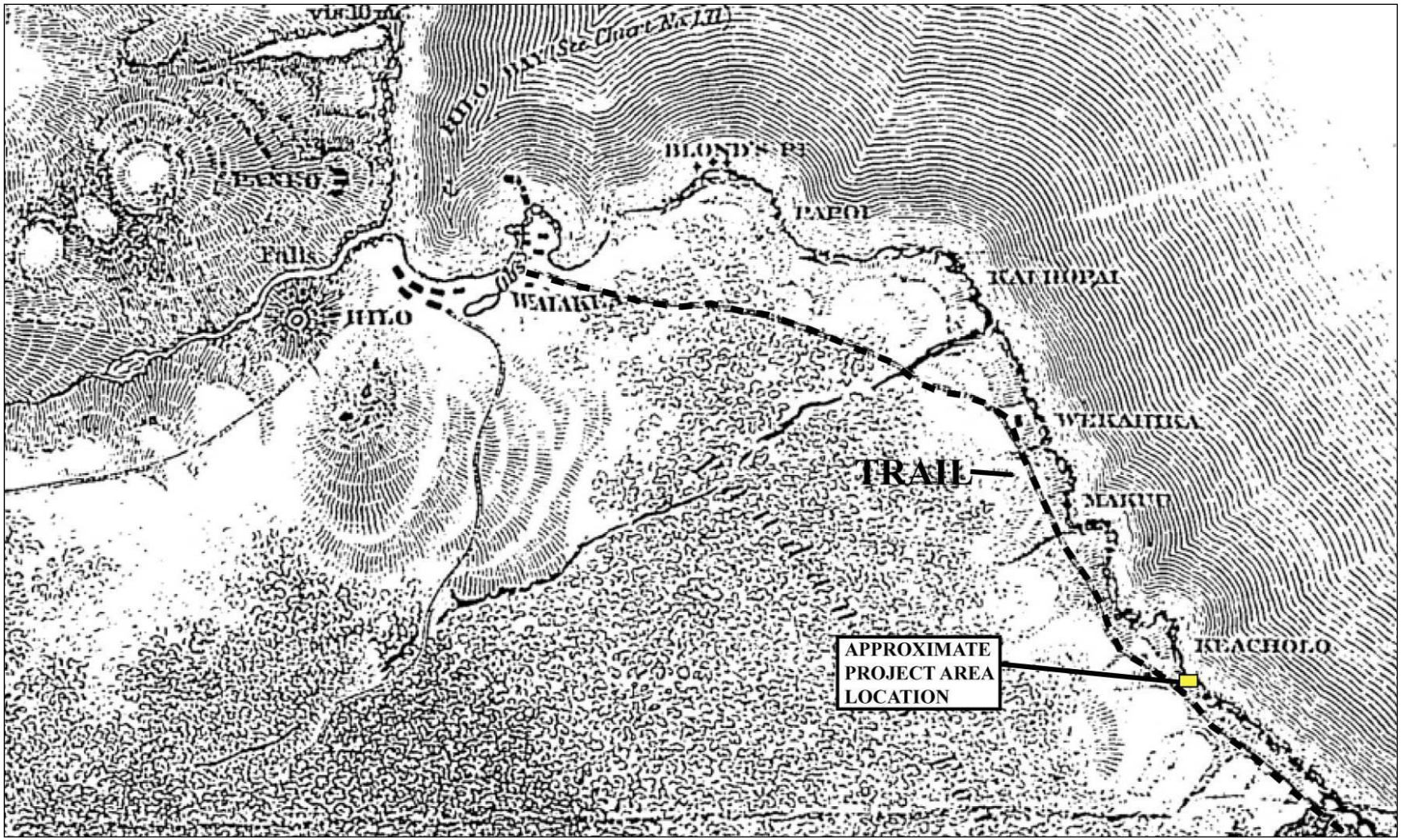

Figure 14: Location of Project Area and Old Government Road from Hilo Bay through Puna District on Portion of Registered Map 424 Drawn by the Wilkes Expedition of 1840-1841.

A general description of the area between the Old Government Road and the newer upper road from Hilo through Kea‘au to Pahoa was recorded in 1889 by the Surveyor General of the Hawaiian Government Survey. The description affords a glimpse into inland and coastal settlement patterns and land use.

> The first settlement met with after leaving Hilo by the sea coast road, is at Keaau, a distant 10 miles where there are less than a dozen inhabitants; the next is at Makuu, distant 14 miles where there are a few more, after which there is occasionally a stray hut or two, until Halepuaa and Koae are reached, 21 miles from Hilo, at which place there is quite a village; thence to Kaimu there are only a few scattered settlements here and there. A good many of those living along the lower road have their cultivating patches in the interior, along or within easy accessibility to the new road (Alexander 1891, cited in Maly 1999:107).

The 1889 description contrasts with Ellis' in which he described numerous villages just sixty-six years earlier. The 1889 description suggests depopulation along the majority of the Puna near-coastal area. In both descriptions, the people in this area appear to have lived somewhat inland, between the coast and the inland gardens. In 1889 people were cultivating small patches of *kalo*, ‘*awa*, and coffee as well as other food items in the inland gardens. The patches were placed in pockets of soil in holes amidst the lava flows. Additionally, sweet potatoes were grown on rock mounds. By 1889, it appears that very few people lived along the Old Government Road (Maly 1999:6). The Surveyor General stated,

> The old sea coast road cannot be kept in repair with the means now at its disposal and its condition each year is becoming more unsafe and ruinous, there is but little travel over it; it has been shown that there is little land capable of cultivation or development either side of it and whatever travel there is now over it would soon be entirely diverted to the upper road (Alexander 1891, cited in Maly 1999:107).

The new road being constructed from Hilo through Kea‘au to Pahoa was designed to allow access to the more arable inland areas. People who traditionally had lived along the Puna coast were moving toward Hilo and into the more fertile upland areas of Puna in

order to find paid work and to produce cash crops for local markets and for export. In particular, people began to work in the inland areas to grow sugarcane.

The same was true of the trail from Hilo, through Kea‘au, and on to Kīlauea Crater (Volcano Road). An improved Volcano Road was built from Hilo to Kīlauea between 1889 and 1893 partly to accommodate tourism, but also to increase access to forest products and agricultural land. Numerous small field parcels belonging to the ‘Ōla‘a Sugar Company and the ‘Ōla‘a Coffee Company were located along this route. The improved Volcano Road is Route 11, though it has been straightened and improved several times since its initial construction.

The modern history of land-use in Kea‘au Ahupua‘a is tied to the development of commercial agriculture and the construction of transportation routes. The potential to use Kea‘au's rich arable land for commercial prospects was recognized as early as the 1870s when it was leased for coffee growing and for cattle grazing. In 1881, the entire *ahupua‘a* was purchased at auction by Samuel Damon, William H. Shipman, and E. Elderts from trustees of the deceased William C. Lunalilo Estate. Shipman bought out the two partners within three years of purchasing the land.

William H. Shipman operated a cattle ranch in Kapoho Ahupua‘a and was the owner of the Waiākea Stock Ranch. Shipman was also co-owner of the Shipman Meat Market, later the Hilo Meat Company. Shipman leased portions of Kea‘au Ahupua‘a to the ‘Ōla‘a Sugar Company beginning in 1899. It was the development of ‘Ōla‘a Sugar Company fields, the construction of the sugar mill in Kea‘au, and the construction of the numerous sugar company camps, that created modern day Kea‘au town as a small commercial and residential center.

SUGARCANE, RAILROADS AND COMMERCE

The ‘Ōla‘a Sugar Company, established in 1899, became the largest sugarcane plantation and milling operation in Puna District. By the 1950s the ‘Ōla‘a Sugar Company was in debt and sugar production and sales were stagnant. The company stockholders changed the company name to the Puna Sugar Company, Ltd. and sold off land to invest in new equipment and upgrade their facilities. By 1966, the company was debt free and making a good profit. American Factors (AMFAC) bought out the minority shareholders in 1969 and Puna Sugar Company became a subsidiary of AMFAC.

AMFAC expanded sugarcane processing in the 1970s through new extraction facilities upgrades at the mill in Kea‘au (‘Ōla‘a Mill) and by building a 15KW bagasse and trash burning power plant next to the mill. Hilo Electric Light Company (HECO) agreed to purchase 12.5KW of power for their customers.

Puna Sugar Company, like many other sugar companies, struggled in the late 1970s and early 1980s due to changes in the sugar market that made sugar production less profitable. By the start of 1982, AMFAC had decided to close Puna Sugar Company. The work of selling off assets and preparing severance packages took three full years. The sugar mill was sold to Fiji Sugar Corporation in 1988 and the power plant operation taken over HECO.

MODERN LAND USE

The project area and surrounding lands were not used for growing sugarcane as the soil is too shallow. The area remained primarily unaltered and undeveloped grasslands with a large variety of introduced and invasive species. The land north of the current project area, 15.6 square miles in total, was purchased by David Watumull from W.H. Shipman, Ltd in 1959. The land was subdivided into nearly 8,800 lots within the newly created Hawaiian Paradise Park (HPP) subdivision.

Currently, the land along the coast near the project area is primarily privately owned. Some of the lots have homes on them and others are still undeveloped. Some of the lands further *mauka* of Old Government/Beach Road are owned by the Department of Hawaiian Homelands (DHHL) and the State of Hawai‘i. Parcel 026 has rock walls and barb, panel and electric wire fence, and has been used as pasture for sheep and goats for many years. Parcel 027 is undeveloped and is partially wooded.

PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

Ewart and Luscomb (1974) recorded 22 archaeological sites along the coast of Waikahekahe, Mukuʻu, Pōpōkī, and Hālona Ahupuaʻa (Figure 15 and Table 1). Sites identified in Pōpōkī and Hālona Ahupuaʻa to the south were documented in Makuʻu Ahupuaʻa in the report. Sites were clustered on either side of Beach Road and consisted of agricultural and habitation complexes. Sites included rock walls, small enclosures and agricultural rock clearing mounds.

Coastal Waikahekahe and Makuʻu archaeological sites were primarily agricultural and habitation complexes containing rock walls, agricultural crock clearing mounds, rock walls, enclosures, pavements, platforms, rock lined wells, and burial features. The sites appear to be primarily pre-Contact to Historic in age. Site 18975 is a possible *heiau* complex (see Figure 18 and Figure 19).

The site concentrations recorded south and west of the current project area are primarily walls, enclosures, terraces and rock mounds. The archaeological features are associated with pre-Contact to Historic era habitation and agriculture.

A single site was identified within the current project area during the Ewart and Luscomb (1974) survey. The site was first recorded as Bishop Museum Site #Ha-A3-15, and was likely designated SIHP #50-1-45-18986. The site appears to be a rock mound though neither Ewart and Luscomb (1974) nor the SHPD SIHP database contain any descriptive information about the site. There were no other archaeological sites or features identified on the current project area.

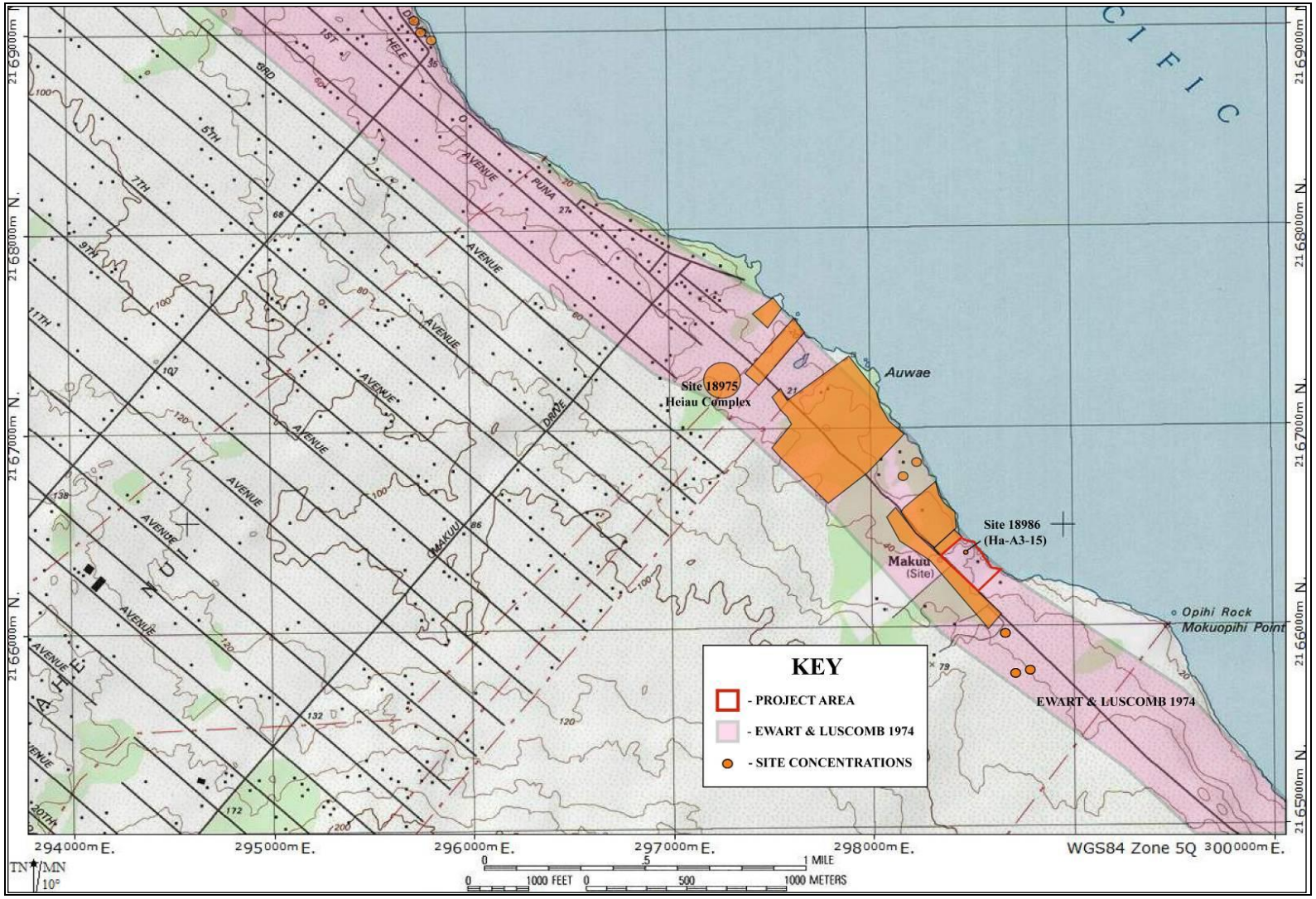

Figure 15: 7.5-Minute Series USGS Topographic Map (Kea'au Ranch Quad) Showing Location of Coastal Sites Recorded in Ewart and Luscomb (1974) (National Geographic Topo!, 2003. Data Sources: National Geographic Society, USGS).

Table 1: Inventory of Waikahekahe and Maku‘u Ahupua‘a Archaeological Sites (Ewart and Luscomb 1974).

SIHP# 50-10-45:	Site Type	Ahupua‘a	Description	Research Potential
18973	Complex	Waikahekahe	Rock walls, retaining walls, walled depressions, and possible platforms	Good
18974	Complex (Agriculture and Habitation)	Waikahekahe	Rock walls, retaining walls, walled depressions, possible pavements, and platforms	Good
18975	Complex	Waikahekahe	Rock walls, retaining walls, platforms, rock mounds, and possible *hieau*	Excellent
18976	Complex (Agricultural)	Maku‘u	Free-standing and retaining walls and small mounds	Good
18977	Wall	Maku‘u	Wall	N/A
18978	Complex	Maku‘u	Free-standing and retaining walls, a mound, a possible *kuleana* wall, and an enclosure	Mediocre
18979	Wall & Enclosure	Maku‘u	Rock wall and enclosure	Some
18980	Complex (Agriculture)	Maku‘u	Rock walls and rock mounds	Good
18981	Petroglyphs	Maku‘u	Modern petroglyphs	N/A
18982	Complex	Maku‘u	Walls, faced areas, a mound with an upright stone, and a rock-lined well	Negligible
18984	Complex (Agriculture and Habitation)	Maku‘u	Trails, several enclosures, and terraces	Excellent
18985	Wall	Maku‘u	Rock wall	Some
18987	Burials	Maku‘u	Historic grave yard	N/A
18987	Complex (Agriculture and Habitation)	Maku‘u	Walls, enclosures, mounds, depressions, and platforms	Good
18988	Complex (Agriculture and Habitation)	Maku‘u	Walls and platforms	No Longer Present
18989	Petroglyph Field	Maku‘u	Petroglyphs	Good
18990	Possible Burial	Maku‘u	Rock mound	N/A
18991	Enclosure	Maku‘u	Rock lined depression	N/A
19005	Possible Burial	Maku‘u	Rock mound	N/A
20598	Trail	Maku‘u	Coastal trail	Good
4222	Petroglyph Field	Maku‘u	Petroglyphs	Good
7476	Kamahele House	Maku‘u	Historic house	No Longer Present

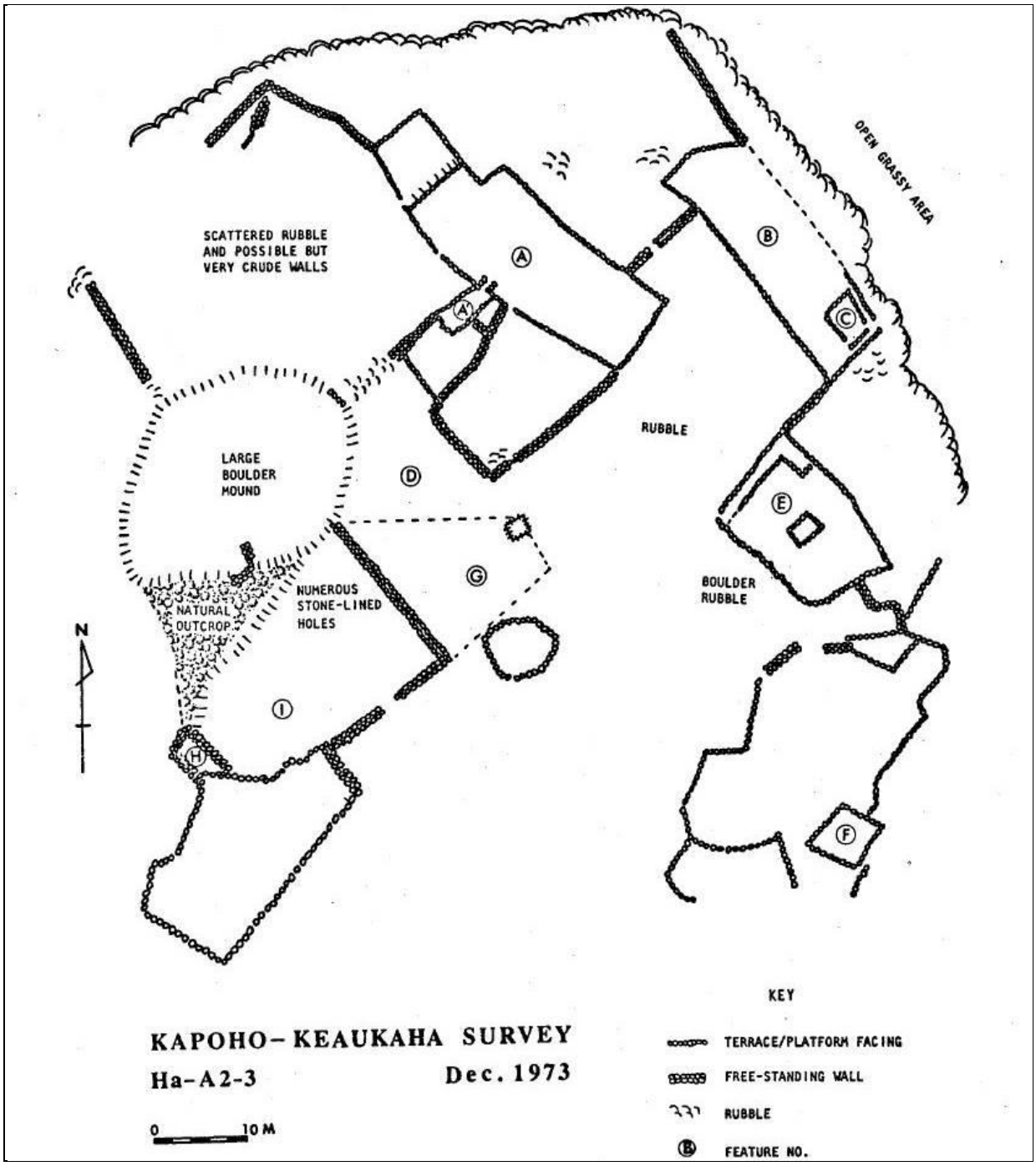

Figure 16: Site 18975 Plan View Map (Ewart and Luscomb 1974:24).

RECENT STUDIES IN PŌPŌKĪ AND SURROUNDING AHUPUA‘A

Twenty archaeological studies have been conducted in Maku‘u, Pōpōkī and Halona Ahupua‘a (Table 2 and Figure 17). The studies were conducted in the upland and coastal regions surrounding the current project area and shed light on pre-Contact to Historic land use. The most striking feature of the studies is the low distribution of archaeological sites documented in the upland project areas. Aside from lava tubes containing pre-Contact era habitation features and burials, only three archaeological features were documented in the upland project areas. Upland features included a possible ceremonial complex (enclosure, platform, rock wall, and rock wall), a rock mound and an agricultural terrace. The lack of sites in the uplands is consistent with early written accounts documenting traditional habitation areas along the coast to a little over one mile inland.

Table 2: Previous Archaeological Studies in Maku‘u, Pōpōki and Halona Ahupua‘a.

Author/Date	Type of Study	Ahupua‘a
Barrera & Lerer 1990	Archaeological Inventory Survey	Maku‘u
Bordner 1977	Reconnaissance Survey	Maku‘u
Chaffee & Spear 1993	Burial Testing	Maku‘u
Clark et al. 2007	Archaeological Inventory Survey	Pōpōkī
Clark et al. 2008	Archaeological Inventory Survey	Maku‘u
Charvet-Pond & Rosendahl 1993	Archaeological Inventory Survey	Maku‘u, Hālona, Pōpōkī
Conte et al. 1994	Archaeological Inventory Survey	Maku‘u, Hālona, Pōpōkī
Desilets & Rechtman 2004	Archaeological Inventory Survey	Maku‘u, Hālona, Pōpōkī
Dirks Ah Sam & Rechtman 2013	Archaeological Inventory Survey	Pōpōkī
Hudson 1932	Archaeological Survey	Various
Ewart & Luscomb 1974	Reconnaissance Survey	Various
Komori & Peterson 1987	Cultural & Biological Resource Survey	Various
McEldowney & Stone 1991	Archaeological/Environmental Survey	Various
Yent 1983	Archaeological Survey	Maku‘u
Rechtman 2003	Archaeological Assessment	Maku‘u, Hālona
Rosendahl 1989	Field Inspection	Maku‘u, Hālona, Pōpōkī
Spear et al. 1995	Data Recovery	Maku‘u
Dircks & Rechtman 2013	Archaeological Inventory Survey	Pōpōkī
Escott 2019	Archaeological Inventory Survey	Maku‘u
Escott & Dols 2020	Archaeological Inventory Survey	Pōpōkī

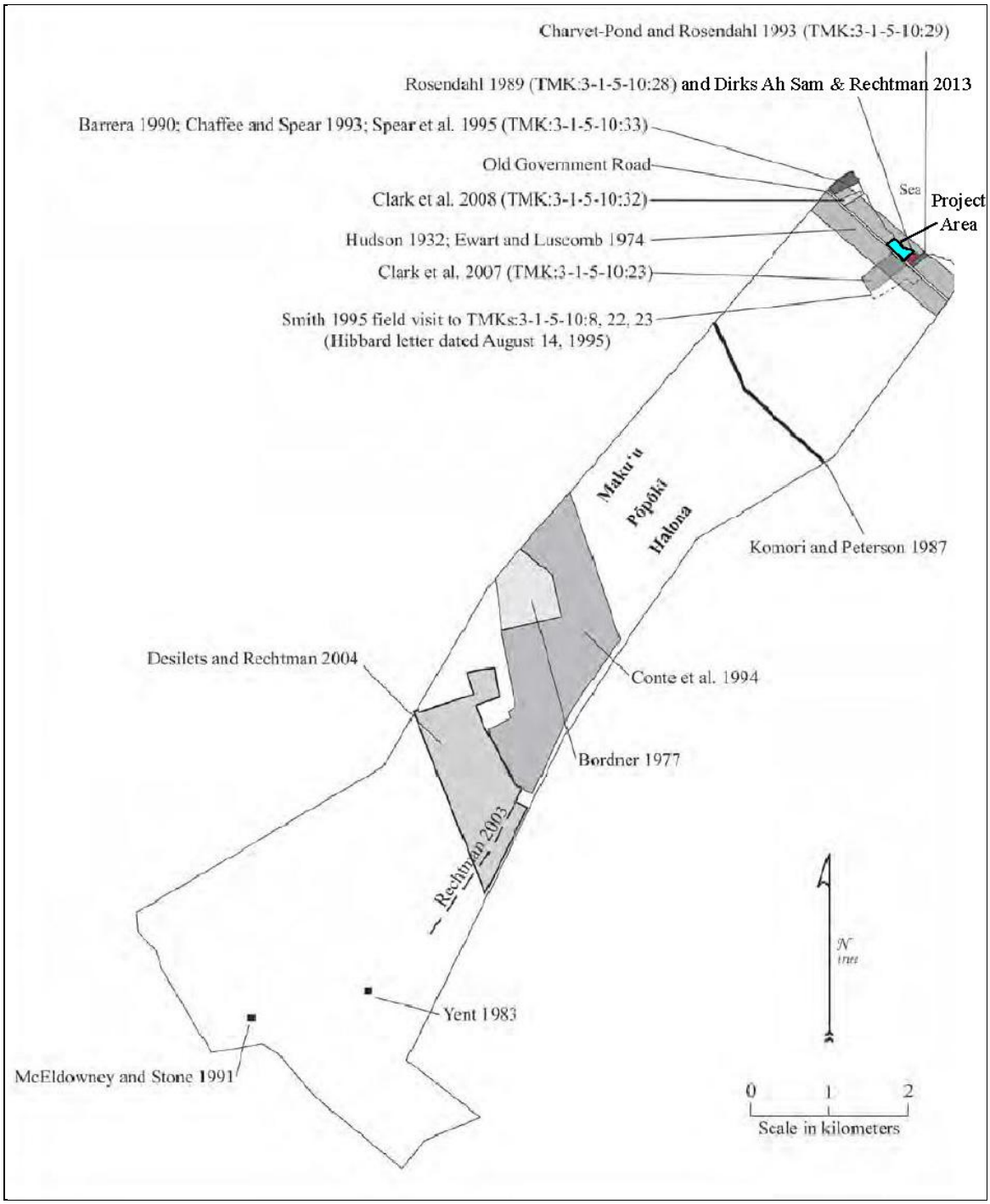

Figure 17: Map Showing Recent Previous Archaeological Studies in Maku‘u and Surrounding Ahupua‘a (Adapted from Dirks Ah Sam and Rechtman 2013:11).

Komori and Peterson (1987) conducted a cultural and biological resources survey along a corridor roughly 2.5 to 3.0 kilometers (1.55 to 1.86 miles) from the coastline. Five agricultural complexes, habitation and burial platforms, burial and refuge caves, and petroglyphs were documented within the project area. All of the sites are pre-Contact to early post-Contact era in age.

Dircks Ah Sam and Rechtman (2013) conducted an archaeological inventory survey directly southeast of the current project area (Figure 17) in Pōpōkī and Hālona Ahupuaʻa [TMK: (3) 1-5-010:028]. This study yielded the recordation of a pre-Contact coastal trail segment (Site 18418) and a Historic rock wall (Site 18419). The rock wall (Site 18419) was interpreted as a pasture boundary and continues into the current project area. The trail (Site 18418) was initially recorded in Parcel 029 by Charvet-Pond and Rosendahl (1993), who noted that the trail continued northwest along the coastline and into Parcel 028. Dircks and Rechtman (2013) recorded a 10.0 m segment of the elevated coastal trail in the southeast portion of Parcel 028. No other trail remnant was observed possibly due to high density ground vegetation and modern disturbance. Site 18418 was recommended for preservation.

Escott (2019a) recorded five archaeological sites on a project area 150 meters northwest of the current project area (Table 3 and Figure 18). Site #50-10-45-7476, 18980 and 18987 were previously recorded in Ewart and Luscomb (1974). The three previously identified sites include a cement foundation at the Kamahele House (Site 7476), an agricultural complex (Site 18980) and the family burial plot (Site 18987). Two newly recorded sites include the rock wall along the boundary of Parcel 009 (Site 31111) and a short rock wall segment (Site 31112) in the southeast corner of the project area. Site 18981 recorded in Ewart and Luscomb (1974) is two modern petroglyphs and is not a historic property.

Table 3: Inventory of Archaeological Sites Identified Within the Project Area.

SIHP #50-10-45:	SITE TYPE	SITE FUNCTION	SITE AGE
7476	Kamahele House	Habitation	Historic era
18980	Complex (Agriculture)	Rock walls and rock mounds	Pre-Contact to early post-Contact era
18987	Burials	Historic graves	Historic era
31111	Rock Wall	Property Boundary	Historic era
31112	Rock Wall	Road edge	Historic era

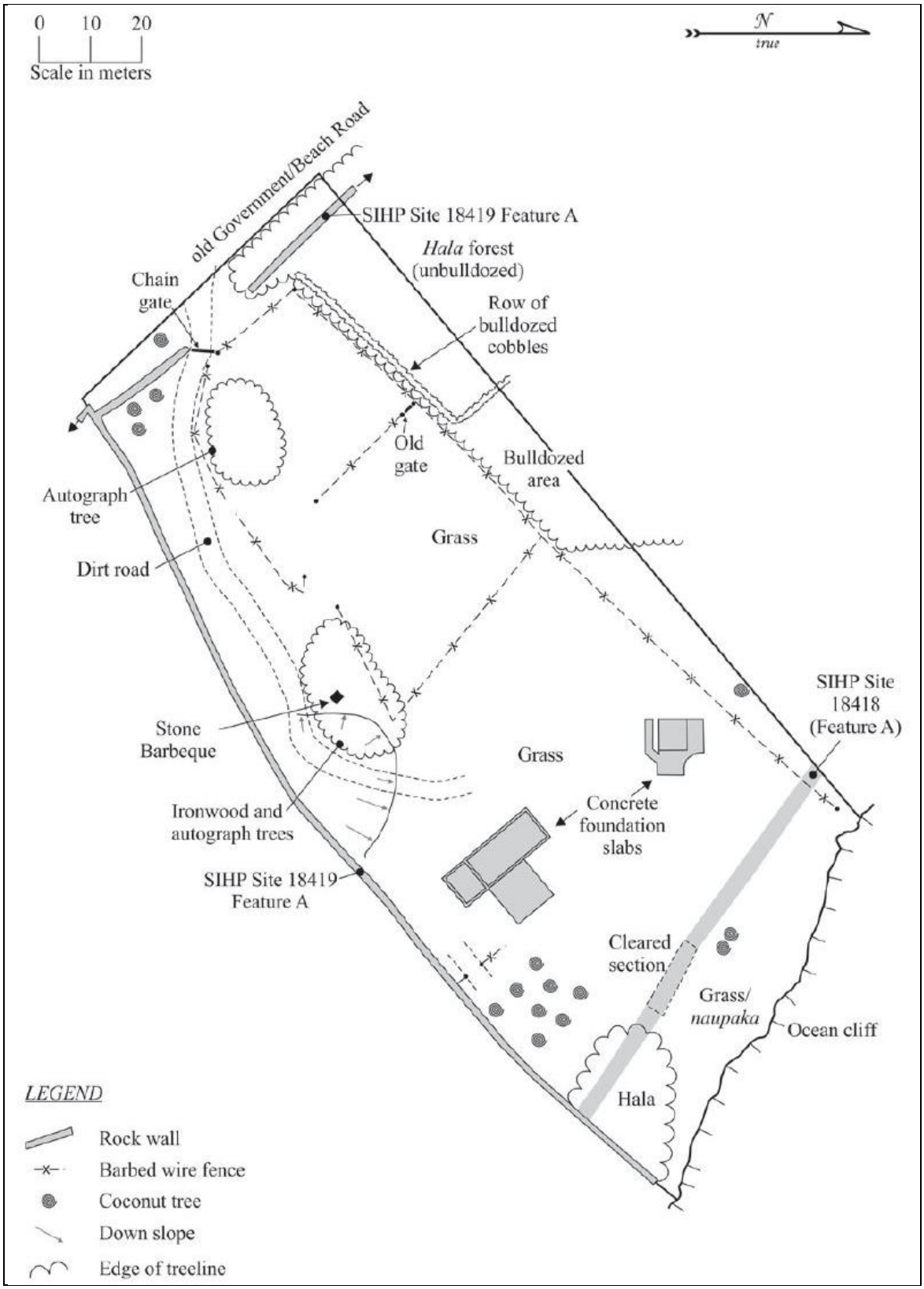

Figure 18: Archaeological Site Plan Map Showing Sites Recorded in Dirks Ah Sam and Rechtman (2013).

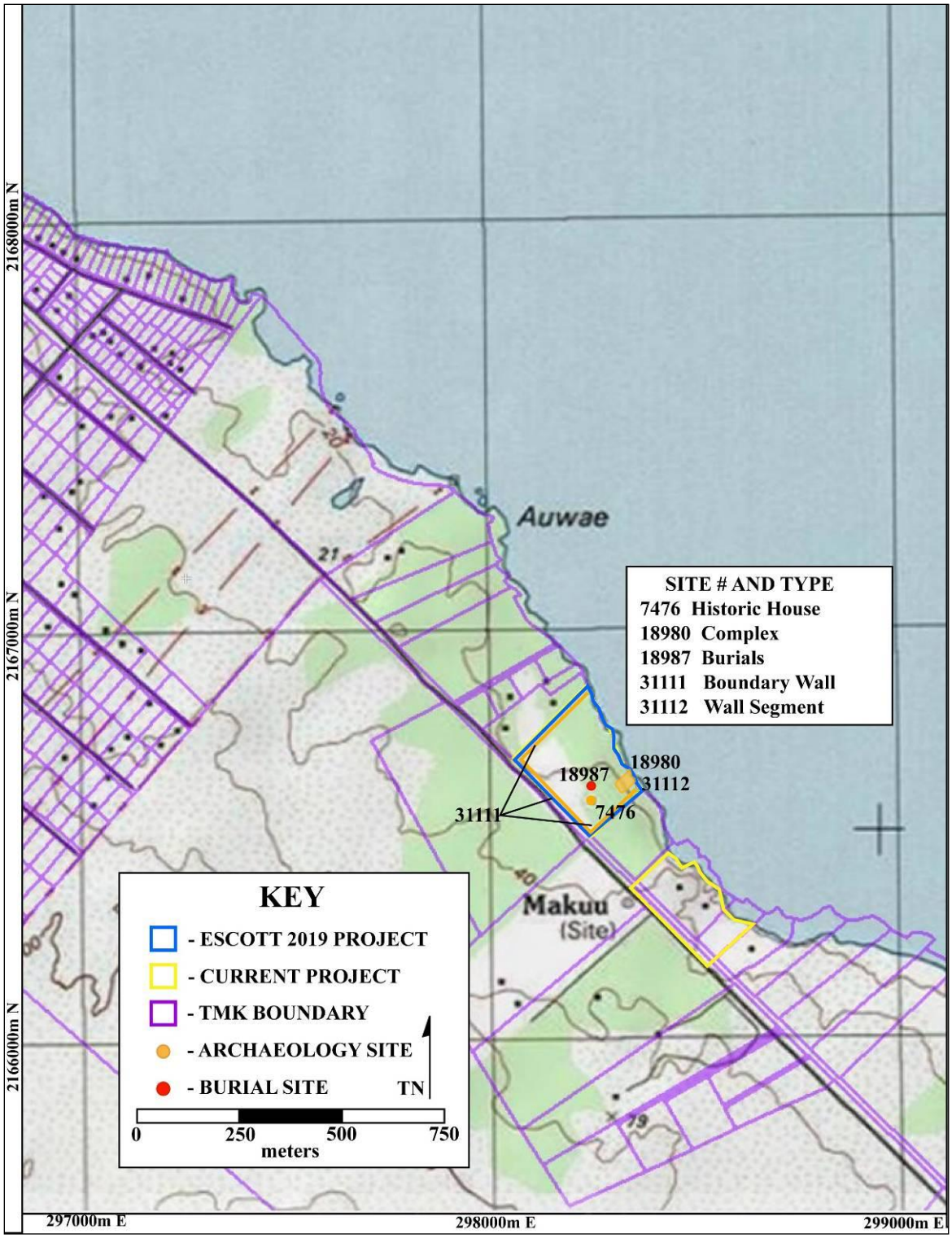

Figure 19: 7.5-Minute Series USGS Topographic Map Showing the Location of Archaeological Sites Documented in Escott (2019) (Kea‘au Ranch Quadrangle. ESRI, 2013. Data Sources: National Geographic and Hawai‘i County Planning Department, 2013).

Escott and Dols (2020) recorded two archaeological sites (Site #50-10-45-18419 and Site 31185) in the current project area (Table 4, Figure 20 and Figure 21). Rock wall Site #50-10-45-18419 was previously recorded in Charvet-Pond and Rosendahl (1993) and Dircks and Rechtman (2013). Site 18419 is a pasture and property boundary wall. The newly recorded site (Site 31185) is a rock wall along the northwest boundary of Parcel 026.

Table 4: Inventory of Archaeological Sites Identified Within the Project Area.

SIHP #50-10-45:	SITE TYPE	SITE FUNCTION	SITE AGE
18419	Rock Wall	Possible Pasture Boundary	Historic
31185	Rock Wall	Property Boundary	Historic

In general, archaeological studies conducted along the coastline in this region documented clusters of pre-Contact to early Historic habitation and agricultural sites including enclosures, platforms, rock walls, rock mounds, burials, petroglyphs, rock lined springs and water catchments, and remnant trail segments.

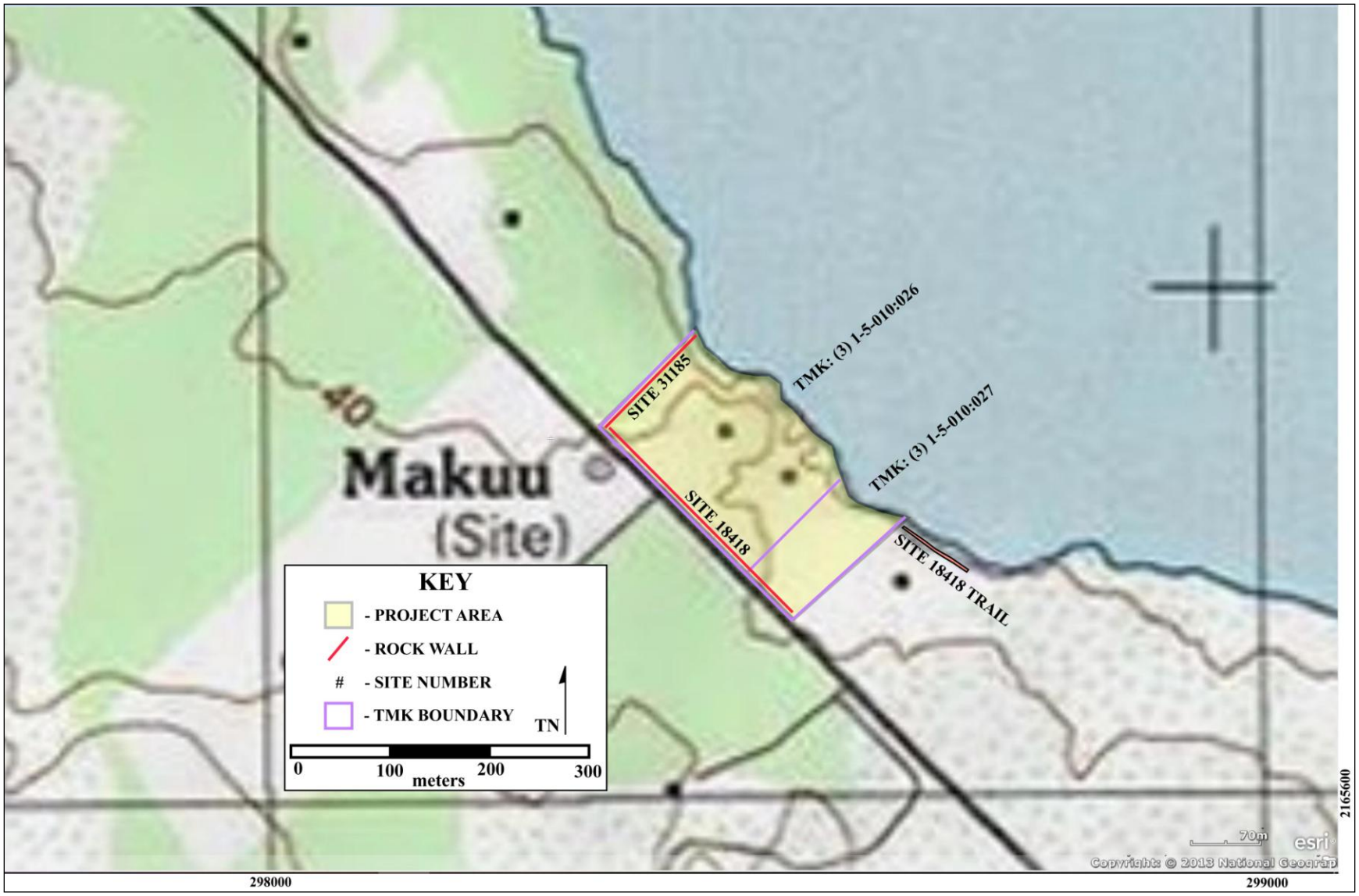

Figure 20: 7.5-Minute Series USGS Topographic Map Showing the Location of Archaeological Sites (Kea‘au Ranch Quadrangle. ESRI, 2013. Data Sources: National Geographic and Hawai‘i County Planning Department, 2013).

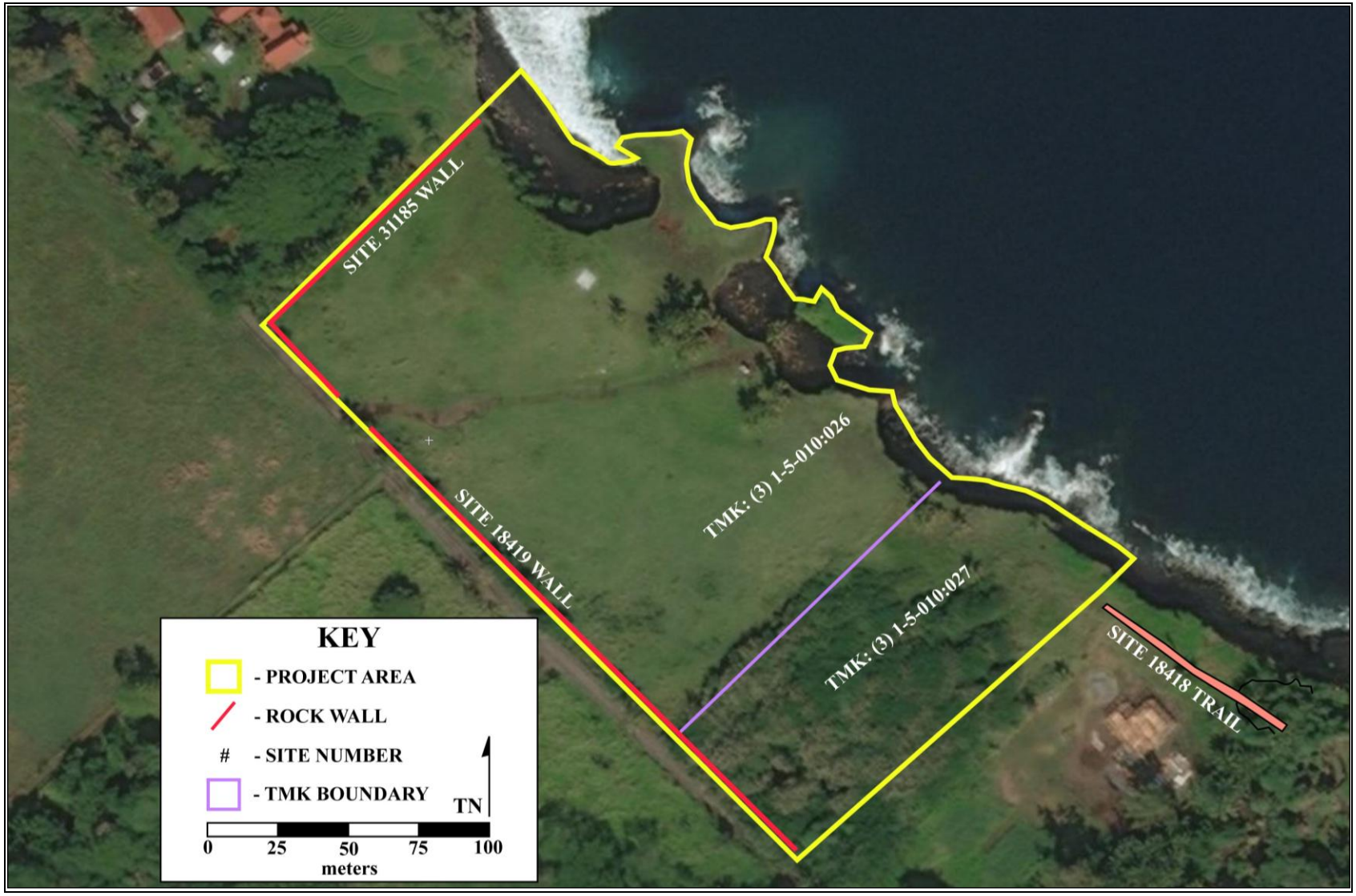

Figure 21: 7.5-Minute Series USGS Topographic Map Showing the Location of Archaeological Sites (Kea‘au Ranch Quadrangle. ESRI, 2013. Data Sources: National Geographic and Hawai‘i County Planning Department, 2013).

CULTURAL INFORMANT INTERVIEWS

Consultation was sought from Kamaile Puluole-Mitchell, Office of Hawaiian Affairs (OHA) East Hawai‘i Island Representative; Jordan Kea Calpito, SHPD Burial Sites Specialist; Sean Naleimaile, State Historic Preservation Division (SHPD) Hawai‘i Island Archaeologist; and Kalena Blakemore, Hawai‘i Island Burial Council (HIBC) Member (Table 5). CIA consultation was also conducted by SCS in 2019 for a property 150.0 meters northwest of the current project area (two property parcels northwest along Beach Road) the project area with members of the Kamahele and Lui families.

Table 5: Individuals Responses to CIA Consultation Request.

Name	Affiliation	Responded	Has Knowledge	Cultural Practices
Kalena Blakemore	HIBC Representative	Yes	Some	No
Kamaile Puluole-Mitchell	OHA East Hawai‘i	No	-	-
Sean Naleimaile	SHPD Archaeologist	No	-	-
Jordan Kea Calpito	SHPD Burial Sites Specialist	Yes	No	-
Greg DeConte	Kamahele Family Member	Yes	Yes	Yes
Kenneth Ha	Kamahele Family Member	Yes	Yes	Yes
Richard Ha	Kamahele Family Member	Yes	Yes	Yes
June Ha	Kamahele Family Member	Yes	Yes	Yes
Shayne Kamahele	Kamahele Family Member	Yes	Yes	Yes
Darrell Pakele	Kamahele Family Member	Yes	Yes	Yes
Puanani Mukai	Sonny Kamahele’s Caretaker	Yes	Yes	Yes
Ramon Lui	Kea Family Descendant	Yes	Yes	Yes
Agnes Lui	Kea Family Descendant	Yes	Yes	Yes
Nicole Lui	Kea Family Descendant	Yes	Yes	Yes

KAMAHELE FAMILY CONSULTATION

Members of the Kamahele and Lui *‘ohana* were interviewed by SCS for an AIS study (Escott 2019b) two properties northwest (150 meters) of the current project area. The interviews were conducted to document cultural and historical information pertinent to the Kamahele property as well as in the broader area. The content of the interviews is pertinent to the current study given the close spatial relationship between the Kamahele property (Parcel 009) and the current project area (Parcels 026 & 027].

Consultation with the Kamahele *‘ohana* was conducted at the property on Saturday April 27, 2019. Seven individuals, including Greg DeConte, Kenneth Ha, Richard Ha, June Ha, Shayne Kamahele, Puanani Mukai, and Darrell Pakele attended and

were interviewed. In addition, SCS Senior Archaeologist Glenn Escott spoke to Sheldon Kamahele at an earlier date on the property.

The Historical land-use information gained from the interviews was largely specific to the Kamahele property at [TMK: (3) 1-5-010: 009]. However, this information provides some insight into Historic era habitation, farming, ranching, and fishing practices in the Puna District. The Kamahele *ʻohana* grew citrus, bread fruit, taro, tomatoes, bananas, and watermelons on Parcel 009. The Kamahele *ʻohana* also kept pigs and cows on the property.

Family members remembered most fondly fishing and swimming along the shoreline. They remembered that there was a shallow spring along the northwest edge of the property that was dug out to make a shallow well with a pump. None of the family members were aware of any cultural practices, other than fishing, that occurred on the property or near Parcel 009.

LUI FAMILY CONSULTATION

Consultation with the Lui family was conducted at the property on Wednesday October 30, 2019. Mr. Ramon Lui, his wife Agnes and daughter Nicole were present. The Lui family is descended from Kea who first owned L.G. 1014. L.G. 1014 was a 56.4 acre property purchased in 1852. Parcel 009 is the southeast corner of the land grant.

Nicole Lui spoke briefly about well-known cultural practices associated with Makuʻu Ahupuaʻa, dark magic in particular. The people that lived in Mukuʻu were known to be accomplished practitioners of the "dark arts".

Members of both families pointed out that Makuʻu and Pōpōkī Ahupuaʻa are very far from Historic and Modern era population centers. It always seemed to take a long time driving along unpaved roads through the woods to arrive and that added to the feeling of being somewhere remote. Subsistence and some small scale commercial agriculture, ranching and fishing were commonly practiced in the area. Hala was abundant and was used to weave mats. The farm and ocean provided good subsistence and other necessary items could be purchased in town, either Pāhoa or Keaʻau.

SUMMARY

The "level of effort undertaken" to identify potential effect by a project to cultural resources, places or beliefs (OEQC 1997) has not been officially defined and is left up to the investigator. A good faith effort can mean contacting agencies by letter, interviewing people who may be affected by the project or who know its history, research identifying sensitive areas and previous land use, holding meetings in which the public is invited to testify, notifying the community through the media, and other appropriate strategies based on the type of project being proposed and its impact potential.

In the case of the present parcel, consultation was sought from Kamaile Puluole-Mitchell, Office of Hawaiian Affairs (OHA) East Hawai'i Island Representative; Jordan Kea Calpito, SHPD Burial Sites Specialist; Sean Naleimaile, State Historic Preservation Division (SHPD) Hawai'i Island Archaeologist; and Kalena Blakemore, Hawai'i Island Burial Council (HIBC) Member , and members of the Kamahele and Lui *'ohana* (see Table 5).

Public notices were published in the Honolulu Star-Advertiser, the Hawai'i Tribune Herald, and The Office of Hawaiian Affairs Ka Wai Ola newspaper (Appendix A).

Historical and cultural source materials were extensively used and can be found listed in the References Cited portion of the report. Scholars such as I'i, Kamakau, Chinen, Kame'eleihiwa, Fornander, Kuykendall, Kelly, Handy and Handy, Puku'i and Elbert, Thrum, and Cordy have contributed, and continue to contribute to our knowledge and understanding of Hawai'i, past and present. The works of these and other authors were consulted and incorporated in the report where appropriate. Land use document research was supplied by the Waihona 'Aina 2007 Data Base.

Consultation with the Kamahele family pointed out that fishing, collecting *'opihi*, and collecting *hala* leaves for weaving mats took place in the wider region of Maku'u and Pōpōkī Ahupua'a. Fishing and gathering of plant materials are both recognized traditional Hawaiian cultural practices. The vast majority of plants on the project area are non-native invasive species and there are no plants traditionally collected by Hawaiian people. Fishing and ocean resources collection access rights legally guarantee fishing and collection access up to ten feet above the high tide mark.

CIA INQUIRY RESPONSE

As suggested in the "Guidelines for Accessing Cultural Impacts" (OEQC 1997), CIAs incorporating personal interviews should include ethnographic and oral history interview procedures, circumstances attending the interviews, as well as the results of this consultation. It is also permissible to include organizations with individuals familiar with cultural practices and features associated with the project area.

As stated above, consultation was sought from the Office of Hawaiian Affairs, the SHPD Burial Sites Branch, the SHPD Archaeology Branch, families associated with Maku‘u and Pōpōkī Ahupua‘a. Public notices were published in the Honolulu Star-Advertiser, the Hawai‘i Tribune Herald, and the Ka Wai Ola. The public notices did not generate responses from the public.

Based on the results of consultation regarding area land-use and cultural practices, there were no past or ongoing cultural practices identified for the project area parcels. There were cultural practices, namely fishing and gathering of ocean and plant resources, associated with the wider region of the project area. While the coastal portion of the property is cliff and makes ocean access difficult, the property owner has no intention to prevent ocean access and shall not prevent people from accessing the ocean to fish and to gather marine resources.

An analysis of the potential effect of the proposed construction of a residential dwelling on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place is a requirement of the OEQC (No. 10, 1997). Based on historical research and the responses from the above listed contacts, it is reasonable to conclude that, as Hawaiian rights related to gathering, access or other customary activities are protected by law, and as the current project property owner will not prevent access, traditional cultural practices within the project area will not be affected and there will be no direct adverse effect upon cultural practices or beliefs.

CULTURAL ASSESSMEMNT

Based on the results of an Archaeological Assessment of the project area, the results of previous archaeological studies, as well as organizational response, individual cultural informant responses, and archival research, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights, or any ethnic group, related to gathering, access or other customary activities will not be affected by development activities on this parcel. The property owner will not restrict shoreline access for fishing and gathering purposes, as is protected by law. No specific cultural activities were identified within the project area, and the proposed undertaking will not produce adverse effects to any native Hawaiian cultural practices.

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APPENDIX A: PUBLIC NOTICES AND AFFIDAVITS

AFFIDAVIT OF PUBLICATION

IN THE MATTER OF
CULTURAL IMPACT ASSESSMENT NOTICE - MAKUU

STATE OF HAWAII }
} SS.
City and County of Honolulu }

Doc. Date: NOV 21 2019 # Pages: 1
Notary Name: COLLEEN E. SORANAKA First Judicial Circuit
Doc. Description: Affidavit of Publication
NOV 21 2019
Notary Signature Date

COLLEEN E. SORANAKA NOTARY PUBLIC No. 90-263 STATE OF HAWAII

CULTURAL IMPACT ASSESSMENT NOTICE

Information requested by Scientific Consultant Services, Inc. of past and ongoing cultural practices on lands of coastal Maku'u Ahupua'a, Puna District, Island of Hawai'i, TMK: (3) 1-5-010:009, 026 and 027. Please respond within 30 days to Glenn Escott at (808) 938-0968.
(SA1245894 11/17, 11/20, 11/21/19)

Lisa Sakakida being duly sworn, deposes and says that she is a clerk, duly authorized to execute this affidavit of Oahu Publications, Inc. publisher of The Honolulu Star-Advertiser, MidWeek, The Garden Island, West Hawaii Today, and Hawaii Tribune-Herald, that said newspapers are newspapers of general circulation in the State of Hawaii, and that the attached notice is true notice as was published in the

Honolulu Star-Advertiser 3 times on:
11/17, 11/20, 11/21/2019
MidWeek 0 times on:
The Garden Island 0 times on:
Hawaii Tribune-Herald 0 times on:
West Hawaii Today 0 times on:
Other Publications: 0 times on:

And that affiant is not a party to or in any way interested in the above entitled matter.

Lisa Sakakida

Subscribed to and sworn before me this 21 day of November A.D. 2019

Colleen E. Soranaka, Notary Public of the First Judicial Circuit, State of Hawaii
My commission expires: Jan 06 2020

COLLEEN E. SORANAKA NOTARY PUBLIC No. 90-263 STATE OF HAWAII

Ad # 0001245894

ICSP NO.: _____

November 2019 Honolulu Star-Advertiser Affidavit

IN THE MATTER OF
CULTURAL IMPACT ASSESSMENT NOTICE - MAKUU

STATE OF HAWAII }
} SS.
City and County of Honolulu }

Doc. Date: NOV 21 2019 # Pages: 1
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(HTH1245897 11/17, 11/20, 11/21/19)

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West Hawaii Today 0 times on:

Other Publications: 0 times on:

And that affiant is not a party to or in any way interested in the above entitled matter.

Lisa Sakakida

Subscribed to and sworn before me this 21 day of November A.D. 20 19

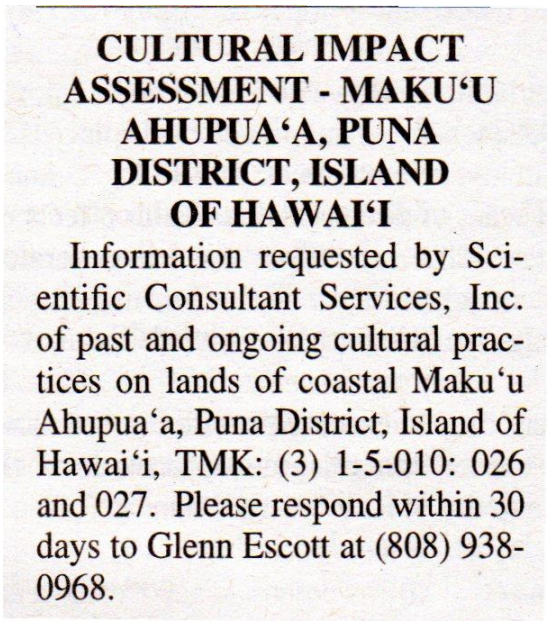
Colleen E. Soranaka, Notary Public of the First Judicial Circuit, State of Hawaii
My commission expires: Jan 06 2020

COLLEEN E. SORANAKA NOTARY PUBLIC No. 90-263 STATE OF HAWAII

Ad # 0001245897

ICSP NO.: _____

November 2019 Hawai'i Tribune-Herald Affidavit



CULTURAL IMPACT ASSESSMENT - MAKU'U AHUPUA'A, PUNA DISTRICT, ISLAND OF HAWAI'I

Information requested by Scientific Consultant Services, Inc. of past and ongoing cultural practices on lands of coastal Maku'u Ahupua'a, Puna District, Island of Hawai'i, TMK: (3) 1-5-010: 026 and 027. Please respond within 30 days to Glenn Escott at (808) 938-0968.

March 2020 Ka Wai Ola Notice

Ryan Pastorek and Paul Pastorek
533 Fernwood Pacific Drive
Topanga, California 90290

October 24, 2023

Michael Cain, Administrator
State of Hawai'i
Department of Land and Natural Resources
Office of Conservation and Coastal Lands (OCCL)
P.O. Box 621
Honolulu, Hawai'i 96809

Dear Mr. Cain,

We are writing to formally acknowledge your letter dated September 15, 2023, in which you expressed concerns about our proposed single-family residences on TMK (3) 1-5-010: 026 & 027 in Maku'u, Puna.

We understand and appreciate that the isolated location of the properties along Government Beach Road poses some unique challenges, including the road's status as a road-in-limbo and the potential dangers of the area's exposure to natural elements and seismic hazards. We are fully aware of the inherent dangers associated with living near the ocean and in proximity to Kilauea volcano. Additionally, we acknowledge that the remote location lacks municipal services and may have limitations in terms of emergency response time.

We share your commitment to ensure the safety and welfare of residents in the event of an emergency. We acknowledge that under such circumstances, we as residents in the area would need to take necessary precautions and actions to ensure our own well-being.

We have carefully considered the potential risks and benefits of the proposed development. While we are aware of the challenges associated with the area's remote location, we feel that the benefits outweigh the risks and wish to proceed with the permitting process.

Once again, we appreciate the concerns raised and your commitment to addressing them responsibly. Thank you for your patience and collaboration with this project.

Mahalo,

Ryan Pastorek and Paul Pastorek

DocuSigned by:
Ryan Pastorek
9CEF59C90A454F9...

Ryan Pastorek

DocuSigned by:
AB9860CE7D424D8...

Paul Pastorek

EXHIBIT D

County of Hawai‘i

WINDWARD PLANNING COMMISSION

Aupuni Center • 101 Pauahi Street, Suite 3 • Hilo, Hawai‘i 96720
Phone (808) 961-8288 • Fax (808) 961-8742

June 28, 2024

John Pipan, Administrator
Land Planning Hawai‘i, LLC
194 Wiwo‘ole Street
Hilo, HI 96720
VIA EMAIL

Dear Mr. Pipan:

SUBJECT: Special Management Area Use Permit Application (PL-SMA-2024-000055)
Applicant: Ryan Pastorek and Paul Pastorek
Permitted Use: Allows to Consolidate and Re-Subdivide Two (2) Parcels Totaling 10.45 Acres and Construct One (1) Single-Family Residence and Related Improvements on Each Parcel
TMK: (3) 1-5-010:026 and 027, Maku‘u and Keonepoko Nui, Puna, Hawai‘i

The Windward Planning Commission, at its duly held public hearing on June 6, 2024, voted to approve the above-referenced request allows to consolidate and re-subdivide two (2) parcels totaling 10.45-acres within the Special Management Area and construct one (1) single-family residence and related improvements on each parcel. The subject properties are located approximately 1.25 miles south of the intersection of Old Government Road and Maku‘u Drive on the makai side, Por. of Maku‘u and Keonepoko Nui, Puna, Hawai‘i.

Approval of this permit is subject to the following conditions:

1) The applicants, its successor(s), or assign(s) shall be responsible for complying with all stated conditions of approval.

2) The applicants shall secure all necessary approvals and permits from other affected Federal, State, and County agencies as necessary to comply with all applicable laws and regulation, including, but not limited to, a Conservation District Use Permit (CDUP), and an approved Aquaculture Pond Management Plan from the Department of Land and Natural Resources.

3) Construction of each new single-family residence and related improvements shall be conducted in a manner that is substantially representative of plans and details as contained within the SMA Permit application dated March 26, 2024, and representations made to the Windward Planning Commission.

4) The applicants shall not construct any wood, metal, or rope ladder, platform, steps, concrete pads, or other constructed appurtenances from the top of the pali (sea cliff) to access the ocean along the entire length of shoreline of each parcel.

5) Construction of the proposed development, including the aquaculture pond, shall be completed within five (5) years from the effective date of this permit.

6) Artificial light from exterior lighting fixtures, including, but not necessarily limited to floodlights, up-lights or spotlights used for decorative or aesthetic purposes shall be prohibited if the light directly illuminates, or is directed to project across property boundaries toward, the shoreline and ocean waters, except as may otherwise be permitted pursuant to Section 205A-71(b), Hawai‘i Revised Statutes.

7) All construction and maintenance activities shall comply with Chapter 27, Flood Control of the Hawai‘i County Code.

8) All earthwork and grading shall conform to Chapter 10, Erosion and Sedimentation Control of the Hawai‘i County Code.

9) All development generated runoff shall be disposed of on site and shall not be directed toward any adjacent properties.

10) The method of sewage disposal shall meet with the requirements of the Department of Health.

11) During construction, measures shall be taken to minimize the potential of both fugitive dust and runoff sedimentation. Such measures shall be in compliance with construction industry standards and practices utilized during construction projects of the State of Hawai‘i.

12) The applicants will comply with any recommendations or requests from the State Historic Preservation Division (SHPD) is conformance with the submitted Hawai‘i Revised Statutes (HRS) Ch. 6E-42 review request.

13) In the event that surface or subsurface historic resources, including human skeletal remains, structural remains (e.g., rock walls, terraces, platforms, etc.), cultural deposits, marine shell concentrations, sand deposits, or sink holes are identified during the demolition and/or construction work, the applicants shall cease work in the immediate vicinity of the find, protect the find from additional disturbance and contact the State Historic Preservation Division at (808) 933-7651. Subsequent work shall proceed upon an archaeological clearance from SHPD when it finds that sufficient mitigation measures have been taken.

14) An initial extension of time for the performance of conditions within this permit may be granted by the Planning Director upon the following circumstances:

A. The non-performance is the result of conditions that could not have been foreseen or are beyond the control of the applicants and that are not the result of their fault or negligence.

B. Granting of the time extension would not be contrary to the General Plan or Zoning Code.

C. Granting of the time extension would not be contrary to the original reasons for the granting of this permit.

D. The time extension granted shall be for a period not to exceed the period originally granted for performance (i.e., a condition to be performed within one year may be extended for up to one additional year).

If the applicants should require an additional extension of time, the Planning Department shall submit the applicants' request to the Planning Commission for appropriate action.

15) Should any of the foregoing conditions not be met or substantially complied with in a timely fashion, the Planning Director may initiate procedures to revoke the permit.

This approval does not, however, sanction the specific plans submitted with the application as they may be subject to change given specific code and regulatory requirements of the affected agencies.

Approval of this request is based on the reasons given in the enclosed Findings Report.

Should you have any questions, please contact Alex Roy of this department at (808) 961-8140 or by email at alex.roy@hawaiicounty.gov

Sincerely,

June 28, 2024

Dennis Lin, Chairman
Windward Planning Commission

P\wp60\PC\PCC2024-2\LPastorekPL-SMA-2024-055wpc

Enclosure: Planning Commission Findings Report
Site Plan

cc w/enclosure via email: Ryan Pastorek
Department of Public Works
County Real Property Tax Division
State Department of Health
GIS Section

COUNTY OF HAWAIʻI
PLANNING COMMISSION FINDINGS

RYAN AND PAUL PASTOREK
SPECIAL MANAGEMENT AREA USE PERMIT APPLICATION
(PL-SMA-2024-000055)

Based on the following findings, Special Management Area Use Permit No. PL-SMA-2024-000055 **is hereby approved the Windward Planning Commission to consolidate and re-subdivide the two (2) subject parcels totaling 10.45-acres and to construct one single-family residence and related improvements on each shoreline parcel within the Special Management Area (SMA)**. The subject properties are located approximately 1.25 miles south of the intersection of Old Government Road and Makuʻu Drive on the makai side, Por. of Makuʻu and Keonepoko Nui, Puna, Hawaiʻi, TMK: (3) 1-5-010:026 and :027.

The applicants' proposed development consists of constructing two (2) separate single-family residential structures, one (1) on each parcel, along with related residential, agricultural, and aquaculture development. The existing properties will be consolidated and resubdivided into Lot A (P. 26) and Lot B (P. 27). The following describes the proposed development for each new parcel.

Lot A – development will include a 3,980 square foot (sf) single-family residence, with three (3) bedrooms, 3.5 bathrooms, a kitchen, dining/living room, covered lanai, and two (2) outdoor showers. Additional development includes the construction of a 725-sf garage, a 300-sf storage/animal shelter to support grazing sheep and other farm uses, fencing to support agricultural activities, additional small farm storage buildings, and related farm and residential development.

Lot B – development will include a 4,060-sf single-family residence with three (3) bedrooms, 1.5 bathrooms, a kitchen, living/dining room, lanai, one (1) outdoor shower, hot-tub, pool, and wooden deck. Additional development includes a 940-sf storage art studio, a 3,591-sf aquaculture pond to farm taro and tilapia, fencing, and other farm and residential related development.

Each of the parcels will include a separate Department of Health (DOH) approved Individual Wastewater system (IWS) and a potable water well approved by the Commission on Water Resource Management (CWRM). The applicants submitted a landscaping plan, which includes 11,300 square feet of landscaping on each parcel, with native plants (e.g., Hau, Lolu palm, Hapuʻu tree fern) integrated into the design. Construction activities will occur on approximately 0.5 acres of each of the parcels, and all applicable Best Management Practices (BMPs) such as silt fencing and other erosion control methods will be employed during construction. The proposed residences will be setback a minimum of 130 feet from the shoreline.

The grounds for approving development within the Special Management Area are based on HRS, Chapter 205A-26(2) (Special Management Area guidelines) and Rule 9-11(e) of the Planning Commission Rules of Practice and Procedure. Planning Commission Rule 9-11(e) states that the Planning Commission may permit the proposed development only upon finding that:

1. The development will not have any significant adverse environmental or ecological effect except as such adverse effect is minimized to the extent practicable and is clearly outweighed by public health, safety, or compelling public interest.
2. The development is consistent with the Special Management Area objectives, policies and guidelines as provided by Chapter 205A, HRS.
3. The development is consistent with the General Plan, Community Plan, Zoning Code, and other applicable ordinances.
4. The development will, to the extent feasible, reasonably protect native Hawaiian rights if they are found to exist, including specific factual findings regarding:

a. The identity and scope of valued cultural historical or natural resources in the petition area, including the extent to which traditional and customary native Hawaiian rights are exercised in the petition area.
b. The extent to which those resources including traditional and customary native Hawaiian rights, will be affected or impaired by the proposed action; and
c. The feasible action, if any, to be taken by the Authority to reasonably protect any valued cultural, historical, or natural resources including any existing traditional and customary native Hawai‘i rights.

In review of the SMA guidelines as listed under HRS 205A-26(2)(A), the proposed development will not have any significant adverse environmental or ecological effect, except as such adverse effect is minimized to the extent practicable and clearly outweighed by public health, safety, or compelling public interest.

In considering the significance of potential environmental effects, the Director shall consider the sum of those effects that adversely affect the quality of the environment and shall evaluate the overall and cumulative effects of the action on the Special Management Area. Such adverse effects shall include, but not be limited to, the potential cumulative impact of individual developments, each one of which taken in itself might not have a substantial adverse effect and eliminate planning options.

As the proposed project is located entirely within the State Land Use (SLU) Conservation District, the applicants submitted a final environmental assessment (FEA) in accordance with Hawaii Revised Statutes (HRS) Ch. 343-5(a)(2) with the application. A notice of Finding of No significant Impact (FONSI) for the FEA was published in the November 23, 2021, issue of the Environmental Notice. Additionally, the applicants are currently working to obtain a Conservation District Use Permit (CDUP) for the proposed project via the Department of Land and Natural Resources, Office of Conservation and Coastal Lands.

The proposed single-family residence constructed on each of the subject parcels would not represent development of coastal areas, as it is considered a permitted use within the Conservation District and will not alter or impact coastal resources. The property has been developed in the past for agricultural purposes and as such is overgrown with non-native species and presents no native habitat. Studies confirm that there is no native floral or faunal species present and therefore no rare species or forest resources would be affected by the proposed project as none were observed. A home on each parcel, farming, agriculture, and an aquaculture pond conducted in the manner as

represented in the FEA would have no adverse effect on natural beauty and scenic view planes, historic properties, and fishing access that currently takes place along this coastline. The property is not situated over any natural drainage system or water feature that would flow into the nearby coastal ecosystem and no floodplains are present in the affected area. In terms of beach protection, the applicants conducted a Coastal Erosion Study which concluded that a 65.2-foot minimum setback was appropriate considering the ongoing erosion along the coast. The applicants propose to exceed that setback by locating construction to more than 130-feet from the top of pali (shoreline) and as such the proposed development would not affect any coastal resources nor adversely affect public use and recreation in this area.

The subject parcels are within an established residential community that both agricultural and residential uses, as well as the fully developed Hawaiian Paradies Park located north of the project site. Based on the submittal of the Archaeological Inventory Survey (AIS) and Cultural Impact Assessment (CIA) it is anticipated that no historic properties will be affected. Staff submitted the project for review by the State Historic Preservation Division (SHPD) for a HRS Ch. 6E-42 review; SHPD has not completed the review request to date.

In reviewing the proposed development against the factors that may constitute a substantial adverse effect as listed under Planning Commission Rule 9-10 (H) (1-10), it has been determined that the proposed project as described above will not have a significant adverse environmental or ecological effect upon the Special Management Area.

In review of the SMA guidelines as listed under HRS 205A-26, the proposed development is consistent with the objectives and policies as provided by Chapter 205A-26, HRS, and Special Management Area guidelines contained in Rule No. 9 of the Planning Commission Rules of Practice and Procedure.

The purpose of Chapter 205A-26, Hawai‘i Revised Statutes (HRS) and Rule 9 of the Planning Commission Rules of Practice and Procedure, is to preserve, protect, and where possible, to restore the natural resources of the coastal zone areas. Therefore, special controls on development within an area along the shoreline are necessary to avoid permanent loss of valuable resources and the foreclosure of management options. The objectives and policies of Chapter 205A-26, HRS and Rule 9-10(h) include, but are not limited to, the protection of coastal recreational resources, historic resources, scenic and open space resources, coastal ecosystems, marine resources, beaches, and controlling development in coastal hazard areas.

The proposed construction of a single-family dwelling, detached bedroom, garage and related improvements is consistent with the objectives and policies of the Coastal Zone Management Program (Chapter 205A, Hawai‘i Revised Statutes) including:

Recreational Resources:

Fishing and gathering of ocean resources is a significant practice in the wider Maku‘u area. The shoreline at the end of Maku‘u Drive is often used for nearshore fishing and the collection of ocean resources such as ‘opihi. This area is located just over 1 mile from the subject property and will not be impacted by the planned aquaculture pond. There is no safe access to the water along the shoreline fronting the parcel due to treacherous cliffs. However, lateral shoreline access will be maintained and access across the property to the shoreline will be available to the public through a designated contact

number.

Historic Resources:

No valuable natural or cultural resources would be committed or lost as the FEA determined that there were no native ecosystems or valuable flora or fauna that be adversely affected by the proposed project. An archaeological inventory survey (AIS) determined that there are two (2) sites (rock walls) but recommended no further action and therefore there would be no adverse effects to historic sites. Based on the applicants CIA, there would be no valuable cultural resources and practices such as shoreline access, fishing, gathering, hunting, or access to ceremonial sites would be adversely affected by the proposed project.

Scenic and Open Space Resources:

The proposed project site is not visible from the vantage point of any public highway since there are no views from the nearest highway towards the project site. The proposed project will not impact scenic or open space resources and the use of a single-family residence is consistent with the other residential development located along this section of shoreline. Additionally, as this parcel has been previously impacted by agricultural purposes for some time, the newly proposed development aims to improve the overall character of this overgrown and un-managed property. The proposed project will not impact existing access along the shoreline and has been designed to be a significant distance from the shoreline. Due to the significant erosion located along the sea cliff and the hazards associated with access, the applicants have agreed that no wood, metal, or rope ladder, platform, steps, stairs, concrete pads, or any other constructed appurtenance to gain access to the ocean from the top of the pali (sea cliff) will be built on either property.

Coastal Ecosystems and Marine Resources:

The proposed land uses comply with provisions and guidelines contained in Chapter 205A, HRS, Coastal Zone Management and SMA. The proposed use would be consistent with Chapter 205A because it would not affect public access to recreational areas, historic resources, scenic and open space resources, coastal ecosystems, economic uses, or coastal hazards, and would not result in any substantial adverse impact on the surrounding environment. The house sites are set far back from the pali and will not restrict any fishing access, and they are not located in a flood zone, nor would it impact drainage areas. The homes will be set back a minimum of 130 feet from the edge of the pali which will mitigate the hazard associated with predicted sea level rise and the predicted retreat of the shoreline pali.

Coastal Hazards:

The property is predominantly within Flood Zone X with a small portion of the shoreline located within Flood Zone VE. Occupied structures are planned to be elevated above base flood elevations plus freeboard, and properly engineered to withstand wind and water loads. No work will occur within the 80-foot shoreline setback area which includes small portions of VE flood zone. The proposed structures will not be subject to flooding since the dwellings will be built according to flood zone regulations and will be outside the 80-foot shoreline setback and at elevations above 50-feet above sea level.

Based on the above information, the proposed development is consistent with the objectives and policies of Chapter 205A, HRS.

The proposed development is consistent with the County General Plan, Puna Community Development Plan (PCDP), Zoning Code, and other applicable ordinances. The General Plan Land Use Pattern Allocation Guide (LUPAG) for the County of Hawai‘i is a policy document expressing the broad goals and policies for the long-range development of the Island of Hawai’i. The plan was adopted by ordinance in 1989 and revised in 2005. The LUPAG map designates the site as Open (ope) which allows for “*Parks and other recreational areas, historic sites, and open shoreline areas*”. The proposed development is consistent with the General Plan LUPAG Map designation as it will complement the goals, policies, and standards of the Land Use Elements of the General Plan. The proposed action is in balance with the natural, cultural, and social environment of the County, and it will create temporary construction jobs for residents and indirectly affect the economy through construction industry purchases from local suppliers. The proposed construction of a single-family home on each parcel and related agriculture and aquaculture activities would not have a substantial adverse effect on the environment and would not diminish the valuable natural resources of the region. The residence and associated improvements would be compatible with the existing residential and agricultural uses in the area surrounding the project parcel. No areas of natural beauty or important viewplanes identified in the County General Plan are visible from the property or located within a mile of it. An analysis of the potential visual impacts from the planned project found that no existing views of the shoreline or to the ocean would be impacted in any way because of the proposed development.

Additionally, the entire property is zoned by the County of Hawai‘i to be within the Agricultural District, minimum lot size of 1 acre (A-1a); although County zoning does not apply in the Conservation District per se. No aspect of the project appears to be inconsistent with the County’s Agricultural zoning designation since a “dwelling, single-family” is a permitted use identified in Section 25-5-70 of the Hawaii County Code (HCC).

The development will to the extent feasible, reasonably protect native Hawaiian rights if they are found to exist. In view of the Hawai‘i State Supreme Court’s “PASH” and “Ka Pa’akai O Ka’Aina” decisions, the issue relative to native Hawaiian rights, such as gathering and fishing rights, must be addressed in terms of the cultural, historical, and natural resources and the associated traditional and customary practices of the site.

Investigation of valued resources: In preparation for the proposed project the applicants conducted an Archaeological Inventory Survey (AIS), a Cultural Impact Assessment (CIA), a Coastal Erosion Study, and a Biological Survey, to investigate the full breadth of the project area’s valued resources. The applicants will also be required to obtain a Conservation District Use Permit (CDUP) which is approved by the Board of Land and Natural Resources (BLNR). In conformance with review criteria the project was submitted to the State Historic Preservation Division (SHPD) for a HRS, Ch. 6E-42 review; to date SHPD has not completed their review, however, based on the AIS the proposed project will have no impact on historic properties.

The valuable cultural, historical, and natural resources found in the area: The Archaeological Inventory Survey (AIS), conducted in support of the proposed project, identified two (2) sites, including a previously identified rock wall (SIHP Site 50-10-45-18419) parallel to Government Beach Road, and a property boundary rock wall (SIHP

Site 50-10-45-31185) along the northwest boundary of Lot A. Both sites hare historic to modern era agriculture and ranching structures and are significant under Criterion D. No other valuable cultural resources and practices such as shoreline access, fishing, gathering, hunting, or access to ceremonial sites were discovered on each of the subject parcels.

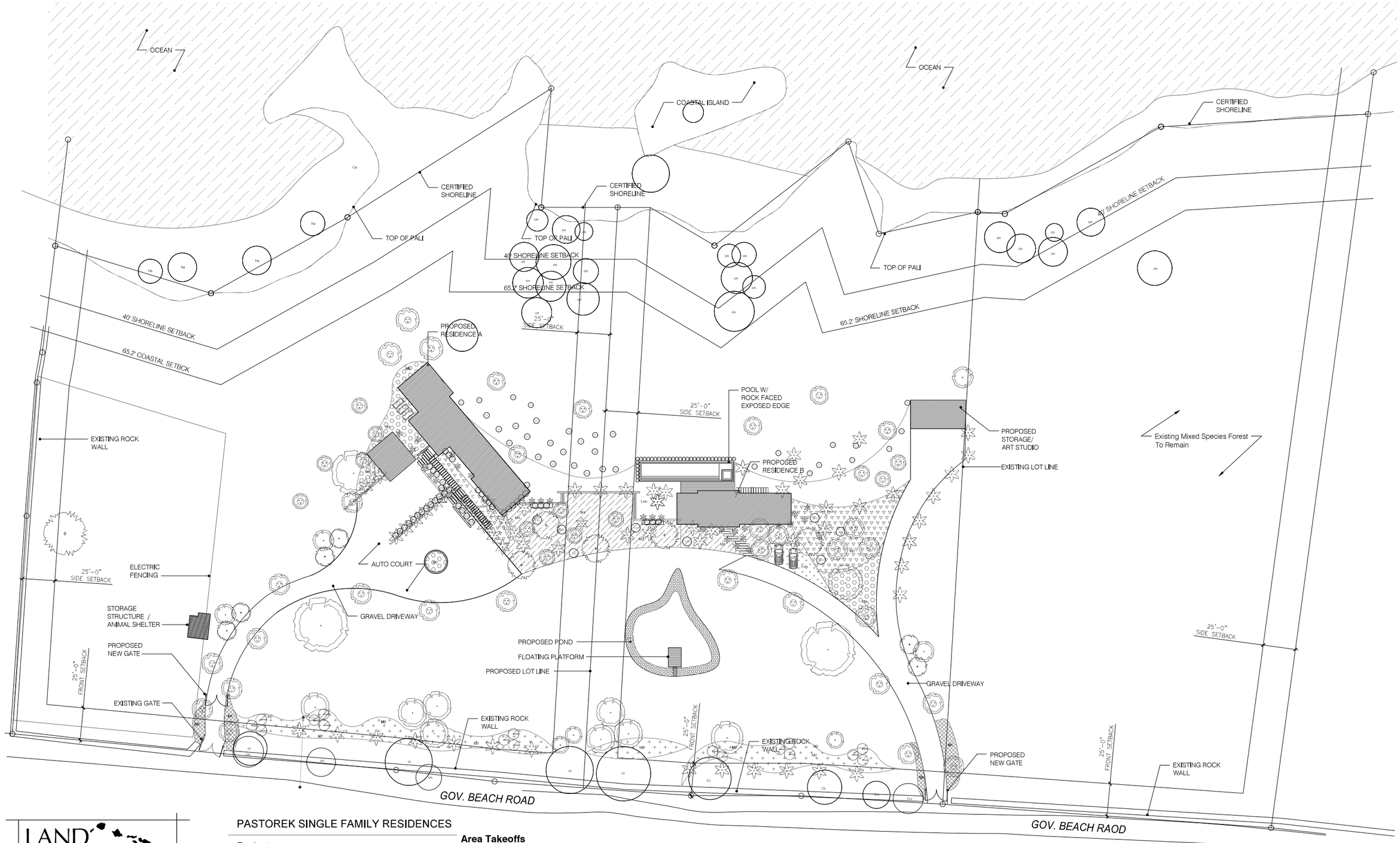
The cultural impact assessment (CIA) found the identified traditional and customary practices located in the larger Maku‘u region, as expressed by the consulted parties, consisted of fishing, collecting ‘opihi, and collecting Hala leaves. Based on the findings of the AIS and CIA, no archaeological, historical, or cultural resources will be significantly impacted by the proposed action. The rock walls identified on the properties are in moderate and good condition and will not be altered by the proposed project.

No floral or faunal species listed as threatened, endangered, or proposed for listing under the federal or state endangered species statutes were identified on the site. Additionally, no species used for cultural gathering purposes were identified within the project area.

Possible adverse effects or impairment of valued resources: No floral or faunal species listed as threatened, endangered, or proposed for listing under the federal or state endangered species statutes are anticipated to be on the site. Additionally, no species used for cultural gathering purposes were identified within the project area. The residential nature of the surrounding areas would make it less likely to find other protected or endangered animal life in this area other than what is found along the shoreline and ocean which is outside the project area. All construction activities will follow Best Management Practices to minimize adverse point and non-point pollution to coastal resources and surrounding areas.

Feasible actions to protect native Hawaiian rights: The proposed development will not restrict the use of natural resources along the shoreline. Conditions of approval have been added to preserve shoreline character and access, as well as siting the development more than 130-feet from the shoreline. A condition of approval has also been added to protect any unidentified cultural, historical, and natural resources in the event any are encountered during construction. To the extent that traditional and customary native Hawaiian rights are exercised, the proposed action will not affect traditional Hawaiian rights.

Lastly, this recommendation for approval is made with the understanding that the applicants remain responsible for complying with all other applicable government requirements in connection with the approved use, prior to its commencement or establishment upon the subject property. Additional governmental requirements may include the issuance of building permits, the installation of approved wastewater disposal systems, compliance with Fire Code, installation of improvements required by the American with Disabilities Act (ADA), among many others. Compliance with all applicable governmental requirements is a condition of this approval; failure to comply with such requirements will be considered a violation that may result in enforcement action by the Planning Department and/or the affected agencies.



LAND PLANNING HAWAII LLC

PRELIMINARY: NOT FOR CONSTRUCTION

PASTOREK SINGLE FAMILY RESIDENCES

Project

S-1.0 ARCHITECTURAL SITE PLAN

Drawing No

Area Takeoffs

Qty:	Type/Description	Notes:
149 lf	*Retaining Lava rock walls*	Not to exceed 30" tall
275 lf	*At grade linear water feature*	
108 sf	*Veggie planters (3)*	
11,370 sf	*Total Landscape (softscape) Parcel 026*	Proposed Parcel 026
11,255 sf	*Total Landscape (softscape) Parcel 027*	Proposed Parcel 027

1 / S-1.0 LANDSCAPE SITE PLAN

SCALE 1/32" = 1'

TRUE NORTH / PLAN NORTH

Figure 26

From: Audrey Wood
To: WPCtestimony
Subject: Testimony for Ryan Pastorek"s SMA application
Date: Monday, June 3, 2024 11:36:23 AM
Attachments: Woods.testimony.pdf

EXHIBIT F

Statement of Susan and Don Wood (Surrounding Property Owners) Concerning Rayan Pastorek's request for a Special Management Area Use Permit (PL-SMA-2024-000055)

Name - Susan M. Wood and Donald E. Wood
Address - 15-2179 Beach Road, Keaau, HI 96749
Phone Number - 808-966-4554
Applicant Docket Number - PL-SMA-2024-000055

Is your interest in this matter clearly distinguishable from that of the general public?
Yes.
If your answer is "yes," please explain.

Statement of Susan M. Wood:
I am a former Vice President of Beach Road Neighborhood Watch (right on Beach off Makuku).
I have watched Ryan reach out to our local representatives to request help with our local road security problems. He has also organized multiple garbage removals from our road with a crew of residents and a dump truck, and he is not yet a resident.

He is a compassionate person who knows how to inspire neighborhood improvement, He allowed our neighborhood watch to have two meetings on his land, providing tents as shelter. He is a positive influence on not only his own property, but also on our neighboring property and on the community during his frequent visits.
We have been living on this road for 22 years, and no one during those decade has demonstrated even a fraction of Ryan's level of

neighborhood involvement. His mere presence alters the nature of our community.
In time the property next to us has been purchased three times. We have received three requests for comments such as this. This is my first positive response.

Signed Susan M. Wood Susan M. Wood

Statement of Donald Wood:

Ryan personifies the sign that greets each driver entering our Beach Road from Makuku; "Malama Aina — Please Help the MEN OF PA'A Keep Beach Road Clean, Positive Action Alliance."

Ryan cares about making lives on Beach Road safer, and garbage free, enjoyable for all ages, locals and tourists alike.

I have known Rayan for three years, and have developed tremendous respect for his character and his deep commitment to doing what is right for everyone associated with him.

Signed Donald E. Wood Donald E Wood

Ryan Pastorek

LM

Lorraine Melella <lamelella@yahoo.com>

Tue, 02 Jul 2024 11:02:34 AM -1000 •

To "john" <john@landplanninghawaii.com>

Sent from my iPad
Greetings
I have known Ryan Pastorek since he obtained the property next to me. He has visited Many times and has proven to be very very knowledgeable person and conservationist .I believe in planning for his future residence he has taken into consideration the land and neighbors . I believe he will be an asset to our neighborhood .
Lorraine Melella
Beach rd resident

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

February 17, 2021

REF: RFD.5393.8

TO: John Pipan, Planning Administrator
Land Planning Hawaii LLC

FROM: M. Kaleo Manuel, Deputy Director
Commission on Water Resource Management

SUBJECT: Early Consultation for Environmental Assessment for Proposed Single Family Residences in the Conservation District, Makuu, Puna, Hawaii (Ryan Pastorek)

FILE NO.: RFD.5393.8
TMK NO.: (3) 1-5-101:026, (3) 1-5-101:027

Thank you for the opportunity to review the subject document. The Commission on Water Resource Management (CWRM) is the agency responsible for administering the State Water Code (Code). Under the Code, all waters of the State are held in trust for the benefit of the citizens of the State, therefore all water use is subject to legally protected water rights. CWRM strongly promotes the efficient use of Hawaii's water resources through conservation measures and appropriate resource management. For more information, please refer to the State Water Code, Chapter 174C, Hawaii Revised Statutes, and Hawaii Administrative Rules, Chapters 13-167 to 13-171. These documents are available via the Internet at http://dlnr.hawaii.gov/cwrm.

Our comments related to water resources are checked off below.

☐ 1. We recommend coordination with the county to incorporate this project into the county's Water Use and Development Plan. Please contact the respective Planning Department and/or Department of Water Supply for further information.

☐ 2. We recommend coordination with the Engineering Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.

☐ 3. We recommend coordination with the Hawaii Department of Agriculture (HDOA) to incorporate the reclassification of agricultural zoned land and the redistribution of agricultural resources into the State's Agricultural Water Use and Development Plan (AWUDP). Please contact the HDOA for more information.

☐ 4. We recommend that water efficient fixtures be installed and water efficient practices implemented throughout the development to reduce the increased demand on the area's freshwater resources. Reducing the water usage of a home or building may earn credit towards Leadership in Energy and Environmental Design (LEED) certification. More information on LEED certification is available at http://www.usgbc.org/leed. A listing of fixtures certified by the EAP as having high water efficiency can be found at http://www.epa.gov/watersense.

☐ 5. We recommend the use of best management practices (BMP) for stormwater management to minimize the impact of the project to the existing area's hydrology while maintaining on-site infiltration and preventing polluted runoff from storm events. Stormwater management BMPs may earn credit toward LEED certification. More information on stormwater BMPs can be found at http://planning.hawaii.gov/czm/initiatives/low-impact-development/

☐ 6. We recommend the use of alternative water sources, wherever practicable.

☐ 7. We recommend participating in the Hawaii Green Business Program, that assists and recognizes businesses that strive to operate in an environmentally and socially responsible manner. The program description can be found online at http://energy.hawaii.gov/green-business-program.

☐ 8. We recommend adopting landscape irrigation conservation best management practices endorsed by the Landscape Industry Council of Hawaii. These practices can be found online at

EXHIBIT G

http://www.hawaiiscape.com/wp-content/uploads/2013/04/LICH_Irrigation_Conservation_BMPs.pdf.

☐ 9. There may be the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.

☐ 10. The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit is required prior to use of water. The Water Use Permit may be conditioned on the requirement to use dual line water supply systems for new industrial and commercial developments.

☒ 11. A Well Construction Permit(s) is (are) are required before the commencement of any well construction work.

☒ 12. A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.

☐ 13. There is (are) well(s) located on or adjacent to this project. If wells are not planned to be used and will be affected by any new construction, they must be properly abandoned and sealed. A permit for well abandonment must be obtained.

☐ 14. Ground-water withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.

☐ 15. A Stream Channel Alteration Permit(s) is (are) required before any alteration can be made to the bed and/or banks of a steam channel.

☐ 16. A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is constructed or altered.

☐ 17. A Petition to Amend the Interim Instream Flow Standard is required for any new or expanded diversion(s) of surface water.

☐ 18. The planned source of water for this project has not been identified in this report. Therefore, we cannot determine what permits or petitions are required from our office, or whether there are potential impacts to water resources.

☐ OTHER:

If you have any questions, please contact W. Roy Hardy of the Commission staff at 587-0225.