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Attorneys for Applicant
KAWAILOA SOLAR, LLC

BEFORE THE PLANNING COMMISSION
OF THE CITY AND COUNTY OF HONOLULU

In the Matter of the Application of KAWAILOA SOLAR, LLC For a New Special Use Permit To Allow Development of a 50-megawatt photovoltaic (PV) Energy Generation Facility and Accessory Uses and Structures On Lands Rated Class A, B and C by the Land Study Bureau, Ashley Road, Kawailoa Ahupua'a, Waialua District, Oahu, Hawai'i, Portions of Tax Map Key Nos.: (1) 6-1-005:001 and (1) 6-1-006:001, Part of Kamehameha School's Kawailoa Plantation	FILE NO. 2014/SUP-6(RY) APPLICANT'S FIRST LIST OF WITNESSES; FIRST LIST OF EXHIBITS; EXHIBITS "1" – "20"; CERTIFICATE OF SERVICE

APPLICANT'S FIRST LIST OF WITNESSES; FIRST LIST OF EXHIBITS

Applicant KAWAILOA SOLAR, LLC ("Kawailoa Solar" or "Applicant"), by and through its attorneys, McCorriston Miller Mukai MacKinnon LLP, hereby submits its First List of Witnesses; First List of Exhibits; Exhibits "1" – "20", in support of the State Special Use Permit that was accepted by the Department of Planning and Permitting for processing on or around November 2014 and approved by the Land Use Commission in March, 2015. These witnesses and exhibits may be used in support of Applicant's request for a State Special Use

Permit. Applicant reserves all rights to identify additional fact witnesses and add rebuttal expert witnesses and exhibits.

LIST OF WITNESSES

Name, Position, Organization	To be qualified as a witness in:	Subject matter	Written Testimony	Length of Direct
Wren Wescoatt/Development Director/Sun Edison LLC	N/A	Project development	Yes, Ex. 5	20-30
Crystal Kua/Director of External Affairs/Sun Edison LLC	N/A	Community relations	Yes. Ex. 11	15
Paul V. Luersen, ACP/Senior Environmental Planner/CH2M Hill	Environmental and Land Use Planning	Environmental and Land Use Planning	Yes. Ex. 9	Reserved

LIST OF EXHIBITS
(Attachments Submitted with the SUP Application Are Also Listed on the Following Table for Ease of Reference)

NO.	DESCRIPTION
N/A	SUP Application, November 2014
ATTM 1	Kawailoa Solar, LLC Organizational Structure
ATTM 2	IRS Determination Letter
ATTM 3	Site Plan and Drawings
ATTM 4	Representative Photographs within Project Site
ATTM 5	Letter of Intent for Sheep Pasturage
ATTM 6	Sheep and Solar Panels in Hawaii
ATTM 7	Decommissioning Plan
ATTM 8	Archaeological Inventory Survey
ATTM 9	Visual Simulations of Proposed Project
ATTM 10	Reflectivity Study
ATTM 11	North Shore Neighborhood Meeting Minutes
ATTM 12	Real Property Assessment for Dedicated Agricultural
EXHIBITS FILED MARCH 26, 2015	
Ex. 1	First Wind Team Biographies (Westcoatt, Siegel, Crown, Dailey)
Ex. 2	Resume of Paul V. Luersen
Ex. 3	Resume of Paul T. Matsuda
Ex. 4	Resume of Crystal Kua
Ex. 5	Resume of Robert B. Rechtman
Ex. 6	Written Direct Testimony of Wren Wescoatt
Ex. 7	Written Direct Testimony of Jed Dailey
Ex. 8	Written Direct Testimony of Tom Siegel
Ex. 9	Written Direct Testimony of David P. Cowan

Ex. 10	Written Direct Testimony of Paul V. Luersen
Ex. 11	Written Direct Testimony of Paul T. Matsuda
Ex. 12	Written Direct Testimony of Crystal Kua
Ex. 13	Kawailoa Solar, LLC - Solar Farm Project Preliminary Civil Considerations, dated March 9, 2015, by Paul T. Matsuda
Ex. 14	Cultural Impact Assessment for the Proposed Kawailoa Wind Farm Project, Multiple Ahupua'a, Waialua District, O'ahu Island, dated June 2011, by Joseph H. Genz, Ph.D. and Hallett H. Hammatt, Ph.D.
Ex. 15	Comments to SUP Application: <u>No Comments/No Impact:</u> (A) Memorandum from DLNR Land Division, dated January 27, 2015. (B) Memorandum from Lori M.K. Kahikina, P.E. Director of Department of Environmental Services, dated January 30, 2015. (C) Memorandum from Mark Tsuyemura, Management Analyst of the Office of the Chief, Honolulu Police Department, dated February 2, 2015. (D) Memorandum from Michael D. Formby, Director of Department of Transportation Services, dated February 13, 2015. (E) Memorandum from Ernest Y.W. Lau, P.E. and Chief Engineer, Board of Water Supply, dated February 25, 2015. <u>Comments:</u> (F) Comment from Socrates D. Bratakos, Assistant Chief, Honolulu Fire Department, dated February 3, 2015. (G) Comments from Paul Murakawa, Aquatic Biologist, DLNR Department of Aquatic Resources, dated February 3, 2015. (H) Comments from Carty S. Chang, Chief Engineer, DLNR Engineering Division, dated February 9, 2015. (I) Comments from Laura Leialoha Phillips McIntyre, AICP, Project Manager, Environmental Planning Office, dated February 10, 2015. (J) Comments from Aaron Nadig, Island Team Manager, United States Department of the Interior, Fish and Wildlife Service, dated February 17, 2015. (K) Comments from Leo R. Asuncion, Acting Director, Office of Planning, dated February 17, 2015. (L) Comments from Scott E. Enright, Chairperson, Office of Planning, Department of Agriculture, dated February 19, 2015. (M) Comments from Ford N. Fuchigami, Director of Transportation, Department of Transportation, dated February 23, 2015. (N) Comments from Susan A. Lebo, Ph.D., DLNR State Historic Preservation Division, dated February 25, 2015. (O) Comments from Lisa J. Hadway, Administrator, DLNR, Division of Forestry and Wildlife, dated March 4, 2015. (P) Comments from W. Roy Hardy, Acting Deputy Director, DLNR, Commission on Water Resource Management, dated March 4, 2015.

Ex. 16	CH2M Hill Responses to Comments, dated March 10, 2015, prepared by Paul Luersen, AICP
Ex. 17	CH2M Gill Responses to Comments, dated March 17, 2015, prepared by Paul Luersen, AICP.
Ex. 18	Email from Gary and Luann Gunder of Tin Roof Ranch to Raymond Young, dated March 9, 2015 RE: Letter in Support of SunEdison's Special Use Permit Application for Kawailoa Solar.
Ex. 19	Letter from Richard Wallsgrove, Program Director for Blue Planet, to Raymond Young, dated November 24, 2014.
Ex. 20	Photographs (2) of Solar Farm/Sheep Grazing on Oma'o Ranch Lands

DATED: Honolulu, Hawai'i, MAR 2 3 2015.

RANDALL F. SAKUMOTO
MARGUERITE S. NOZAKI

Attorneys for Applicant
KAWAILOA SOLAR, LLC

SUNEDISON, LLC – KAWAILOA SOLAR, FARM

Wren Wescoatt joined First Wind in 2007[1] and was the lead developer for the 30 MW Kahuku Wind and 69 MW Kawailoa Wind projects, coordinating the design, engineering, permitting, land rights and power purchase agreements for those projects. He is responsible for primary development of First Wind's new projects on O'ahu and Maui including the Waiawa, Kawailoa, Mililani I and II solar sites. Prior to joining First Wind, Mr. Wescoatt was the founder and executive director of College Connections Hawai'i, a statewide nonprofit which involved extensive community outreach and interface with community organizations throughout Hawai'i. Raised on the island of Molokai and a graduate of Kamehameha Schools, Mr. Wescoatt now lives with his family in Manoa on O'ahu. Mr. Wescoatt holds a Master's in Education from the University of North Carolina and a Bachelors of Arts in Communication from Stanford University.

Tom Siegel, Vice President of Transmission, joined First Wind in 2009 and oversees the interconnection of all First Wind's development portfolio to the electric transmission system. Mr. Siegel is further responsible for integrating First Wind's projects into the various markets which may include developing energy storage or alternative transmission solutions to increase wind power production. Mr. Siegel has supported the development of energy storage systems totaling 30 MWh of energy storage capacity and has been involved in energy storage system sizing exercises, determining the control functionality to meet the system and interconnecting utility needs, and evaluating the utility operational benefits that can be derived from the use of energy storage. Mr. Siegel has more than 25 years of utility experience. Prior to joining First Wind, Mr. Siegel served as Manager of Transmission Operations Engineering for Pacific Gas & Electric where he led the engineering support for the operation of Pacific Gas & Electric's 18,000 mile transmission system. Prior to Pacific Gas & Electric, Mr. Siegel served as Manager of Operational Compliance at the California Independent System Operator where he was responsible for monitoring and enforcing market participants' commitments to deliver energy and ancillary services. Prior to joining the California Independent System Operator, Mr. Siegel was employed at Pacific Gas & Electric and PECO Energy where he was responsible for Transmission Planning and Operations. Mr. Siegel holds a Master's Degree and a Bachelor's Degree in Electrical Engineering from Ohio University.

[1] First Wind was acquired by SunEdison, LLC in 2015.

EXHIBIT 1

Dave Cowan is located in First Wind's Portland, Maine office and oversees the Environmental Affairs group at First Wind, where he is responsible for all aspects of environmental permitting and compliance for projects throughout the United States. As the senior environmental permitting executive at First Wind, Mr. Cowan oversees permit compliance at over 900 MW of projects currently operating in Hawai'i, Utah, New York, Vermont, Washington and Maine, with several hundred MWs of additional projects currently under development around the United States. He represents First Wind before environmental and energy siting boards, and participates in regional and national environmental forums on behalf of the industry, actively shaping environmental regulations and wind power policy. In Hawai'i, he oversaw the approval of the first Habitat Conservation Plans ("HCPs") to benefit endangered species for wind energy projects in the U.S. (in support of four projects in Hawai'i). Mr. Cowan's prior experience includes over 20 years in environmental and biological consulting, and a Research Associateship with the Cornell Laboratory of Ornithology. Mr. Cowan holds a Master's Degree in Marine Science and a Bachelor of Science in Wildlife Biology. He is a Certified Wildlife Biologist (The Wildlife Society) and a Professional Wetland Scientist (Society of Wetland Scientists).

Jed Dailey leads First Wind's Wind Construction Department in the West (including Hawai'i) from his home office in Montana. Prior to joining First Wind in 2007, Jed worked for eight years in a project management role for a well know and well-respected general contractor in the renewable energy sector, M.A. Mortenson Company. Four of these years were spent in M.A. Mortenson's Energy Group, which was focused solely on wind energy design and construction. Jed Dailey was the Project Manager for M.A. Mortenson on the Kaheawa Wind Project I Facility (First Wind's first ever wind energy project), and joined the company two years later to lead construction efforts. Since joining First Wind, Jed Dailey has successfully managed the construction of First Wind's Kahuku Wind, Kaheawa Wind II and Kawailoa Wind projects in Hawai'i, in addition to other projects on the mainland. For the last eighteen months, Jed has also been actively involved in the development of First Wind's solar portfolio providing engineering, procurement and construction support. Since starting in the renewable energy industry, Jed Dailey has directly managed and constructed projects in aggregate of more than 500 MW and brings a wealth of engineering, construction, and logistics experience to our renewable project development and construction team.

CH2MHILL

PAUL V. LUERSEN, AICP — SENIOR ENVIRONMENTAL PLANNER, *CH2M HILL*

EXPERTISE
Project Management and Environmental Planning

HRS Chapter 343 and NEPA Documentation

Compliance with Federal, State and Local Regulations

EDUCATION
M.C.R.P., City Planning/Regional Development, Harvard Graduate School of Design, 1978

B.A., Near Eastern Studies, University of Washington, 1973

PROFESSIONAL REGISTRATIONS
American Institute of Certified Planners: 1984

Mr. Luersen has 37 years of experience as an environmental/land use planner. He has served as a principal planner and project manager on EAs and EISs for a variety of facilities, including renewable energy projects (wind farm and PV farms), electric transmission lines, substations and power plants. He has been engaged as the senior planner for highways and harbor projects for the Hawaii Department of Transportation. He has participated in the preparation of visual impact analyses and reports on electric and magnetic fields (EMF) as part of siting studies, EAs, and permits. He is based in CH2M HILL's Honolulu office at 1132 Bishop Street, Suite 1100.

Representative project experience

Planning and Permitting Services for Various Renewable Energy Facilities. Managed efforts to provide strategic planning for a wind energy facility with a capacity up to 22 MW on the island of Maui, Hawaii. Obtained approval of State of Hawaii Chapter 343 Environmental Review (Environmental Impact Statement), and a Conditional Use Permit for a 69MW wind farm at Kawailoa, Oahu. Prepared application and received approval for a Conditional Use Permit for 34 megawatt PV facility in the vicinity of Mililani.

Permitting Services to Hawaiian Electric Company. Senior consultant and planner on strategic permitting services on various HECO projects, including upgrades to substations, power plant facilities, and transmission and distribution lines. Work includes preparing GIS maps, analyzing potential permitting requirements, identifying environmental concerns, preparation of environmental reports, development of permit schedules and costs, and preparation of permit applications. Issues addressed include consistency with land use plans and policies, visual effects, and EMF. Worked on HECO, MECO and HELCO projects since 1990.

Indefinite Quality Contract; USACE Honolulu Engineer District; Honolulu, Hawaii. Program manager for an IDIQ A/E Services contract for Engineering and Environmental Planning services. Task orders include (1) Ala Wai Watershed Plan Feasibility Scoping Package in preparation for a joint Federal/State Environmental Impact Statement; (2) Stakeholder engagement tasks for a Federal supplemental EIS on the Maalaea Harbor Navigation Improvements project on Maui; (3) Feasibility Study and joint Federal/State Environmental Assessment for the Mokuhinia Ecosystem Restoration project in Lahaina, Maui.

Statewide and Regional Long-Range Land Transportation Plans for Maui, Hawaii and Kauai Counties, Statewide, Hawaii. Stakeholder and environmental task lead for Statewide and Regional (island) plans. The Statewide plan is the overarching land (highway) transportation plan that will set the structure to integrate the individual regional plans into a comprehensive, multimodal statewide plan. The Regional Long-Range Land Transportation Plans will define goals, needs and solutions specific to each county, will set the direction for system improvements for the various counties and allow for priorities and funding to be developed.

EXHIBIT 2

Paul T. Matsuda, P.E., LEED AP

PRINCIPAL, DIRECTOR OF CIVIL ENGINEERING

GROUP 70 INTERNATIONAL

group70int.com

Mr. Matsuda has more than 20 years of Civil Engineering experience in a wide variety of project types including, commercial, industrial, residential and educational site development, and transportation and utility infrastructure throughout Hawai'i and the Pacific Northwest. Responsibilities include the preparation of construction plans, specifications, and cost estimates for various civil site projects including, subdivisions, cluster housing, planned development housing and infrastructure improvement projects. Duties include the design of roads, drainage, water, and sewer systems; grading; quantity take-offs; and preparation of drainage reports and NPDES permit applications.

SELECT PROJECTS

Sun Edison 50MW Waiawa Solar Farm	*Waiawa, O'ahu*
First Wind 35MW Mililani Solar Farm	*Mililani, O'ahu*
Sunetric 5MW Solar Farm, Kalaeloa	*Kalaeloa, O'ahu*
Sunetric 5MW Solar Farm, Ma'ili	*Ma'ili, O'ahu*
East Kapolei Solar Farm	*Kapolei, O'ahu*
Sunetric Residential Solar, Farrington – Permitting	*Waianae, O'ahu*
Sunetric Residential Solar, Mahina 'au – Permitting	*Waianae, O'ahu*
Hawai'i BioEnergy – HECO Biofuels Program Development	*Kaua'i and Hawai'i*
Hawai'i Dairy Farms	*Kaua'i, Hawai'i*
City & County of Honolulu – Honolulu Fire Department Regional Fire Training Center	*Honolulu, O'ahu*
County of Maui – Wailuku Campus Master Plan	*Wailuku, Maui*
Department of Hawaiian Home Lands – Ka'u Water Master Plan	*Ka'u, Hawai'i*
Department of Hawaiian Home Lands – Lualualei Homestead Subdivision and Stream Study	*Lualualei, O'ahu*
Department of Education – Kihei High School	*Kihei, Maui*
University of Hawai'i at Manoa – College of Education Master Plan	*Honolulu, O'ahu*
Kamehameha Schools – Hale'iwa Commercial Redevelopment	*Hale'iwa, O'ahu*
Kamehameha Schools – Hale'iwa Rural Village Drainage Master Plan	*Hale'iwa, O'ahu*
Kamehameha Schools – Kawailoa Agribusiness Center Master Plan	*Kawailoa, O'ahu*
Kamehameha Schools – Kohou Infrastructure Evaluation	*Honolulu, O'ahu*
Armstrong Builders – Wailea Multifamily Residential	*Wailea, Maui*
Hoakalei Resort – Master Plan	*'Ewa, Oahu*
Kolōa Landing at Pō'ipu Beach – Multifamily Residential	*Koloa, Kaua'i*
New Hope Leeward – Kunia Site Development	*Waipahu, O'ahu*
Girl Scouts of Hawai'i – Paumalu Camp Master Plan	*North Shore, O'ahu*
Special Olympics Hawai'i	*Kapolei, O'ahu*
Papakolea Community Development Corporation – Papakolea Master Plan	*Honolulu, O'ahu*
Kaua'i Community Federal Credit Union	*Lihu'e, Kaua'i*

EXHIBIT 3

Paul T. Matsuda, P.E., LEED AP

PRINCIPAL, DIRECTOR OF CIVIL ENGINEERING

GROUP 70 INTERNATIONAL

group70int.com

CVS Kapolei Distribution Center – Industrial Warehouse Facility/Distribution Facility for CVS Longs Drugs*	*Kapolei, O'ahu*
Hale'iwa Road Drainage Improvements Study*	*Hale'iwa, O'ahu*
Hualalai Na Hale at Kahikole – Multifamily Residential*	*Ka'upulehu, Hawai'i*
Makakilo C & D(Kahiwelo) – Residential Subdivision*	*Makakilo, O'ahu*
Makakilo Phase 5 (Oceanridge) – Multifamily Residential*	*Makakilo, O'ahu*
USMC Base Finegayan Drainage Master Plan*	*Guam*

**Projects prior to Group 70*

PROFESSIONAL HONORS & ASSOCIATIONS

American Society of Civil Engineers, Hawai'i Section (ASCEH)	Current
American Council of Engineering Companies Hawai'i (ACECH)	Current
American Water Works Association, Hawai'i Section (AWWA)	Current
U.S. Green Building Council, Hawai'i Chapter	Current
Honolulu Habitat for Humanity, Building Committee Chair, Board Member	2008-2010
Honolulu Habitat for Humanity, Fran Brossy Lifetime Achievement Award	2011
Pacific Business News, Forty under 40 Class of 2009	2009

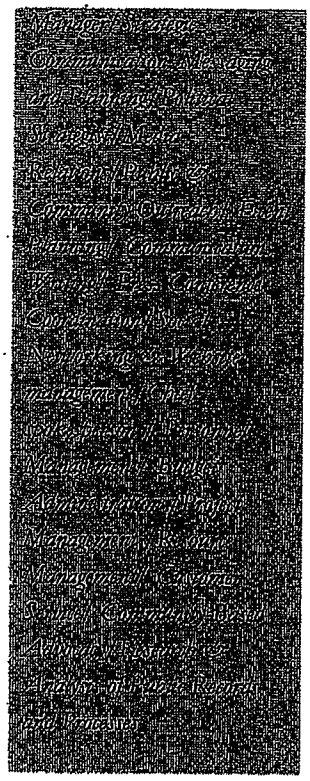
PROFESSIONAL REGISTRATIONS & EDUCATION

State of Hawai'i – Professional Civil Engineer (P.E.) #10901	Current
State of Oregon – Professional Civil Engineer (P.E.) #19,250	Current
State of Washington – Professional Civil Engineer (P.E.) #35,943	Current
USGBC LEED Accredited Professional	2008
University of Washington, Seattle, WA – B.S. in Civil Engineering	1993

CRYSTAL L. KUA

1099 Alakea Street, Suite 2440
Honolulu, HI 96813
Telephone (808) 695-3310
Email: ckua@firstwind.com

CAREER SKILLS & HIGHLIGHTS



- **Coordinated lobbying and community outreach** strategies that resulted in the passage of a law that opened up more agricultural land for utility-scale solar energy facilities.
- **Developed and implemented major television, print, radio media campaign and community outreach** in support of legislative funding for universal preschool for 4-year-olds in Hawai'i. Participated in overall strategic planning related to legislative lobbying and advocacy.
- **Advocated on behalf of Native Hawaiian beneficiaries** through strategic communications and community outreach as Administrator of the Hawaiian Home Lands Trust's Information and Community Relations Office and previously as Communications Director overseeing the Office of Hawaiian Affairs' Public Information Office.
- **Planned home blessing ceremony** involving U.S. Secretary of Housing and Urban Development Shaun Donovan and native Hawaiian family ready to move onto its Hawaiian homestead in Kānehili, Kapolei, O'ahu.
- **News reporter for more than 20 years in Hawai'i** working for media including the Honolulu Star- Bulletin, the Hawaii Tribune-Herald (Hilo) and KIPA radio (Hilo) reporting on the federal, state and county governments, Hawai'i's education system, the governor, state Legislature, statewide politics and elections and general community news, events and issues.
- **Traveled to Washington D.C.** in February 2009 to coordinate communications strategy, long distance press conference and media interviews via video link and community outreach surrounding oral arguments at the U.S. Supreme Court in the Office of Hawaiian Affairs' lawsuit to prevent the sale of ceded lands.
- **Overseas news assignment in Japan** in October 2005 writing and filing stories from Tokyo on Honolulu mayor's trip to inspect rail transit systems.

PROFESSIONAL EXPERIENCE

DIRECTOR OF EXTERNAL AFFAIRS – HAWAI'I — November 2013 to Present
First Wind, Honolulu, Hawai'i
Oversees community outreach, media relations and government relations on the county and state levels in Hawai'i in support of First Wind's planned and completed renewable energy projects; supervises community outreach coordinator; media spokesperson; coordinated strategies that resulted in passage of a law that opened up more agricultural land for utility-scale solar energy facilities in Hawai'i; writes media statements; plans community outreach events.

COMMUNICATIONS & FUND DEVELOPMENT OFFICER — August 2012 to November 2013
Good Beginnings Alliance, Honolulu, Hawai'i
Developed and implemented communications and public outreach strategies related to campaigns advocating on behalf of early childhood issues; writes and disseminates news releases to Hawai'i media; assisted in writing and producing television and radio spots; coordinated media buying; worked with community partners to implement events, programs and projects; worked with executive director and policy director to formulate overall advocacy and legislative lobbying strategies; assisted executive director in the development and implementation of fundraising strategies.

EXHIBIT 4

ADMINISTRATOR — January 2011 to August 2012
Information & Community Relations Office, Hawaiian Home Lands Trust, Kapolei, Hawai'i.
Managed four staff members and agency media tools including website content, social networking sites, quarterly newspaper and web-based newsletter and radio show. Managed annual operating budget of approximately $300,000. Developed communications and public outreach plans related to state and federal legislation, issues and regulatory processes. Worked in concert with other in state departments, the Governor's Office, outside agencies and community organizations to carry out agency strategic plan.

- **Supervisory and administrative responsibilities:** Managing a staff of five employees; personnel hiring including screening applications and conducting employment interviews; collaborated with agency staff to plan community events; formulated department budgets, expenditure, attendance and activity reports; travel arrangements; department task and project production; set meeting calendars; negotiated, drafted and implemented contracts with vendors; wrote correspondence; and answered telephone, email and in-person inquiries from the public.
- **Communications responsibilities:** Chief spokesperson; developed communications and public outreach plans related to state and federal legislation and issues; wrote and disseminated news releases to and maintained contact with Hawai'i and national media; assisted in writing and producing radio spots; coordinated media appearances on television and radio; worked directly with community members to implement events, programs and projects; prepared and presented testimony for the state Legislature, wrote speeches and remarks for trustees and administrator

ASSISTANT TO THE PRESIDENT & FOUNDER — October 2010 – December 2010
AsiaPacificFilms.com, Honolulu, Hawai'i
Assisted company president with a variety of marketing and overall operations responsibilities including preparation of grant and funding proposals; writing newsletter articles, press releases, correspondence and other business materials; producing brochures and flyers; event planning; research on Asia-Pacific films and filmmakers; social media networking including Facebook and YouTube posting.

CAMPAIGN COMMUNICATIONS DIRECTOR — February 2010 – June 2010
Hanabusa for Congress 2010 Special Election, Honolulu, Hawai'i

- **Supervisory responsibilities:** Coordinated communications assignments with volunteers and public relations and media services vendors.
- **Communications responsibilities:** Campaign spokesperson; media relations involving Hawai'i and national media; writing press releases, statements, e-mail newsletter and other campaign materials; debate preparation; event planning and publicity; social media networking including Facebook posting; writing and posting website content; and messaging strategizing and implementation.

DIRECTOR OF COMMUNICATIONS — July 2007 – February 2010
Public Information Office, Office of Hawaiian Affairs, Honolulu, Hawai'i

- **Managerial and administrative responsibilities:** Managing a staff of seven employees and one volunteer; personnel hiring including screening applications and conducting employment interviews; collaborated with agency staff to plan community events; formulated department budgets, expenditure, attendance and activity reports; travel arrangements for staff and outside vendors; electronically tracked department task and project production; set meeting calendars; negotiated, drafted, implemented and supervised contracts with vendors; wrote correspondence; and answered telephone, email and in-person inquiries from the public.
- **Communications responsibilities:** Chief spokesperson; developed communications and public outreach plans related to state and federal legislation, issues and regulatory processes; polling; wrote and disseminated news releases to Hawai'i and national media; assisted in writing and producing of television and radio spots; oversight of production of two prime time television specials; produced radio shows both on O'ahu and neighbor islands; wrote stories for monthly newspaper; coordinated media appearances on television and radio; worked directly with community members to implement events, programs and

projects; prepared and presented testimony for the state Legislature, wrote speeches and remarks for trustees and administrator.

REPORTER
Honolulu Star-Bulletin, Honolulu, Hawai'i October 1998 – July 2007
Hawai'i Tribune-Herald, Hilo, Hawai'i January 1991 – September 1998
Honolulu Star-Bulletin, Honolulu, Hawai'i January 1988 – December 1990

Wrote stories covering several beats including Honolulu City Hall (since 2003), the governor and the state Legislature (1999 to 2002), statewide education (1999 to 2002), elections and politics (2000 to 2006); the courts (1998 to 1999); Honolulu Police Department and criminal court cases (1988 to 1990); Big Island police and courts reporter and Hawaii County government reporter (1991-1998). Also wrote stories on federal, state and county legislation, laws and court cases.

RADIO REPORTER & CLERK
KIPA Radio, Hilo, Hawaii December 1986 – December 1987

General assignment news reporting and writing; read news stories on air; wrote and produced radio spots, weekend board operator, updating the daily program log, and general clerical duties including typing and answering phones.

INTERN
KOMO-TV News, Seattle, Washington June 1985 to September 1985

Wrote stories, organized scripts and assisted in the production of the early evening newscast at this ABC-affiliate.

EDUCATION

Bachelor of Arts in Journalism
SEATTLE UNIVERSITY – Seattle, Washington

High School Diploma
KAMEHAMEHA SCHOOLS – Honolulu, Hawaii

VOLUNTEER

CAMPAIGN ADVISER
Jarrett Keohokalole for State House District 48, Kāne'ohe, Hawai'i April 2014 to November 2014

A member of the core campaign advisory team which coordinated and implemented strategies leading to candidate Jarrett Keohokalole being elected to the state House District 48 seat; provided advice on media interviews; assisted in preparation of candidate for forums and television appearances; wrote informational pieces, news releases and other campaign materials.

Robert B. Rechtman, Ph.D.
Principal Archaeologist, ASM Affiliates, Inc

Total Years of Experience: 36

Education:

Ph.D.	1992/Anthropology/University of California, Los Angeles
M.A.	1985/Anthropology/University of California, Los Angeles
B.A.	1983/Anthropology/University of California, Los Angeles

Professional Profile:
Robert B. Rechtman, Ph.D. is currently the Director of Pacific Island Operations for ASM Affiliates, Inc. (ASM). Prior to joining ASM, Dr. Rechtman founded and was the Principal Archaeologist of Rechtman Consulting, LLC, a cultural resources management firm that successufully completed more than 800 cultural resources management projects throughout the State of Hawai'i. The range of projects included Section 106 Compliance, Cultural Impact Assessments, Archaeological Assessments, Reconnaissance Surveys, Inventory Surveys, Site Testing, Data Recovery, Preservation Planning, Burial Treatment Planning, and Archaeological Monitoring. These projects were been conducted for private landowners and developers, and county, state, and Federal agencies. Before forming Rechtman Consulting, LLC, Dr. Rechtman was a Senior Archaeologist with PHRI for three years, where among other responsibilities was a Principal Investigator for a portion of an IDIQ contract with the U.S. Navy, Pacific Division. And before that, from 1995 to 1997, Dr. Rechtman served as the Cultural Resources Manager for the U.S. Army's National Training Center at Fort Irwin; for which he received the Secretary of the Army Environmental Award. Collateral responsibilities included historic preservation advisor to the California Military Environmental Coordination Committee and the California Biodiversity Council, and lead cultural resources person for the Mojave Ecosystem National Performance Review Project, for which he received a National Performance Review Award. As a result of his work with the U.S. Army, Dr. Rechtman has gained substantial expertise in Federal contracting and regulatory compliance activities. Dr. Rechtman's research has focused on human adaptations to island environments, which is reflected in his numerous papers and publications. Dr. Rechtman's 36 years of professional archaeological experience includes work on archaeological projects in the Pacific (Samoa and Fiji) dating back to 1986, and in the Hawaiian Islands dating back to 1989.

Training, Honors & Awards
Section 106 Training. Advisory Council on Historic Preservation (1995) .
Advanced Training: Agreement Documents under Section 106. Heritage Resource Management Program (1996).
Archaeological Resources Protection Training. Federal Law Enforcement Training Center (1996).
Secretary of the Army Environmental Award. Pentagon (1999).
National Performance Review Award. White House (1997).
National Science Foundation Grant (1991).
Fulbright Fellowship, Institute of International Education/U.S. Information Service (1989/90).

Professional Memberships
Society for Hawaiian Archaeology
Society for American Archaeology

Certified Expert Witness Testimony
Hawai'i State Land Use Commission
Hawai'i State Board of Land and Natural Resource
Hawai'i County Planning Commission

Recent Publications

2013 Ancient Gardening in the Kona Field System, Hawaii, US.In: *Sourcebook for Garden Archaeology* (Parcs et Jardins Vol. 1) pp.673-684. (CoAuthored with Horrocks)

2012 Dark Hill of Omens, Hill of Seeking: Ethnography of Place and Petroglyphs in Hawai'i. *Time and Mind* Vol. 5, No. 3. (Coauthored with Loubser)

2009 Sweet potato (*Ipomoea batatas*) and banana (*Musa* sp.) microfossils in deposits from the Kona Field System, Island of Hawaii. *Journal of Archaeological Sciences* 36:5 pp.1115-1126. (CoAuthored with Horrocks)

2004 The Hunger for Power: Fijian Warfare and Cannibalism. In *Archaeology Without Limits: Papers in Honor of Clement W. Meighan.* Edited by B. Dillon and M. Boxt. Labyrinthos Press, Lancaster, CA.

EXHIBIT 5

WRITTEN DIRECT TESTIMONY OF WREN WESCOATT

1. **Please state your name and business address for the record.**

Wren Wescoatt, 1099 Alakea Street, Suite 2440, Honolulu, Hawai'i 96813.

2. **What is your current occupation?**

I am the Hawai'i Development Director for SunEdison, LLC, formerly First Wind Holdings, LLC.

3. **How long had you worked as the Development Director for First Wind Holdings, LLC, prior to it being acquired by SunEdison, LLC?**

I have worked for First Wind for 8 years and have been the Development Director for two years.

4. **Did you provide a copy of your biography for these proceedings?**

A brief biography was filed as **Exhibit 1**.

5. **Can you describe for the Planning Commission what it is you do as the Development Director of SunEdison?**

I am responsible for the primary development of SunEdison's projects on Oahu and Maui. As part of my position as Development Director, I am responsible for the coordination of design, engineering, permitting, land rights and power purchase agreements for SunEdison's projects, among other things.

6. **Is First Wind the applicant for this State Special Use Permit ("SUP")?**

No. The applicant is Kawailoa Solar, LLC. As explained in Attachment 1 to our SUP Application, Kawailoa Solar, LLC is wholly owned by Kawailoa Solar Holdings, LLC, which was in turn 100% owned by First Wind Solar Portfolio, LLC, which was owned by First Wind Holdings, LLC. Since First Wind Holdings, LLC was acquired by SunEdison, LLC, so were its subsidiaries.

Kawailoa Solar, LLC is the developer of a 50 megawatt ("MW") solar farm project that is the subject of the SUP Application.

7. **Are there other First Wind or SunEdison-related entities that have done, or are doing, renewable energy projects in Hawai'i?**

Yes. In Hawai'i, SunEdison is the state's largest renewable energy generator, including the company's very first wind project, Kaheawa Wind Power, which

EXHIBIT 6

began operating in 2006. SunEdison is also developing five (5) utility-scale solar energy projects on Oahu, including this Project.

The following is a list of our projects currently in operation as well as the projects under development:

Project	State	Technology	Size (MW)	C.O.D.
UNDER DEVELOPMENT				
Mililani South PV I	HI	Solar	20	2016
Mililani South PV II	HI	Solar	15	2016
Kawailoa Solar	HI	Solar	50	2016
Waipio PV	HI	Solar	47	2016
SunE Waiawa PV	HI	Solar	50	2016
OPERATING PROJECTS				
Kawailoa Wind	HI	Wind	69	2012
Kaheawa Wind II	HI	Wind	21	2012
Kahuku Wind	HI	Wind	30	2011
Kaheawa Wind II	HI	Wind	30	2006

8. **Were you involved in the development of any of those projects?**

Yes, extensively. I was the lead developer of Kahuku Wind and Kawailoa Wind projects, and am currently the developer of four of the five solar projects listed in my previous response, which make up 182 MW in total. My role includes finding the project site and coordinating the design, engineering, permitting, land rights and power purchase agreements for the projects.

9. **Can you describe the Kawailoa Solar Farm Project that is the subject of the SUP Application?**

The purpose of the Kawailoa Solar Farm Project is to produce clean, low-cost renewable energy for the island of Oahu. Kawailoa Solar is proposing to develop a 50 MW solar farm in an area approximately 4 miles northeast of Hale'iwa town, on the North Shore of the island of Oahu. The proposed site is within Kamehameha School's Kawailoa Plantation, which is comprised of agricultural fields and which is the current site of the Kawailoa wind farm built in 2012.

In fact, Kawailoa Solar has been designed to utilize existing infrastructure, including the existing network of onsite roads and the interconnection facilities to the HECO electrical transmission system as the Kawailoa Solar Farm Project has been selected by HECO and received a waiver from the Public Utilities

Commission as a low-cost, utility-scale renewable energy project. By interconnecting to the same electrical switchyards and transmission lines as the existing wind farm, the proposed project builds on work that was done to support the wind farm and enables connection to HECO's electrical grid without the need for new interconnection infrastructure.

The Kawailoa Solar Farm Project will also add diversity to the generation resources on the North Shore, and will provide more consistent and productive electrical output throughout the year. It is intended to complement the already existing wind farm and will be an additional source of clean energy during periods when the wind farm is not producing.

The Kawailoa Solar Farm Project is described in greater detail in the SUP Application.

10. Does Kawailoa Solar have to construct an access road for the Project?

No. For construction, operation and maintenance purposes, access for the Project will be through the already existing Ashley Road and other roads that were improved to support the existing wind farm. Within the Kawailoa Solar Farm site, a series of new interior gravel roads with a width of approximately 20 feet would be constructed.

11. Why does Kawailoa Solar have to obtain a SUP?

Chapter 205 of the Hawai'i Revised Statutes and provisions of recently passed Act 55, require solar energy facilities that occupy more than 10 percent of the parcel or 20 acres of land with a Land Study Bureau productivity rating of Class B or C soils are a permitted use within the Agricultural District, subject to issuance of a SUP. The Project proposes more than 20 acres of solar use on LSB Class soils B and C and therefore Kawailoa Solar is required to obtain a SUP.

The proposed project site is located within the State Agricultural District and would occupy approximately 332.3 acres of Class B land, 37.9 acres of Class C land, 12 acres of Class E land, and 1.9 acres of Class A land, which is comprised entirely of an existing roadway, under which approximately 550 linear feet of electrical line would be installed. The proposed site area has recently been classified as Important Agricultural Land under Part III of Chapter 205, HRS.

12. Earlier, when you were describing the Kawailoa Solar Farm Project, you mentioned HECO. Is HECO involved in the Project?

The Kawailoa Solar Farm Project will be built by Kawailoa Solar but is one of the projects included in HECO's Low Cost Waiver Projects.

13. **What are the Low Cost Waiver Projects?**

In 2013, HECO issued two rounds of requests for proposals for Low-Cost Waiver Projects on Oahu. The Public Utilities Commission approved waivers from competitive bidding for both rounds of waiver projects.

Initially, HECO sought projects that could provide power under a price of 17 cents per kilowatt hour. In the second round, HECO set a new threshold price of 16.25 cents per kilowatt hour. The average price of the second round waiver projects was approximately 15.9 cents per kilowatt hour.

The energy that will be produced by this Project will be sold to HECO under a Power Purchase Agreement ("PPA"). Through a confidential and competitive process, HECO selected 9 projects consisting of 240 MW. HECO has negotiated and executed PPAs with 7 solar projects, consisting of a total of approximately 222 MW. All of the PPAs between HECO and the selected renewable energy projects have been filed with, and must be approved by, the PUC.

The State LUC recently approved a SUP for the Waipio Solar Project (formerly known as Waiawa Solar) that was previously approved by the Honolulu Planning Commission, as well as the land use entitlements for two other Low Cost Waiver solar projects, including a project on land owned by Kamehameha Schools of 50 megawatts, with a second phase up to 65 MW, and a Ho'ohana Solar project of 20 MW.

14. **Has Kawailoa Solar executed a PPA with HECO?**

Yes. We executed the PPA dated December 3, 2014. We also made a substantial payment to HECO in connection with the PPA.

15. **At what cost will Kawailoa Solar be selling power to HECO?**

13.475 cents per kWh.

16. **Will this Project lower energy costs for Hawai'i consumers?**

Most definitely. Hawai'i pays some of the highest costs for energy in the country. Because HECO generates most of its energy from oil and coal, HECO's "avoided cost" to produce electricity from fossil fuel varies with the price of that fuel, and since that cost is passed through directly to consumers, HECO's rates can be volatile and high. Large solar photovoltaic systems are capable of generating electricity for a cost that is substantially less than HECO's "avoided cost" to produce the same electricity using fossil fuel, without the greenhouse gas emissions from burning that fuel.

Based on the projected output of the Kawailoa Solar Farm over a 27-year period, the Project will generate enough energy in a year to power the equivalent of 15,000 average Oahu households, will save consumers $200 million compared to HECO's typical avoided cost over the past five years, and will prevent the burning of millions of barrels of oil and millions of tons of carbon dioxide from entering the atmosphere.

17. **What is the term of the PPA and can the term be extended?**

The PPA has a minimum term of 22 years, as well as a 5 year extension for HECO to recapture banked curtailed energy, and the flexibility to extend for additional years with the mutual agreement of both the producer and the utility.

18. **How long does Kawailoa Solar need to have this SUP in place?**

Kawailoa Solar asks that the Planning Commission authorize the SUP to be in place for 35 years from the date of the Land Use Commission's approval. The SUP Application described an anticipated timeframe of approximately 25-30 years of operation. However, that timeframe does not include the time needed to complete the land use entitlements process for the Project, site work and construction, and the eventual decommission of the panels. Also not addressed in the application is the fact that the solar equipment, with regular maintenance, can still be operating productively for longer than 30 years.

19. **How long is construction of the Project expected to take?**

Construction of the Project is proposed to start in January 2016 and is estimated to take approximately 10 months.

20. **When does Kawailoa Solar intend to have the Project operational?**

It is essential that we get the Project into commercial operations before the end of 2016 in order to qualify for the available 30% Federal investment tax credits or ITC for solar energy projects. It is only because of the ITC that Kawailoa Solar can sell the power to HECO at such a low rate. There is also a State tax credit available for renewable energy, but for utility scale projects like Kawailoa Solar Farm Project, the State credit is almost entirely passed through to HECO, and back to ratepayers.

21. **What would be the impact on the Project if it is not into commercial operations before the end of 2016?**

If the Project is not completed before January 1, 2017, then the Federal ITC is reduced from 30% to 10%. Without the 30% credit, the Project would not be economically feasible at the fixed price agreed to in the PPA, and the savings

generated by the large Federal credit for solar would not be passed along to Oahu consumers.

22. **What are the chances that the tax credits will be extended?**

That is impossible to predict with any confidence. Given the difficulty and uncertainty in passing previous extensions to wind energy tax credits, along with recent inability of Congress to pass legislation of all kinds, no one that I know believes an extension is likely. More importantly, commercial lenders will not finance a utility scale solar project unless there is a high degree of confidence that it will be completed and operational before the 2016 deadline.

23. **When do you expect the PUC to approve the PPA?**

Because of the short time-frame in which we need to permit, finance, construct and connect the Kawailoa Solar Farm Project, we wrote a letter to the PUC in which we requested approval of the PPA no later than 2015.

24. **What happens if the Planning Commission does not approve the SUP Application?**

If the SUP is not approved, then the Project would not be able to proceed and the PPA would be terminated.

25. **Earlier, you mentioned HRS Chapter 205 and Act 55, which allow solar farms on State Agricultural lands with Land Study Bureau B or C soils as long as a special unit permit is obtained. Are there any other requirements under Act 55?**

Yes, there are several requirements that must be met in order to obtain the SUP related agricultural use and decommissioning.

Under HRS § 205-4.5(a)(21)(A), the land occupied by the solar farm must also be made available for compatible agricultural activities at a lease rate that is at least fifty percent (50%) below the fair market rent for compatible properties. "Agricultural activities" is defined as (1) cultivation of crops, including crops for bioenergy, flowers, vegetables, foliage, fruits, forage, and timber; (2) game and fish propagation; and (3) raising of livestock, including poultry, bees, fish, or other animal or aquatic life that are propagated for economic or personal use.

With respect to decommissioning, HRS § 205-4.5(a)(21)(C) requires the owner of the solar farm to remove all of the solar energy equipment within 12 months of the conclusion of operation or the useful life of the improvements, and to restore the ground to substantially the same physical condition as existed prior to the development of the solar energy facility.

Furthermore, under § 205-4.5(a)(21)(B), Kawailoa Solar must provide proof of financial security to cover those decommissioning activities before it starts commercial generation of energy.

26. **What compatible agricultural activities will Kawailoa Solar implement in the Project?**

As described in the SUP Application, Kawailoa Solar plans to lease the Project area for the pasturage of sheep, which is a use recognized as compatible with solar panels. Kawailoa Solar plans to lease the majority of the solar farm area to a tenant who will pasture sheep on the Property. The lease would commence after the Project is operational and will provide the tenant with fencing, access, and other infrastructure on the Project site. Kawailoa Solar has been in discussions with several ranchers who have expressed an interest in leasing the Property for sheep pasture. Kawailoa Solar's parent company has executed a Letter of Intent with one potential lessee, a copy of which is included as Attachment 5 to the SUP Application. The proposed lessee is Kualoa Ranch Hawai'i, Inc.

The Letter of Intent states that the lease rent shall be $10 per acre per year, (*i.e.*, at least fifty per cent below the fair market rent for comparable properties) not to exceed $2,000 per year, for a term of at least five years. In addition, Kawailoa Solar plans to install perimeter fencing and roads as part of the proposed Project, at no cost to the sheep operation, and will work with the rancher to facilitate watering systems, electrified fencing, pens and loading facilities, depending on the needs of the operation.

27. **The Letter of Intent states that it is non-binding. Does that mean that Kawailoa Solar may not lease to Kualoa Ranch?**

There are still many aspects of the lease terms to be worked out between the parties, and at least 2-3 years until the Property will be ready for livestock. The non-binding letter of intent indicates that the parties intend to work together on an agreement but does not commit either party to a lease, the terms of which still need to be identified and negotiated.

28. **Should Kualoa Ranch not lease the Property, or lease it for only a short while, will Kawailoa Solar get another agricultural lessee on the Property?**

Yes. Kawailoa Solar is committed to finding one or more agricultural tenants to lease and use the property for agriculture.

29. **Earlier, you described the solar panels which will be four feet six inches (4'-6") to nine feet six inches (9'-6") off the ground. Does that provide enough room for sheep to graze?**

Yes. At full growth, the sheep are approximately 24-30 inches in height and will have no problem grazing under the panels.

30. **Why do you believe sheep farming could be a viable agricultural use of the Property?**

Sheep grazing on solar farms has been done in Europe and parts of the United States. One example is the OCI Solar Power farm in San Antonio, Texas, which is a 4.4 MW solar farm with approximately ninety (90) sheep grazing on the property. A sheep rancher in England has 500 ewes grazing on a pasture sited with 20,000 PV panels. On Kauai, a rancher grazers a heard of twenty (20) to thirty (30) sheep under about 3 acres of solar panels.

Nevertheless, we recognize that sheep are not common in Hawai'i, and we wanted to make sure that sheep pasturage is truly viable here. Therefore, we commissioned a study called Sheep and Solar Panels in Hawai'i, which was prepared by a Ph.D. and a Master's of Science candidate at the Department of Human Nutrition, Food and Animal Sciences, College of Tropical Agriculture and Human Resources, U.H. Manoa. A copy of that study was filed with the SUP Application as Attachment 6.

The report speaks for itself but a few highlights are that there is a viable market in Hawai'i for the sale of lamb to local stores and restaurants; that Oahu has almost no local sheep farms, while Maui, Kauai and Hawai'i islands together have nearly $1 million in annual sheep sales. The report also makes several recommendations for best practices in the ranching of sheep.

31. **Is sheep farming the only possibility for the Property?**

No. As discussed above, permitted "agricultural activities" includes (1) cultivation of crops, including crops for bioenergy, flowers, vegetables, foliage, fruits, forage, and timber; (2) game and fish propagation; and (3) raising of livestock, including poultry, bees, fish, or other animal or aquatic life that are propagated for economic or personal use. Therefore, if sheep farming is not successful, other agricultural activities would be pursued. Having solar panels on the property does restrict some types of agriculture, but it may be possible to integrate bees, aquaculture, poultry or other types of livestock. As a landowner, we intend to find creative ways for agriculture and energy to work together.

32. **Will the livestock operation on the Project site interfere with the current uses of the Property?**

No. The Project site was previously used for agricultural operations, including, most recently, sugar cane. The Waialua Sugar Company ceased operations and closed its doors for good in 1998, after which it surrendered its lease and land to Kamehameha Schools. Currently, Kamehameha Schools operates the Kawailoa Plantation and leases plots to individual farmers for diversified agricultural purposes. Neither the solar project nor the agricultural activity is expected to interfere with the current agricultural uses of the other plots on the property.

33. **Who is responsible for removing wastes generated from the sheep grazing operations?**

Typically, there is no need to remove animal waste in a rural pasture setting, since it becomes natural fertilizer for the pasture grasses. However, the lessee would be responsible for all aspects of the agricultural operation. Kawailoa Solar will work with the lessee to create a cooperative agreement and conservation plan for the sheep operation consistent with government rules and regulations that incorporates and utilizes recognized best management practices to control runoff and reduce erosion.

34. **Will Kawailoa Solar comply with the requirement to remove all of the solar energy equipment within 12 months of the conclusion of operation or the useful life of the improvements, and to restore the ground to substantially the same physical condition as existed prior to the development of the solar energy facility?**

Yes. We prepared a Decommissioning Plan, which was filed as Attachment 7 to the SUP Application, which addresses the scope and timeframe for the decommissioning. It is Kawailoa Solar's obligation and commitment to conduct this decommissioning and remove all of the PV panels, racks, foundational piles and underground collector lines following the useful life of those components.

Solar modules degrade slowly over time, usually losing less than one percent of their capacity per year. When the capacity of the modules has degraded to the point where it is no longer generating enough energy to make it financially viable to operate, the Project is decommissioned, and this can be longer than 30 years. The decommissioning activities will include the complete removal of the foundational piles and modules and all associated components to a depth of thirty six (36) inches below grade, which includes any concrete foundations. All metal components shall be recycled to the extent possible in order to minimize the contribution to local landfills. The Property will be returned to substantially the same condition as it was prior to the solar farm use. Because the Property is currently used for other agricultural uses, we do not anticipate any difficulty in returning it to its present state.

The standard practice is to sell substation/switchyard equipment "where-is as-is," meaning, a refurbisher would remove the improvements and take it away to sell or recycle. It is conceivable that with all of the solar projects planned in Hawai'i, a local PV recycling facility could open in Hawai'i within the next 25-30 years as older solar panels and facilities reach the end of their useful life. If not, to the extent feasible, the equipment will be sent to the Mainland for recycling. For the metals that make up the pane racking system, there are several recycling options already in place on Oahu.

35. **How will Kawailoa Solar demonstrate financial security for the decommissioning?**

Prior to beginning commercial operation, the Applicant will put financial security in place to cover the estimated cost of decommissioning. The purpose of posting security is to ensure that at the end of the project's useful life, sufficient funds are available to pay for the removal of equipment and restoration of the land. Based on industry estimates of removal costs and salvage value of recycled materials, the projected cost to decommission the project is approximately $4M. Decommissioning security would be provided in the form of a parent guaranty, letter of credit, or some other acceptable form of security.

36. **Will Kawailoa Solar conduct an EA or EIS prior to decommissioning?**

There is no HRS Chapter 343 trigger that would require an EA or EIS to be conducted prior to decommissioning the solar farm. However, Kawailoa Solar will comply with all applicable laws and regulations.

Respectfully submitted,

WREN WESCOATT

DATED: Honolulu, Hawai'i, March 16, 2015.

WRITTEN DIRECT TESTIMONY OF JED DAILEY

1. **Please state your name and business address for the record.**

Jed Dailey, 179 Lincoln Street, Suite 500, Boston, MA 02111.

2. **What is your current occupation?**

I am the Vice President of Construction (West) for SunEdison, LLC, formerly First Wind Holdings, LLC. I travel out of Helena, Montana and manage all construction projects in the West and Hawai'i. I have worked with Wren Westcoatt on three projects in Hawai'i.

3. **How long have you in that position?**

I have been with First Wind for 7 years, managing construction in the West and Hawai'i for the last five of those years.

4. **Did you provide a copy of your biography for these proceedings?**

Yes, my brief professional biography was filed as Exhibit 1. My written direct testimony was filed as **Exhibit 6.**

5. **Can you briefly describe your educational background?**

I graduated from Montana State University in Construction Engineering. I have been actively working in the construction industry for almost 15 years. Over half of that has been focused solely on renewable energy.

6. **Do you specialize in any particular areas?**

My background is primarily engineering and construction of renewable energy projects. In my current role, I am generally responsible for the management of design and construction for the SunEdison portfolio of renewable energy projects.

7. **Please describe your activities with other First Wind or SunEdison entities regarding renewable energy projects.**

I have successfully managed, or am in the process of managing the following renewable energy projects on behalf of SunEdison, formerly First Wind:

Stetson Wind (Maine)	Kawailoa Wind (Oahu, Hawai'i)
Milford Wind Phase 2 (Utah)	Palouse Wind (Washington)

EXHIBIT 7

Kaheawa 2 (Maui, Hawai'i)	Route 66 Wind (Texas)
Kahuku Wind (Oahu, Hawai'i)	Seven Sisters Solar (Utah)
Waiawa Solar (Waiawa, Hawai'i)	South Plains Wind (Texas)
South Plains II (Texas)	

8. **Can you describe the Kawailoa Solar Farm Project that is the subject of the SUP Application?**

The Kawailoa Solar Farm Project is described in detail in the SUP Application. In summary, the Project is planned to be a 50-megawatt ("MW"), utility scale, solar farm on approximately 384.1 acres of land on the North Shore of Oahu, approximately 4 miles northeast of Hale'iwa town. The area is within tax map keys 6-1-006:001 and 6-1-005:001, which are part of a larger lot owned by Kamehameha Schools.

The proposed project involves installation of a horizontal single-axis tracking, ground-mounted photovoltaic system. On average, the panels are expected to extend approximately 4'-6" to 9'-6" off the ground. Each panel would generate power at 1000 volts. Within vicinity of the panels, electrical equipment including combiner boxes, inverters, pad mounted transformers, weather monitoring stations and switch gear would be installed.

The Project would also have a 34.5kV collector system, two 46kV substations, which would provide for the termination of the collector lines and connect to the existing HECO Mauka and Makai switchyards.

9. **What is your role in the proposed 50-MW Kawailoa Solar Farm Project?**

My team will be responsible for the engineering, construction, and turnover (to the SunEdison Operations Department) of the solar project. My team will be comprised of Project Managers, Construction Managers, and Quality Technicians which will manage the day-to-day construction effort of our contractor(s).

10. **Who will maintain the substations and switchyard?**

SunEdison's Operations Department will own and maintain the substations. HECO owns and maintains the existing Mauka and Makai switchyards, both of which were constructed as part of the adjacent wind farm project.

11. **Will there be any above-ground utility lines?**

Each of the two substations would be an open switchrack design with free-standing steel structures, and would occupy an area of approximately 0.75 acres,

enclosed by an 8 foot high chain-link perimeter fence. Within each of the switchyards, new electrical equipment to support interconnection of the solar facilities would be installed. However, the vast majority of the new electrical lines that collect the energy from the PV panels and bring the power to the substations will be routed underground.

12. **Are there communication devices, and if so, are they on the panels themselves or are they part of the substation?**

Telecommunications would be provided via an existing fiber optic cable, which will allow communication, control, and data collection from the individual inverters. The communication infrastructure will not extend out to individual panels.

13. **Does Kawailoa Solar have to construct a new primary access road?**

No. The Project will use the existing Ashley Road that will provide access to the Project site. Within the Project site we will install a series of new interior service roads to reach critical equipment. These will be gravel roads that are approximately 20 feet in width.

14. **Will the Project adversely affect surrounding property?**

Construction of the solar facilities would result in short-term impacts that are temporary, intermittent, and localized. In particular, project construction would involve a variety of ground disturbing activities, including site preparation and grading, equipment assembly and installation, and trenching for the underground collection lines. Use of heavy equipment and earthmoving operations conducted as part of these activities would generate noise, as well as fugitive dust and internal combustion engine emissions, resulting in temporary impacts to local air quality. Best management practices would be implemented to minimize noise, air emissions, and stormwater runoff. Vehicular traffic would also increase during construction, but this increase would also be short-term and localized. None of these impacts would alter the character of surrounding areas.

Once the Project is built, it would be a primarily passive operation. Little to no noise would be generated from the facility, given the site's isolation from populated areas. The nearest residences are those just mauka of Kamehameha Highway and those in Pupukea, which are approximately 0.7 mile to the west and 1.0 mile to the north, respectively. Other residential developments are located in Hale'iwa (approximately 3.0 miles to the west), and in Waialua (approximately 5.0 miles from the facilities). Ground-mounted inverters and transformers make a humming noise during daytime hours when the solar array generates electricity, and there may be some noise generated from switching gear associated with the Project substations and mowers and string trimmers for vegetation control, but none of these are expected to be audible from the nearest residences.

The proposed project would not directly interfere with the military training at the TFTA. The potential for indirect impacts associated with glare was considered as part of the reflectivity study, which was attached to the SUP Application as Attachment 10. Although it was not possible to assess the precise glare impacts to aviators within the TFTA (given the variability in training times, locations and elevations), the study concluded that the potential for significant glare-related impacts is unlikely, and any glare would be of extremely short duration and probably barely perceptible to aviators in the TFTA. Should the Project create a hazardous condition for pilots, SunEdison will immediately initiate steps to mitigate the hazard upon notification by the appropriate authorities (*e.g.*, Federal Aviation Administration).

15. **Will the Project result in heavy foot-traffic on the Project site?**

Power generation is expected to occur between the hours of 9:00 a.m. and 4:00 p.m., based on solar intensity. Aside from periodic maintenance and inspection, normal operation of the facility would not require onsite personnel, and, therefore, the site would not be manned on a daily basis.

16. **Will the Project require public infrastructure?**

The proposed Project would require minimal public infrastructure. Normal operation of the facility would not require onsite personnel, will not be permanently manned, and will not require permanent wastewater facilities. Small amounts of water would be required for occasional cleaning of the solar panels and to support co-located ranching operations. Water would be available either from the rainwater catchment equipment, onsite irrigation ponds, or transported via truck. No hook-up to the municipal water system is planned. Drainage on the site already exists and the Project is not expected to significantly alter the existing drainage patterns.

17. **Will construction of the Project generate much solid waste?**

Construction and operation of the proposed Project is not anticipated to generate a significant amount of solid waste. During construction, all waste would be temporarily stored onsite and periodically transported and properly disposed of in a permitted landfill. Little to no waste would be generated during operation. As such, the Project is not expected to affect refuse collection services.

18. **Will the Project include high voltage equipment?**

Yes, but only within the substations and the existing HECO switchyards. The PV array contains only medium and low voltage equipment.

19. **Will the Project have an impact on fire protection services?**

The Waialua Fire Station is located approximately 2 miles from the entrance to the project site. Construction of the proposed project would involve the use of electrical generating equipment and some flammable materials. The proposed project includes an existing access road and turnaround area that can accommodate fire apparatus. It is anticipated that the solar project will not need to provide water supply for fire flow as no occupied buildings would be constructed within the project site.

20. **Will the Project increase the risk of wildfires?**

Once the Project is built, the chances of wildfires should be even lower than at present since the property will be secured by perimeter fencing and the sheep and/or mowing of the groundcover should keep the tall vegetation, which could be fuel source of a wildfire, to a minimum.

21. **Does Kawailoa Solar have a decommissioning plan in place? If so, what does decommissioning entail?**

Yes. When the operational period of the solar farm is done, the utility improvements will be decommissioned. A Decommissioning Plan was included as Attachment 7 to the SUP Application.

22. **Does Kawailoa Solar have any experience decommissioning a solar farm or any other renewable energy facility of comparable size?**

Not to date. But it is important to remember that the majority of a solar project is comprised of piling, racking, and panels that are not difficult to disassemble, and remove from the grounds. All underground cable locations are recorded and kept in the project records, which will make for easy removal. The challenges of solar decommissioning are much less complicated than other projects (*e.g.*, large commercial, fossil power plants, etc.).

Respectfully submitted,

JED DAILEY

DATED: Honolulu, Hawai'i, MARCH 20, 2015.

WRITTEN DIRECT TESTIMONY OF TOM SIEGEL

1. **Please state your name and business address for the record.**

Tom Siegel. 1200 Folsom Street, Suite 100, San Francisco, CA 94103.

2. **What is your current occupation?**

I am the Vice President of Transmission for Sun Edison, LLC.

3. **How long have you in that position?**

I had been with First Wind for 5 years, overseeing the interconnection of all of First Wind's development portfolio. In Hawai'i, I was actively involved in the interconnection of Kaheawa Wind Phase II on Maui and Kahuku Wind and Kawailoa Wind on Oahu. I am currently actively involved in the interconnection of four solar projects including Mililani South Solar Park, Miliani Phase II, Kawailoa Solar and Waiawa Solar. First Wind was recently acquired by Sun Edison, LLC. I will continue in the same position with Sun Edison as I had when with First Wind.

4. **Did you provide a copy of your biography for these proceedings?**

Yes, my brief professional biography was filed as Exhibit 1. My written direct testimony was filed as Exhibit 7.

5. **Please briefly describe your educational background?**

I have a Master's Degree and a Bachelor's Degree in Electrical Engineering from Ohio University.

6. **Do you specialize in any particular areas?**

My background is primarily in the area of utility system transmission planning and operations.

I have been working in the utility industry for over 25 years. I have supported the development of more than 528 MW of operating renewable energy projects which are either in construction or otherwise expected to be in operation before 2017. My experience in the utility industry helps me understand the unique challenges of integrating renewable energy projects into the utility grid.

EXHIBIT 8

7. **Please describe your activities with other First Wind or Sun Edison entities regarding renewable energy projects.**

I have successfully managed the interconnection for, or am in the process of managing the interconnection for, the following renewable energy projects (partial list) on behalf of First Wind:

Stetson Wind Phase 2 (Maine)	Kawailoa Wind (Oahu, Hawai'i)
Milford Wind Phase 2 (Utah)	Palouse Wind (Washington)
Kaheawa 2 (Maui, Hawai'i)	Route 66 Wind (Texas)
Kahuku Wind (Oahu, Hawai'i)	Seven Sisters Solar (Utah)
Rollins Wind (Maine)	Sheffield Wind (Vermont)
Steel Winds II (New York)	Bull Hill (Maine)
Milbury and Warren A, B, & C (Massachusetts)	
South Plains Wind 1 & 2 (Texas)	Four Brothers (Utah)
Oakfield Wind (Maine)	Bingham Wind (Maine)
Bowers Wind (Maine)	

8. **Can you describe the Kawailoa Solar Farm Project that is the subject of the SUP Application?**

The Project is planned to be a 50-megawatt ("MW"), utility scale, solar farm on approximately 384.1 acres of land on the North Shore of Oahu, approximately 4 miles northeast of Hale'iwa town. The area is within tax map keys 6-1-006:001 and 6-1-005:001, which are part of a larger lot owned by Kamehameha Schools.

The proposed project involves installation of a horizontal single-axis tracking, ground-monitored photovoltaic system. On average, the panels are expected to extend approximately 4'-6" to 9'-6" off the ground. Each panel would generate power at 1000 volts. Within vicinity of the panels, electrical equipment including combiner boxes, collector lines, inverters, weather monitoring stations and switch gear would be installed.

The Project would also have a collector system, two electrical substations, which would provide for the termination of the collector lines and connect to the existing HECO Mauka and Makai switchyards.

9. **What is your role in the proposed 50-MW Kawailoa Solar Farm Project?**

My role in the Project is to coordinate with HECO, to provide them with any information necessary for them to evaluate the impact that interconnection of the Project might have on their system, to assess the results of HECO's Interconnection Requirements Study and to negotiate the interconnection-related language in the Power Purchase Agreement.

10. **Will the Project prevent individual residents and businesses from installing rooftop solar?**

No. The Project will interconnect with HECO's grid through a 138 kV line, while individual residential and commercial PV systems connect to the HECO grid at the distributional 12 kV level. Therefore, the Project will not interfere with residential solar hookups. Furthermore, under the PUC guidelines, Rule 14H, when HECO determines circuit penetration for rooftop solar, HECO focuses on the 12 kV circuit penetration. Taking all of this into consideration, the development of this 50 MW solar energy Project should not directly compete with residential and rooftop commercial PV systems.

Respectfully submitted,

TOM SIEGEL

DATED: Honolulu, Hawai'i, 3/25, 2015.

WRITTEN DIRECT TESTIMONY OF
DAVID P. COWAN

1. **Please state your name and business address for the record.**

David P. Cowan, 129 Middle Street, 3rd Floor, Portland, ME 04101.

2. **What is your current occupation?**

I oversaw environmental and compliance for the development and operation of First Wind's utility-scale renewable energy development projects throughout the United States. I will also be working in the same capacity for SunEdison, LLC since its recent acquisition of First Wind.

3. **How long have you been in that position?**

I was with First Wind since 2004. Before joining First Wind, I spent over 20 years working as an environmental consultant doing project management, environmental assessment, regulatory permitting, and mitigation services for major utility, transportation, and renewable energy projects throughout the U.S. Before going into the consulting field, I was a Research Associate with the Cornell University Lab of Ornithology.

4. **Did you provide a copy of your biography for these proceedings?**

Yes, my brief professional biography was filed as **Exhibit 1**. My written direct testimony was filed as **Exhibit 8**.

5. **Please briefly describe your educational background?**

I have a Master of Science, Marine Biology, from SUNY Stony Brook, Marine Sciences Research Center and a Bachelor of Science, Wildlife Biology, from SUNY Syracuse College of Environmental Science and Forestry. I am also a Certified Wildlife Biologist and Professional Wetland Scientist.

6. **Do you belong to any professional organizations?**

I am a member of the American Wind Energy Association – Siting and Environmental Compliance Committee, the American Wind and Wildlife Institute Research Committee, The Wildlife Society and the Society of Wetland Scientists.

EXHIBIT 9

7. **Do you have experience working on any other solar or renewable energy projects in Hawai'i?**

Yes. In Hawai'i, I oversaw the approval of the first Habitat Conservation Plans ("HCPs") to benefit endangered species for wind energy projects in the U.S. Those HCPs covered four wind energy projects in Hawai'i.

8. **Did you consult with the US Fish & Wildlife Service ("FWS") or the Hawai'i Division of Forestry and Wildlife ("DOFAW") when getting those HCPs approved?**

Extensively. HCP approval is a multi-year process that requires close collaboration with FWS and DOFAW. HCPs are triggered when there is a likelihood that a project will adversely affect one or more species listed under the Endangered Species Act ("ESA"), as determined in consultation with FWS, DOFAW, and the Endangered Species Recovery Committee ("ESRC"). In Hawai'i, projects that may have an adverse effect are required by law to demonstrate a net conservation benefit to each affected species through appropriate mitigation measures.

We began consultation for our first wind energy project on Maui in 2004 and have been collaborating with FWS, DOFAW, and ESRC on a continuous basis ever since. In that time we have prepared and are implementing four separate HCPs: two on Maui Phases I and II of the Kaheawa Wind project, and two on Oahu for the Kahuku and Kawailoa Wind projects. Preparing an HCP involves conducting site-specific studies for each potentially affected species, estimating likely impacts, identifying appropriate mitigation measures, and going through a lengthy state and federal review and approval process. My role has been as the primary point of contact with the agencies on behalf of First Wind, as well as oversight of consultant teams in scoping and conducting the necessary studies and in preparation and review of the HCPs.

9. **Have you ever been qualified as an expert witness as a land use planner before the Planning Commission, Land Use Commission, or in any other proceeding?**

I have not previously been qualified as an expert witness before the Planning Commission, Land Use Commission, or in any other proceeding although I have previously testified before the Planning Commission at the SUP hearing for the Waiawa Solar Farm Project and as well as before other commissions in other jurisdictions. In Hawai'i, I have also appeared before the Endangered Species Recovery Committee.

10. **Are you familiar with the Kawailoa Solar, LLC proposed 50 megawatt solar farm project (the "Project") that is the subject of the SUP Application?**

Yes. The Project is planned to be a 50-megawatt ("MW") utility-scale, solar farm on approximately 384.1 acres of land on the North Shore of Oahu, approximately 4 miles northeast of Hale'iwa town. The area is within tax map keys 6-1-006:001 and 6-1-005:001, which are part of a larger lot owned by Kamehameha Schools, which is also known locally as the Kawailoa Plantation. Of the 384.1 acres, 332.3 acres is Class B land, 37.9 acres is Class C land, and 1.9 acres of existing roadway is on Class A land. The Kawailoa Solar Farm will be located adjacent to the existing Kawailoa Wind Farm on the same TMKs, and will interconnect to the same electrical switchyards and transmission lines, and HECO's electrical grid.

The Project site was previously used for agricultural operations over an extended period of time, and as such, there was extensive ground disturbance and very minimal remaining natural habitat. The proposed solar farm is further described in the SUP application.

11. **Are any endangered or threatened plant or animal species located within the property?**

As stated earlier, there is minimal natural habitat present on the site due to past agricultural uses. A biological resources survey was conducted by SWCA Environmental Consultants in 2014, which found that no state or federally listed threatened, endangered, or candidate plant species have been recorded within the study area. As the study area does not contain designated (or proposed) critical habitat, construction and operation of the Solar Farm facility is not expected to result in any significant adverse impact on botanical resources.

Wildlife surveys were conducted within the larger Kawailoa wind power facility project area and a total of 26 bird species have been detected, of which only four are native or winter migrants to the Hawaiian Islands. The proposed photovoltaic arrays are black as opposed to reflective, and are not expected to pose a risk of collision for native or migrant birds that have been detected within or flying over the Project site.

The only native mammal species which is still extant within the Hawaiian islands is the Hawaiian hoary bat (*Lasiurus cinereus semotus*), which has been documented residing in the Kawailoa area. To minimize the potential for impacts to this species, clearing and/or trimming of trees above 15 feet in height will not occur between June 1 and September 15 to avoid the period when non-volant juveniles may be present. In addition, the perimeter fencing will have a barbless top-strand of wire to prevent entanglement and SunEdison will work with the U.S. Fish and Wildlife Service and the State of Hawai'i Department of Land and natural Resources Division of Forestry and Wildlife to develop appropriate

protocols for the construction and operation of the Project to document and mitigate risks to protected species.

12. **How was that determined?**

First Wind engaged SWCA Environmental Consultants to prepare a Preliminary Natural Resource Assessment of the proposed Project site. I was involved in commissioning and reviewing that report. First Wind worked with SWCA Environmental Consultants on its wind energy projects that required the HCP's, so we have confidence in their scientific conclusions.

13. **Describe the methodology used in the natural resources assessment.**

SWCA Environmental Consultants conducted the natural resource assessment in 2012, and covered additional areas in 2014. The methodology used included reviewing available scientific and technical literature regarding the natural resources within the property. Such literature included scientific and technical journals and reports, environmental assessments/environmental impact statements, relevant government documents, unpublished data, geospatial data, aerial photographs, and topographic maps. A field reconnaissance survey of the property was conducted on July 9, 2012.

SWCA Environmental Consultants were instructed to: (i) provide a description of flora and fauna communities at the property; (ii) provide a description of wetlands, streams or waterways, if any, at the property; (iii) identify the presence of any State or Federally listed candidate, threatened or endangered plant or animal species, and any species of concern within the property; and (iv) provide recommendation to prevent "take" should any species listed be identified within the property.

14. **Is there a risk that birds will mistake the solar array for water?**

We have heard of this happening at specific projects in desert locations on the U.S. mainland. However, while there are a number of solar farms operating here in Hawai'i, we have not heard of any incidents where birds have mistaken those panels for water. Additionally, the panels used for this Project will be substantially similar to those used for rooftop solar and we have not heard of any problems with birds mistaking those panels for water.

15. **Is there a risk that the solar panels will fry birds?**

There has been concern about this on the U.S. mainland, with one particular type of installation that is not contemplated here. Specifically, there have been reports that the tail feathers of birds flying over a 377 MW solar farm in California have ignited. This is not a concern for this Project, which will use very different technology. The California solar farm consists of mirrors that reflect sunlight to

boilers that sit atop towers. When the concentrated sunlight strikes the boiler pipes, it heats the water to create steam, which is then piped to a standard turbine where electricity is generated.

In contrast, the PV panels that will be used in this Project are designed to absorb as much solar energy as possible and will therefore create minimum or no glare, and will not generate heat. These panels will not be reflecting sunlight into the atmosphere. The PV panels used for this Project are basically the same as those used for the rooftop solar installations on private homes.

16. **In your professional opinion as a biologist, will the proposed Project negatively impact natural resources in the Project area?**

No. As stated earlier there is minimal intact habitat present on the Project site due to past agricultural uses, and Kawailoa Solar will employ measures to minimize the potential for impacts to native wildlife that might be present during construction and operation of the Project. In addition, best management practices will be used to reduce potential impacts to adjacent water features during the construction phase.

Respectfully submitted,

DAVID P. COWAN

DATED: Honolulu, Hawai'i, MAR 23 2015, 2015.

WRITTEN DIRECT TESTIMONY OF PAUL V. LUERSEN, AICP

1. **Please state your name and business address for the record.**

Paul V. Luersen, 1132 Bishop Street, Suite 1100, Honolulu, Hawai'i 96813.

2. **What is your current occupation?**

I am a Senior Environmental Planner at CH2M Hill.

3. **How long have you worked as an environmental planner?**

For 37 years.

4. **Did you provide a copy of your biography for these proceedings?**

Yes, my brief professional biography was filed as **Exhibit 2**. My written direct testimony was filed as **Exhibit 9**.

5. **Please briefly describe your educational background and professional certifications.**

I have a Master of City and Regional Planning with an emphasis in City Planning/Regional Development from Harvard Graduate School of Design and a Bachelor's degree in Near Eastern Studies from the University of Washington.

I am a member of the American Institute of Certified Planners (AICP), an industry certification for planners.

6. **Do you specialize in any particular areas?**

I specialize in project management and environmental planning, and Hawai'i Revised Statutes ("HRS") Chapter 343 and National Environmental Policy Act ("NEPA") document preparation.

7. **Please describe any renewable energy projects in Hawai'i that you have worked on.**

I assisted with the strategic planning efforts for the following: (1) 22 megawatt ("MW") wind energy facility on Maui, (2) 69 MW wind farm at Kawailoa, Oahu, and (3) 35 MW PV facility in Mililani, and (4) 47 MW PV facility in Waipio, Oahu.

EXHIBIT 10

soils on the property have an agricultural productivity rating by the Land Study Bureau of Class A, B and C as shown in Attachment 3, Figure 4 of the SUP Application. Under a law that was enacted April 30, 2014 (Act 55), solar energy facilities of any size are now allowed in the SLU Agricultural District on LSB B and C soils as long as a SUP is obtained.

12. **Are you familiar with the legal criteria for obtaining a SUP?**

Yes, and those criteria are addressed in detail in the SUP Application.

Under HRS § 205-6(a), the Planning Commission may permit certain "unusual and reasonable uses" within SLU Agricultural and Rural districts other than those for which the district is classified if a SUP is obtained, but only when the proposed use would promote the effectiveness and objectives of the State Land Use law (Chapter 205, HRS). The State Land Use Commission has established five guidelines for determining "unusual and reasonable use" as follows:

(1) The use shall not be contrary to the objectives sought to be accomplished by Chapters 205 and 205A, HRS, and the rules of the Commission;

(2) The proposed use would not adversely affect surrounding property;

(3) The proposed use would not unreasonably burden public agencies to provide roads and streets, sewers, water drainage, and school improvements, and police and fire protection;

(4) Unusual conditions, trends, and needs have arisen since the district boundaries and rules were established; and

(5) The land upon which the proposed use is sought is unsuited for the uses permitted within the district.

HAR § 15-15-95(c). These criteria are substantially similar to those set forth in the Commission's rules, Rule 1-45.

13. **How does the proposed Project "promote effectiveness and objectives" of HRS Chapter 205?**

This is described in Section 5.0 of the SUP Application. In summary, the Project promotes the effectiveness and objectives of Chapter 205 because it will continue to allow the property to be used for agricultural activities. In fact, due to the requirements under Act 55 for the property to be made available for lease at a rate that is at least 50% below fair market rent for comparable properties, the Project greatly enhances the chances of agricultural activity taking place on the property.

land and substantially less than 10% of the roughly 385-acre Project site. The area identified for the Makai substation is within the fenceline and so the acreage is included with the solar arrays. As such, the substations are allowed without any special considerations.

17. **Will the solar farm unreasonably burden public agencies to provide roads and streets, sewers, water drainage and school improvements, and police and fire protection?**

No. Project access will be over a private road (Ashley Road). No wastewater facilities are needed for this Project as there will not be any full-time employees on site once the Project is in operations. The Property is not serviced by the Honolulu Board of Water Supply, and no municipal water meters will be sought for this Project. The Kawailoa Solar Farm Project is not residential, and after the brief period of construction, will have very few employees on site. Therefore, the Project will not cause an increased demand for schools or police services. Drainage is likewise not anticipated to be an issue as only minimal water will be used to clean the solar panels and stormwater runoff resulting for agricultural uses of the property will be appropriately addressed through design features that incorporate best management practices to minimize the quantity of water quality impacts of the runoff. As explained by Mr. Dailey, the Vice President of Construction, construction of the Project should decrease any chances of wildfire, as the property will be secured by perimeter fencing, and the vegetation will be managed, thereby reducing potential fuel sources.

18. **Have any unusual conditions, trends, and needs arisen since the district boundaries and rules were established?**

As described in Section 5.0 of the SUP Application, a significant trend that has arisen since the State Land Use Districts were first established several decades ago is a world-wide recognition that energy from fossil fuels is detrimental to the environment and the economy, and that renewable energy is a highly desirable alternative. In Hawai'i, starting in 2001, the legislature established an ambitious renewable portfolio goal for the State. Under the current Renewable Portfolio Standard, each electric utility company must achieve certain targets which are measured as percentages of renewable electrical energy sales:

10% of net electricity sales by December 31, 2010
15% of net electricity sales by December 31, 2015
25% of net electricity sales by December 31, 2020
40% of net electricity sales by December 31, 2030

As of December 31, 2013, 18% of HECO's electrical energy sales on Oahu was generated by renewable energy sources.

In addition, the solar panels would not be expected to result in glare impacts to motorists or residences, given the distance of the residences from the Project site, and the natural topography and vegetation, which obstruct the view of the Kawailoa Solar Panel Farm.

Respectfully submitted,

PAUL W. LUERSEN, AICP

DATED: Honolulu, Hawai'i, March 10, 2015.

KAWAILOA SOLAR, LLC
WRITTEN DIRECT TESTIMONY OF
PAUL T. MATSUDA, P.E.

1. **Please state your name and business address for the record.**

Paul T. Matsuda, 925 Bethel Street, 5th Floor, Honolulu, Hawai'i 96813

2. **What is your current occupation?**

I am a Principal and the Director of Civil Engineering at Group 70 International, Inc.

3. **How long have you worked as a civil engineer?**

Over 20 years.

4. **Did you provide a copy of your resume for these proceedings?**

Yes, my resume was provided as **Exhibit 3.**

5. **Please briefly describe your educational background.**

I have a Bachelor of Science in Civil Engineering from the University of Washington. I am a licensed professional civil engineer in Hawai'i, Oregon, and Washington. I am also a U.S. Green Building Council LEED accredited professional.

6. **To what professional organizations do you belong?**

I am a member of the American Society of Civil Engineers, Hawai'i Section; the American Council of Engineering Companies Hawai'i, the American Water Works Association, Hawai'i Section; and the U.S. Green Building Council, Hawai'i Chapter. I served as a board member and Building Committee Chair for Honolulu Habitat for Humanity and was awarded the Fran Brossy Lifetime Achievement Award in 2011. I am also a member of Pacific Business News' Forty under 40 Class of 2009.

7. **Do you specialize in any particular Area?**

I specialize in civil engineering, primarily site development, transportation and utility infrastructure projects.

8. **Have you ever been qualified as an expert witness in civil engineering before the Planning Commission, Lane Use Commission, or in any other proceeding?**

Yes. I was recently qualified as an expert witness in land and use planning before the State of Hawai'i Land Use Commission in October 2014 for a 50 megawatt ("MW") utility scale solar project on Oahu.

EXHIBIT 11

9. **What is your role in the proposed Kawailoa Solar Farm Project (the "Project")?**

I prepared a report titled Kawailoa Solar, LLC - Solar Farm Project Preliminary Civil Considerations, dated March 9, 2015. A copy of that report was filed as **Exhibit 12.**

10. **Describe the details of the proposed Project.**

The solar farm will be comprised of a horizontal single-axis tracking, ground-mounted photovoltaic system. Photovoltaic modules (PV Panels) will be mounted on steel racks which are anchored to the ground on driven piles. The racks will be attached to the piles, tilted in the southerly direction and will track the sun along a single axis from east to west. Groups of racks will be arranged and combined to deliver energy to inverter skids which will also be mounted on driven piles. These inverters will deliver the energy to the existing Mauka and Makai substations and interconnection switchyards, which were constructed as part of the Kawailoa wind farm project. HECO's Mauka switchyard provides for interconnection with the HECO's Waialua-Kuilima 46kV sub-transmission line, and HECO's Makai switchyard provides for interconnection with HECO's existing Waialua-Kahuku 46kV sub-transmission line. The solar farm project needs to interconnect with both sub-transmission lines, as each can only accept a limited amount of generation.

Infrastructure improvements required for the solar farm include: substation, PV panels, combiner boxes, collector lines, inverters and electrical equipment, access driveways, perimeter fencing, security systems, and drainage and vegetation improvements.

11. **Briefly describe the proposed location of the Project.**

The Project is proposed within three parcels (TMK 6-1-005:001, 6-1-006:001, 6-1-007:001), which are part of Kamehameha School's Kawailoa Plantation. The area is comprised of agricultural fields located atop a series of tablelands interspersed with gulches formed by intermittent drainages. The topography ranges from relatively flat or moderately sloping in the agricultural fields to steeply sloping in the gulches. Elevations range from 200 feet above sea level (ASL) to 1,280 feet ASL, which equates to an average grade of approximately 7 percent. The tablelands are accessed via a network of cane haul roads that were developed as part of the plantation operations.

12. **What are the past and current uses of the property?**

The property is comprised of agricultural fields and had previously been a sugar cane plantation until 1996. After Waialua Sugar Co. surrendered its lease of 24,000 acres of agricultural and conservation land to Kamehameha Schools, the land has been leased to individual farmers for diversified agricultural purposes. Above the agricultural areas, Kamehameha Schools has planted koa trees and the larger areas have been fenced for a cattle lease. Within the proposed area for the Project, there exists the Kawailoa wind farm.

13. **What are the flood zones of the property?**

The U.S. Federal Emergency Management Agency Flood Insurance Rate Map provides that the Project site is located in Flood Zone D, where flood hazards are undetermined.

14. **How does runoff discharge within the property now?**

In general, the solar farm will be located on the ridgelines where the former tilled sugar cane fields were located. The project area generally slopes mauka to makai down from elevations of 1,280 feet to 200 feet with an average slope of approximately 7%. The project site is in Flood Zone D. Optimal placement of the PV panels will be on the flatter more gradually sloped areas on the ridgelines and away from the steep ravines that lead to the valleys below. No public agencies will be required to provide drainage improvements to support the solar farm project.

Several intermittent waterways run alongside the Project site; however, these features are located within steep gulches, such that flooding of the Project site is not expected. Drainage across the site currently exists in the form of surface runoff based on the natural topography; the proposed Project would not significantly alter the existing drainage patterns.

15. **What must be done to prepare the land for solar farm Project?**

Clearing, grubbing and grading will need to be completed to install the solar panels, equipment, facilities, access driveways, fence and vegetated buffers.

To allow grading and grubbing of the Project site, Kawailoa Solar will have to obtain the following approvals and permits:

- State of Hawaii Department of Health (DOH) - NPDES General Permit for Construction Activities, Notice of Intent (NOI-C)
- City and County of Honolulu - Grading, Grubbing and Stockpiling Permit

16. **Are any requirements imposed when submitting such permit applications?**

Yes. The applications for both State and C&C grading and erosion control permits identified above require agency review and approval of Grading and Erosion Control Construction Plans including related Storm Water Pollution Prevention Plans, Erosion Control Calculations, and Drainage Reports.

17. **What impacts are expected from construction of the Project?**

The Project will create minimal, short term impacts that are temporary, intermittent and localized. Construction of the Project will involve such activities as site preparation and

grading, equipment assembly and installation, and trenching for the underground collection lines. While heavy equipment and earthmoving operations would generate noise as well as fugitive dust and internal combustion engine emissions, such results will be only temporary impacts to local air quality. Given the Project site's isolation from populated areas, construction-related impacts would not be significant. Nevertheless, best management practices ("BMPs") would be implemented to minimize noise, air emissions, and stormwater runoff.

18. **Are there any measures to counter those impacts?**

Temporary and permanent BMPs will be required through the grading and erosion control regulations and permits required by the State and City and County of Honolulu. Temporary BMPs are required during construction activities and will remain in place until permanent BMPs are established.

Temporary BMPs may include things like preservation of natural vegetation, minimization of areas of clearing and grubbing, vegetated buffers, temporary soil stabilization with grass and/or mulch, silt fences/fiber filtration tubes, gravel bag berms/check dams, stabilized construction entrances and exits, sediment traps and basins, temporary diversion swales and ditches, and water application and/or dust screens for control.

Permanent BMPs may include things like permanent soil stabilization with landscaping, pavement, or gravel, infiltration trenches, dry wells and sumps, grass swales and ditches, filter strips and sediment traps and basins.

19. **Do you anticipate that there will be increased runoff from the property after the Project is constructed?**

No. The PV panes will be elevated so the existing ground will remain as is, which is highly pervious. Rainwater will hit the panel, run to the edge and fall to the ground, which will be left in a pervious state. The only increase in impervious area would be from the pads that are actually put in to hold the racks. That is an insignificant amount of land coverage. The substation and switchyard will include and create some small areas of impervious surface, but because we're not changing the hydrologic characteristics of the underlying ground, there should be no increase in runoff. Nevertheless, certain BMPs, such as preservation of natural vegetation, minimization of areas of clearing and grubbing, vegetated buffers, silt fences/fiber filtration tubes, gravel bag berms/check dams, stabilized construction entrance, sediment traps and basins, grass swales and ditches, and soil stabilization will be employed where appropriate.

20. **Will there be any significant use of or impacts to groundwater or surface water by the Project?**

No. The PV panels do not generate pollution. No cleaning solutions or chemical materials will be used to clean the PV panels.

No new water sources will be required for the development of the Project. Water will be made available for compatible agricultural uses, *e.g.* sheep, once the solar farm Project is constructed, and will incorporate recognized BMPs.

21. **Are there any plans to provide fire protection, hydrants up in that area for substations or for the utility equipment?**

Not for municipal fire service. There is no need. Kawailoa Solar informed me that the Honolulu Fire Department sent a comment letter to DPP in response to the SUP application on February 3, 2015. The letter stated generally that Kawailoa Solar is required to comply with the Fire Code of the City and County of Honolulu with respect to photovoltaic systems and fire department access and water supply requirements.

Although the letter from the Honolulu Fire Department did not state any specific requirements or concerns, I previously met with Captain Sheldon Yasso from HFD on December 5, 2014 regarding the Waiwa PV Project, which is a similar project to the Kawailoa Solar Farm Project, and he explained that fire access roads and a water supply approved by the City and County and capable of supplying required fire flow protection are only required and enforced when there is a "building" that is part of the permitted work. In this case, the solar farm racks and substation would likely be considered "structures" by building officials. As a result, fire code compliance including fire access and water would not be required and the solar farm Project will not unreasonably burden public agencies to provide fire protection.

The terms "building" and "structure" are defined in the fire code (NFPA 1 Uniform Fire Code, as amended by the City and County of Honolulu). The definitions and related code language is somewhat subject to interpretation, but HFD has been interpreting "structure" as something that does not need to comply with the fire code requirements for access and water supply. Captain Sheldon confirmed that the building officials have generally made determinations on whether the project includes a "building" or "structure." The Kawailoa Solar Farm Project will only include installation of solar farm structural racking, foundations, and electrical substation, it does not include any "buildings" or any use or occupancy that would trigger the need for fire code compliance.

Once the Project is built, the chance of naturally occurring or arson related wildfires would be reduced, since the Property will be secured by perimeter fencing, and the vegetation that could be fuel for a wildfire would be controlled by animal grazing and/or mowing.

Respectfully submitted,

PAUL T. MATSUDA

DATED: Honolulu, Hawai'i, March 17, 2015.

WRITTEN DIRECT TESTIMONY OF CRYSTAL L. KUA

1. **Please state your name and business address for the record.**

Crystal L. Kua, 1099 Alakea Street, Suite 2440, Honolulu, Hawai'i 96813

2. **What is your current occupation?**

I am the Director of External Affairs- Hawai'i for SunEdison, LLC, formerly First Wind.

3. **How long have you worked in that capacity?**

For over one year. Before taking the position with SunEdison, formerly First Wind, I had positions doing community relations type work for Good Beginnings Alliance, Hawaiian Home Lands Trust, Office of Hawaiian Affairs and other organizations. Prior to that I was a news reporter for various Hawai'i media.

4. **Did you provide a copy of your resume for these proceedings?**

Yes. My resume was filed as Exhibit 4.

5. **Do you specialize in any particular areas?**

I specialize in community outreach and communications.

6. **Can you describe the Kawailoa Solar Farm Project that is the subject of the SUP application?**

The Project is planned to be a 50-MW, utility scale, solar farm on approximately 384.1 acres of land on the North Shore of Oahu, approximately 4 miles northeast of Hale'iwa town. The area is within tax map keys 6-1-006:001 and 6-1-005:001, which are part of a larger lot owned by Kamehameha Schools.

The proposed project involves installation of a horizontal single-axis tracking, ground-monitored photovoltaic system. On average, the panels are expected to extend approximately 4'-6" to 9'-6" off the ground. Each panel would generate power at 1000 volts. Within vicinity of the panels, electrical equipment including combiner boxes, collector lines, inverters, weather monitoring stations and switch gear would be installed.

The Project would also have a collector system, two electrical substations, which would provide for the termination of the collector lines and connect to the existing HECO Mauka and Makai switchyards.

EXHIBIT 12

7. **What is your role with this Project?**

I am generally responsible for overseeing community outreach, media relations and governmental relations for SunEdison, formerly First Wind renewable energy projects on the county and state levels.

8. **What community outreach was done for this Project?**

Kawailoa Solar did a considerable amount of outreach for this Project and other renewable energy projects within the last year. Community outreach for this Project began in October, 2013. Prior to its acquisition by SunEdison, First Wind held more than 100 meetings or presentations with stakeholders - individuals and organizations - to provide information on the development of its planned utility-scale solar projects in Mililani, Waiawa and Kawailoa. The outreach was intended to inform people about the projects and their effects in the communities. And also to gather ideas and suggestions from stakeholders that could improve the projects. SunEdison, formerly First Wind has met with the following stakeholders, grouped into categories below:

Government – Gov. Neil Abercrombie's staff; state Senate and House Energy, Agriculture, and Water/Land Committee chairs and members; individual members of the Hawai'i State Legislature; individual members of the Honolulu City Council, State Department of Business, Economic Development and Tourism; Land Use Commission staff; Office of State Planning, City Department of Planning and Permitting, Hawai'i County Research and Development Department.

Community and Business - North Shore Chamber of Commerce, individual members of the North Shore Neighborhood Board, chairs and members of the Mililani Mauka-Launani Valley Neighborhood Board, Mililani-Waipio Neighborhood Board, Pearl City Neighborhood Board, Sunset Beach Community Associations, Waialua High and Intermediate Foundation, Mililani Middle School community during STEM Night 2014, Pacific Resource Partnership, North Shore Economic Vitality Partnership.

Native Hawaiian Organizations- Office of Hawaiian Affairs, state Department of Hawaiian Home Lands, Waialua Hawaiian Civic Club, Waimea Valley.

Agriculture - Director and staff of the State Department of Agriculture, Dean and faculty of the University of Hawai'i College of Tropical Agriculture, Hawai'i Farm Bureau, North Shore Chamber of Commerce Agriculture Committee, North Shore Neighborhood Board Agriculture Committee.

Media - Reporters and editors representing the Honolulu Star-Advertiser, Pacific Business News and Hawai'i News Now.

Respectfully submitted,

Crystal L. Kua

CRYSTAL L. KUA

DATED: Honolulu, Hawai'i, March 25, 2015.

Kawailoa Solar, LLC
Solar Farm Project
Preliminary Civil Considerations

Kawailoa, Waialua, O'ahu
TMK (1) 6-1-006: 001 (por) and TMK (1) 6-1-005: 001 (por)

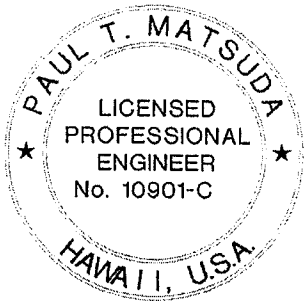


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EXHIBIT 13

GROUP 70
INTERNATIONAL

Kawailoa Solar, LLC – Solar Farm Project
Preliminary Civil Considerations

Project Description

The proposed Kawailoa Solar, LLC Solar Farm Project is located on Kamehameha Schools property on State Land Use Agricultural District lands in Kawailoa, Waialua, Oahu (TMK 6-1-006:001 and TMK 6-1-005:001). The property was historically used for sugar cane cultivation. Currently the property contains a variety of uses including a wind farm, agriculture, conservation and military operations.

The solar farm project is planned to generate approximately 50 MW of power and will be constructed within an approximately 304 acres on two parcels; TMK 6-1-006:001 (2,050 acres) and TMK 6-1-005:001 (1,452 acres). The actual areas of the solar farm will vary depending on existing topography and system design and layout. The solar farm will be co-located with the Kawailoa Wind Farm and will interconnect with the wind farm's existing electrical switchyards and substations.

The solar farm will be comprised of a horizontal single-axis tracking, ground-mounted photovoltaic system. Photovoltaic modules (PV Panels) will be mounted on steel racks which are anchored to the ground on driven piles. The racks will be single-axis tracking, supported by driven piles, tilted in the southerly direction and will track the sun along a single axis from east to west. Groups of racks will be arranged and combined to deliver energy to inverter skids which will also be mounted on driven piles. These inverters will deliver the energy to the existing Mauka and Makai substations and interconnection switchyards, which were constructed as part of the Kawailoa wind farm project. HECO's Mauka switchyard provides for interconnection with the HECO's Waialua-Kuilima 46kV sub-transmission line, and HECO's Makai switchyard provides for interconnection with HECO's existing Waialua-Kahuku 46kV sub-transmission line. The solar farm project needs to interconnect with both sub-transmission lines, as each can only accept a limited amount of generation.

Infrastructure improvements required for the solar farm include: substation, PV panels, combiner boxes, collector lines, inverters and electrical equipment, access driveways, perimeter fencing, security systems, and drainage and vegetation improvements.

Access

Access to the site is provided by a private agricultural road (Ashley Road), which extends from Kamehameha Highway up through the project area, and is maintained as part of the existing wind farm. There is no public access to the site. There are numerous unpaved agricultural roads throughout the property. No public agencies will be required to provide roads or streets for the solar farm project.

Grading and Drainage

In general, the solar farm will be located on the ridgelines where the former tilled sugar cane fields were located. The project area generally slopes mauka to makai down from elevations of 1,280 feet to 200 feet with an average slope of approximately 7%. The project site is in Flood Zone D.

Optimal placement of the PV panels will be on the flatter more gradually sloped areas on the ridgelines and away from the steep ravines that lead to the valleys below. No public agencies will be required to provide drainage improvements to support the solar farm project.

Clearing, grubbing and grading will be needed on the project site for placement of the solar panels, equipment, facilities, access driveways, fence and vegetated buffer. In general, the steeper areas of the project site will be avoided and PV racks will be concentrated in areas of more gradual slopes. The site is moderately sloped with an average slope of less than 7 percent. Site grading associated with the project will be limited to smoothing out localized high or low spots. It is anticipated that the earthwork volumes and related construction costs will be minimized by optimal placement of the PV racks by following the existing grades and elevations. Where possible, the existing agricultural roads will continue to be utilized for access.

Permits and approvals will be required from the State of Hawaii and the City and County of Honolulu (C&C) to allow grading and grubbing of the site including:

- State of Hawaii Department of Health (DOH) - NPDES General Permit for Construction Activities, Notice of Intent (NOI-C)
- City and County of Honolulu - Grading, Grubbing and Stockpiling Permit

The applications for both State and C&C grading and erosion control permits identified above require agency review and approval of Grading and Erosion Control Construction Plans including related Storm Water Pollution Prevention Plans, Erosion Control Calculations, and Drainage Reports.

Stormwater Quantity Management

Since the solar farm is generally located on the ridgelines, the project area is generally not subject to runoff from offsite areas mauka of the site. Existing runoff currently discharges through sheet flow or shallow concentrated flow into swales onto adjacent downstream areas. The existing drainage patterns will not be altered in this project with earthwork limited to leveling for access driveways, equipment pads, and the substation.

Addition of impervious area from concrete equipment pads, control structures, substation and switchyard, and micro-pile/pier foundations will be minimal. Due to the even distribution of impervious area throughout the project site, slight leveling of driveway areas, and use of raised gravel driveways, the increase in impervious area is not anticipated to increase runoff rates. As a result, there will not be a significant pre-development to post-development increase in stormwater flows due to the construction of the project.

Onsite stormwater will be properly directed away from equipment pads and any other structures to minimize erosion. Drainage channels with velocity reduction controls will be constructed in which water will flow to stormwater basin(s) and/or other volume control facilities if required. The volume control facilities will be situated at the proper downstream locations, and will discharge out with non-erosive velocities back into the natural drainage features.

Offsite flows, to the extent there are any, will be diverted around the site or through the site so as to not impact the existing drainage paths as well as the proposed construction. If required,

diversion channels will be constructed with check dams, drop structures or other velocity reducing controls and flow back into the natural drainage features.

Best Management Practices

Both temporary and permanent Best Management Practices (BMPs) are required to be implemented for the project through the grading and erosion control regulations and permits required by the State and C&C agencies. Temporary BMPs are required during construction activities and will remain in place until permanent BMPs can be established. Temporary erosion control measures will be incorporated during the construction period to minimize soil loss and erosion hazards. It is anticipated that the erosion control BMPs to be used on-site may include the following:

- Preservation of natural vegetation
- Minimize area of clearing and grubbing
- Vegetated buffers
- Temporary soil stabilization with grass and/or mulch
- Silt fences/fiber filtration tubes
- Gravel bag berms/check dams
- Stabilized construction entrances
- Sediment traps and basins
- Temporary diversion swales and ditches
- Dust control – water application and/or dust screens

Due to the size of the project, the above temporary BMPs would be implemented in a phased manner through grading increments as required by the regulatory agencies. Details on the grading increments and related BMPs will be shown on the Grading and Erosion Control Plans.

Permanent erosion control BMPs will also incorporated into the design and are required to close out grading and erosion control permits. Typically permanent BMPs primarily include final stabilization of exposed soils through landscaping or installation of impervious surfaces including pavement and buildings. Additional BMPs are also typically required to provide treatment of stormwater runoff to remove pollutants. However for solar farm projects, the total additional impervious surface is minimal and the PV panels are not pollution generating surfaces.

C&C Civil Engineering Branch (CEB) is responsible for interpreting and approving BMP and drainage system designs. Typically, C&C regulations include minimum thresholds for requirements related to installation of BMPs for stormwater quality based on the project's total disturbed area regardless of the added impervious area or pollutant generation from a project. However for solar farms, CEB has recently allowed the grassed areas under the PV panels to be excluded from the project's calculated disturbed area since grassing is an acceptable permanent BMP. Therefore, the grassed areas underneath the PV panels will not have to comply with the C&C low impact development (LID) requirements. However, any areas within the project area that could be considered disturbed or developed such as a substation, will have to comply with LID requirements as defined below:

- Unless infeasibility criteria, as defined in §1-5.2 of the Water Quality Design Standards, can be met for each type of LID feature, Water Quality Volume (WQV) must be calculated

using the 1" design storm runoff depth and retained on-site through use of permanent BMPs that utilize infiltration or evapotranspiration.

- If infeasibility criteria are met, any portion of the WQV that is not retained must be bio-filtered using permanent erosion control BMPs.

In summary, the project will likely be required to provide onsite treatment of 1" of runoff only for areas that are fully disturbed and developed such as a substation. BMP requirements and applicable drainage criteria and standards will be confirmed with the C&C during design. It is anticipated that permanent BMPs to be utilized on the project for the few fully disturbed and developed areas include the following:

- Permanent soil stabilization with landscaping, pavement, or gravel
- Infiltration trenches
- Dry wells and sumps
- Grass swales and ditches
- Filter strips
- Sediment traps and basins

Fire Hazard

The solar farm project will not unreasonably burden public agencies to provide emergency services for response to fires. Since the solar farm project will not include any "buildings", it is not anticipated that building permits for the project would be subject to fire code compliance. Once the project is built, the chance of naturally occurring or arson related wildfires would be reduced since the property will be secured by perimeter fencing and the tall vegetation that could be fuel for a wildfire will be cleared, then controlled by animal grazing and/or mowing.

PV Panel Maintenance

Once the PV panels are installed, very little maintenance is needed. The PV panels will be cleaned primarily by rain. However, if it is exceptionally dry and the solar plant is experiencing soiling losses (lost energy due to a thin film of dust on the panels), the operations staff would employ a round of panel rinsing, likely no more than once per year. There's no anticipation of having to use solvents or harsh chemicals to clean the PV panels. Water and squeegee is typically all it takes to clean the panels.

Air Quality

There are no direct air emissions from operating the solar farm. Operation and maintenance activities may result in small amounts of fugitive dust or tailpipe emissions from vehicular traffic and landscape maintenance. However, it is not anticipated that the operations at the site would adversely affect air quality.

During construction, there will be short-term impacts in the form of exhaust from increased traffic and fugitive dust generated by the construction activity. Temporary BMPs will be used to mitigate impact from fugitive dust during construction. These BMPs may include dust fences, windbreaks, watering of disturbed areas and other soil management measures. BMPs will be identified and included on the erosion control plans that are required for both C&C and State grading and erosion control permit approvals. Construction activities at the site will comply with the regulations for fugitive dust control in HAR, Section 11-60.1.

Cultural Impact Assessment for the Proposed Kawailoa Wind Farm Project, Multiple Ahupua'a, Waialua District, O'ahu Island

TMK: [1] 6-1-005:001, 003, 007, 014, 015, 016, 019, 020, 021, 022; 6-1-006:001, 6-1-007:001, 6-1-008:025, 6-2-002:001, 002, 025; 6-2-009:001; 6-2-011:001; & 6-7-003:024

Prepared for

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EXHIBIT 14

Prefatory Remarks on Language and Style

A Note about Hawaiian and other non-English Words:

Cultural Surveys Hawai'i (CSH) recognizes that the Hawaiian language is an official language of the State of Hawai'i, it is important to daily life, and using it is essential to conveying a sense of place and identity. In consideration of a broad range of readers, CSH follows the conventional use of italics to identify and highlight all non-English (i.e., Hawaiian and foreign language) words in this report unless citing from a previous document that does not italicize them. CSH parenthetically translates or defines in the text the non-English words at first mention, and the commonly-used non-English words and their translations are also listed in the *Glossary* (Appendix A) for reference. However, translations of Hawaiian and other non-English words for plants and animals mentioned by community participants are referenced separately (see explanation below).

A Note about Plant and Animal Names:

When community participants mention specific plants and animals by Hawaiian, other non-English or common names, CSH provides their possible scientific names (Genus and species) in the *Common and Scientific Names of Plants and Animals Mentioned by Community Participants* (Appendix B). CSH derives these possible names from authoritative sources, but since the community participants only name the organisms and do not taxonomically identify them, CSH cannot positively ascertain their scientific identifications. CSH does not attempt in this report to verify the possible scientific names of plants and animals in previously published documents; however, citations of previously published works that include both common and scientific names of plants and animals appear as in the original texts.

Abbreviations

AIS	Archaeoalogical Inventory Survey
AMS	Army Mapping Service
Board of Commisioners to Quiet Land Titles	Land Commission
CIA	Cultural Impact Assessment
CSH	Cultural Surveys Hawai'i
DNLR	Department of Land and Natural Resources
EIS	Environmental Impact Statement
HAR	Hawai'i Administrative Rules
HCP	Habitat Conservation Plan
HECO	Hawaiian Electric Company
HRS	Hawai'i Revised Statutes
Kawailoa Wind	Kawailoa Wind, LLC
First Wind	First Wind, LLC
KS	Kamehameha Schools
LCA	Land Commission Award
OEQC	Office of Environmental Quality Control
OHA	Office of Hawaiian Affairs
OIBC	O'ahu Island Burial Council
OR&L	Oahu Railway and Land Company
SHPD	State Historic Preservation Division
SIHP	State Inventory of Historic Properties
TCP	Traditional Cultural Property
TMK	Tax Map Key
turbines	wind turbine generators
USDA	United States Department of Agriculture
USGS	United States Geological Survey

Management Summary

Reference	Cultural Impact Assessment for the Proposed Kawailoa Wind Farm Project, Multiple Ahupua'a, Waialua District, O'ahu Island (TMK: [1] 6-1-005:001, 003, 007, 014, 015, 016, 019, 020, 021, 022; 6-1-006:001, 6-1-007:001, 6-1-008:025, 6-2-002:001, 002, 025; 6-2-009:001; 6-2-011:001; & 6-7-003:024) (Genz and Hammatt 2011)
Date	June 2011
Project Number	Cultural Surveys Hawai'i (CSH) Job Code: KAWAILOA 8
Agencies	State of Hawai'i Department of Health/Office of Environmental Quality Control (DOH/OEQC)
Project Location	The proposed Project involves a wind farm site in the *mauka* (inland) regions of Kawailoa Ahupua'a that are traversed by existing onsite access roads, as well as a communication site near the summit of Mount Ka'ala in Kamananui Ahupua'a.
Land Jurisdiction	The permanent Project footprint of the wind power facilities Project is located on Kamehameha Schools (KS) property (private). Lands owned by other entities are included as existing onsite access roads traverse these properties. KS currently has reciprocal agreements with these landowners for access through their properties; it is anticipated that these rights would be extended to Kawailoa Wind for construction and operation of the project. Microwave communication facilities for the Project will be installed at existing communication sites on State-owned land (public), leased to Hawaiian Telcom, on Mount Ka'ala.
Project Description	Kawailoa Wind, LLC (Kawailoa Wind) was formed by First Wind, LLC (First Wind), a Boston-based wind energy company, for the express purpose of developing a wind power facility at the former Kawailoa Plantation on the North Shore of O'ahu in order to supply clean, renewable energy for the State of Hawai'i. Kawailoa Wind is proposing to construct, operate, and maintain a wind farm with a generating capacity of up to 70 megawatts. Specific Project components would include 30 wind turbine generators (turbines), underground and overhead electrical collector lines to carry the electrical power from each wind turbine generator to an electrical substation, a battery energy storage system, electrical switching station facilities and sub-transmission lines, an operations and maintenance building, Hawaiian Electric Company (HECO) control buildings, a communication tower with microwave dishes, meteorological

	monitoring equipment, and onsite roads to facilitate access to each of these facilities. The Project would also include installation of additional communication equipment on Mount Ka'ala in order to provide a dedicated communication link between the wind farm and existing HECO substations in Waialua and Wahiawā.
Project Acreage	The permanent Project footprint, which includes wind turbine generators, collector lines, buildings, meteorological monitoring equipment, and access roads, is 21.7 acres (see the Environmental Impact Statement [EIS] for a detailed description of the Project's components). Since the communication facility on Mount Ka'ala will be installed on top of an existing structure, there is no additional acreage.
Permanent Project Footprint and Cultural Survey Area	For this Cultural Impact Assessment (CIA), the cultural survey included the entire *ahupua'a* (land division usually extending from the uplands to the sea) of Kawailoa (and Lauhulu, Kuikuiloloa, Punanue, and Kāpaeloa; see Section 3.3 for clarification of these land divisions), and Kamananui, including the permanent Project footprint.
Document Purpose	The Project requires compliance with the State of Hawai'i environmental review process (Hawai'i Revised Statutes [HRS] Chapter 343), which requires consideration of a proposed project's effect on cultural practices and resources. CH2M HILL requested CSH conduct this CIA. Through document research and ongoing cultural consultation efforts, this report provides information pertinent to the assessment of the proposed Project's impacts to cultural practices and resources (per the *Office of Environmental Quality Control's Guidelines for Assessing Cultural Impacts*) which may include Traditional Cultural Properties of ongoing cultural significance that may be eligible for inclusion on the State Register of Historic Places, in accordance with Hawai'i State Historic Preservation Statute (Chapter 6E) guidelines for significance criteria according to Hawai'i Administrative Rules (HAR) §13-275 and §13-284 under Criterion E. The document is intended to support the Project's environmental review and may also serve to support the Project's historic preservation review under HRS Chapter 6E and HAR Chapter 13-275 and 13-284.
Consultation Effort	Hawaiian organizations, agencies and community members were contacted in order to identify potentially knowledgeable individuals with cultural expertise and/or knowledge of the permanent Project footprint and the vicinity. The organizations consulted included the State Historic Preservation Division, the Office of Hawaiian Affairs, the O'ahu Island Burial Council, Hui Mālama I Nā Kūpuna O Hawai'i

	Nei, the Waialua Hawaiian Civic Club, and community members of Kawailoa and Kamananui Ahupua'a.
Results of Background Research	Background research for this Project yielded the following results (presented in approximate chronological order): 1. The *moku* (district) of Waialua contained a set of centrally located productive lands and peripheral areas that were ecologically marginal but that had access to abundant ocean resources. The fertile center consisted of the area surrounding Kaiaka and Waialua Bays located in the *makai* (seaward) regions of the *ahupua'a* of Kamananui, Pa'ala'a, and Kawailoa. This core productive region likely supported the majority of the Waialua population. In marked contrast, small fishing communities were located on marginal lands at the edges of Waialua, including Kāpaeloa. 2. The earliest settlements along the northern coastal areas of O'ahu have yet to be recovered archaeologically, but a settlement complex in Anahulu Valley, which was most likely a peripheral extension of the core Waialua production lands, dates to A.D. 1300. This complex, located next to the southern section of the Kawailoa permanent Project footprint, includes numerous habitation sites, rock shelters, irrigation systems, and dryland agricultural remains (Kirch 1992). 3. *Mo'olelo* (oral traditions) chronicle the rise of divine kingship in the uplands of Waialua. Located near what some people consider the *piko* (navel or center) of O'ahu, the site of Kūkaniloko was a birthing place of *ali'i kapu* (sacred chiefs), who were the *akua* (gods) of the land (Kamakau 1964:12). The *ahupua'a* system of territorial land units was established in approximately A.D. 1400 by Mā'ilikūkahi, an *ali'i kapu* who was born at Kūkaniloko in the uplands of Waialua, and whose chiefly title was consecrated at the *heiau* (sacred place of worship, temple) of Kapukapuākea (Kirch 2010:84–90) 4. *The Wind Gourd of La'amaomao* tells the story of how Pāka'a and his son Kuāpāka'a, descendants of the wind god La'amaomao, controlled the winds of Hawai'i through a gourd that contained the winds and could be called forth by chanting their names (Nakuina 1992). Pāka'a's chant traces the winds of O'ahu and the *moku* of Waialua, including the wind that blows at Mount Ka'ala, called Pu'u-ka'ala. Other *mo'olelo* connect the gourd of La'amaomao to the god Lono, a cosmic gourd from whence came the winds, clouds, and rain (Handy and Handy 1972:220; *Ka Na'i Aupuni* 1906). A cultural connection

	can be made between the *mo'olelo* of the wind goddess La'amaomao and modern wind farms: Wind farms (such as First Wind), just like the descendants of La'amaomao, involve the capturing and harnessing of wind energy. One difference is that while Pāka'a once malevolently summoned the winds to detain his *ali'i* on Moloka'i (Nakuina 1992), wind farms (such as First Wind) aim to benevolently use the wind as a means of renewable energy. 5. The summit of Ka'ala, the highest point on O'ahu, is considered a sacred place (Wai'anae Ecological Characterization 2011). *Kāhuna* (priests) described the summit plateau as being "clothed in the golden cloak of Kane," a resting place for spirits of the dead (McGrath et al. 1973:11). It is possible that this resting place was for souls heading down the spine of the Wai'anae mountains toward Ka'ena Point, a *leina 'uhane* (leap of the soul), or place where the souls of the dead leaped into the next world (McAllister 1933:125–126). Other *mo'olelo* relate the significance of the Ka'ala summit for weather forecasting and making prophecies (Kalākaua 1890:155–173; 455–480). 6. The distant lands of the proposed Project, from the southwest mountainous peak of Ka'ala to the northeast coastal region of Kāpaeloa, were once connected culturally and politically prior to the introduction of private property with the Māhele of 1848. The proposed microwave communications facility Project area near the summit of Mount Ka'ala is part of Kamananui Ahupua'a, formerly the political and ritual center of Waialua. The *konohiki* (stewards) of Kamananui also managed detached, outlying lands, including the fishing community of Kāpaeloa at the eastern border of Waialua. Then, in the 1820s, the ruling chief of Kamananui Ahupua'a moved to Anahulu Valley in the *ahupua'a* of Kawailoa, which resulted in a redrawing of *ahupua'a* boundaries. Kāpaeloa and other outlying sections of Kamananui were thus subsumed into the land of Kawailoa (Sahlins 1992:20–21). The proposed wind power facility permanent Project footprint is located in this expanded region of Kawailoa. 7. Previous archaeological research and recent cultural resource management work indicate that the *ahupua'a* of Kawailoa and Kamananui contain numerous cultural sites and *wahi pana* (storied places) indicative of ancient settlement patterns. *Mo'olelo* suggest that the summit swamp of Mount Ka'ala near the microwave communication facility Project area was

formerly a freshwater fishpond called Luakini. McAllister (1933) documented two sites in the vicinity of the *makai* access roads of the Kawailoa permanent Project footprint —a *heiau* called 'Ili'ilikea (Site 237), which was destroyed in 1916 by W. Harpham for the Waialua Agricultural Company (but according to Mr. Jan Becket, part of it is still standing, although not in the permanent Project footprint; see Results of Community Consultation), and a complex of partially enclosed terraces, platforms, and walls called Kahōkūwelowelo (Site 240) that has been variously described as a priestly dwelling, monastery, and *heiau* (*Honolulu Advertiser* 1933; McAllister 1933:143; Thrum 1906). The accompanying Archaeological Inventory Survey (AIS) (Rechtman et al. 2011) confirmed that there are not any *heiau* or other Native Hawaiian cultural sites in the permanent Project footprint.

8. Previous archaeological research and recent cultural resource management work indicate numerous burials in Kawailoa and Kamananui. In proximity to the Kawailoa permanent Project footprint are burials within and near the early settlements in the upper Anahulu Valley (Kirch 1992:88, 94,104, 112) and along the coastal strip of Kawailoa on the inland side of Kamehameha Highway (State Inventory of Historic Properties [SIHP] No. 50-80-01-3724, Bath 1988; SIHP No. 50-80-01-4670, Avery and Kennedy 1993; SIHP No. 50-80-01-5495, Borthwick et al. 1998).

9. Land Commission Award documentation of the Māhele indicates a wide range of indigenous Hawaiian subsistence practices in the vicinity of the permanent Project footprint in Kawailoa prior to 1850. The land claims reveal that Hawaiian households had multiple *'āpana* (lots) in different geographical locations, involving the cultivation of taro, bananas, bitter gourds, melon, corn, sugarcane, and sweet potatoes, and *pali* (cliffs) were exploited for the collection of *wauke* (paper mulberry) (Waihona 'Aina 2000).

10. The landscape of Kawailoa and Kamananui Ahupua'a shifted dramatically during the last two decades of the nineteenth century with rice, sugar, and pineapple cultivation. The development of the Oahu Railway and Land Company (OR&L) led to the rise of the Waialua Agricultural Company, later named the Waialua Sugar Company. The Kawailoa Plantation, situated on the rolling ridges above Hale'iwa, included 6,000 acres of sugar cultivation. After the Waialua Sugar Company closed in 1998, Kamehameha Schools began managing the

	Kawailoa Plantation as a diversified farming operation (*Imua* 2005:15–16). The accompanying AIS (Rechtman et al. 2011) did identify 17 historic sites associated with the former plantation (and military) activities in the permanent Project footprint. 11. Philip Ninomiya and Manabu Nonaka, descendants of Japanese immigrants in Waialua, describe in previously recorded oral histories a diet of mostly fish for the Japanese plantation workers and their families, including *aji* (*akule*, big-eyed scad fish), *pāpio* (young stage of *ulua*, crevalle, jack, or pompano), *āholehole* (young stage of *āhole*, Hawaiian flagtail), *moi* (threadfish), *'oama* (young stage of *weke*, goatfish), and *tako* ([Japanese] squid, octopus), as well as *ogo* ([Japanese] seaweed). They also constructed rafts out of *akakai* (reeds) that grew along Anahulu Stream (UH 1977).
Results of Community Consultation	CSH attempted to contact 37 community members and government agency and community organization representatives. Of the 17 people that responded, nine *kūpuna* (elders) and/or *kama'āina* (Native-born) participated in formal interviews for more in-depth contributions to the CIA. This community consultation indicates: 1. Community participants share a range of *mana'o* (thoughts, opinions) and views on the proposed wind farm. Four participants support the Project. Mr. Thomas Shirai states that the Project will not have any cultural impacts, Ms. Gladys Awai-Lennox does not have any cultural concerns, Mrs. Lavina Agader believes that the wind farms will be a good use of the land since it is no longer supporting agriculture, and Mr. Kawika Au is supportive if the Project is done *pono* (in the correct way). Other participants articulated their *mana'o* as to how the Project may impact cultural sites, beliefs, and practices: 2. Community participants describe and map the locations of numerous cultural sites in the *makai* section of Kawailoa, several of which are located near the Project's access roads. Based on the teaching of *kupuna* Rudy Mitchell, Mr. Jan Becket maps the locations of the following cultural sites in the vicinity of the permanent Project footprint: Kahōkūwelowelo Heiau, Kahōkūwelowelo Hale, burials, an enclosure, a wall, a rock carving, an altar, and other rock structures (see Figure 35). Mrs. Emmaline Causey describes the locations of two Japanese graveyards just *makai* and *mauka* of her property very close to Old Cane Haul Road and Kawailoa Road, and Mrs. Agader

	describes three burials at the former Kawailoa Camp. Having previously noticed how the transport of wind turbines required the entire width of a two-lane road, she is concerned that the transport of wind turbines along Old Cane Haul Road and Kawailoa Road may disturb these two graveyards, which are only maintained twice a year and may thus be at times obstructed from view. In addition, Ms. Coochie Cayan, the History and Culture Branch Chief of the SHPD, states that the proposed Project will have an impact on the area's well documented *mo'olelo*, historic sites, archaeological sites, and burials. The accompanying AIS (Rechtman et al. 2011) has not identified any cultural sites in the permanent Project footprint; however, 17 historic sites associated with the former plantation activities or former military operations have been identified within the permanent Project footprint and archaeological monitoring is recommended. 3. Mr. Becket draws attention to intensive archaeological investigations in the upper Anahulu Valley (Kirch and Sahlins 1992) and suggests that parallel groupings of upper valley settlements may be located in the gulches in the northern *mauka* sections of Kawailoa, including the permanent Project footprint. Ms. Awai-Lennox and Mr. Butch Helemano also describe, in general terms, several *heiau* in the *mauka* lands of Kawailoa, and Mr. Au is aware of numerous cultural sites in the *mauka* portions of Kawailoa, including *three* heiau, several former habitation sites, and walls, although he does not specify their location. The accompanying AIS (Rechtman et al. 2011) has not identified any *heiau* or other cultural sites in the permanent Project footprint, and is avoiding the gulches and steep slopes where burials could be found. 4. The entire landscape of Waialua was covered in sugarcane during the first half of the twentieth century, according to Mrs. Agader. Immigrants settled in various "camps," including Japanese, Chinese, Korean, and Filipino laborers and their families at Kawailoa Camp near the southern access roads of the Project. 5. The *makai* and *mauka* lands of Kawailoa contain abundant ocean and forest resources. Along the coast at Kāpaeloa, Mrs. Causey and her family used to gather *'ōpihi* (limpet), *pipipi* (pearl oyster), and *limu* (seaweed), including *ogo* and

	wāwae'iole, and catch *akule*, *kūmū* (goatfish), *'āweoweo* (big eye), *manini* (convict tang), and *āholehole*. Near Hale'iwa, Ms. Gladys Awai-Lennox and her family used to cultivate taro, breadfruit, and bananas. Her family also fished extensively along the coast, catching *nenue* (chub fish), *kala* (surgeon fish), *'oama*, and gathered *wana* (spiny urchins), *ha'uki'uki* (shingle urchins), *pipipi*, and several kinds of *limu* including *wāwae'iole*, *ogo*, *'ele'ele*, and *kohu*. Her family also collected the seed pods of *kiawe* (mesquite) for cattle and pig fodder, and made leis from the red *hala* (pandanus) fruit. In addition, she also describes the importance to her family of the *'alae 'ula* (Common Hawaiian Moorhen). Mrs. Agader also relates that Kamehameha Schools recently planted *koa* in the *mauka* portions of Kawailoa. Ms. Cayan, as the History and Culture Branch Chief of the SHPD, recommends that access and gathering rights should not be prevented, as certain families, practitioners, and groups continue to practice Hawaiian spirituality, traditional burials, and other activities, such as hunting and hiking. Although community members have not identified such cultural practices, First Wind will work with Kamehameha Schools to facilitate access in the wind farm permanent Project footprint and the *mauka* Kawailoa property for hiking, hunting, gathering, and cultural practices. 6. Drawing from the Kumulipo, a cosmological creation chant, and *kūpuna*, Mr. Tom Lenchanko articulates an expansive view of Kūkaniloko (the current State of Hawai'i five-acre park site noted to be Kūkaniloko Birthstones State Monument, a sacred site for the birth of *ali'i* [chiefs]) that extends geographically to encompass 36,000 acres of land within a network of *ka'anani'au* (boundary markers). This area, which has *mana* (divine power), includes the *mauka* portions of Kawailoa and Kamananui. Mr. Lenchanko is concerned that the proposed Project will trespass upon his family's *'āina* (land) and *iwiawaloa* (ancestral burial places). He also asserts his belief that the wind turbines will forever impact the traditional cultural properties of the *mauka* sections of Kawailoa and Mount Ka'ala—they will impede the vision of the traditional natural landscape and interfere with the view plane of those who are buried in the land. The accompanying AIS (Rechtman et al. 2011) has not identified any burial features in the permanent Project footprint. According to First Wind, the wind farm Project will not make a

	permanent change to the landscape—the wind turbine equipment will either be replaced or removed after 20 years. 7. Mr. Moki Labra and Mr. Helemano are concerned about the massive scale of development (30 wind turbines) in Kawailoa: Mr. Labra states that "parts of the *ahupua'a* need to be rested" and that the *'āina* (land) needs to "get balance," and Mr. Helemano criticizes land stewardship that enables the desceration of "our sacred lands and fragile natural resources." Mr. Au and Ms. Betty Jenkins concur with Mr. Labra that if the Project is not done in the correct way (*pono*), the "winds might not listen and could stop blowing altogether." Mr. Labra questions the company name, 'Kawailo Wind,' and the location of the Project—'Kawailoa' is not the name of the wind that blows through the *ahupua'a* and other places on O'ahu have much stronger winds. Mr. Au summarily states that he could support the Project if it benefits local Hawaiian people and is not only to make outsiders rich. According to First Wind, the company will work with the Waialua community to seek input about the Project and how the wind farm should support community priorities in the area in order to create a balance to any perceived negative impacts. In addition, previous First Wind projects were blessed by *kahu* (guardians) at several stages during the construction process in accordance with cultural traditions.
Impacts and Recommendations	Based on the information gathered for the cultural and historic background and community consultation detailed in this CIA report, the proposed Project may potentially impact Native Hawaiian burials and cultural beliefs. CSH identifies these potential impacts and makes the following recommendations: 1. The accompanying AIS has not documented any burial features in the permanent Project footprint (Rechtman et al. 2011), and it is unlikely that burials will be encountered due to previous disturbance from former plantation activities and military operations. However, community participants Mr. Becket and Mrs. Causey express concerns of the proximity of the Project's *makai* access roads to cliff burials and Japanese graveyards, and Ms. Cayan, as the History and Culture Branch Chief of the SHPD, states that the Project will impact burials. Since land-disturbing activities may uncover presently undetected burials, personnel involved in the construction activities of the permanent Project footprint should be informed of the possibility of inadvertent cultural finds, including human

	remains. The accompanying AIS (Rechtman et al. 2011) recommends archaeological monitoring as appropriate mitigation to address (in part) the possibility of presently unidentified burials. Should burials (or other cultural finds) be identified during ground disturbance, the construction contractor should immediately cease all work and the appropriate agencies notified pursuant to applicable law. 2. Community participants Mr. Lenchanko, Mr. Labra, and Mr. Helemano express that the wind turbines will impact the visual landscape and the integrity of the cultural landscape of Kawailoa. Although these community participants did not describe visual impacts from any specific cultural sites, First Wind notes that some of the wind turbines will be visible from cultural sites, such as Pu'u o Mahuka Heiau, and culturally significant locations, including Waimea Valley, which was nominated as a Traditional Cultural Property (Monahan 2008), and Hale'iwa, which is a State Historic, Cultural, and Scenic District. Other community members, such as Mr. Shirai, Ms. Awai-Lennox, Mrs. Agader, and Mr. Au, are supportive of the Project for a variety of reasons if it is conducted *pono*. According to First Wind, the company aims to operate this wind energy Project in a way that is respectful to Native Hawaiian cultural beliefs. For other wind farm projects, First Wind has sought community input about the Project and how the wind farm should support community priorities so as balance the perceived negative impacts. For this Project, First Wind has already engaged the Waialua community and intends to form a long-term partnership with Waimea Valley to support their efforts to promote Hawaiian culture. First Wind should continue to brief and consult with community members and organizations as the Project design and construction progresses in order to inform the community of any changes that could result in unanticipated adverse cultural impacts and to better understand and incorporate the Hawaiian cultural worldview.

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Section 1 Introduction

1.1 Project Background

At the request of CH2M HILL, Cultural Surveys Hawai'i, Inc. (CSH) conducted a Cultural Impact Assessment (CIA) for the proposed Kawailoa Wind Farm Project, Multiple Ahupua'a, Waialua District, O'ahu Island and includes the following parcels:

- Wind Farm Site: TMK [1] 6-1-005:001; 6-1-006:001; 6-1-007:001; 6-2-011:001
- Traversed by Existing Onsite Access Roads: TMK [1] 6-1-005:003, 007, 014, 015, 016, 019, 020, 021, 022; 6-1-008:025; 6-2-002:001, 002, 025; 6-2-009:001 (Figure 1 to Figure 3)
- Mount Ka'ala Communication Sites: TMK [1] 6-7-003:024 (Figure 4 to Figure 6)

The permanent Project footprint, which includes wind turbine generators, collector lines, buildings, meteorological monitoring equipment, and access roads, is 21.7 acres (see the Environmental Impact Statement [EIS] for a detailed description of the Project's components). Since the communication facility on Mount Ka'ala will be installed on top of an existing structure, there is no additional acreage. For this CIA, the cultural survey included the entire *ahupua'a* (land division usually extending from the uplands to the sea) of Kawailoa (and Lauhulu, Kuikuiloloa, Punanue, and Kāpaeloa; see Section 3.3 for clarification of these land divisions), and Kamananui, including the permanent Project footprint.

Kawailoa Wind, LLC (Kawailoa Wind) was formed by First Wind, LLC (First Wind), a Boston-based wind energy company, for the express purpose of developing a wind power facility at the former Waialua Sugar Plantation on the North Shore of O'ahu in order to supply clean, renewable energy for the State of Hawai'i. Kawailoa Wind is proposing to construct, operate, and maintain a wind farm with a generating capacity of up to 70 megawatts on Kamehameha Schools (KS) property located on the North Shore of O'ahu. The proposed wind farm facilities would be located on KS land at the former Waialua Sugar Plantation (Kawailoa, Lauhulu, Kuikuiloloa, Punanue, and Kāpaeloa Ahupua'a). The proposed wind farm would support the fiduciary responsibility of this *ali'i* (chiefly) land trust. Lands owned by other entities are included as existing onsite access roads traverse these properties. KS currently has reciprocal agreements with these landowners for access through their properties; it is anticipated that these rights would be extended to Kawailoa Wind for construction and operation of the Project. Microwave communication facilities for the Project will be installed at existing communication sites on State-owned land, leased to Hawaiian Telcom, on Mount Ka'ala (Kamananui Ahupua'a).

Specific Project components would include 30 wind turbine generators (turbines), underground and overhead electrical collector lines to carry the electrical power from each wind turbine generator to an electrical substation, a battery energy storage system, electrical switching station facilities and sub-transmission lines, an operations and maintenance building, Hawaiian Electric Company (HECO) control buildings, a communication tower with microwave dishes, meteorological monitoring equipment, and onsite roads to facilitate access to each of these facilities (Kawailoa Road, Mid-Line Road, Ashley Road, and Cane Haul Road). The Project

would also include installation of additional communication equipment on Mount Ka'ala in order to provide a dedicated communication link between the wind farm and existing HECO substations in Waialua and Wahiawā.

At each of its wind projects in Hawai'i, First Wind works to study and understand the important environmental and cultural resources in and around the project area. First Wind's goal is to develop and operate wind energy projects in a way that is respectful to Hawai'i's unique cultural and natural resources while also contributing to the local communities where its wind farms are located. First Wind has conducted previous cultural and environmental mitigation and community outreach on other wind farm projects, and is planning on conducting mitigation and outreach for the Kawailoa wind farm (see Section 7.4 for proposed mitigation and community outreach).

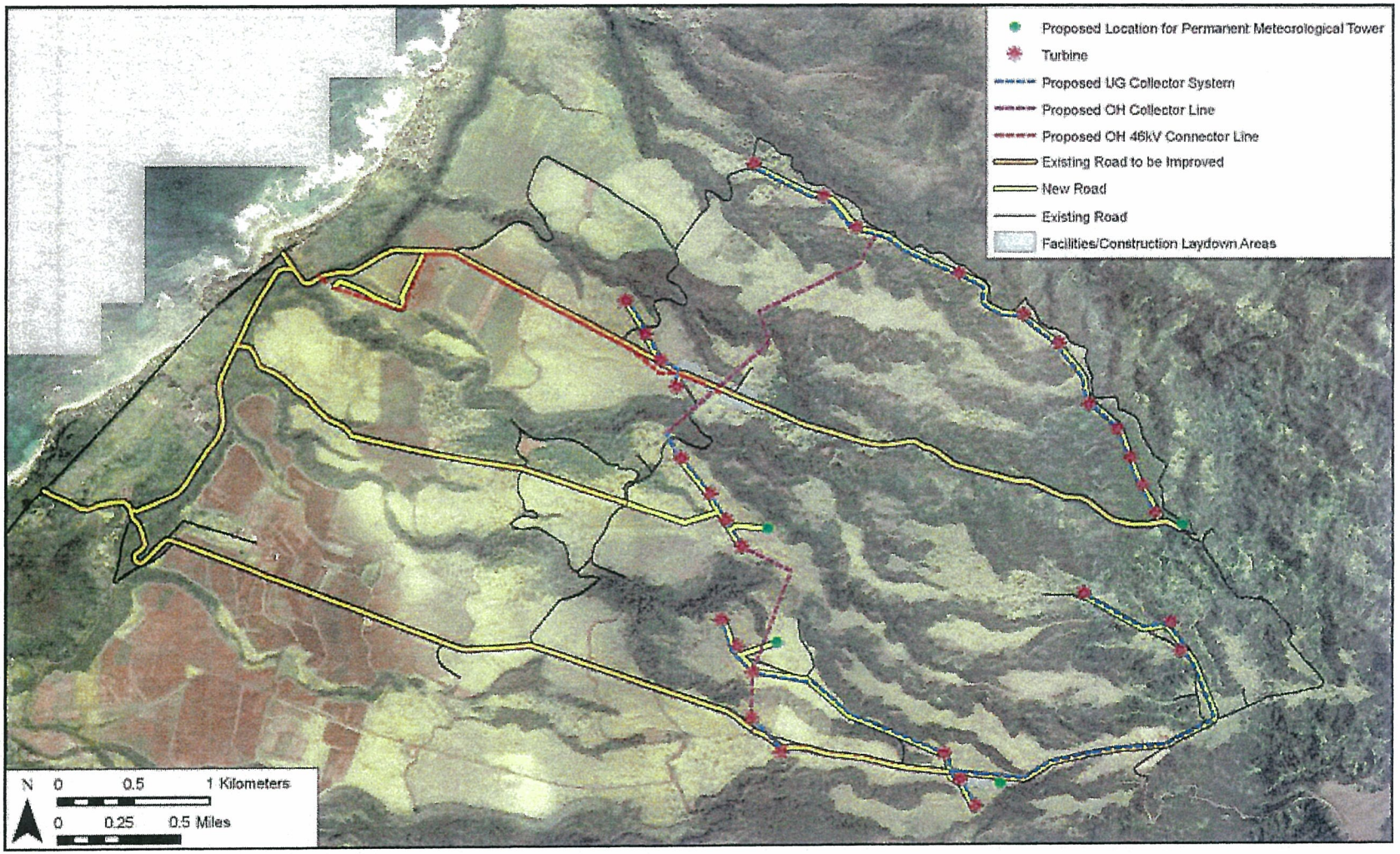

Figure 1. Portion of the orthoimagery of the 2005 U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle showing the proposed Project in Kawailoa

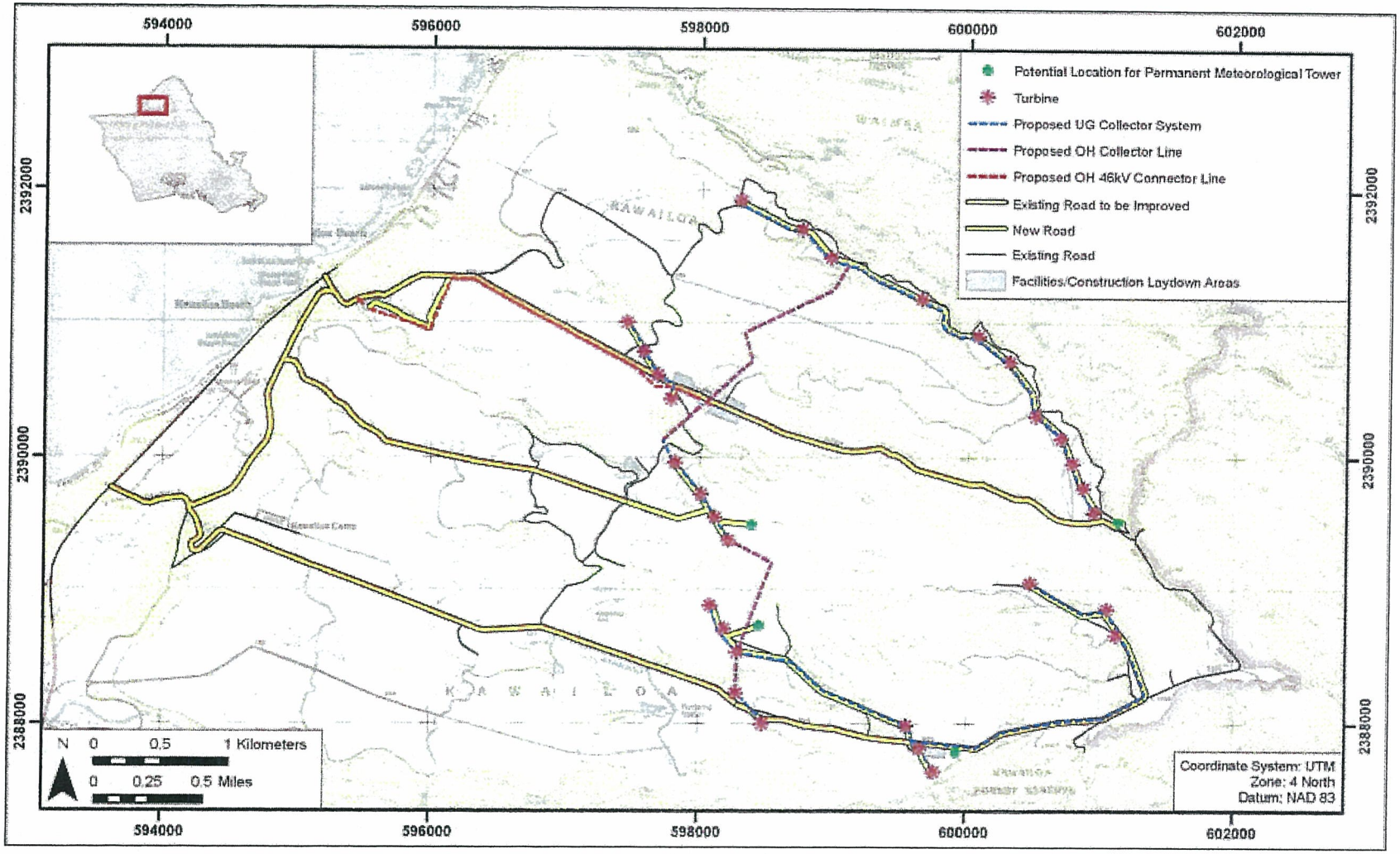

Figure 2. Portion of the USGS 7.5-minute series topographic map, Waimea (1998), Hale'iwa (1999), and Hau'ula (1992) quadrangles, showing the proposed Project in Kawailoa

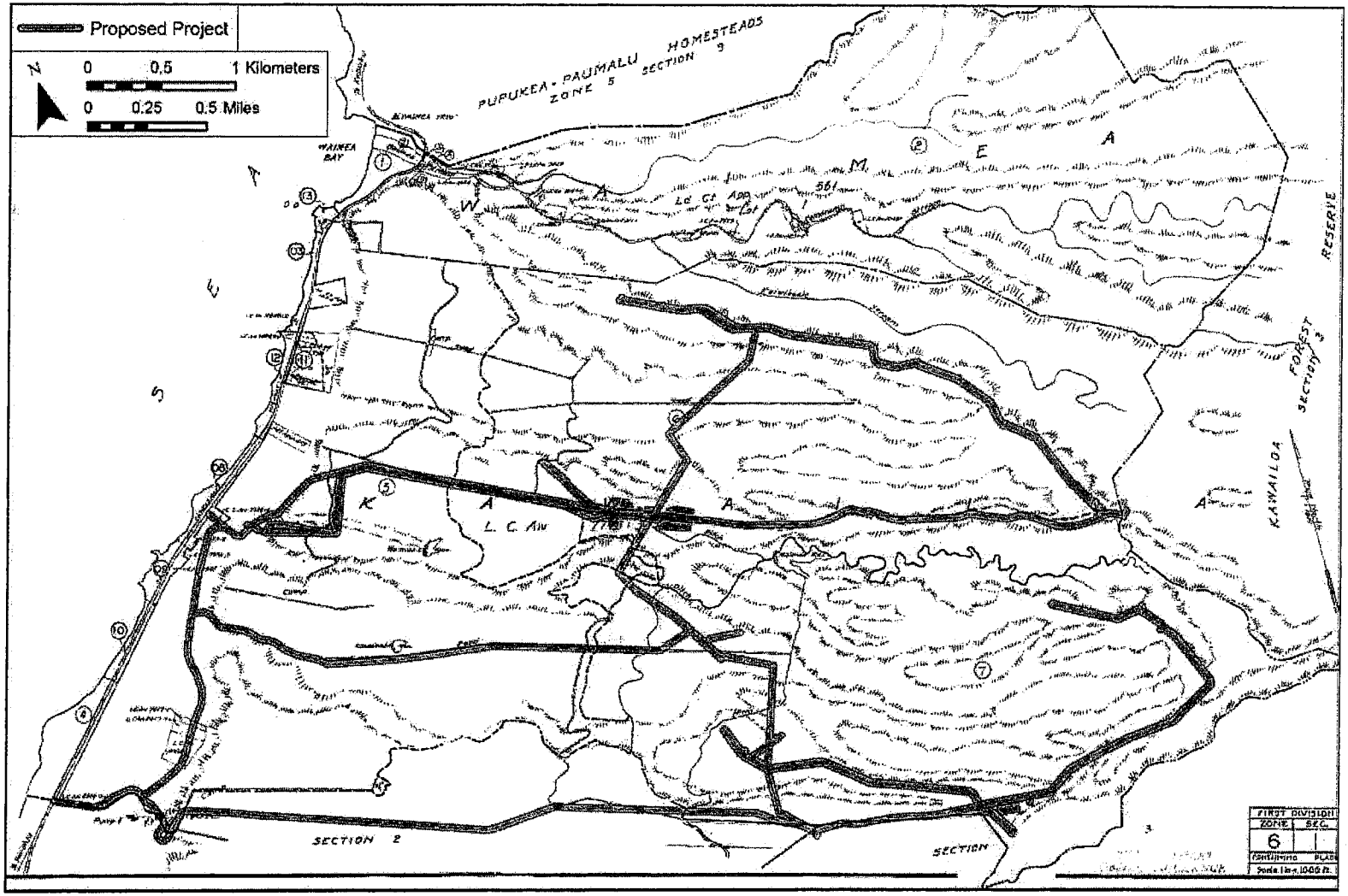

Figure 3. Tax Map Key (TMK): [1] 6-1 showing the proposed Project in Kawailoa (Hawai'i TMK Service 2011)

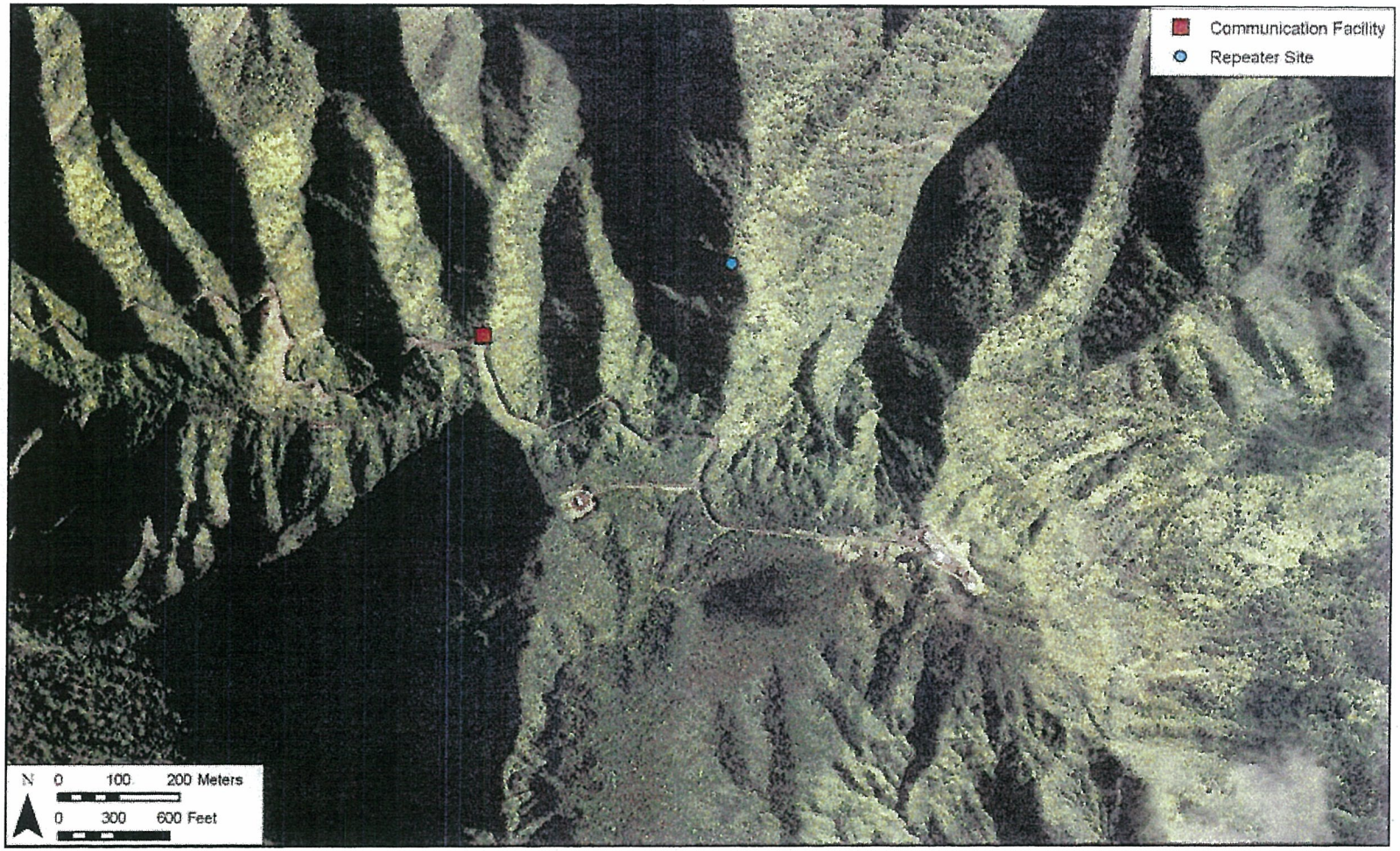

Figure 4. Portion of the orthoimagery of the 2005 USGS 7.5-minute topographic quadrangle showing the Project area on Mount Ka'ala

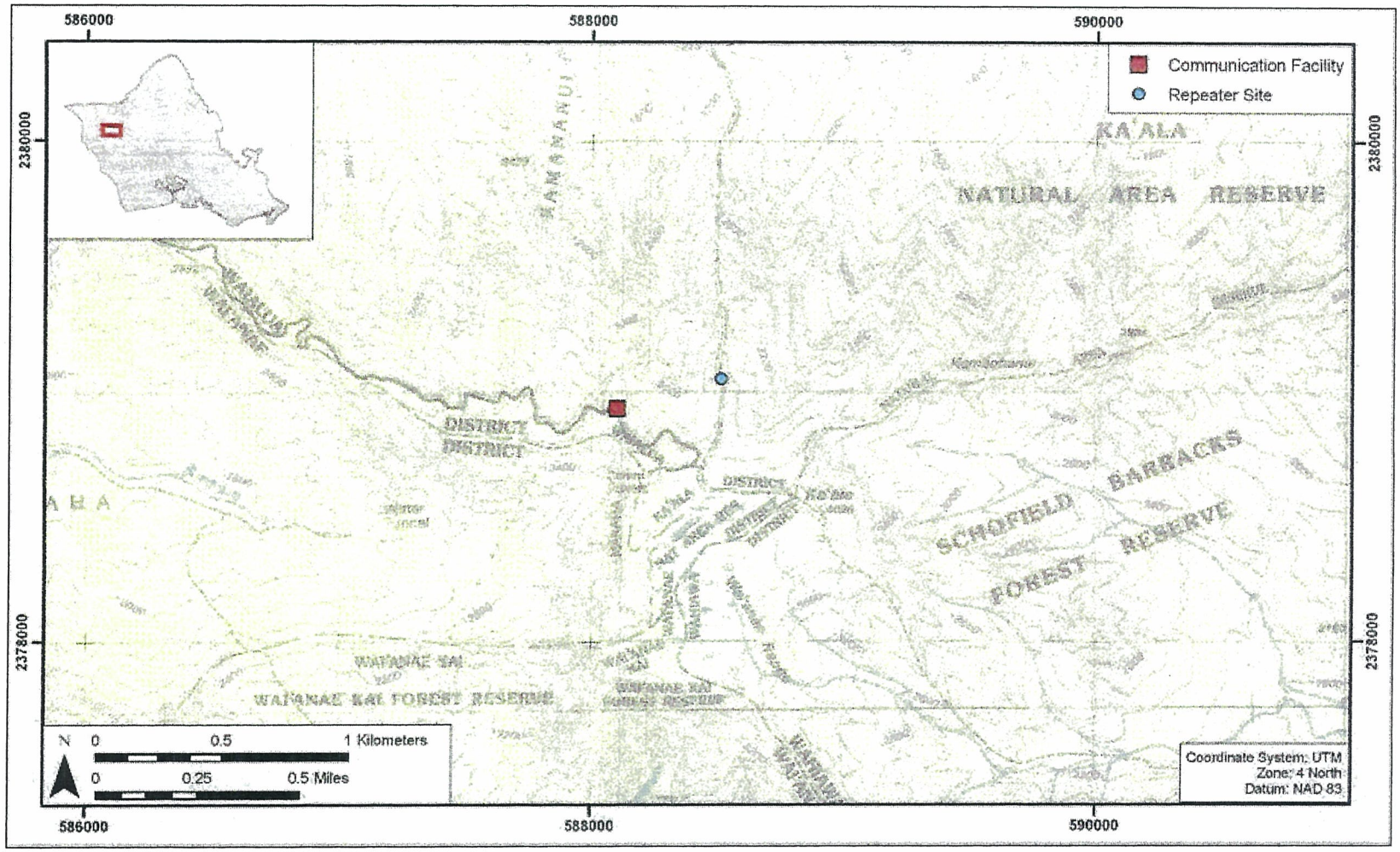

Figure 5. Portion of the U.S. Geological Survey 7.5-minute series topographic map, Ka'ena (1998), Hale'iwa (1999), and Hau'ula (1992) quadrangles, showing the Project area on Mount Ka'ala

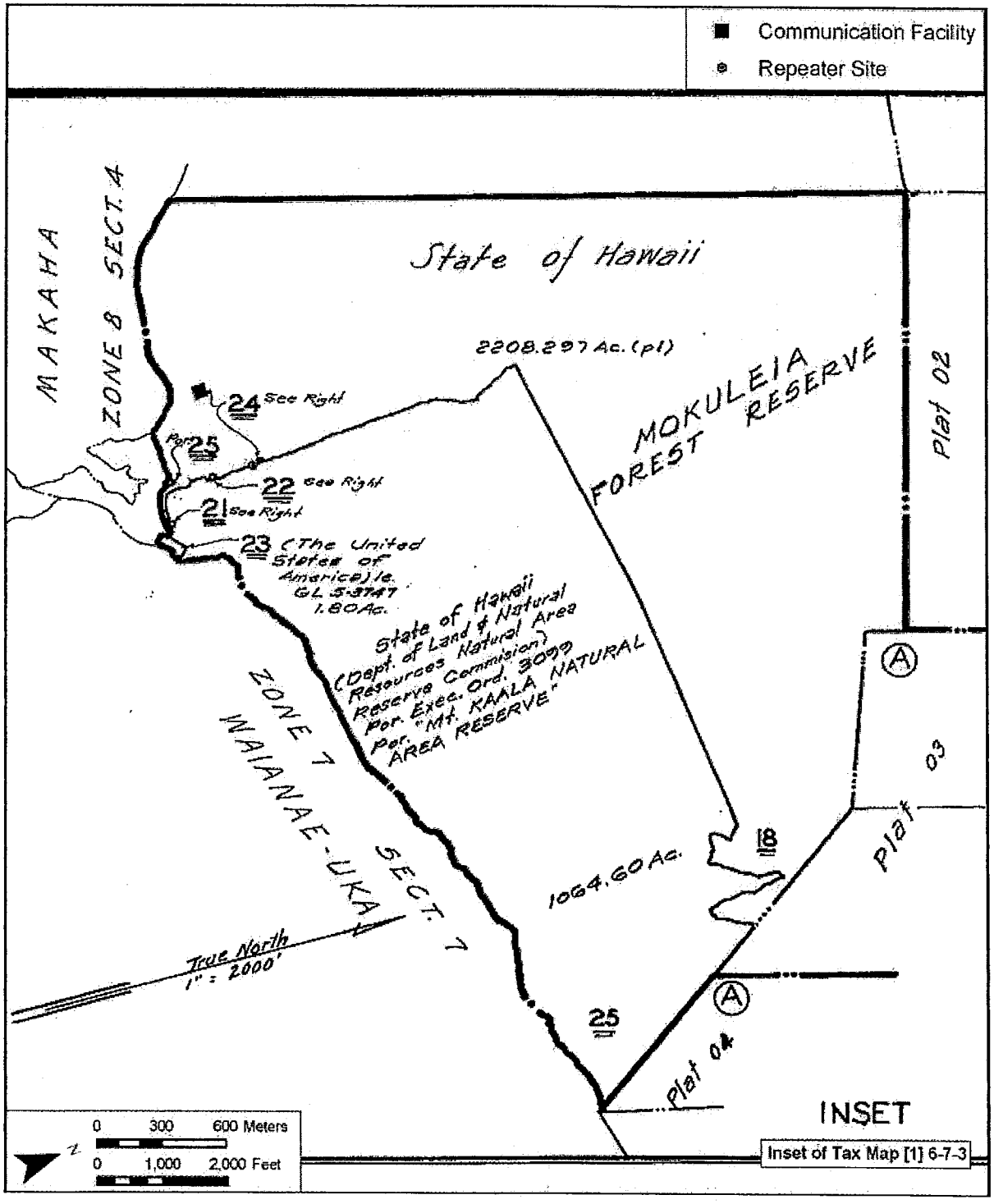

Figure 6. TMK [1] 6-7-003 showing the Project area on Mount Ka'ala (Hawai'i TMK Service 2011)

1.2 Document Purpose

The Project requires compliance with the State of Hawai'i environmental review process (Hawai'i Revised Statutes [HRS] Chapter 343), which requires consideration of a proposed project's effect on cultural practices. CSH conducted this CIA at the request of CH2M HILL. Through document research and ongoing cultural consultation efforts, this report provides information pertinent to the assessment of the proposed Project's impacts to cultural practices and resources (per the *Office of Environmental Quality Control's Guidelines for Assessing Cultural Impacts*), which may include Traditional Cultural Properties (TCPs) of ongoing cultural significance that may be eligible for inclusion on the State Register of Historic Places, in accordance with Hawai'i State Historic Preservation Statute (Chapter 6E) guidelines for significance criteria in Hawai'i Administrative Rules (HAR) §13-275 and §13-284 under Criterion E, which states that to be significant an historic property shall:

> Have an important value to the 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 or oral accounts—these associations being important to the group's history and cultural identity.

The document is intended to support the Project's environmental review and may also serve to support the Project's historic preservation review under HRS Chapter 6E and HAR Chapter 13-275 and 13-284.

Rechtman Consulting, LLC conducted an Archaerological Inventory Survey (AIS) for the permanent Project footprint. The results of this archaeological study are presented in a companion report (Rechtman et al. 2011) (see Section 3.4.5).

1.3 Scope of Work

The scope of work for this CIA includes:

1. Examination of cultural and historical resources, including Land Commission documents, historic maps, and previous research reports, with the specific purpose of identifying traditional Hawaiian activities including gathering of plant, animal, and other resources or agricultural pursuits as may be indicated in the historic record.
2. Review of previous archaeological work at and near the subject parcel that may be relevant to reconstructions of traditional land use activities; and to the identification and description of cultural resources, practices, and beliefs associated with the parcel.
3. Consultation and interviews with knowledgeable parties regarding cultural and natural resources and practices at or near the parcel; present and past uses of the parcel; and/or other practices, uses, or traditions associated with the parcel and environs.
4. Preparation of a report that summarizes the results of these research activities and provides recommendations based on findings.

1.4 Environmental Setting

1.4.1 Natural Setting, Geology, and Topography

The wind farm permanent Project footprint is located within the coastal lowlands, extending *mauka* (inland) towards the base of the Ko'olau mountain range. The proposed wind farm turbines and facilities are located within moderately sloping lands that range in elevation from 200 to 1,280 feet above mean sea level. The proposed communication facilities Project area is located along steep (nearly vertical) mountainous ridges near the summit of Mount Ka'ala at an elevation of 3,600 and 3,200 feet above mean sea level.

1.4.2 Streams, Rainfall, Soils, and Vegetation

Two streams flank the permanent Project footprint in Kawailoa—Anahulu River flows to Waialua Bay and Kaiwiko'ele Stream flows to Waimea Bay. Other streams occur within the permanent Project footprint but are primarily dry throughout most of the year. The *mauka* and *makai* (seaward) regions of Kawailoa Ahupua'a receive moderate rainfall annually (between 800 and 1,500 millimeters) (Giambelluca, et al. 1986).

According to U.S. Department of Agriculture (USDA) soil survey data (Foote et al. 1972), sediments in the Kawailoa permanent Project footprint consist (generally from *mauka* to *makai*) of Paaloa Silty Clay (PaC), Leilehua Silty Clay (LeB, LeC), Wahiawā Silty Clay (WaA, WaB, WaC), Lahaina Silty Clay (LaB, LaC), Ewa Stony Silty Clay (EwC), Waialua Silty Clay (WkB), Jaucas Sand (JaC) (Figure 7). The predominant soil types at the permanent Project footprint are in the Lahaina, Leilehua, and Wahiawa series, all of which are typically well-drained soils derived from weathered basalt that form in upland areas. Alluvial fans are present along the base of the Ko'olau mountain range, as well as colluvial deposits along the sides of stream gulches.

Typical vegetation in the Kawailoa permanent Project footprint includes (generally from *mauka* to *makai*) Bermuda grass, guava, *koa haole* (common shrub), *honohono* (dayflower), lantana, *'ōhi'a* (native tree), ferns, *koa*, California grass, Formosa *koa*, eucalyptus, feather fingergrass, *'ilima* (native shrub), *kiawe* (Algaroba tree), lantana, *'uhaloa* (a small American weed), klu, brisly foxtail, and Australian saltbush (Foote et al. 1972:30, 48, 79, 81, 106, 124, 128).

The mountainous region of the communication facility Project area near the summit of Mount Ka'ala receives heavy rainfall annually (2,000 millimeters) (Giambelluca et al. 1986). A large bog exists at the summit plateau of Mount Ka'ala, as well as intermittent streams and pools. According to USDA soil survey data (Foote et al. 1972), the Project area on Mount Ka'ala consists of areas of Tropohumults-Dystrandepts association (rTP) (Figure 8). These are areas dominated by deep drainages and narrow ridges, with slopes reaching 90 percent. Tropohumults, which occur at the highest elevations, are well-drained soils with a surface layer of reddish-brown silty clay, subangular subsoils, and an underlying structure of ironstone pan or saprolite (Foote et al. 1972:122). Typical vegetation near the summit of Mount Ka'ala includes *'ōhi'a*, *koa*, *'a'ali'i* (native hardwood shrubs), and ferns (Foote et al. 1972:122).

1.4.3 Built Environment

The *mauka* portion of these lands was leased to Waialua Sugar Company for the cultivation of sugar cane from 1889 to 1996. During this period of cultivation, the land was heavily disturbed by activities including construction of site access roads and stockpiling of soil and vegetative debris. Several roads extend *mauka* into the Kawailoa permanent Project footprint, some of which are proposed to be improved for site access. In addition, an existing meteorological tower is located in the northeastern section of the permanent Project footprint.

The proposed sites for the Project's microwave communication facilities near the summit of Mount Ka'ala are already being used as communication facilities by Hawaiian Telcom, and are accessed with a paved single-lane road. Existing structures include small buildings, towers, and several antennas and antennae dishes.

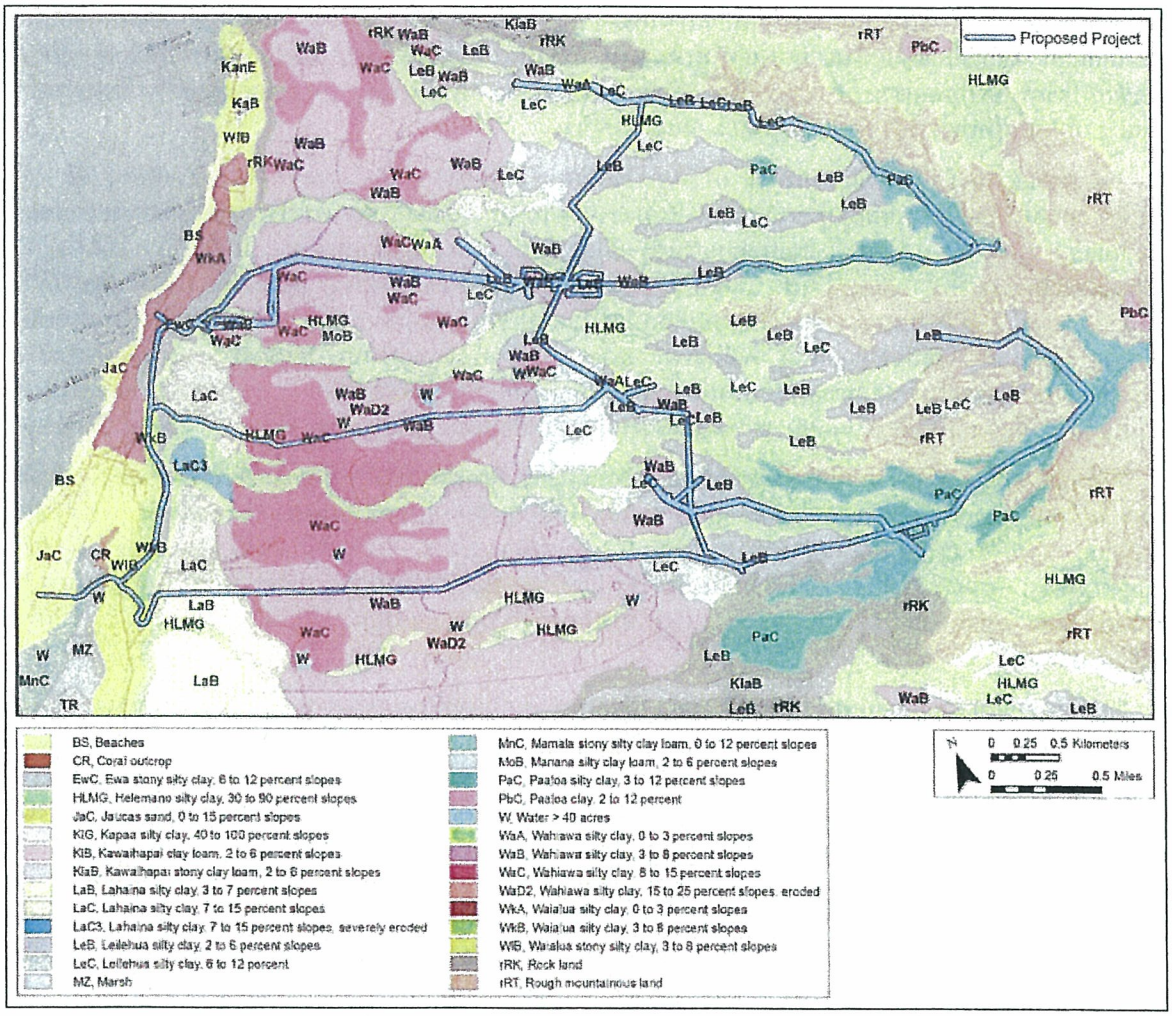

Figure 7. Portion of the USGS 7.5-minute series topographic map, Waimea (1998), Hale'iwa (1999), and Hau'ula (1992) quadrangles, showing the permanent Project footprint in Kawailoa with soil overlay (Foote el al. 1972)

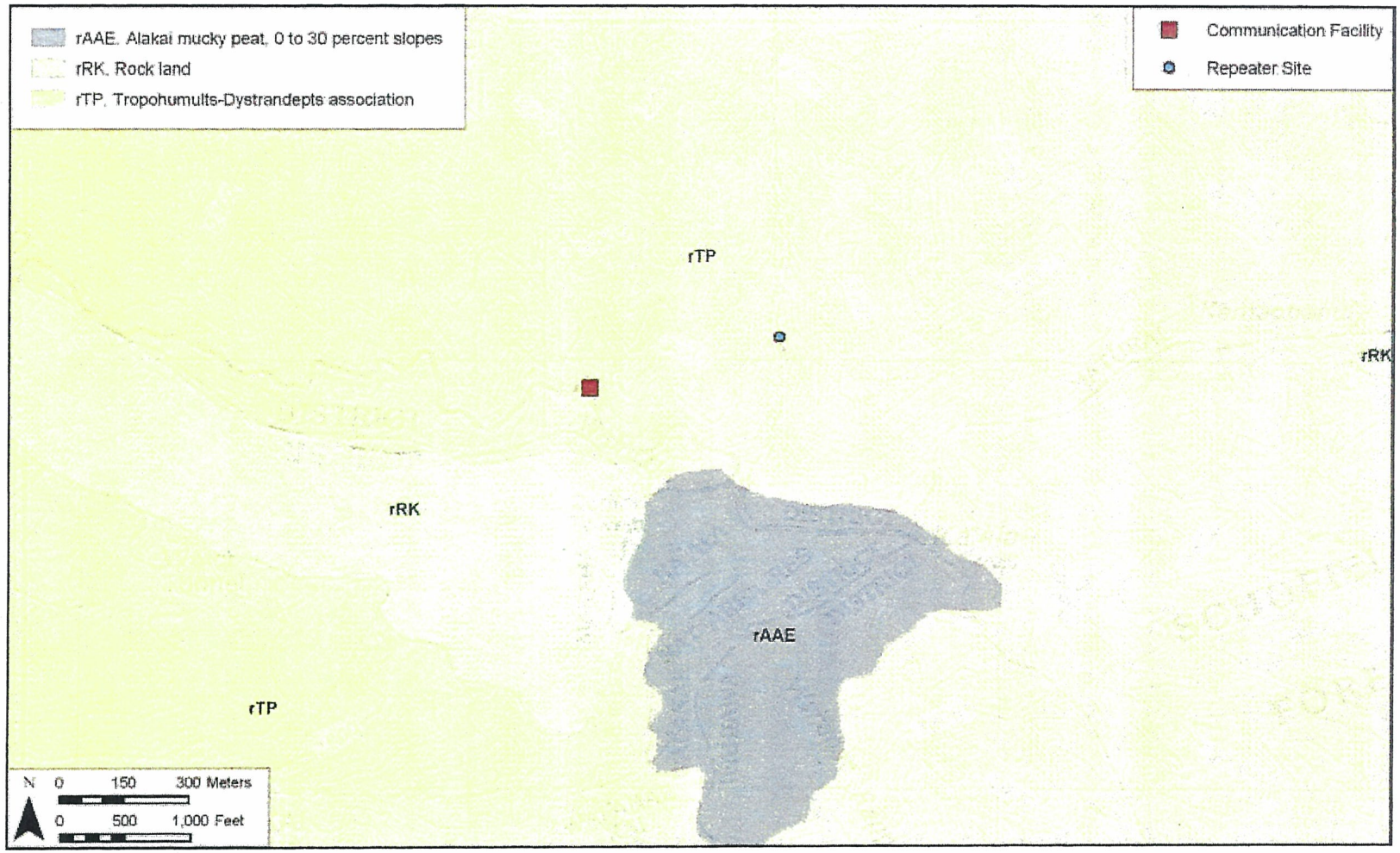

Figure 8. Portion of the USGS 7.5-minute series topographic map, Ka'ena (1998), Hale'iwa (1999), and Hau'ula (1992) quadrangles, showing the Project area on Mount Ka'ala with soil overlay (Foote el al. 1972)

Section 2 Methods

2.1 Archival Research

Historical documents, maps and existing archaeological information pertaining to Kawailoa and Kamananui Ahupua'a were researched at the CSH library and other archives including the University of Hawai'i at Mānoa's Hamilton Library, the State Historic Preservation Division (SHPD) library, the Hawai'i State Archives, the State Land Survey Division, and the archives of the Bishop Museum. Previous archaeological reports for the area were reviewed, as were historic maps and photographs and primary and secondary historical sources. Information on Land Commission Awards (LCAs) was accessed through Waihona 'Aina Corporation's Māhele data base as well as a selection of CSH library references. Research for the Cultural and Historical Background section centered on the following cultural and historic resources, practices, and beliefs: religious and ceremonial knowledge and practices; traditional subsistence land use and settlement patterns; gathering practices and agricultural pursuits; *wahi pana* (storied places) and associated *mo'olelo* (stories, oral traditions), *mele* (songs), *oli* (chants), and *'ōlelo no'eau* (proverbs); and historic land transformation, development, and population changes (see Scope of Work above).

2.2 Community Consultation

2.2.1 Sampling and Recruitment

A combination of qualitative methods, including purposive, snowball, and expert (or judgment) sampling, were used to identify and invite potential participants to the study. These methods are used for intensive case studies, such as CIAs, to recruit people that are hard to identify, or are members of elite groups (Bernard 2006:190). Our purpose is not to establish a representative or random sample. It is to "identify specific groups of people who either possess characteristics or live in circumstances relevant to the social phenomenon being studied....This approach to sampling allows the researcher deliberately to include a wide range of types of informants and also to select key informants with access to important sources of knowledge" (Mays and Pope 1995:110).

We began with purposive sampling informed by referrals from known specialists and relevant agencies. For example, we contacted the SHPD, Office of Hawaiian Affairs (OHA), O'ahu Island Burial Council (OIBC), and community and cultural organizations in Kawailoa (and Lauhulu, Kuikuiloloa, Punanue, Kāpaeloa) and Kamananui Ahupua'a for their brief response/review of the Project and to identify potentially knowledgeable individuals with cultural expertise and/or knowledge of the permanent Project footprint and vicinity, cultural and lineal descendants, and other appropriate community representatives and members. Based on their in-depth knowledge and experiences, these key respondents then referred CSH to additional potential participants who were added to the pool of invited participants. This is snowball sampling, a chain referral method that entails asking a few key individuals (including agency and organization representatives) to provide their comments and referrals to other locally recognized experts or stakeholders who would be likely candidates for the study (Bernard 2006:192). CSH also employs expert or judgment sampling which involves assembling a group of people with

recognized experience and expertise in a specific area (Bernard 2006:189–191). CSH maintains a database that draws on over two decades of established relationships with community consultants: cultural practitioners and specialists, community representatives and cultural and lineal descendants. The names of new potential contacts were also provided by colleagues at CSH and from the researchers' familiarity with people who live in or around the study area. Researchers often attend public forums (e.g., Neighborhood Board, Burial Council and Civic Club meetings) in (or near) the study area to scope for participants. Please refer to Table 4, Section 4, for a complete list of individuals and organizations contacted for this CIA.

CSH focuses on obtaining in-depth information with a high level of validity from a targeted group of relevant stakeholders and local experts. Our qualitative methods do not aim to survey an entire population or subgroup. A depth of understanding about complex issues cannot be gained through comprehensive surveying. Our qualitative methodologies do not include quantitative (statistical) analyses, yet they are recognized as rigorous and thorough. Bernard (2006:25) describes the qualitative methods as "a kind of measurement, an integral part of the complex whole that comprises scientific research." Depending on the size and complexity of the project, CSH reports include in-depth contributions from about one-third of all participating respondents. Typically this means three to twelve interviews.

2.2.2 Informed Consent Protocol

An informed consent process was conducted as follows: (1) before beginning the interview the CSH researcher explained to the participant how the consent process works, the Project purpose, the intent of the study and how his/her information will be used; (2) the researcher gave him/her a copy of the Authorization and Release Form to read and sign (Appendix C); (3) if the person agreed to participate by way of signing the consent form or providing oral consent, the researcher started the interview; (4) the interviewee received a copy of the Authorization and Release Form for his/her records, while the original is stored at CSH; (5) after the interview was summarized at CSH (and possibly transcribed in full), the study participant was afforded an opportunity to review the interview notes (or transcription) and summary and to make any corrections, deletions or additions to the substance of their testimony/oral history interview; this was accomplished either via phone, post or email or through a follow-up visit with the participant; (6) the participant received the final approved interview and any photographs taken for the study for record. If the participant was interested in receiving a copy of the full transcript of the interview (if there is one as not all interviews are audio-recorded and transcribed), a copy was provided. Participants were also given information on how to view the report on the OEQC website and offered a hardcopy of the report once the report is a public document.

2.2.3 Interview Techniques

To assist in discussion of natural and cultural resources and cultural practices specific to the study area, CSH initiated semi-structured interviews (as described by Bernard 2006) asking questions from the following broad categories: cultivation, gathering practices and *mauka* and *makai* (seaward) resources, burials, trails, historic properties, and *wahi pana*. The interview protocol is tailored to the specific natural and cultural features of the landscape in the study area identified through archival research and community consultation. For example, for this study, cultivation and gathering practices were emphasized over other categories less salient to Project

participants. These interviews and oral histories supplement and provide depth to consultations from government agencies and community organizations that may provide brief responses, reviews and/or referrals gathered via phone, email and occasionally face-to-face commentary.

2.2.3.1 In-depth Interviews and Oral Histories

Interviews are conducted with individuals or in focus groups comprised of *kūpuna* (elder) and *kama'āina* (Native-born) who have a similar experience or background (e.g., the members of an area club, elders, fishermen, *hula* dancers). Interviews are conducted initially at a place of the study participant's choosing (usually at the participant's home or at a public meeting place) and/or—whenever feasible—during site visits to the proposed Project. Generally, CSH's preference is to interview a participant individually or in small groups (two–four); occasionally participants are interviewed in focus groups (six–eight). Following the consent protocol outlined above, interviews may be recorded on tape and in handwritten notes, and the participant photographed. The interview typically lasts one to four hours, and records the—who, what, when and where of the interview. In addition to questions outlined above, the interviewee is asked to provide biographical information (e.g., connection to the study area, genealogy, professional and volunteer affiliations, etc.).

2.3 Compensation and Contributions to Community

Many individuals and communities have generously worked with CSH over the years to identify and document the rich natural and cultural resources of these islands for cultural impact, ethno-historical and, more recently, TCP studies. CSH makes every effort to provide some form of compensation to individuals and communities who contribute to cultural studies. This is done in a variety of ways: individual interview participants are compensated for their time in the form of a small honorarium and/or other *makana* (gift); community organization representatives (who may not be allowed to receive a gift) are asked if they would like a donation to a Hawaiian charter school or nonprofit of their choice to be made anonymously or in the name of the individual or organization participating in the study; contributors are provided their transcripts, interview summaries, photographs and—when possible—a copy of the CIA report; CSH is working to identify a public repository for all cultural studies that will allow easy access to current and past reports; CSH staff do volunteer work for community initiatives that serve to preserve and protect historic and cultural resources. Generally our goal is to provide educational opportunities to students through internships, share our knowledge of historic preservation and cultural resources and the State and Federal laws that guide the historic preservation process, and through involvement in an ongoing working group of public and private stakeholders collaborating to improve and strengthen the Chapter 343 environmental review process.

Section 3 Cultural and Historical Background

This section draws from archaeology and ethnography, histories, *mo'olelo* written by Native Hawaiians, and an archive of historic documents and images to present a portrait of Hawaiian culture and history as it relates to the specific permanent Project footprint. It first explores Hawaiian cosmogonic and genealogical origins (Section 3.1). Focusing in on geographic and temporal scales, this section then traces the exploration of the Pacific Ocean and the subsequent discovery, settlement, and expansion of the Hawaiian archipelago (Section 3.2). This broad overview of Hawaiian history introduces key concepts and terms used throughout the report and leads to a general history of the *moku* of Waialua (Section 3.3). The focus then narrows to the two *ahupua'a* of Kamananui and Kawailoa (Section 3.4) regarding the earliest known settlement and subsistence patterns, a compilation of *wahi pana* and associated *mo'olelo*, successions of chiefly rule, the introduction of private property, shifting land uses, and previously recorded oral histories, with particular emphasis on the permanent Project footprint.

3.1 Cosmogonic and Genealogical Origins

Cosmogonic narratives and origin genealogies are indigenous forms of knowledge that account for the creation of the world and the first Hawaiians. Complementing this is an anthropological perspective informed primarily by archaeology (and genetics and linguistics) that traces the path of ancestral voyagers across the Pacific through their material remains (and genes and languages) (see Section 3.2). These two ways of understanding the past are often contrasted as "indigenous knowledge" and "Western scientific knowledge," respectively. Recent studies, however, emphasize a plurality of knowledges that are epistemologically equivalent (Agrawal 1995; Meyer 2001). Following recent studies that blend oral traditions and archaeology to better understand Hawaiian history (Kirch 2010; Kirch and Sahlins 1992), accounting for the origins of Hawaiians is a quest that requires attention to both the stories of Hawaiian procreation and the anthropology of voyaging.

There are several founding narratives of the origin of the Hawaiian world, including the *Kumulipo*. This cosmogonic, genealogical prayer chant, which is over two thousand lines in length, was used to trace the divine origins of *ali'i* through ruling chiefs, deified ancestors, and gods backwards in time through the animals, plants, and elements to the beginning of the universe. The *Kumulipo* is one of a class of such cosmological chants, but no others of such length are preserved (Silva 2004:103). This chant, titled *He Pule Ho'ola'a Ali'i* (A prayer to consecrate [an] *ali'i*) (Silva 2004:98), was composed for the Hawai'i Island *ali'i* Ka'ī'īmamao, also known as Lonoikamakahiki, when several *kapu* (sacred) rituals were performed that elevated him to the status of a god (Beckwith 1970:311), or divine king, in approximately A.D. 1600 (Kirch 2010:83). The text of the *Kumulipo* was first recorded by David Kalākaua in 1889 and translated by Queen Lili'uokalani (1897), which was not available when folklorist Martha Beckwith completed her own translation and detailed study (1951).

Starting from, "*O ke kumu o ka lipo*" (At the beginning of the deep darkness), the *Kumulipo* divides the genesis of the world into 16 *wā* (epochs, time periods) (Beckwith 1951). These 16 *wā* are categorized into two periods, *pō* (darkness, the realm of the gods) and *ao* (light). During the first period of *pō* there was a continuous birthing of the lower life forms to sea life, plants, and

eventually mammals. During the second period of *ao* came the opening of light and the appearance of the first woman and man, La'ila'i and Ki'i, respectively, and the coming of the gods, including Kāne and Kanaloa, which resulted in over a thousand genealogical pairs (Beckwith 1970: 310–11). Significantly, Hawaiian identity today is derived from origin genealogies such as the Kumulipo: "...every aspect of the Hawaiian conception of the world is related by birth, and as such, all parts of the Hawaiian world are one indivisible lineage" (Kame'eleihiewa 1992:2).

3.2 Discovery, Settlement, and Expansion of the Hawaiian Islands

Complementing the cosmogic and genealogical origins of Hawaiians detailed in the *Kumulipo* is an anthropological perspective on ancient patterns of voyaging. Archaeological studies have shown that by 10,000 years ago, humans had migrated to occupy nearly all the habitable land on the planet. Aside from crossing a series of short water gaps to reach Australia and New Guinea, they had reached it all by walking. The remaining unexplored region was the vast Pacific Ocean. Approximately 4,500 years ago, coastal dwellers of southeast China began a wave of migration through the closely-spaced, inter-visible islands of Southeast Asia. Advances in sailing strategies, canoe technology, and navigation techniques enabled their descendents to sail past the familiar insular waters a millennium later. These precocious seafarers systematically explored the remote, uninhabited regions of the Pacific Ocean to the east, as well as the Indian Ocean to the west. This led to the eventual discovery and colonization of virtually every habitable island in the Pacific Ocean, as well as coastal trading along the Indian sub-continent and settlement as far west as Madagascar (Howe 2007; Irwin 2007).

The ancient wayfinders most likely employed an expansionary strategy of first staging a series of exploratory probes to find likely islands, followed by returns to the homeland, and then launching colonizing expeditions (Irwin 1992). To do so, they sailed their double-hulled voyaging canoes eastward against the direction of the dominant trade winds by waiting for westerly wind shifts. After mentally mapping the positions of newly discovered islands in terms of celestial referents, they returned to their homelands to share the sailing directions for future voyages of colonization (Finney 1996). As most of the Pacific Islands are volcanic in origin, the exploratory seafarers, also horticulturalists, necessarily transported a living landscape. They brought with them taro, yams, breadfruit, bananas, and coconuts, as well as domesticated pigs, dogs, and chickens, and, possibly with intention, rats (Irwin 2007; Kirch 2000).

Later voyagers discovered and settled the distant archipelagoes of western Polynesia (e.g., Samoa, Tonga, and Fiji), the northwestern archipelagoes of Micronesia (e.g., Marshall Islands and Caroline Islands), and eastern Polynesia (e.g. Tahiti and Marquesas), and from there settled the widely-separated archipelagoes of Hawai'i and Aotearoa as well as the solitary island of Rapa Nui (Irwin 2007; Kirch 2000). Anthropologist Ben Finney suggests that a waxing and waning rhythm of voyaging characterized the large, high-island archipelagoes of eastern Polynesia: "a flurry of back and forth sailings as the islands are being discovered, settled and supplied; then some continued long-range travel for personal, religious or other reasons; and then by a contraction of voyaging as populations grew and rival chiefdoms fought over land and power" (Finney 2007:145).

Archeological excavations, linguistic reconstructions, and genetic studies suggest that the initial settlement of Hawai'i came from eastern Polynesia (Kirch 2000) around A.D. 700–800 (Athens et al. 2002). *Mo'olelo* link Hawai'i to Kahiki—the generic word for the ancestral homeland of Hawaiians, not a specific island—through accounts of the discovery of certain Hawaiian islands and subsequent inter-archipelago return trips (Beckwith 1970). The first settlers of Hawai'i from within the region of Kahiki were probably from the Marquesas Islands (Kirch 2000:291). The archaeological record suggests that early Hawaiians formed settlements of hamlets along the coasts, interred the dead, ate domesticated pigs, dogs, and chickens, and began to clear tracts of forest between A.D. 600–1100 (Kirch 2000:293).

The early settlers of the Hawaiian archipelago would have been especially attracted to windward O'ahu with its coral reefs, bays, and sheltered inlets for fishing, dense basalt dikes for the production of stone adzes and other tools, and amphitheatre-headed valleys and broad alluvial floodplains that contained fertile soils, numerous permanently flowing streams, and abundant rainfall for the cultivation of crops (Kirch 1985:69). Excavation data from the coastal region of Waimānalo provide a glimpse into the life of the settlers' descendants. The Bellows Beach sand dune occupation site (O18) reveals a particularly rich cultural stratigraphy that has recently been radiocarbon dated after 40 years of dispute (e.g., Dye 2000; Kirch 1985:71; Pearson et al. 1971; Tuggle and Spriggs 2001) to A.D. 1040–1219 (Dye and Pantaleo 2010), several centuries after the current estimates of first settlement. Archaeological excavation data from this site indicate that the settlers' descendants, like their east Polynesian ancestors, lived in pole-and-thatch dwellings, interred the dead beneath these structures, cooked in small hearths, and manufactured stone tools as well as bone and shell fishhooks, and supported themselves by cultivating inland crops, raising domesticated animals, hunting seabirds on offshore islets, fishing, and gathering shellfish (Kirch 1985:71–74). As they adapted to local conditions, they invented distinctive Hawaiian artifacts, including two-piece fishhooks and the *lei niho palaoa* (*lei* of rock oyster shell), which, in addition to other ornaments interred with individuals, suggests a degree of social stratification (Kirch 1985:71–74). Hawaiians also cared for the dead with a variety of *ilina* (burials, graves) depending on the social status of the deceased, including cremation burials, burial caves, burials in the sand and earth, burials directly underneath house floors, burials in the platforms of *heiau* (temples), and burials marked on the surface by stone terraces, mounds, platforms, and other monuments (Kirch 1985:238–242).

New fishhook styles discovered in Hawaiian archaeological sites and Tahitian words entering into the Hawaiian language suggest contact with Tahiti around A.D. 1200 (Kirch 2000:291). In addition, numerous *mo'olelo* chronicle the era of two-way voyaging between the archipelagoes of Tahiti and Hawai'i by detailing the feats of specific navigators (Cachola-Abad 1993). The Hawai'i-Tahiti voyaging corridor eventually ceased as Hawaiians and Tahitians began to focus more on local initiatives, such as building, maintaining, and deploying fleets of war canoes rather than guiding them on overseas adventures (Finney 2007:145). According to Abraham Fornander's synthesis of *mo'olelo*, the *ali'i* La'amaikahiki closed the era of voyaging between Tahiti and Hawai'i when he returned to his ancestral homeland 21 generations before the 1870s (Fornander 1878:168-169). With an average of 20 years between generations, that places the cessation of Hawaiian long-distance voyaging at about A.D. 1450 (Fornander 1878:168–169).

The archaeological record suggests that Hawaiians experienced exponential population growth, intensification of production, and increased social stratification around A.D. 1100–1650. Hawaiians converted valley floors and hillsides to *lo'i* (terraced fields) with *'auwai* (canals and ditches) that diverted stream water to irrigate *kalo* and other crops in flooded pond fields, developed dryland field systems for the cultivation of *'uala* (sweet potato) and other crops, and constructed stone-walled *loko i'a* (fishponds) on shallow reef flats to grow and harvest fish (Kirch 2000:293–295). By A.D. 1600, the population, which had burgeoned to at least several hundred thousand people, expanded from the fertile windward regions into the most arid and marginal regions of the archipelago—the leeward valleys and coasts (Kirch 2007). This agricultural and aquacultural intensification supported emerging classes of *ali'i* and *maka'āinana* (commoners), whose labor created enduring *heiau* and other monumental architecture that survive in the archaeological record (Kirch 2000:295–296).

The original settlers and their descendents had likely organized themselves into kin-based social groups. The necessity of defining territorial boundaries increased as the population rapidly grew, the amount of available land diminished, voyaging spheres contracted, and the society became more differentiated, hierarchical, and competitive (Kirch 1985:306). The original lineage territories and associated chiefdoms were most likely *moku'āina*, or *moku*, (districts) that were sequentially divided (Ladefoged and Graves 2006). Between A.D. 1400–1500, Hawaiians developed a hierarchically nested system of land tenure that centered on the *ahupua'a*, a territorial unit that typically extended from the peaks of the mountains down to the sea, encompassing the entire ecology of an island and incorporating its main resource zones, including interior uplands and mountains, coastal lowlands, and fringing reefs (Kirch 2000:296). The *maka'āinana* remained on the land they cultivated, but *ali'i* governed this *ahupua'a* pattern of territorial units. These *ahupua'a* territories changed through time; the regions in a *moku* with greater predictability of resources were most likely settled first and defined according to topographic features, and later divided into separate communities if increases in production could support larger populations (Ladefoged and Graves 2006). Based on the distribution of sites in the most arid and marginal lands, virtually all of O'ahu was territorially claimed and possibly occupied by A.D. 1650 (Kirch 1992:15). Then, on the eve of European contact (1778), critical transformations in the social structure took place that shifted Hawai'i from a chiefdom to an emerging state-level society, especially the rise of divine kingship legitimated in a new religious ideology (the state cults of the gods Kū and Lono) with a formal priesthood (including human sacrifice) and maintained by a monopoly of force (Kirch 2010).

3.3 Waialua Moku

The earliest settlements along the northern coastal areas of O'ahu have yet to be recovered archaeologically, but the discovery in Hale'iwa of a basalt adze similar in form to adzes of the Bellows Beach sand dune occupation site (O18) in Waimānalo strongly suggests early occupation (Kirch 1992:14). Indeed, rich marine resources, alluvial floodplains, and permanent streams at the confluence of the Anahulu, Helemano, and Kamananui Valleys would have been particularly attractive to early settlers of the region (Kirch 1992:14). A settlement complex in Anahulu Valley, which was most likely a peripheral extension of the core Waialua production lands, dates to A.D. 1300, a time of inland expansion (Kirch 1992:27).

Mo'olelo chronicle the rise of divine kingship in the uplands of Waialua (Kirch 2010). Located near what some people consider the *piko* (navel or center) of O'ahu (Becket and Singer 1999:64), Kūkaniloko was a site of *mana* (divine power) that the gods recognized in the child born there (Mililani High School 2001), "an *ali'i*, an *akua*, a *wela*—a chief, a god, a blaze of heat," (Kamakau 1992:38) starting with Kapawa around A.D. 1100 (Fornander 1916:247; Kamakau 1964:12). This was a sacred birthing place of *ali'i kapu* (sacred chiefs), who were "the *akua* [gods] of the land" (Kamakau 1992:53). These *ali'i* were Lo Ali'i, a class of *ali'i* who lived in the mountains above Waialua, preserving their chiefly *kapu* by intermarrying among themselves (Kamakau 1964:5; Sahlins 1992:23).

In approximately A.D. 1310 (a time estimate based on an average length of generational intervals in chiefly genealogies), Māweke partitioned O'ahu into three districts: the Kona region, the 'Ewa, Wai'anae, and Waialua region, and the windward Ko'olau region. Then, in approximately A.D. 1490, the *'aha ali'i* (council of chiefs) chose Mā'ilikūkahi, an *ali'i kapu* who was born at Kūkaniloko, to be the new *ali'i nui* (paramount chief) of O'ahu. After his paramountship was installed at the *heiau* of Kapukapuākea (Site 225; McAllister 1933:140) in central Waialua, Mā'ilikūkahi instituted an explicit land division and administration structure: O'ahu was divided into six *moku*—Kona, 'Ewa, Wai'anae, Waialua, Ko'olauloa, and Ko'olaupoko—that were further divided into 86 *ahupua'a* and smaller territorial units (Kirch 2010:84–90).

The *moku* of Waialua contained a set of centrally located productive lands and peripheral areas that were ecologically marginal but that had access to abundant ocean resources. The fertile center consisted of the area surrounding Kaiaka and Waialua Bays located in the *makai* regions of the *ahupua'a* of Kamananui, Pa'ala'a, and Kawailoa. Large irrigated taro fields were located on the floodplains of four major streams that flowed from mountain gorges to these bays, and two large fishponds, 'Uko'a and Lokoea, were located around Waialua Bay. This core productive region likely supported the majority of the Waialua population (approximately 6000–8000 people prior to Western contact). In marked contrast, small fishing communities were located at the extreme western and eastern edges of Waialua—Ka'ena and Kāpaeloa—in sandy coastal soils. These marginal lands were offset by access to very rich deep-sea fishing grounds (Sahlins 1992:20).

The distant lands of the permanent Project footprint, from the southwest mountainous peak of Ka'ala to the northeast coastal region of Kāpaeloa, were once connected culturally and politically. According to anthropologist Marshall Sahlins, Kamananui Ahupua'a was once the dominant political and ritual center of Waialua Moku that included detached, outlying lands, including the remote fishing community of Kāpaeloa at the eastern border of Waialua with its prime marine resources, that were controlled by stewards (*konohiki*) of Kamananui proper (Sahlins 1992:20-21). Then, in the 1820s, the ruling chief of Kamananui Ahupua'a moved to Anahulu Valley in the *ahupua'a* of Kawailoa, which resulted in a redrawing of *ahupua'a* boundaries. Kāpaeloa and other outlying sections of Kamananui were thus subsumed into the land of Kawailoa.

This history suggests that prior to the middle nineteenth century land reforms known as the Māhele, the *ahupua'a* of Kawailoa extended from its current northern boundary to Kāpaeloa at the northern border of Waialua. Other sources depict relatively small *ahupua'a* in this region

during pre-Māhele times that were considered to be sub-units of neighboring *ahupua'a*, including Kāpaeloa, Punanue, Kuikuiloloa, and Lauhulu. Since these lands were never surveyed during the Māhele process of dividing the land for private ownership, their boundaries are estimated and do not appear to follow natural topographic and geographic features similar to other *ahupua'a*. In most references (e.g. LCAs), Kāpaeloa, Punanue, Kuikuiloloa, and Lauhulu are considered *'ili* (land division smaller than an *ahupua'a*) of Kawailoa Ahupua'a, while Kāpaeloa is also considered an *'ili* of Kamananui Ahupua'a in the early nineteenth century.

Despite the difficulty in defining the exact type of territorial divisions in the northern lands of the permanent Project footprint (i.e. Kawailoa), converging ethnohistorical and documentary evidence suggests that the discontiguous lands of the Project areas formed two connected cultural areas prior to the Māhele. The proposed microwave communications facility Project area near the summit of Ka'ala is part of Kamananui Ahupua'a, formerly the political and ritual center of Waialua. The rulers of Kamananui controlled the detached lands of Kāpaeloa for its rich marine resources, which became subsumed under new leadership with a shift in political domination from Kamananui to Kawailoa. The proposed wind power facility permanent Project footprint is located in this expanded region of Kawailoa. From this perspective, the subsequent cultural and historic background of the permanent Project footprint and surrounding area in this report centers on Kawailoa Ahupua'a (including the lands of Kāpaeloa, Punanue, Kuikuiloloa, and Lauhulu) and Kamananui Ahupua'a, with a focus on the mountainous region of Ka'ala.

The cultural landscape of the entire *moku* of Waialua has been severely destroyed or obscured during the past two centuries, especially due to the clearing and plowing under of coastal land and sloping uplands between gulches for sugarcane cultivation with the Waialua Agricultural Company (later named the Waialua Sugar Company) (Sahlins 1992:17). Yet, archaeological documentation of sites in the early to mid-twentieth century based in part on the recollections of old Hawaiian residents (McAllister 1933; Thrum 1906), archaeological research (Kirch 1992), and more recent cultural research management surveys and excavations, combined with collected *mo'olelo* and documented observations, illuminate the cultural landscape—patterns of ancient habitation, subsistence, and *wahi pana*—for the *ahupua'a* of Kawailoa (Figure 9 and Figure 11, Table 1) and Kamananui (Figure 13, Table 2). While this CIA focuses on the *ahupua'a* of Kawailoa and Kamananui, it should be noted that the neighboring *ahupua'a* of Waimea in the *moku* of Ko'olaupoko contains numerous cultural and archaeological sites throughout Waimea Valley, which was recently nominated as a Traditional Cultural Property (Monahan 2008).

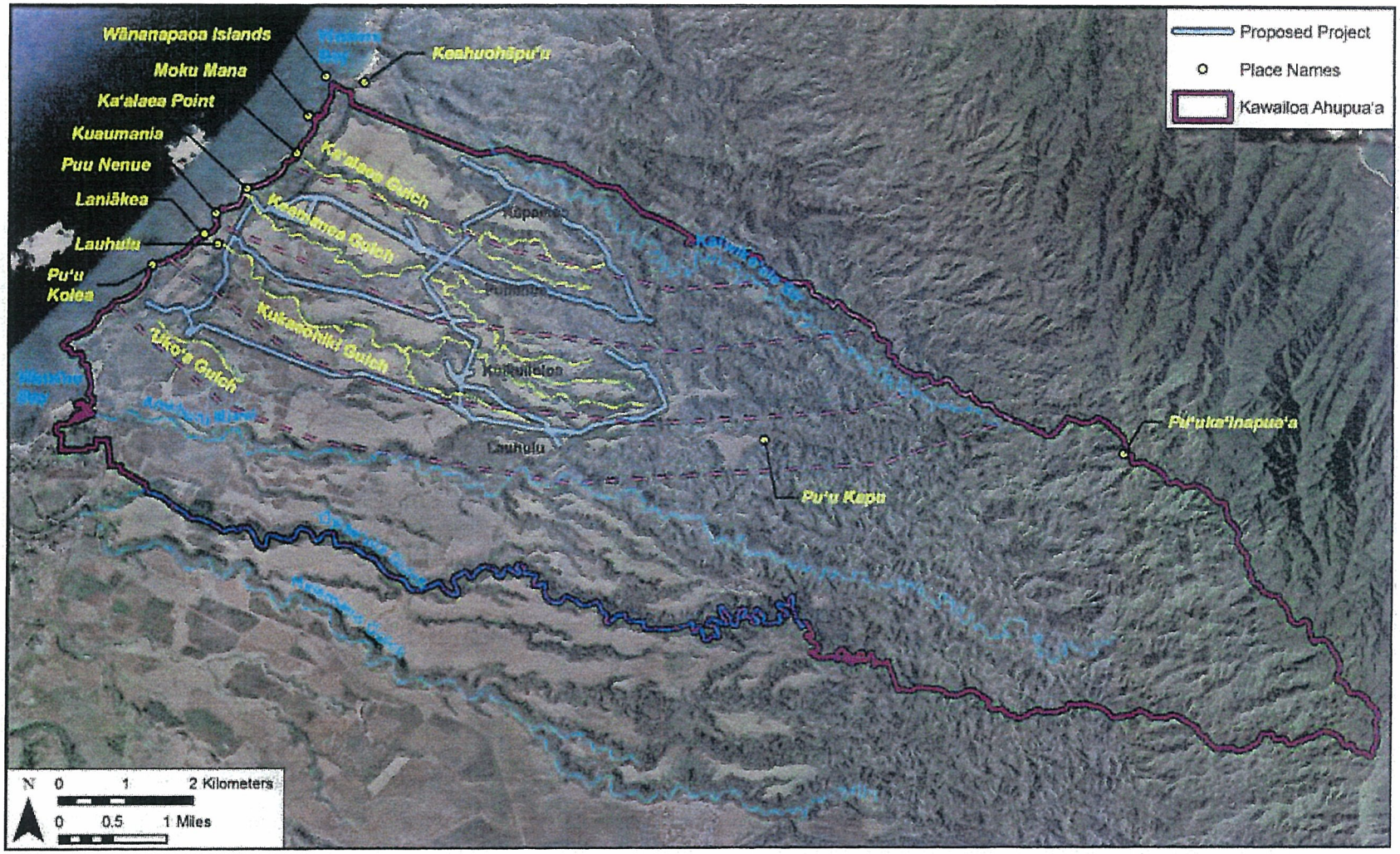

Figure 9. Place names of Kawailoa Ahupua'a (base image, 2005 USGS 7.5-minute topographic quadrangle)

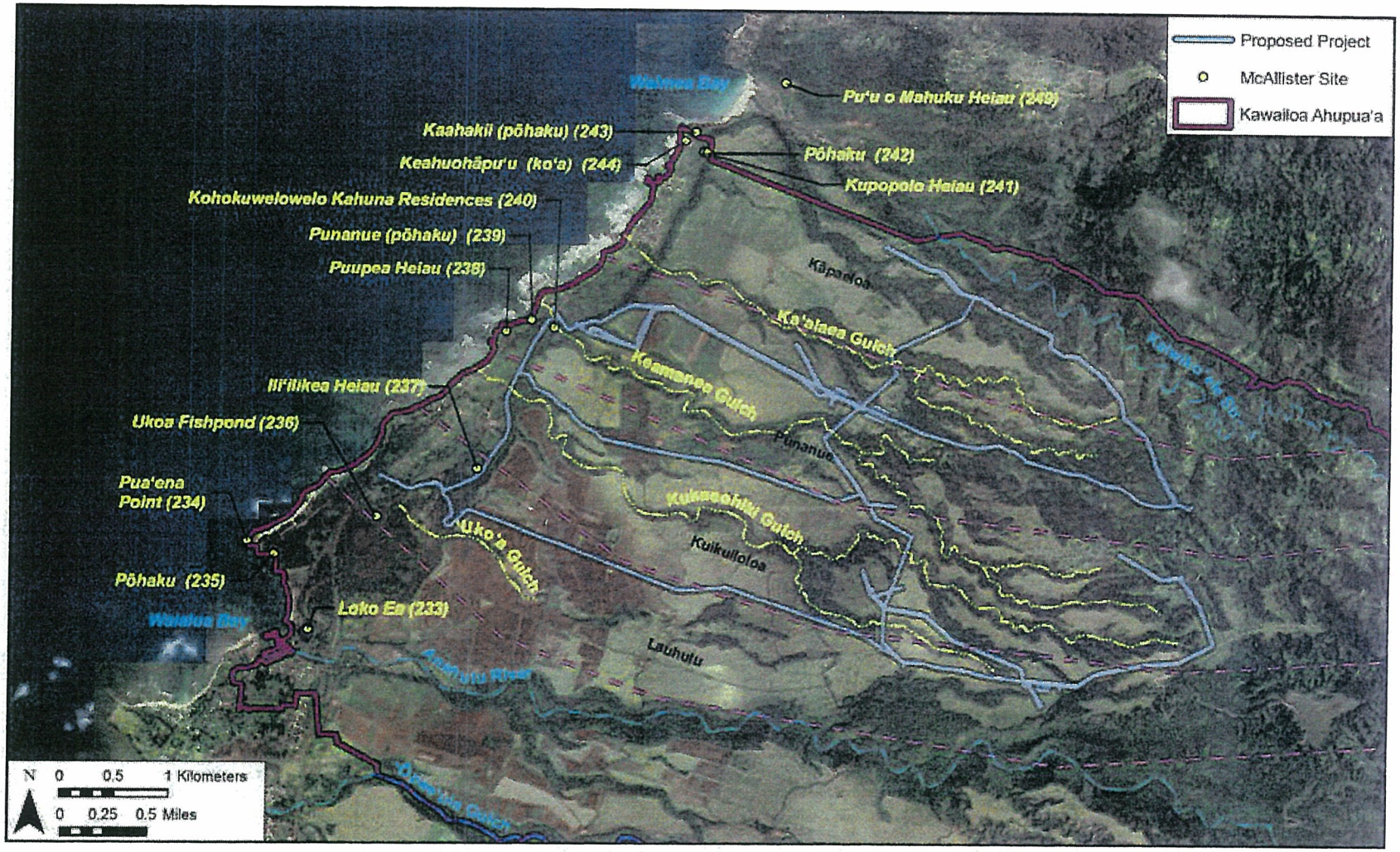

Figure 10. Known locations of *wahi pana* of Kawailoa Ahupua'a in the vicinity of the permanent Project footprint, based on McAllister (1933) (base image, 2005 USGS 7.5-minute topographic quadrangle)

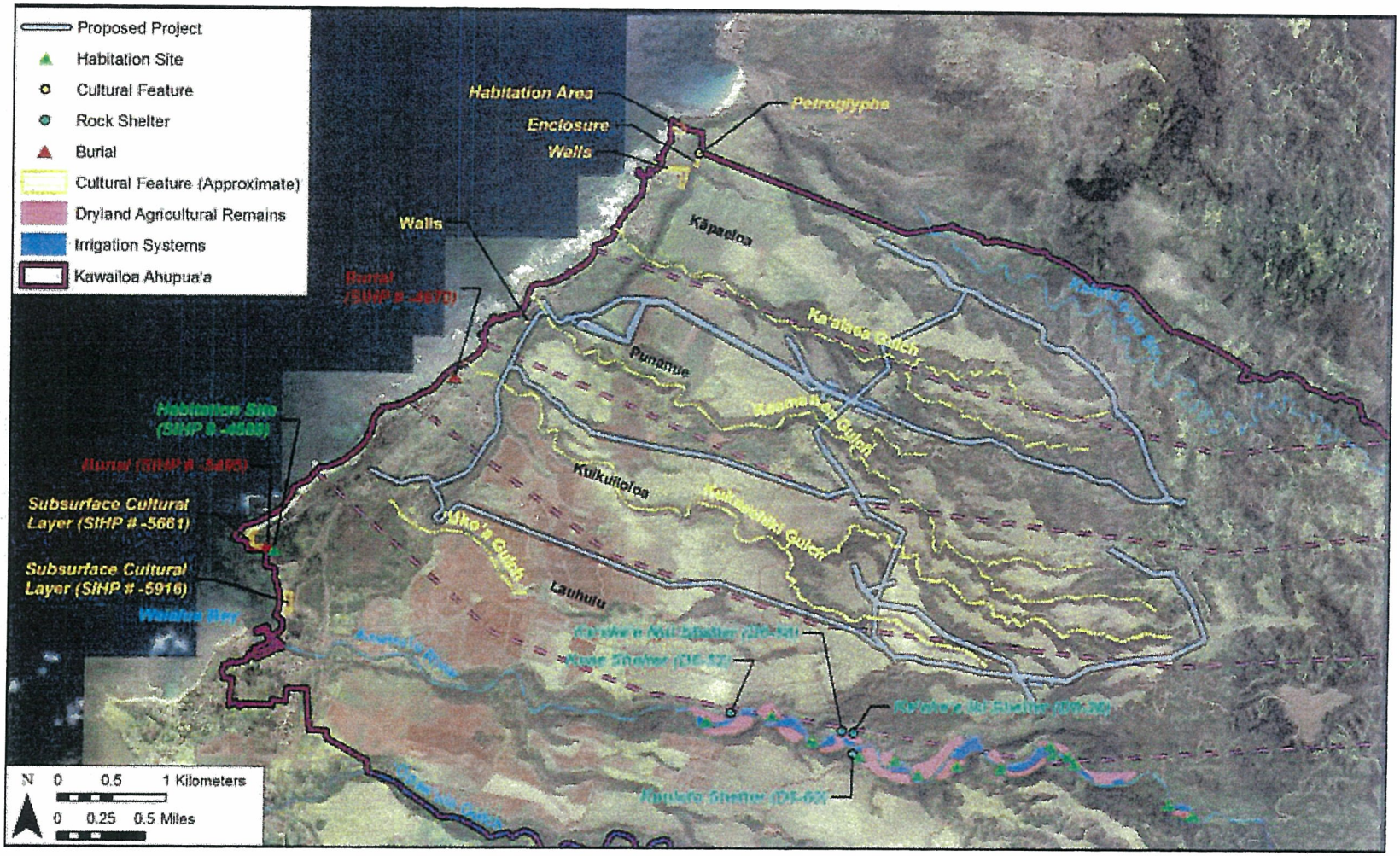

Figure 11. Archaeological sites in Kawailoa Ahupua'a, based on Bath (1988); Borthwick et al. (1998); Borthwick at al. (2002); Cluff (1968); Hammatt and Shideler (2006); Kirch and Sahlins (1992); Masterson et al. (1995); Moore et al. (1993); Welch (1981) (base image, 2005 USGS 7.5-minute topographic quadrangle)

Table 1. Archaeological sites in and near Kawailoa Ahupua'a*

Site Number	Site	Ahupua'a Area	Author (date)
233	Lokoea	Pa'ala'a	McAllister (1933)
234	Pua'ena	Pa'ala'a	McAllister (1933)
235	Pōhaku	Pa'ala'a	McAllister (1933)
236	Loko 'Uko'a	Pa'ala'a	McAllister (1933)
237	'Ili'ilikea Heiau	Kawailoa	McAllister (1933)
238	Puupea Heiau	Kawailoa	McAllister (1933)
239	Punanue (*pōhaku*)	Kawailoa	McAllister (1933)
240	Kahōkūwelowelo	Kawailoa	McAllister (1933)
241	Kūpōpolo	Kawailoa	McAllister (1933)
242	Pōhaku	Kawailoa	McAllister (1933)
243	Kaahakii (*pōhaku*)	Kawailoa	McAllister (1933)
244	Keahuohāpu'u (*ko 'a*)	Kawailoa	McAllister (1933)
249	Pu'u o Mahuka Heiau	Kawailoa	McAllister (1933)
D6-17	Petroglyphs, Enclosure	Kawailoa	Cluff (1968)
D6-36	Ke'eke'e Iki Rockshelter	Kawailoa, Anahulu Valley	Kirch 1992
D6-52	Keae Rockshelter	Kawailoa, Anahulu Valley	Kirch 1992
D6-58	Ke'eke'e Nui Rockshelter	Kawailoa, Anahulu Valley	Kirch 1992
D6-60	Kuolulo Rockshelter	Kawailoa, Anahulu Valley	Kirch 1992
Numerous	Habitation Sites	Kawailoa, Anahulu Valley	Kirch 1992
Numerous	Irrigation Systems	Kawailoa, Anahulu Valley	Kirch 1992
Numerous	Dryland Agricultural Remains	Kawailoa, Anahulu Valley	Kirch (1992)
50-80-01-2483	Midden	Kawailoa	Athens and Shun (1982)
50-80-01-2484	Midden	Kawailoa	Athens and Shun (1982)
50-80-04-3724	Burial	Kawailoa	Bath (1988)
50-80-04-4589	Habitation Site	Kawailoa	Moore et al. (1993)
50-80-04-4670	Burial	Kawailoa	Avery and Kennedy (1993)
50-80-04-5495	Burial	Kawailoa	Borthwick et al. (1988)
50-80-04-5661	Subsurface Cultural Layer	Kawailoa	Borthwick et al. (1988)

Site Number	Site	Ahupua'a, Area	Author (date)
50-80-04-4589	Habitation Site	Kawailoa	Moore et al. (1993)
none	Habitation Site	Kawailoa	Welch (1981)
none	Walls	Kawailoa	Hammatt and Shideler (2006)
none	Walls	Kawailoa	Masterson et al. (1995)

*The accompanying AIS did not find any of these specific historic properties or any of these types of historic properties in the area to be disturbed by the Project

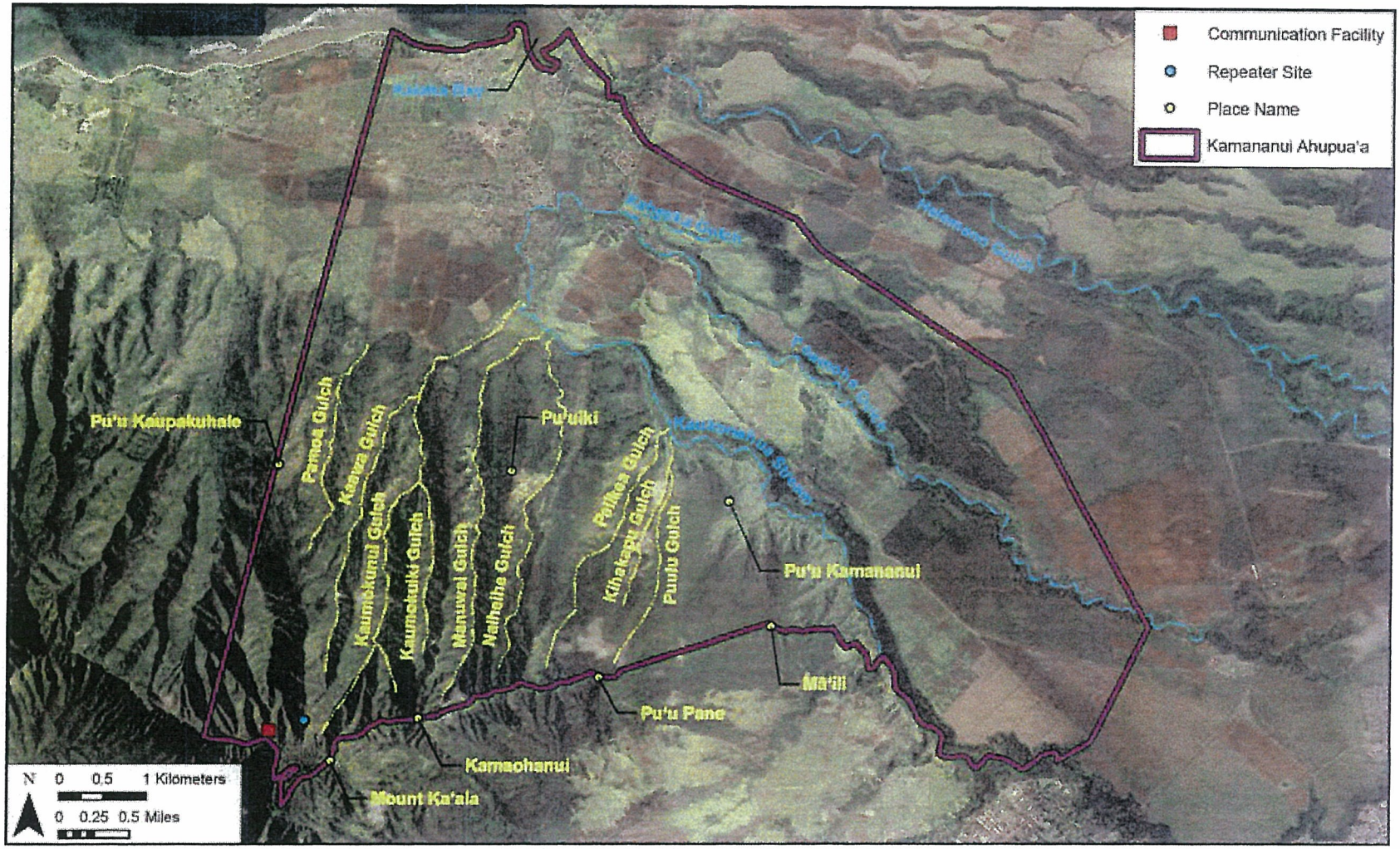

Figure 12. Place names in Kamananui Ahupua'a (base image, 2005 USGS 7.5-minute topographic quadrangle)

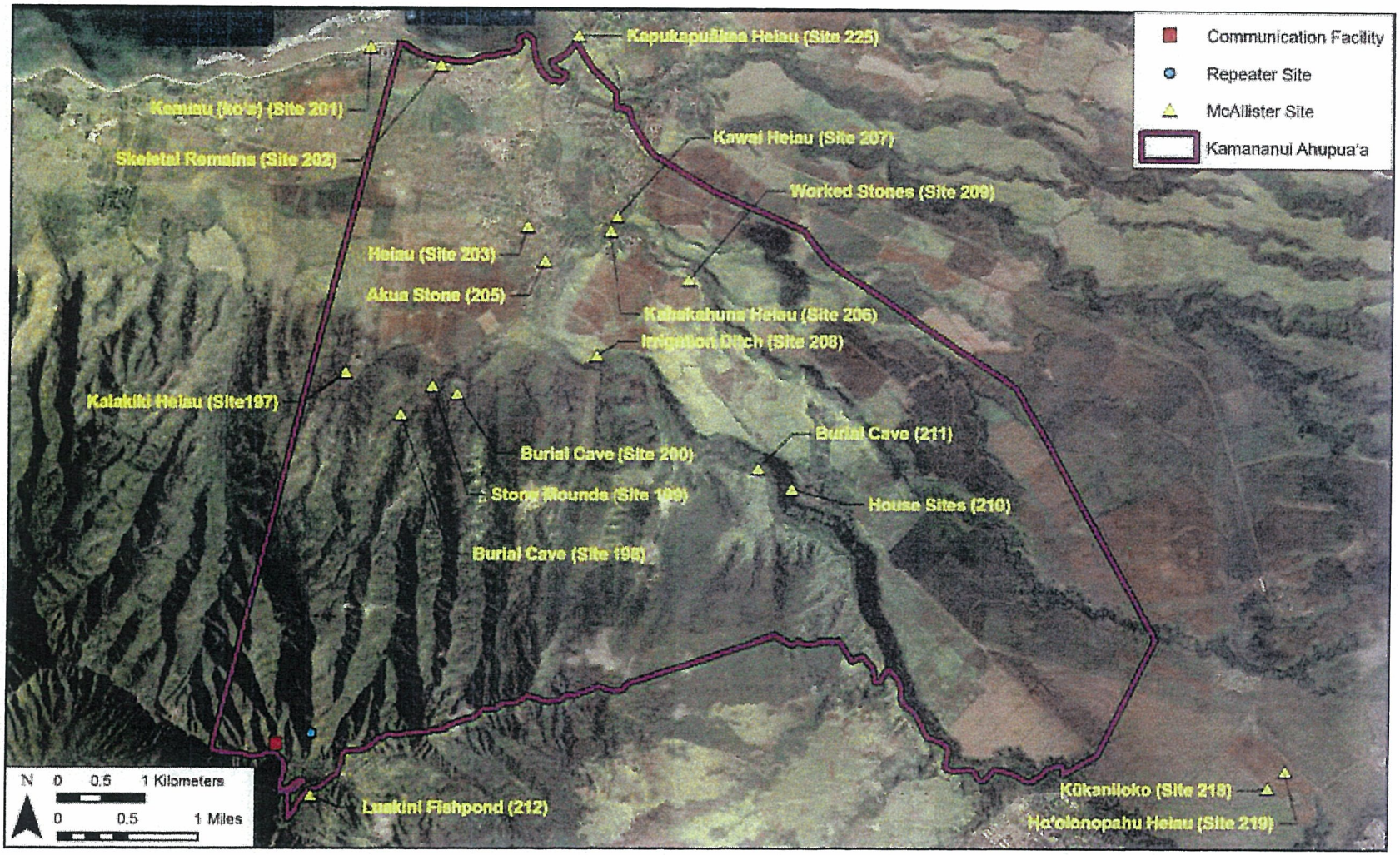

Figure 13. Archaeological sites and known locations of *wahi pana* in Kamananui Ahupua'a, based on McAllister (1933) (base image, 2005 USGS 7.5-minute topographic quadrangle)

Table 2. Archaeological sites in and near Kamananui Ahupua'a*

Site Number	Site	Ahupua'a	Author (date)
197	Kalkiki Heiau	Kamananui	McAllister (1933)
198	Burial Cave	Kamananui	McAllister (1933)
199	Stone Mounds	Kamananui	McAllister (1933)
200	Burial Cave	Kamananui	McAllister (1933)
201	Keauau (*ko'a*)	Kamananui	McAllister (1933)
202	Skeletal Remains	Kamananui	McAllister (1933)
203	Heiau	Kamananui	McAllister (1933)
205	Akua Stone	Kamananui	McAllister (1933)
206	Kahakahuna Heiau	Kamananui	McAllister (1933)
207	Kawai Heiau	Kamananui	McAllister (1933)
208	Irrigation Ditch	Kamananui	McAllister (1933)
209	Worked Stones	Kamananui	McAllister (1933)
210	House Sites	Kamananui	McAllister (1933)
211	Burial Cave	Kamananui	McAllister (1933)
212	Luakini Fishpond	Kamananui	McAllister (1933)
218	Kūkaniloko	Wahiawā	McAllister (1933)
219	Ho'olonopahu Heiau	Wahiawā	McAllister (1933)
225	Kapukapuākea Heiau	Pa'ala'a	McAllister (1933)

*The accompanying AIS did not find any of these specific historic properties or any of these types of historic properties in the permanent Project footprint.

3.4 Kamananui and Kawailoa Ahupua'a

While the surface archaeological record of Kamananui and Kawailoa Ahupua'a has been extensively disturbed, obscured, and, in some cases, destroyed over the past two centuries, pioneering efforts in the early twentieth century to document sites (McAllister 1933; Thrum 1906), recent archaeological research (Kirch 1992) and cultural resource management work, combined with *mo'olelo*, offer a window into the ancient past. Importantly, there is a close spatial association between major *heiau* and intensive agriculture for the entire island of O'ahu, and residential sites are usually distributed around the margins of irrigation systems and up into lower valleys (Kirch 1992:16–17). Thus, fragments of information about residential sites, cultivation and irrigation, trails, burials, and monumental structures and other *wahi pana* derived from archaeology, ethnography and historical records illuminate ancient settlement patterns, part of the overall cultural landscape.

Reconstructing patterns of ancient settlement draws heavily from *wahi pana*, a term not easily defined or described. A Hawaiian *wahi pana* "physically and poetically describes an area while revealing its historical or legendary significance" (Landgraf 1994:v). *Wahi pana* are sacred places that include such cultural properties as *heiau*, *loko i'a*, *ala hele* (trails), *ilina* and *iwi kūpuna* (ancestral bone remains), land divisions, and natural geographic locations (place names), such as streams, peaks, rock formations, ridges, and offshore islands and reefs that are associated with culturally significant beliefs or events. A *wahi pana* leaves an imprint on the landscape even if its tangible properties no longer exist, as the *mana* of previous people and events associated with this space continues to manifest itself. For example, the stereotypical *heiau* is composed of terraces, enclosures, walls, mounds, or upright stones, but *heiau* can also be sacred places on a landscape that lack built structures, natural landscape features such as rock outrcoppings, and earthworks where *mana* is concentrated and transferred between the deities and worshippers (Becket and Singer 1999:xix-xx). Further, previously documented and ongoing *mo'olelo* of *wahi pana* that no longer have material traces are precisely the evidence of their enduring significance (Sahlins 1992:22). For clarity, the locations of *wahi pana* are bolded in the text and labeled (see Figure 9) if their locations are known; all *wahi pana* meanings are cited from Pukui et al. (1974) unless otherwise noted; and spelling and use of diacriticals follow Pukui et al. (1974).

Wahi pana are but one class of numerous cultural properties that create a cultural attachment to the landscape for Hawaiians. Kepā Maly explains the concept of "cultural attachment" from a Hawaiian cultural worldview:

> (Cultural attachment)...embodies the tangible and intangible values of a culture. It is how a people identify with and personify the environment (both natural and manmade) around them. Cultural attachment is demonstrated in the intimate relationship (developed over generations of experiences) that people of a particular culture share with their landscape – for example, the geographic features, natural phenomena and resources, and traditional sites etc., that make up their surroundings. This attachment to environment bears direct relationship to beliefs, practices, cultural evolution, and identity of a people. In Hawai'i, cultural attachment is manifest in the very core of Hawaiian spirituality and attachment to landscape, the creative forces of nature which gave birth to the islands (e.g.,

> Hawai'i), mountains (e.g., Mauna Kea) and all forms of nature, also gave birth to *na kanaka* (the people), thus in Hawaiian tradition, island and mankind share the same genealogy. (Maly 1999:27)

In a Hawaiian cultural worldview, a sense of place relies on keeping the integrity of the cultural landscape (Maly 2001). Maly succinctly articulates this connection between a sense of place and the cultural landscape:

> The integrity of the land- and ocean-scapes [landscape], and their sense of place depends upon the well-being of the whole entity, not only a part of it. Thus, what we do on one part of the landscape has an affect on the rest of it. (Maly 2001:2)

3.4.1 Settlement Patterns

3.4.1.1 Place Names

Hawaiian place names convey a wide variety of information about the relationships among people, landscapes and other natural and cultural resources. Place names may also express cultural, historical and/or spiritual values and concepts important to Hawaiian world views. It is common for places and landscape features to have multiple names, some of which may only be known to certain *'ohana* (families) or even certain individuals within *'ohana*, and many of which have been lost, forgotten or kept secret through time. Place names may also convey *kaona* (hidden meanings) and *huna* (secret) information that may even have political or subversive undertones. Before the introduction of writing to the islands, when cultural information was exclusively preserved and perpetuated orally, Hawaiians gave names to literally everything in their environment, including individual garden plots and *'auwai*, house sites, intangible phenomena such as meteorological and atmospheric effects, *pōhaku* (rocks), *pūnāwai* (fresh-water springs), and many others.

The *moku* of **Waialua** is not translated by Pukui et al. (1974); however, a literal translation is "two" (*lua*) "water[s]" (*wai*), which may be a reference to the pair of major streams that empty into its two main bays. Sterling and Summers (1978:88) compiled other alternative interpretations of the origins of the meaning of Waialua, including references to a particular *lo'i*, a specific *pūnāwai* at a place called Kemo'o, and a cruel ancient chief named Waia.

The *ahupua'a* of **Kamananui** (the supreme or highest spiritual power; *ka-mana-nui*) is partially delineated by place names of ridges, peaks, and hills. **Mount Ka'ala**, the highest point on O'ahu and the site of the proposed microwave communication facility Project area, is located along the mountainous border of Waialua and Wai'anae Moku at the intersection of Kamananui, Mākaha, and Wai'anae Ahupua'a (see Section 3.4.2 for *mo'olelo* of Mount Ka'ala). Along the ridge separating Kamananui from Wai'anae Ahupua'a are the peaks **Kamaohanui**, **Pu'u Pane** (answering hill), and **Mā'ili** (pebbly). A ridge called **Pu'u Kaupakuhale** (house ridgepole or roof) lines the extreme western side of the *ahupua'a*, and isolated peaks called **Pu'uiki** (small hill) (also the name of a coastal section of land) and **Pu'u Kamananui** are located in the central part of the *ahupua'a*. A slope called **Keawawaihe** overlooks the *moku* of Waialua. This place, also called the Valley of Spears, was a place where brigands accosted travelers by disjointing them through the practice of *lua* (hand-to-hand fighting) and sometimes killing them with spears (*Honolulu Advertiser* 1925, cited in Sterling and Summers 1978:107). Three streams

permanently flow through gulches from the *mauka* lands of Kamananui (and Pa'ala'a) Ahupua'a toward **Kaiaka Bay** (shadowed sea)—**Poamoho Stream** (and **Gulch**), **Kaukonahua Stream**, and **Helemano Stream** (and **Gulch**) (many snared or many going). Other intermittent streams flow in gulches that punctuate the mountains sections of Kamananui, including **Kaheeka Gulch**, **Naiheihe Gulch**, **Manuwai Gulch**, **Kaumokuiki Gulch**, **Kaumokunui Gulch**, **Kaawa Gulch**, **Pamoa Gulch**, **Palikea Gulch** (white cliff), **Kihakapu Gulch**, **Puulu Gulch** (*Bryon's Sectional Maps of O'ahu* 2011).

In the *ahupua'a* of **Kawailoa** (the long water), **Anahulu River** (ten days), the longest continuous stream drainage system on O'ahu (67 miles), flows from the distant *mauka* lands in Kawailoa Ahupua'a through **Kawailoa Gulch** toward **Waialua Bay**. In addition, **'Ōpae'ula Stream** (red shrimp) flows along the boundary of Kawailoa and Pa'ala'a Ahupua'a toward Kaiaka Bay, and **Kaiwiko'ele Stream** (the rattle bones) flows toward **Waimea Bay**. Other streams flow intermittently in gulches, including **Ka'alaea Gulch** (the ocherous earth) that terminates at **Ka'alaea Point** on the coast, **Keamanea Gulch** (also called **Kawailoa Gulch**) that terminates at **Kuaumania** (also called Chuns Reef Beach), **Kukaiohiki Gulch** (also called **Laniākea Gulch**) that terminates at a surfing area called **Laniākea** (wide sky), and **'Uko'a Gulch** (*Bryon's Sectional Maps of O'ahu* 2011). In the extreme northern coastal point of the *ahupua'a*, **Kehuohāpu'u** (also Keahuohāpu'u; the-altar-of-[the]-*hāpu'u* [black sea bass]) refers to a natural rocky point as well as a fishing shrine located upon this point. **Wānanapaoa** (unsuccessful prophecy) is a group of small islets immediately adjacent to Kehuohāpu'u, and the islet of **Moku Mana** is located farther south. Farther south is a surfing area called **Laniākea** (wide sky). The southern coastal section of Kawailoa Ahupua'a is punctuated by **Pu'u Kolea**, **Pua'ena Point** and **Punenue Point**, with the plains of **Lauhulu** running from Punanue Point toward Anahulu Stream. Prominent peaks in the *mauka* lands of Kawailoa include **Pu'u Kapu** (sacred hill) and **Pu'uka'aumakua** (the family diety hill), which demarcates the intersection of the moky of Koolaupoko, Koolauloa. As mentioned above, **Kāpaeloa** was previously detached lands of Kamananui Ahupua'a, and **Punanue**, **Kuikuiloloa**, and **Lauhulu** were *ahupua'a* that became absorbed into Kawailoa prior to the Māhele. These lands are now generally considered *'ili* of Kawailoa Ahupua'a.

3.4.1.2 Subsistence and Habitation

The fertile coastal plains of Kamananui and Kawailoa Ahupua'a were watered from the streams flowing from the Ko'olau mountains, and dense settlements and large complexes of irrigated taro fields were located on the floodplains of these streams near the coast (Sahlins 1992:20). Two stream-fed ponds, **Lokoea** (Site 233, McAllister 1933:141) and **Loko 'Uko'a** (Site 234, McAllister 1933:142) contributed freshwater fish. Large terraces once extended along the flatlands between the junction of Poamoho Stream and Helemano Stream (in adjacent Pa'ala'a Ahupua'a to the east) and west of Poamoho Stream in the *makai* section of the Kamananui Ahupua'a (Handy 1940:85). A rock-lined irrigation ditch extended about two miles from Kaukonahua Stream toward these flatlands (later modified by the Waialua sugar Plantation for the sugar mill) (Site 208, McAllister 1933:133), irrigating *lo'i kalo* (Handy and Handy 1972:466). Smaller terraces were also located in the lower flats of Poamoho and Kaukonahua Valleys, and Hawaiians most likely cultivated sweet potatoes and bananas in the *mauka* gulches (Handy 1940:85). On both sides of Kaukonahua Gulch farther *mauka* are four closely-spaced

piles of large stones indicative of former habitations (Site 210, McAllister 1933:133). In the extreme western portion of the Kamananui Ahupua'a, several oval-shaped piles of stones are located at the mouth of Kaumoku Gulch and may have been cleared away for agricultural purposes prior to the plantation period in the early twentieth century (Site 199, McAllister 1933:130).

In the high, level saddle region between the two mountain ranges of O'ahu in the former lands of Kamananui (now Wahiawā), extensive cultivation took place, which suggests sizable populations of ancient Hawaiians (Handy and Handy 1972:464). The present town of Wahiawā, was an area of extensive irrigated sweet potato and yam cultivation (Handy and Handy 1972:464–465) on a plain called Leilehua (*lehua* [the flower of the *'ōhi'a* tree] lei). Numerous *lo'i kalo* were maintained at a place called Kukui-o-Lono; *mo'olelo* describe that an ancient high chief, Kūkaniloko, grew the first *lo'i* there (Handy and Handy 1972:465).

Mount Ka'ala, the site of the proposed microwave communication facility Project area, is a circular plateau approximately one mile across. Aside from four radiating ridges, the plateau is bounded by precipices 1,000–2,000 feet high. The following two *'ōlelo no'eau* reflect the heavy precipitation that has formed a swamp at the summit:

Ka ua Kolowao o Ka'ala The Mountain-creeper rain of Ka'ala

This rain is accompanied by a mist that seems to creep among the trees (Pukui 1983:169)

Nani Ka'ala, he ki'owai na ke kēhau Beautiful Ka'ala, a pool that holds the dew

Praise of Mt. Ka'ala, on O'ahu, a depository for the dew (Pukui 1983:248).

A *mo'olelo* about a woman named Paliuli also mentions a pool at Ka'ala (Manu 1884). Small streams from the swampy plateau cascade as waterfalls into the lower valleys. *Mo'olelo* suggest that the summit swamp was formerly a freshwater fishpond called **Luakini**, in which *hīnālea* (wrasses), *wuwoa* (a kind of mullet), and other fish grew (Site 212; McAllister 1933:133). In addition, a *mele* within a *mo'olelo* of Kūali'i references freshwater crabs at Ka'ala:

> *Ka limu kau I ka laau, Ka elemihi ula I ka luna o Kaala-la*
>
> The moss that hangs on the wood, The red crab on the top of Kaala (Fornander 1916:390).

Yet, observations in the mid-twentieth century did not reveal any stone walls, which would have been required to keep water from flowing out of a deep depression in the swamp, and the presence of moss-laden *lehua* trees in the swamp meant that the pond had not been used in a very long time (McGuire 1953, cited in Sterling and Summers 1978:132).

The interior reaches of Anahulu Valley in the southern section of Kawailoa Ahupua'a contain archaeological evidence of settlement patterns that extend as far back as A.D. 1300. Kirch's (1992:30–56) excavations at four rock shelters (Kē'ae Shelter, D6-52; Ke'eke'e Nui Shelter, D6-58; Ke'eke'e Iki Shelter, D6-36; and Kuolulo Shelter, D6-60) on the cliff faces of Anahulu Gulch uncovered stratified occupation sequences with well-preserved faunal remains (e.g., pig,

dog, chicken, birds, fish), floral remains (e.g., pandanus, candlenut), Hawaiian artifacts (e.g., fishhooks, adzes, abraders, hammer stones, awls, flaked basalt and volcanic glass, *'ulu maika* [ball for bowling game], tattooing needles), foreign artifacts in the upper deposits (glass sherds, ceramics, iron fragments, and gun flints), and features (e.g., hearths with charcoal deposits, *imu* [earth ovens] lined with fire-altered stones, earth-filled terraces with stone retaining walls). From this evidence, Kirch suggests that around A.D. 1300 the Ke'eke'e Nui rock shelter was used by coastal residents as an intermittent camp, followed by the other three shelters a few centuries later, for the extraction of mountain resources. A shift occurred between A.D. 1600–1700 with more permanent occupation and expanded cultivation: "A shifting of household groups from the lowlands to the interior hinterlands, whether as a result of dispossession of lands or as a more opportunistic mode of exploiting an upland ecological niche" (Kirch 1992:49).

By the time of the arrival of Kamehameha's forces in 1795 and their settlement onto the O'ahu landscape in 1804, shifting cultivation and forest-product extraction had supported several household groups living in the rock shelters in the upper Anahulu Valley, and foreign material goods had begun to arrive from the lowlands. Then, a rapid, radical transformation of land use and agricultural intensification occurred. Kamehameha encouraged the expansion and intensification of agricultural production to sustain his invading forces when they returned to O'ahu in 1804, including the peripheral lands of the upper Anahulu Valley. The rock shelters were abandoned, and descendants of Kamehameha's conquering forces constructed a series of open house sites in association with intensive pond field irrigation of taro on the alluvial terraces at the bends of the main stream and adjacent *kula* (dryland agriculture) lands, as well as made clearings in the smaller forested valleys and ravines to cultivate bananas, yams, *wauke* (paper mulberry), sweet potatoes, and dryland taro (Kirch 1992:57–59).

Recent archaeological surveys and excavations for cultural resource management work has revealed numerous cultural features and artifacts along the coastal strip of Kawailoa Ahupua'a that are indicative of former habitation. In the northern region of Kāpaeloa, the University of Hawai'i (Cluff 1968) identified Kūpōpolo Heiau (see Section 3.4.1.3 below), two petroglyph concentrations, a stone enclosure that may contain an *akua* stone, and historic artifacts (glass bottles). In the same area, the Bishop Museum identified a small *heiau*, a water hole, enclosures, two stone walls, rock shelters, a midden scatter, a midden deposit, stone platforms, and a railroad bed (Welch 1981). Excavations at two sites (State Inventory of Historic Properties [SIHP] No. 50-80-01-2483 and 50-80-01-2-2484) revealed extensive fish bone and marine shell midden as well as the presence of numerous indigenous Hawaiian artifacts, including fishhooks, coral and sea urchin spine files, volcanic glass flakes, basalt adzes, and an *'ulu maika* (Athens and Shun 1982). Nearby, CSH also identified walls of terraces of traditional Hawaiian construction (Hammatt and Shideler 2006). Farther south on an approximately three-acre parcel at Kawailoa Beach, located on the *makai* boundary of the Projectt's access road, CSH identified an historic bridge constructed of basalt and mortar, a segment of the Oahu Railway and Land Company (OR&L) right-of-way (SIHP No. 50-80-01-9714), and stacked basalt boulder walls (Masterson et al. 1995). Rudy Mitchell of Waimea Falls Park believed these walls may have been remnants of Pu'upea Heiau, but based on McAllister's distant location of the *heiau*, it was determined that the observed walls were not associated with Pu'upea Heiau (Masterson et al. 1995). Closer to Hale'iwa, investigations have revealed subsurface cultural layers (SIHP No. 50-80-01-5916,

Borthwick et al. 2002; SIHP No. 50-80-01-5661, Borthwick et al. 1998), and a habitation site (SIHP No. 50-80-01-4589, Moore et al. 1993).

3.4.1.3 Heiau, Pōhaku, and other Ceremonial and Religious Structures

Major *heiau* and other ceremonial and religious structures were closely associated with intensive agriculture and residential sites (Kirch 1992:16-17). In the western section of Kamananui Ahupua'a, two *heiau* once stood at the crest of a ridge below Pu'u Kaupakuhale. **Kalakiki Heiau**, located about three miles north of the microwave facility Project area, once contained at least two terraces, but only a large front terrace is not covered by dense foliage (Site 197, McAllister 1933:129). **Onehana Heiau**, of *po'okanaka* class (human sacrifice) formerly adjoined Kalakiki Heiau (Thrum 1906:47), but no physical features remain today (Sterling and Summers 1978:104).

In the *makai* section of Kamananui Ahupua'a, a *heiau* of unknown name once occupied a site near Kaukonahua Stream (Site 203, McAllister 1933:132). Nearby, an *akua* stone once sacred to the goddess Pele is located in an area that remained untouched in the midst of sugar cane fields (Site 205, McAllister 1933:132). **Kahakahuna Heiau** and **Kawai Heiau** once flanked the nearby Poamoho Stream; the latter was one of the first *heiau* to be destroyed during the plantation era (Sites 206 and 207, McAllister 1933:132). Farther *makai*, a *ko'a* (fishing shrine) called **Keauau** was formerly located on the beach at Pu'uiki (Site 201, McAllister 1033:132). Artificially worked stones were discovered underground during the digging of the shaft for a pump in Poamoho Gulch in Kamananui Ahupua'a. They are reported to have resembled *'ulu maika* (Site 209, McAllister 1933:133).

About six miles east of the microwave communication facility Project area in the modern *ahupua'a* of Wahiawā, which was formerly part of Kamananui until 1913 (Sterling and Summers 1978:138), is the sacred site of **Kūkaniloko** (Site 218, McAllister 1933:134–137), one of two famous birthing places in the Hawaiian archipelago (the other is in Kaua'i) for the highest ranking chiefs, the *ali'i kapu* (Figure 14). Located near what some people consider the *piko* of O'ahu (Becket and Singer 1999:64), Kūkaniloko was a site of *mana*, which the gods recognized in the children born there (Mililani High School 2001). *Mo'olelo* describe that Kahihiokalani, the wife of the *ali'i* Nanakaoko, gave birth to their son, Kapawa, at a birthing stone called Kūkaniloko in the twelfth century, an event witnessed by 36 chiefs (Fornander 1920:247). With the beating of two special *pahu* (drums) to inform the commoners of the birth of a new *ali'i*, Kapawa and subsequent newborns were taken to nearby **Ho'olonopahu Heiau** (sounding the *pahu*) (Site 219, McAllister 1933:137), now destroyed, where 48 chiefs presided over the ceremonial cutting of the naval cord (Thrum 1911). *Kāhuna* prepared each pregnant noble woman for what was hoped to be less painlfull birth through a strict diet and exercise regime, hence the meaning of Kūkaniloko, "to anchor the cry from within" (Mililani High School 2001). Although the ancient structure had deteriorated, in 1797 Kamehameha I arranged for the birth of his heir, Liholiho, to take place at Kūkaniloko but his wife's illness prevented this from occurring (Fornander 1878, Vol.2:20). As the most sacred site on O'ahu, Kūkaniloko was protected by the Daughters of Hawaii in 1925 until stewardship was transferred to the Wahiawā Hawaiian Civic Club in the early 1960s, then listed on the National Registers of Historic Places in 1973 and the State Register of Historic Places in 1973, and finally placed under the

jurisdiction of State Parks in 1992 (Omandam 1998). Today, the naturally weathered stones of Kūkaniloko still receive offerings (Kirch 1996:34–35).

Farther southeast of Kūkaniloko at the former division between 'Ewa and Waialua Moku (prior to the establishment of Wahiawā Ahupua'a) are a pair of stones named **O'ahu nui** (big), the shape of which resembles the outline of O'ahu (Site 204, McAllister 1933), and **O'ahu iki** (small). The mapped location of this *pōhaku* by Sterling and Summers (1978) in the *makai* section of Kamananui appears inconsistent with the description and mapped location by John Papa 'Ī'ī (1959:96) at southern edge of the former boundary of Kamananui.

In the extreme northern coastal section of Kawailoa Ahupua'a, three religious sites are located along the boundary line separating the *moku* of Waialua and Ko'olauloa (and the *ahupua'a* of Kawailoa and Waimea). A *heiau* called **Kūpōpolo**, which measures 266 feet by 110 feet, is a two-terraced rock-paved structure located near the coast (Site 241, McAllister 1933:144) (Figure 15). Kūpōpolo is associated with one of the most famous prophesies in Hawaiian history by Ka'opulupulu, who fatefully anticipated O'ahu's imminent subjugation under powers from the windward direction, which have been interpreted as either Kahekili sailing from Maui to defeat Kahāhana, Kamehameha coming from Hawai'i, or the arrival of foreigners (Fornander 1920:287). In a line from Kūpōpolo Heiau to the islets of Wānanapaoa are located a sacred *pōhaku* in a rock shelter (Site 242, McAllister 1933:146), a tongue-shaped *pōhaku* named **Kaahakii** (Site 243, McAllister 1933:146), and a *ko'a* called **Keahuohāpu'u** (Site 244, McAllister 1933:146). Several ceremonial structures are located just across the *ahupua'a* division at Waimea Bay, including **Haleolono** (House of Lono), a restored *heiau* with thatched *hale* (house) and *amu'u* (towers) (Becket and Singer 1999:106), and **Pu'u o Mahuka Heiau** overlooking Waimea Bay, the largest *heiau* on O'ahu (Site 249, McAllister 1933:147) (Figure 17).

In the mid-coastal section of Kawailoa Ahupua'a, four religious sites are closely-spaced. A *heiau* called **'Ili'ilikea**, which measured 75 feet by 267 feet, was destroyed in 1916 by W. Harpham for the Waialua Agricultural Company (Site 237, McAllister 1933:142). Another *heiau* called **Puupea**, located on the beach of Punanue Point, once measured over 100 feet by 250 feet (Site 208, McAllister 1933:142). Nearby, a small smooth stone is reported to be an *akua* stone called **Punanue** (Site 239; McAllister 1933:143). Slightly *makai* is a complex of partially enclosed terraces, platforms, and walls approximately 140 feet by 120 feet called **Kahōkūwelowelo** (Figure 18) that has been variously described as a priestly dwelling (Site 240; McAllister 1933:143), monastery (*Honolulu Advertiser* 1933), and *heiau* (Thrum 1906). According to Thrum's recorded *mo'olelo*, the *kahuna* Ka'opulupulu journeyed from Kahōkūwelowelo Heiau across the plains of Lauhulu to Anahulu Stream, and then to Kūkaniloko to make the prophecy of the arrival of foreigners (Thrum 1923:205).

In the southern coastal section of Kawailoa Ahupua'a, a stone on the sands of the beach near Pua'ena Point was known for its curative powers (Site 235, McAllister 1933:142).

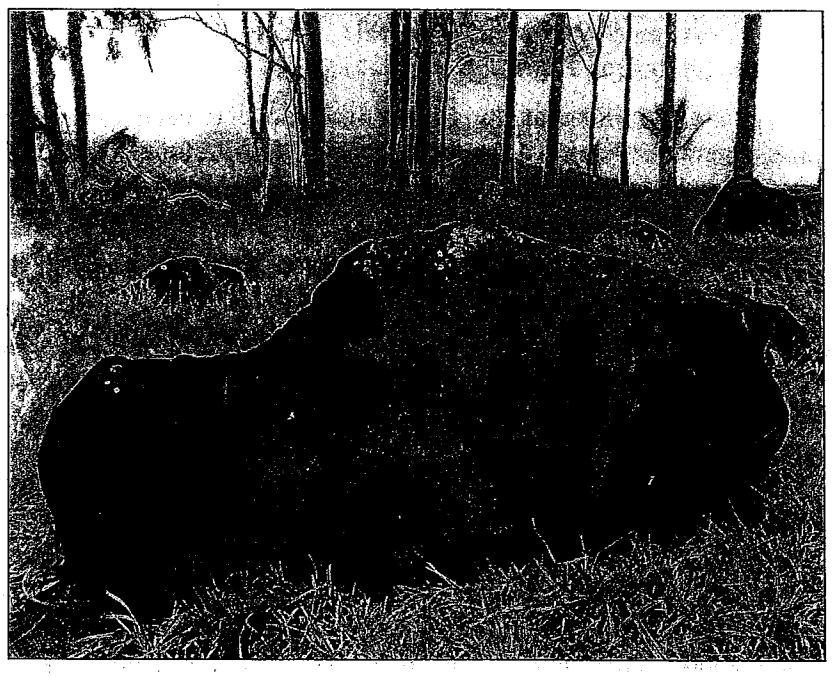

Figure 14. The site of Kūkaniloko (not the principal stone, also called Kūkaniloko) located at the southern edge of a former boundary of Kamananui Ahupua'a (now Wahiawā Ahupua'a) (Becket and Singer 1999:65)

Figure 15. Kūpōpolo Heiau (Becket and Singer 1999:105)

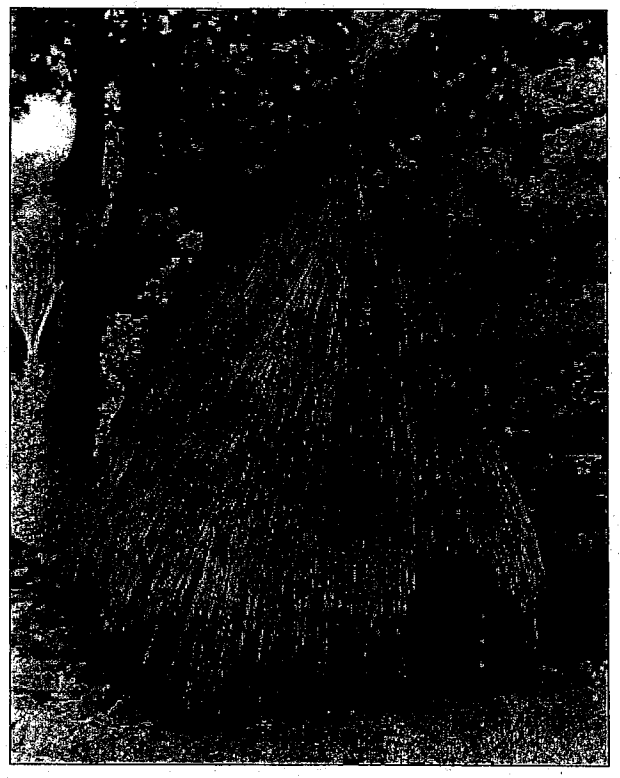

Figure 16. Haleolono (Becket and Singer 1999:107)

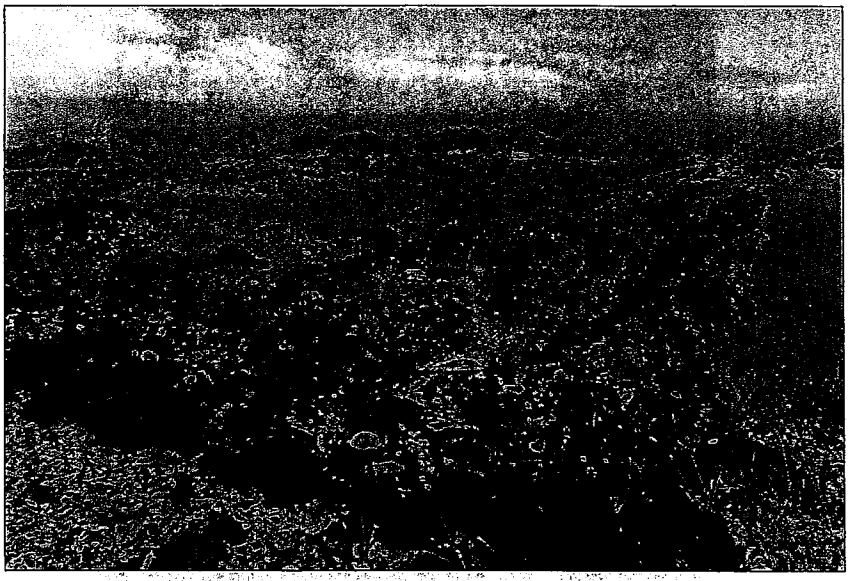

Figure 17. Pu'u o Mahuku Heiau (CSH June 23, 2010)

Figure 18. Kahōkūwelowelo Heiau, marred by bunkers from World War II (Becket and Singer 1999:103)

3.4.1.4 Ala Hele

John Papa 'Ī'ī depicts and briefly describes a network of *ala hele* connecting the *moku* of Waialaua, Wai'anae, 'Ewa, and Kona that passed through the central site of Kūkaniloko. From there, a trail traversed Kamananui Ahupua'a along Kaukonahua Stream and spanned the coastal section of Kawailoa Ahupua'a ('Ī'ī 1959:96) (Figure 19).

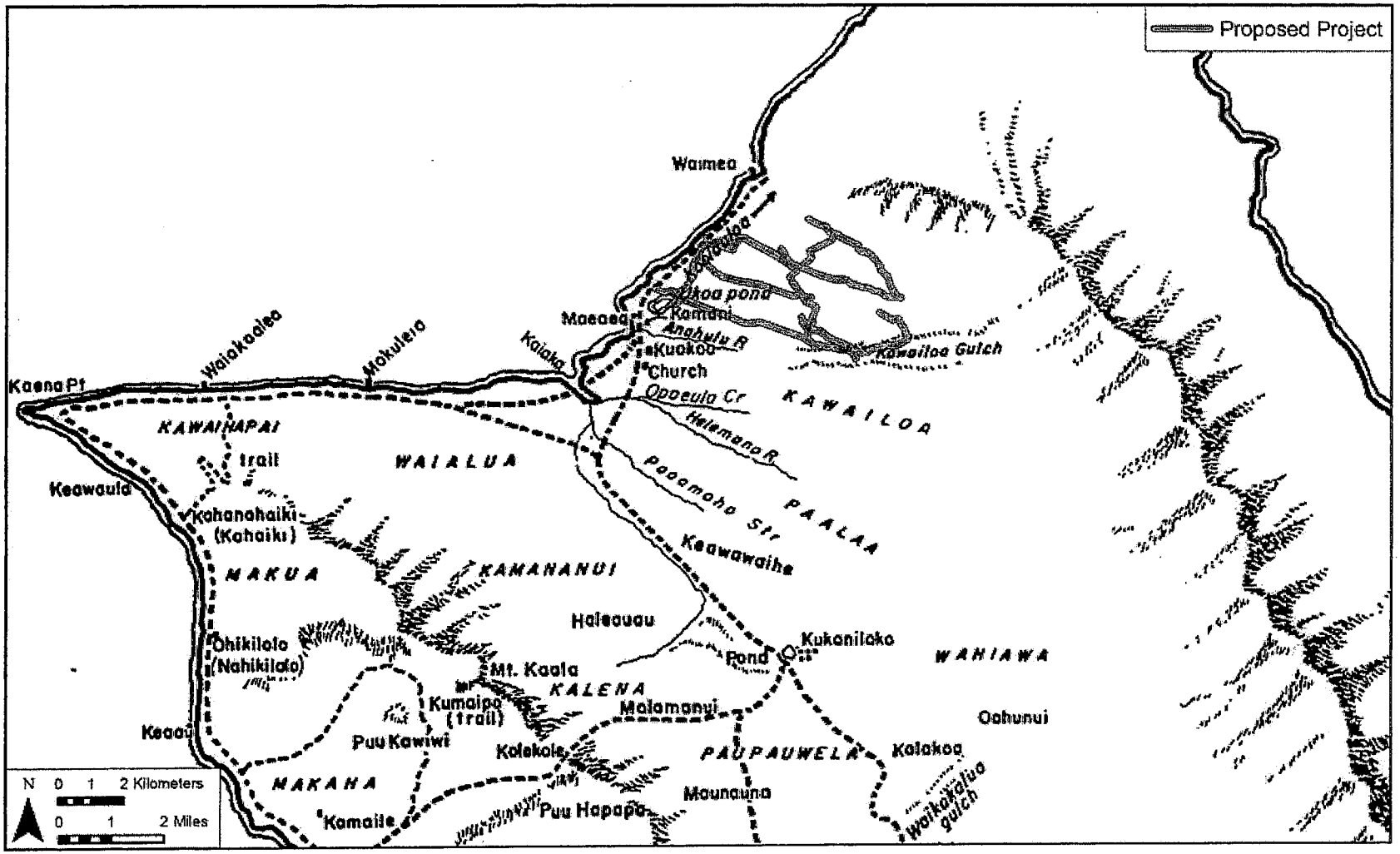

Figure 19. Network of leeward trails described by John Papa 'Ī'ī, map by Paul Rockwood, indicating the central site of Kūkaniloko ('Ī'ī 1959:96)

3.4.1.5 Ilina

Two burial caves are located about three miles north of the microwave communication facility Project area at the cliffs of Kaumoku Gulch beneath Pu'u Kaupakuhale in Kamananui Ahupua'a (Sites 198 and 200, McAllister 1933:130–131). Skeletal remains have also been discovered near the coastal area of Pu'uiki (Site 202, McAllister 1933:132). Hawaiians have also been recently buried in an area near the *akua* stone (Site 205) in the central *makai* portion of the *ahupua'a* (McAllister 133:105). Farther *mauka* about two miles northwest of the microwave communication facility Project area, two caves with skeletal remains are located along Kaukonahua Gulch (Sites 210 and 211, McAllister 1933:133).

In the southern coastal section of Kawailoa Ahupua'a, the point of Pua'ena was a place where the body of an *ali'i* named Elani was placed, and corpses of commoners were also placed on the rocks, such that their "the fluids from the decaying body would seep into the sea and attract sharks, which the people killed" (Site 234, McAllister 1933:141–142). Two burial sites were discovered in this coastal area (SIHP No. 50-80-01-4670, Avery and Kennedy 1993; SIHP No. 50-80-01-5495, Borthwick et al. 1998). In the southern mountainous section of Kawailoa Ahupua'a, burials are located within and near the settlements in the upper Anahulu Valley, including stone burial crypts, a cliff burial, and a walled burial cave (Kirch 1992:88, 94,104, 112). Along the northern coastal strip of Kawailoa, the SHPD reported findings of human remains (SIHP No. 50-80-01-3724) on the inland side of Kamehameha Highway, although this stretch of coast tends to be rocky and lacking in Jaucas sand deposits (Bath 1988). It is unclear at this time whether this burial find was truly anomalous or whether burial in terrigenous soils was a pattern where Jaucas sand beach deposits were not available.

3.4.2 Remembered Landscape

Moolelo Hawaii o Pakaa a me Ku-a-Pakaa, na Kahu Iwikuamoo o Keawenuiaumi, ke Alii o Hawaii, a o na Moopuna hoi a Laamaomao, concisely rendered into English as *The Wind Gourd of La'amaomao*, tells the story of how Pāka'a and his son Kuāpāka'a, descendants of the wind goddess La'amaomao, control the winds of Hawai'i through a gourd, a "wind calabash," that contains the winds and could be called forth by chanting their names (Nakuina 1992). Throughout the *mo'olelo*, the winds respond to the calling of their names and accomplish what the caller desires. In the case of Pāka'a, it is to summon whatever wind he desired during his voyages and, in one malevolent case, to detain his *ali'i* on Moloka'i. Part of Pāka'a's chant traces 45 winds of O'ahu, each with a name and peculiarities of its own. The section on Waialua mentions the wind that blows at Mount Ka'ala (Pu'u-ka'ala):

> The wind of Ka'ena turns in two directions,
>
> Hinakokea is of Mokulē'ia,
>
> The winds of Waialua blow,
>
> Moving silently at the cape of Ka'ena,
>
> Pu'u-ka'ala blows at Ka'ala,
>
> Kehau is of Kapo. (Nakuina 1992:51)

There are numerous other *mo'olelo* of La'amaomao. According to the newspaper *Ka Na'i Aupuni* (June 16, 1906), La'amaomao was a name for the sky and the directions from which came the winds and rains, which were important for *'uala* planters and the priests of Lono, the god of agriculture and fertility (Handy and Handy 1972:220). Lono was associated with the *kona* (southerly) winds that brought rain to the dry areas where gourds were grown. Thus, the gourds were the *kino lau* (embodiments) of Lono, and Lono was the cosmic gourd: "The cosmic gourd is the heavens whence come winds, clouds, and rain" (Handy and Handy 1972:220).

The practical knowledge of the winds was crucial to the island environment of Hawai'i, especially for sailing and navigating: "If you knew the name of the *makani* (wind) that blew through a particular area, you were never lost, both geographically and...epistemologically...To know the winds of a particular place was to know one's precise location, to understand the deities that existed therein, and to be sensitive to the differences in the landscape and seascape in that space" (Iaukea 2009:48–49).

The summit of Ka'ala, the highest point on O'ahu, is considered a sacred place (Wai'anae Ecological Characterization 2011):

> Ancient kahunas (priests) spoke of Mount Kaala as being clothed in the golden cloak of Kane, the first diety of the Hawaiian pantheon. Kaala was the guardian of the road to the west, the path of the sun, the resting place on that great road to death where spirits of the dead return to their homeland (McGrath et al. 1973:11).

From the summit plateau of Mount Ka'ala, the spine of the Wai'anae mountains extends into the sea at Kaena Point, the most northeastern extension of O'ahu. This place was a *leina 'uhane* (leap of the soul), a place where the souls of the dead leaped into the next world (McAllister 1933:125–126). Perhaps the "resting place" of Ka'ala mentioned by McGrath et al. (1973:11) was for these souls heading toward Kaena Point.

Several *mo'olelo* relate the significance of the Ka'ala summit for weather forecasting and making prophecies. In one *mo'olelo* chronicled by Kalākaua (1890:155-173), Hua, the ruling chief of Hāna, Maui in the twelfth century, slays a *kahuna*, Luaho'omoe. An ensuing drought afflicted Hua and his attendants wherever they went. This terrible scourge follows another Hāna chief and his retainers to Waimalu, 'Ewa, O'ahu where a celebrated prophet, Naula-a-Maihea, lived. Alarmed at the threat of destruction, Naula-a-Maihea "ascended the highest peak of the Wai'anae Mountains" (Kalākaua 1890:170). After observing the patterns of clouds, he voyaged to Maui to perform rituals with the sons of Luaho'omoe so that the rains and fertility of the land would be restored.

Kalākaua (1890:455-480) chronicled another *mo'olelo* involving a search for atmospheric signs from Mount Ka'ala. Two daughters, Laieikawai and Laielohelohe, were sent upon their birth to live with Waka, their grandmother, and a priest in order to avoid being put to death by their father, the *ali'i* of the two Ko'olau districts. The priest took Laielohelohe to the enclosure of Kūkaniloko and Waka took Laieikawai to a cavern, which, after diving, opened into a pool called Waiapuka. When the pair entered the cavern, a rainbow appeared and was constantly visible so long as the child remained inside. Hulumaniani, a great prophet of Kaua'i, observed this distant rainbow for twenty days in succession. He sailed toward O'ahu, landing at Wai'anae and quickly

reaching the pool. Waka noticed the prophet and dove into the water. In the morning, he noticed that the rainbow appeared over Kūkaniloko. Traveling in that direction, "he ascended Mount Ka'ala, when he saw the rainbow over the island of Molokai" (Kalākaua 1890:458). Still in pursuit, he erected a small *heiau* near Hāna, Maui and conjured the wraiths of Waka and Laieikawai. He then set forth to a rainbow on the windward side of the island of Hawai'i, but lost all traces of the pair.

3.4.3 Ruling Chiefs

In 1783, Kahekili, the *mō'ī* (ruler) of Maui, fought for control of O'ahu from Kahāhana, the *mō'ī* of O'ahu. Kahekili killed Elani, the father of Kahāhana, and other O'ahu chiefs. Elani's body was left to decompose on a ledge at Pua'ena Point (McAllister 1933:141–142). Samuel Kamakau records that Kawailoa also figured in the fate of Hu'eu, one of Kahekili's Maui chiefs, who had been installed at Waialua. While Kahekili and the other Maui chiefs had been warned of the O'ahu chiefs' plot and escaped, "Hu'eu, who was living at Ka'owakawaka, Kawailoa, in Waialua, was killed on one of the Kaloa nights while his guards were asleep" (Kamakau 1992:138).

In 1794, Ka'eokūlani recruited the "warriors of Waialua and Wai'anae" to make war on his nephew Kalanikūpule, then ruler of O'ahu (Kamakau 1992:168). By December, 1794, Ka'eokūlani had been killed and his forces were defeated. Kalanikūpule would himself be deposed the following year when the invading Hawai'i Island forces of Kamehameha prevailed at the battle of Nu'uanu in April, 1795. Kamehameha became the sole ruler of O'ahu, Moloka'i, Lāna'i, Hawai'i and Maui (Kamakau 1992:172–173).

Waialua was spared direct involvement in the battles associated with Kamehameha's conquest, but Kamehameha's hegemony on O'ahu had immediate consequences for the district. In 1804, the old local families were generally stripped of their ancestral lands in order to reward the Big Island warriors with lands to settle. As Waialua was one of the most sought after places to settle, there was a substantial turnover of land holdings in the *moku* in the early decades of the nineteenth century (Sahlins 1992).

At the time of Kamehameha's conquest, the political and ritual center of Waialua was Kamananui Ahupua'a. The following *'ōlelo no'eau* is suggestive of such power:

> *Pili pono ka lā i Kamananui* The sun is very close to Kamananui
>
> A play on Ka-mana-nui (The-great-power). When the person in power becomes angry, everyone around him feels uncomfortable, as in the scorching, blistering sun. (Pukui 1983:291)

According to anthropologist Marshall Sahlins, Kamananui was a dominant *ahupua'a* that included detached, outlying lands, including the remote fishing community of Kāpaeloa at the eastern border of Waialua with its prime marine resources and the fishponds 'Uko'a and Lokoea, that were controlled by *konohiki* of Kamananui proper (Sahlins 1992:20–21). Then, in the 1820s, the ruling chief of Kamananui Ahupua'a moved to Anahulu Valley in the *ahupua'a* of Kawailoa, which resulted in a redrawing of *ahupua'a* boundaries. Kāpaeloa and other outlying sections of Kamananui were thus subsumed into the land of Kawailoa. The historic shift in political domination from Kamananui to Kawailoa was paralleled by a relocation of the religious center of

the *moku*. In the 1830s, the Kawailoa-based Protestant mission of Waialua "usurped the ritual hegemony from the temples of human sacrifice [*po'okanaka*] that not long before had sanctified the landscape of Kamananui" (Sahlins 1992:21).

Despite the reorganization of Waialua around the new chiefs in Kawailoa and previous intrusions by Kamehameha's invading forces with their settlement onto the O'ahu landscape in 1804, certain "old Waialuans" continued to live in small hamlets under the informal leadership of ordinary "big men," an older form of leadership based on kinship rather than chiefly status (Sahlins 1992:173–174). A sketch by missionary Edwin Locke of the *makai* portion of Kawailoa reveals the fishponds of 'Uko'a (A) and Lokoea (B), Pua'ena Point with its small settlement (C), the fishing hamlet of Kāpaeloa (D), a set of homes belonging to Nāuahi *mā* (Nāuahi folks; *maka'āinana*) with irrigated taro fields (E), and an area of sweet potato, gourd, and melon cultivation (F) (Sahlins 1992:174) (Figure 20). A massive spring-fed taro complex was located to the left (southwest) of Locke's vantage point and other river-irrigated taro fields were located along the Anahulu River to the right (southeast) of Locke's sketch.

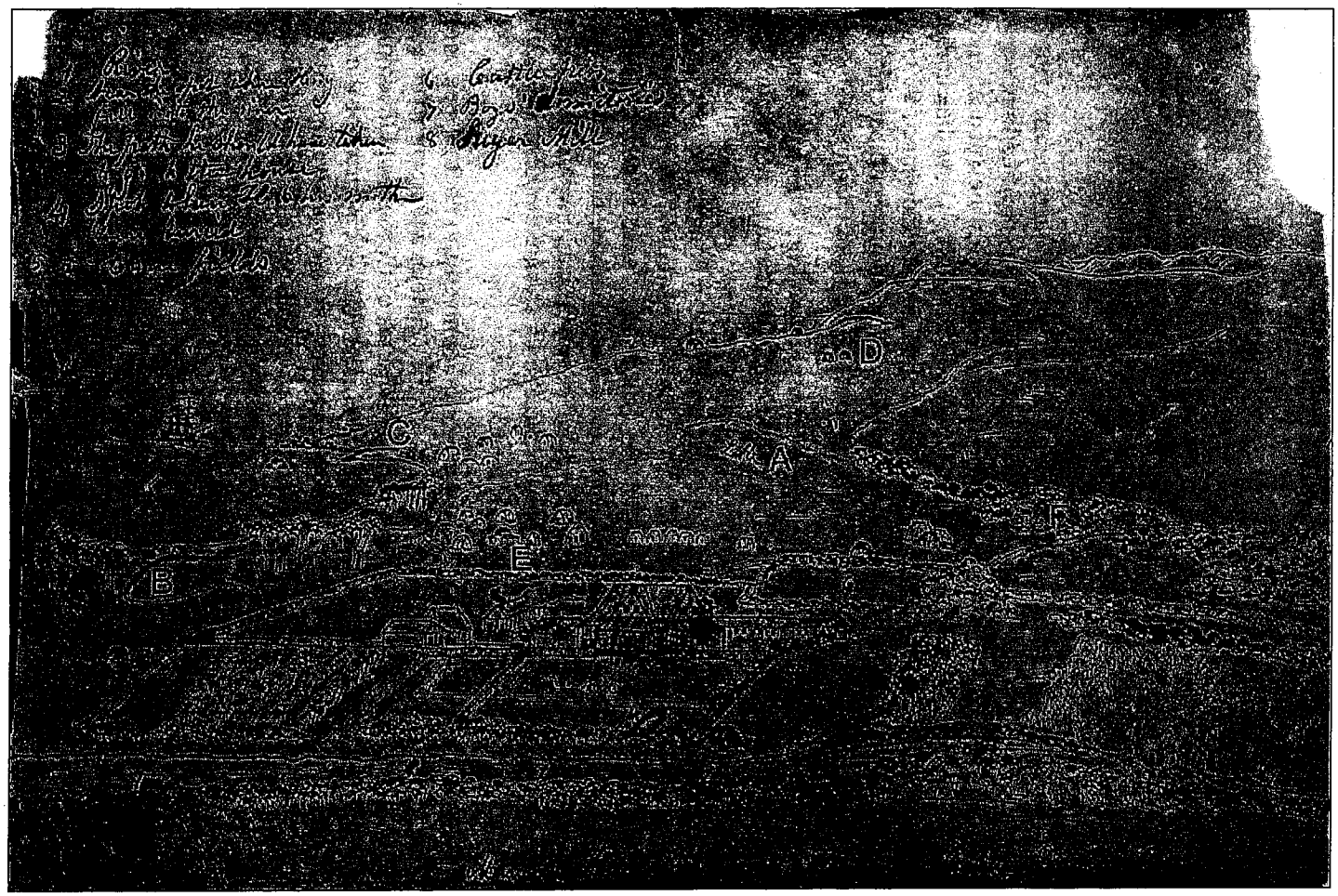

Figure 20. Lower Anahulu River, 1842 or 1853, sketch by Edwin Locke, showing fishponds of 'Uko'a (A) and Lokoea (B), Pua'ena Point with its small settlement (C), the fishing hamlet of Kāpaeloa (D), a set of homes belonging to Nāuahi *mā* (Nāuahi folks; *maka'āinana*) with irrigated taro fields (E), and an area of sweet potato, gourd, and melon cultivation (F) (cited in Sahlins 1992:174)

3.4.4 The Māhele

To try to maintain sovereignty of the land, the Mōī (King) Kauikeaouli (Kamehameha III) in 1846–1848 supervised the Māhele—the division of Hawaiian lands—that transformed the land system in Hawai'i from collective to private ownershp. Modeled after Western concepts, certain lands to be reserved for himself and the royal house were known as Crown Lands, lands claimed by *ali'i* and their *konohiki* were called Konohiki Lands, and lands set aside to generate revenue for the government were known as Government Lands. In 1850, these three categories of land were subject to the rights of the *maka'āinana* and other tenants (naturalized foreigners, non-Hawaiians born in the islands, or long-term resident foreigners), who could make claims for their habitation and agricultural plots, known as *kuleana* (Native land rights) parcels (Chinen 1958:8–15).

Under the Kuleana Act of 1850, the *maka'āinana* were required to file their claims with the Board of Commisioners to Quiet Land Titles (Land Commission) within a specified time period in order to apply for fee-simple title to their lands. The claim could only be filed after the claimant arranged and paid for a survey, and two witnesses testified that they knew the claimant and the boundaries of the land, knew that the claimant had lived on the land since 1939, and knew that no one had challenged the claim. Then, the *maka'āinana* could present their claims to the Land Commision to receive their Land Commission Award (LCA) (Kame'eleihiwa 1992).

Not everyone who was eligible to apply for *kuleana* lands did so and not all of those claims were awarded. Some claimants failed to follow through and come before the Land Commission, some did not produce two witnesses, and some did not get their land surveyed. In addition, some *maka'āinana* may have been reluctant to claim *'āina* that had been traditionally controlled by their *ali'i*, some may have not been familiar with the concept of private land owndership, and some may have not known about the Māhele, the process of making claims (which required a survey) or the strict deadline for making claims. Further, the Land Commission was comprised largely of foreign missionaries, so the the small number of claimants and awards may reflect only those *maka'āinana* who were in good standing with the church (Kame'eleihiwa 1992:296–297). Significantly, the surveying of the land was not standardized.

A total of 14,195 claims were filed and 8,421 awards were approved to about 29 percent of the 29,220 adult Native Hawaiian males living at the time of the Māhele, averaging three acres each (Kame'eleihiwa 1992:295). Out of the potential 2,500,000 acres of Crown and Government lands, 28,658 acres of land were awarded to the *maka'āinana*, less than one percent of the total acreage of Hawai'i (Kame'eleihiwa 1993:295). The small number of *kuleana* awards and their small size were significant prevented the *maka'āinana* from maintaining their independent subsistence (Chinen 1958:32), often forcing them to abandon their newly acquired property (Lyons 1875)

Although many Hawaiians did not submit or follow through on claims for their lands, the distribution and written testimonies of LCAs can provide insight into patterns of residence and agriculture. Many of these patterns probably had existed for centuries. By examining the patterns of *kuleana* LCA parcels in the vicinity of the permanent Project footprint, insight can be gained to the likely intensity and nature of Hawaiian activity in the area.

In 1848, the Crown, the Hawaiian government, and the *ali'i* received their land titles. The majority of Waialua was awarded to Victoria Kamāmalu, sister of Alexander Liholiho (King Kamehameha IV) and Lot Kamehameha (King Kamehameha V). All of western Waialua from Kamananui to Ka'ena Point was ceded to Kauikeaouli (Kamehameha III), which he designated as Government Lands. Kamāmalu retained the two *ahupua'a* of Kawailoa and Pa'ala'a, excluding the *kuleana* of the residents (LCA 7713, *'Āpana* [Lot]33) (Sahlins 1992). Upon Kamāmalu's death in 1866, the lands of Kawailoa were passed to her brother Lot and then to Princess Ruth Keelikōlani in 1872. With her passing in 1883, Kawailoa was transferred to Bernice Pauahi Bishop and became integrated into her estate in 1887. Now, the land is managed by the Land Assets Division of Kamehameha Schools (*Imua* 2005:23).

The *maka'āinana* received their *kuleana* awards (individual land parcels) in 1850 and thereafter. There were 95 LCA *kuleana* claims filed within Kawailoa Ahupua'a, of which 81 were awarded (Waihona 'Aina 2000). Eight *kuleana* parcels are located in or near the vicinity of the *makai* portions of the permanent Project footprint (Figure 21 and Table 3). The claims reveal that Hawaiian households had multiple *'āpana* in different geographical locations, involving the cultivation of taro, bananas, bitter gourds, melon, corn, sugarcane, and sweet potatoes, as well as the *pali* (cliffs) exploited for the collection of *wauke* (Waihona 'Aina 2000). Overall, the LCA documentation indicates a wide range of indigenous Hawaiian subsistence activities being practiced in the vicinity of the permanent Project footprint in Kawailoa.

There were 23 LCA claims filed within Kamananui Ahupua'a, but no *kuleana* LCAs were awarded. The missionary in residence, John S. Emerson, concluded it was in the interest of the Hawaiians to buy land outright as grants rather than to complete the LCA application process (Emerson 1928:141). The claims that were completed reveal that Hawaiians used the land in the *mauka* portions of Kamananui Ahupua'a primarily to cultivate taro and *wauke* (Waihona 'Aina 2000).

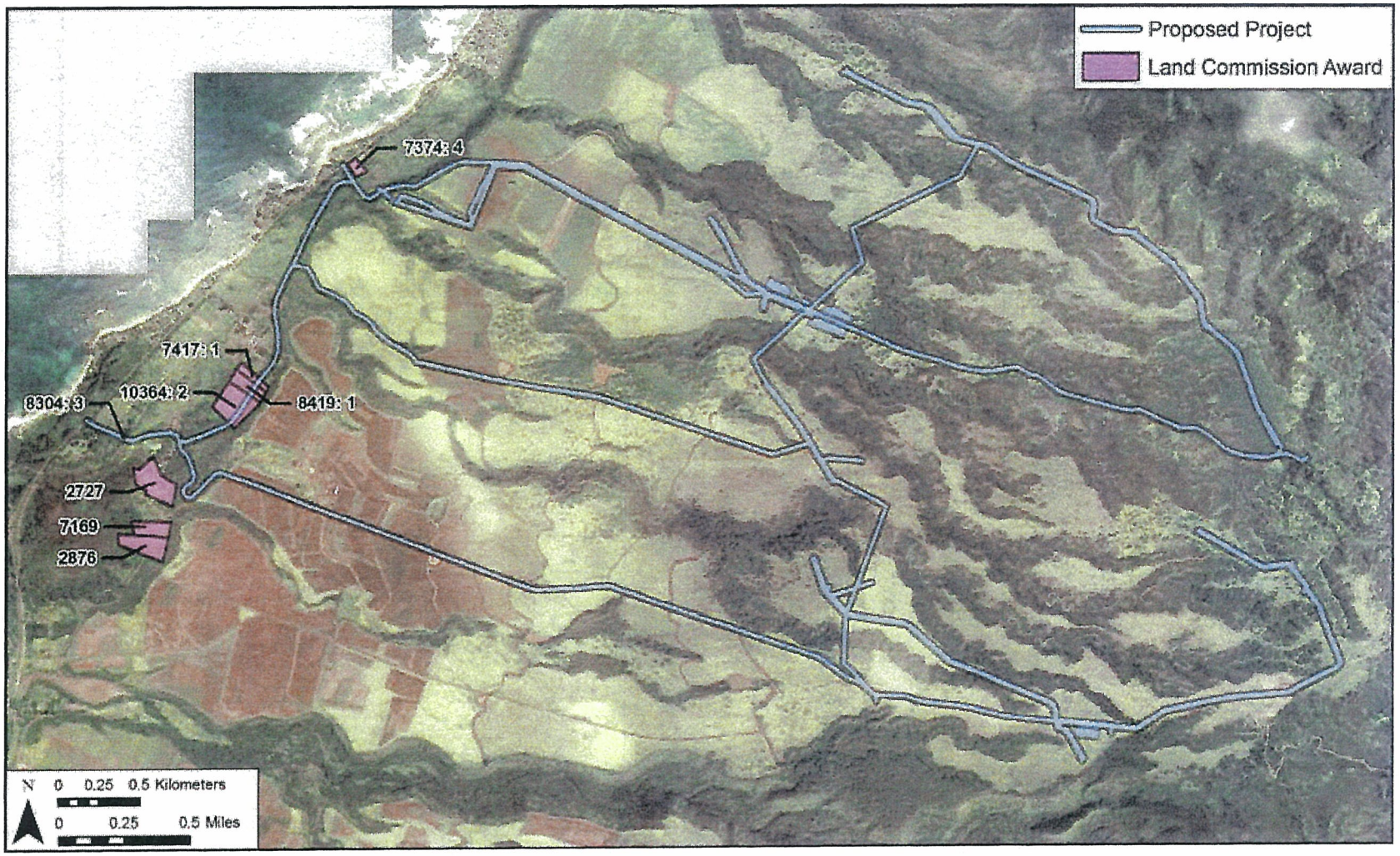

Figure 21. LCAs in the vicinity of the proposed Project (base map, portion of the 1992, 1998, 1999 USGS 7.5-minute series topographic quadrangle)

Table 3. LCAs located in the vicinity of the permanent Project footprint

LCA	Claimant	'Ili	Land Use	Landscape Feature
2727	Puu	'Uko'a, Lahuinoho, and Hakaai	House lot and *lo'i*	'Uko'a pond
2876	Kanepilau	'Uko'a, Lokokea, and Kawela	House lot and *lo'i*	*'Auwai*/ditch
7169	Koa	'Uko'a	House lot and *lo'i*	*Loko*
7374:4	Kapule	Koheo and Punenui	House lot, bananas, sweet potatoes, bitter melon/gourd, corn, sugarcane, and taro	*Koa* canoe tree
7417:1	Kaukaliu	Lauhulu, Puuaki, Kalokoeli, Pukeamauka, Wailele, and Wailelekai	House lot, *lo'i*, kula, *wauke*, *noni* (Indian mulberry), sweet potatoes, bananas, bitter melon/gourd, sugar cane, and corn	*'Auwai*/ditch, wall/fence, and pond
7713:33	Victoria Kamāmalu	(Kawailoa Ahupua'a)	n/a	n/a
8304:3	Kalamahiai	'Uko'a, Waipuolo, Konohikilau, and Kealia	House lot and *lo'i*	*'Auwai*/ditch, stream, and *muliwai* (river)
8419:1	Kealainanea	Lauhulu, Kalualeuo, Iliilikea, and Punakai	House lot, *lo'i*, and sweet potatoes	Road/path, wall/fence, and four small fish ponds bounded by cattle pasture
10364:2	Nanokaeho	Punakai	House lot, *lo'i*, kula, *wauke*, and sweet potatoes	*Pali*

3.4.5 Shifting Landscape

The landscape of Kawailoa and Kamananui Ahupua'a shifted dramatically during the last two decades of the nineteenth century with rice, sugar, and pineapple cultivation, and the infrastructure associated with these agricultural pursuits (plantation camps, railroads, ditches, and reservoirs) can be seen on maps spanning the first half of the twentieth century (Figure 22 to Figure 27). In the 1880s, immigrant Chinese laborers began leasing and buying former taro lands from the Hawaiians of Waialua to convert to rice farming. By 1892, 180 acres of rice were under cultivation in Waialua, including rice fields in the *ahupua'a* of Kawailoa and Kamananui (Coulter and Chun 1937:12, 21).

The Oahu Railway and Land (OR&L) Company, organized by Benjamin Dillingham in 1889, connected outlying areas of O'ahu to Honolulu. During the last decade of the nineteenth century, the railroad would reach from Honolulu to Pearl City in 1890, to Waianae in 1895, to Waialua in 1898, and to Kahuku in 1899 (Kuykendall 1967:100). In 1899, Dillingham, capitalizing on the increasing numbers of visitors to the north shore of O'ahu, opened the Victorian stye, two-story Hale'iwa Hotel at Waialua Bay in 1899. He named it after a seminary's dormitory for women along Anahulu Stream, which in turn was named from the nest, or house (hale) of the large frigate bird (*'iwa*). The hotel's name eventually identified the area above the bay as workers left the sugarcane and pineapple fields to set up stores in the growing town (Jacobs 2006). Today, the town's architecture still resembles the plantation industry in the early 1900s. In 1984, the City and County of Honolulu established Hale'iwa as a State Historic, Cultural, and Scenic District, mandating preservation rules and new construction constraints for Hale'iwa Town (Haleiwa Town 2011).

The development of the railroad also spurred the development of large-scale sugar farming in Waialua. Sugarcane had been first cultivated at Waialua earlier in the century by the missionary John Emerson who constructed a small mill to produce sugar and molasses. During subsequent decades, other missionaries and western entrepreneurs continued expanding sugar cultivation in the district, though still on a small-scale. When the OR&L reached Waialua in 1898, Dillingham persuaded Castle & Cook to lease about 600 acres of Waialua land already under sugarcane cultivation, which led to the rise of the Waialua Agricultural Company (Figure 28). Flumes, siphons, and ditches for irrigation were constructed that are still in use today. Later named the Waialua Sugar Company, it expanded during the first decades of the twentieth century to reach more than 12,000 acres, including extensive portions of Kawailoa and Kamananui Ahupua'a (*Imua* 2005:20).

The Kawailoa Plantation, situated on the rolling ridges above Hale'iwa, included 6,000 acres of sugar cultivation. Plantation villages, or camps, allowed workers to walk to work in the fields, including Kawailoa Camp and Kawailoa Camp 8 (see Figure 24 to Figure 26). A Buddhist temple, the Kawailoa Ryusenji Soto Mission, was established in the Kawailoa Camp in 1924 to minister to the needs of the Japanese workers and their families (Clark 2007). The *mauka* Waimea Camp was part of the Hawaiian Pineapple Company (see Figure 24 to Figure 26), which merged with Castle & Cooke in 1961 and changed its name to Dole Food Company, Inc. in 1991. The Waialua Sugar Company closed in 1998, surrendering its lease of agricultural and conservation lands to Kamehameha Schools. In 1999, Kamehameha Schools began managing the Kawailoa Plantation as a diversified farming operation, with 11 tenant farmers cultivating

asparagus, wet and dryland taro, papaya, seed and feed corn, tuberose, banana, plumeria, noni, and lettuce on 2,200 acres (*Imua* 2005:15–16).

Prior to the Pacific theater of World War II between 1939 and 1945, modernization of the coastal defenses of the Hawaiian Islands included the Kawailoa Military Reservation in the vicinity of the southern portion of the permanent Project footprint and the Waimea Military Reservation near the northern portion fo the permanent Project footprint. Various gun emplacements were constructed, including (in the Kawailoa Military Reservation) Battery Hale'iwa, Battery Ashley, and Battery Kawailoa, and (in the Waimea Military Reservation) Battery Waimea (Bennett 2002), as well as O'ahu's command and fire control cable system that was established as a warning and response system (Bennett 2002).

Numerous structures are located on Mount Ka'ala, including various military installations, bunkers, radar, and weather stations, much of which dates to the Pacific theater of World War II. Maps from the first half of the century do not indicate any development (Figure 29 to Figure 32), but an aerial photograph indicates the presence of roads that are associated with the weather towers and other equipment (Figure 33). The swamp-filled summit plateau of Mount Ka'ala and steep gulches and ridges that form its eastern flank are part of the Hawai'i Natural Reserves System, which was established in 1981 to protect native Hawaiian ecosystems (State of Hawai'i Department of Land and Natural Resources [DNLR] 2011).

The companion archaeological inventory survey has documented 17 historic sites within the study area that are associated with either former plantation activities or former military operations (Rechtman et al. 2011). Sites associated with World War II infrastructure include concrete pillars (SIHP No. 50-8—04-7155 and -7156) and a metal pole/concrete base (-7158). Sites associated primarily with the irrigation of the sugar and pineapple plantations include a concrete marker (-7157), four ditch complexes (-7159, -7169, -7170, and -7171)), stone abutments (-7160), concrete foundations (-7161), a kerbstone alignment (-7162), stone/concrete culverts (-7163, -7165, -7166, -7167), a metal pipeline (-7164), and a concrete bridge (-7168). Rechtman et al. (2011) determined that the three military sites are signifinant under HAR 13§13-284-6 Criteria A (be associated with events that have made an important contribution to the broad patterns of history) and Critera D (have yielded, or is likely to yield, information important for research on prehistory or history), and that the remaining plantation sites are significant under Criteria D. Based on a no historic properties affecting determination, they recommend no further work but suggest that a program of archaeological monitoring be maintained during the Project's construction activitites.

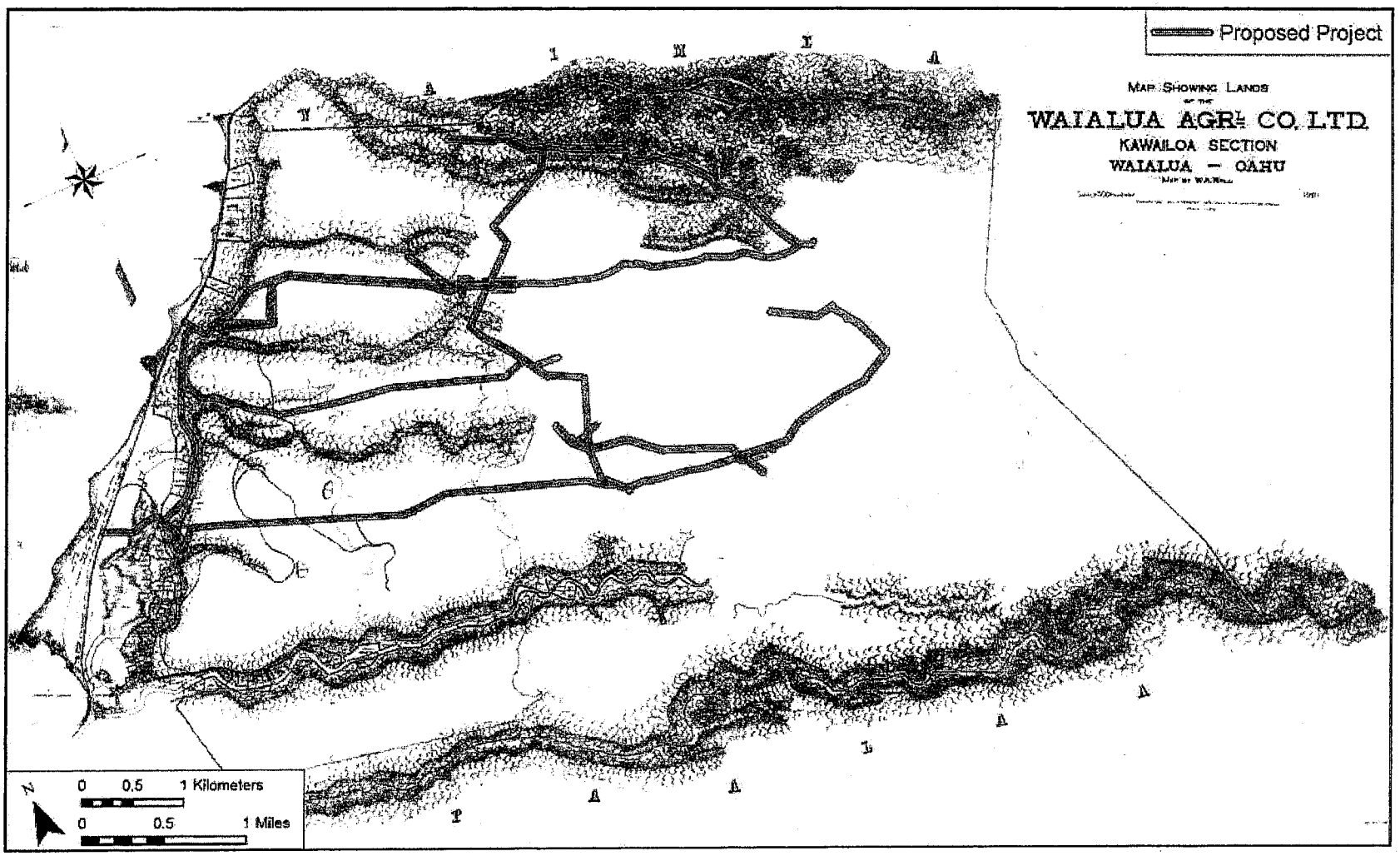

Figure 22. Map of the Waialua Agricutlural Company in Kawailoa, showing the proposed Project (Wall 1901)

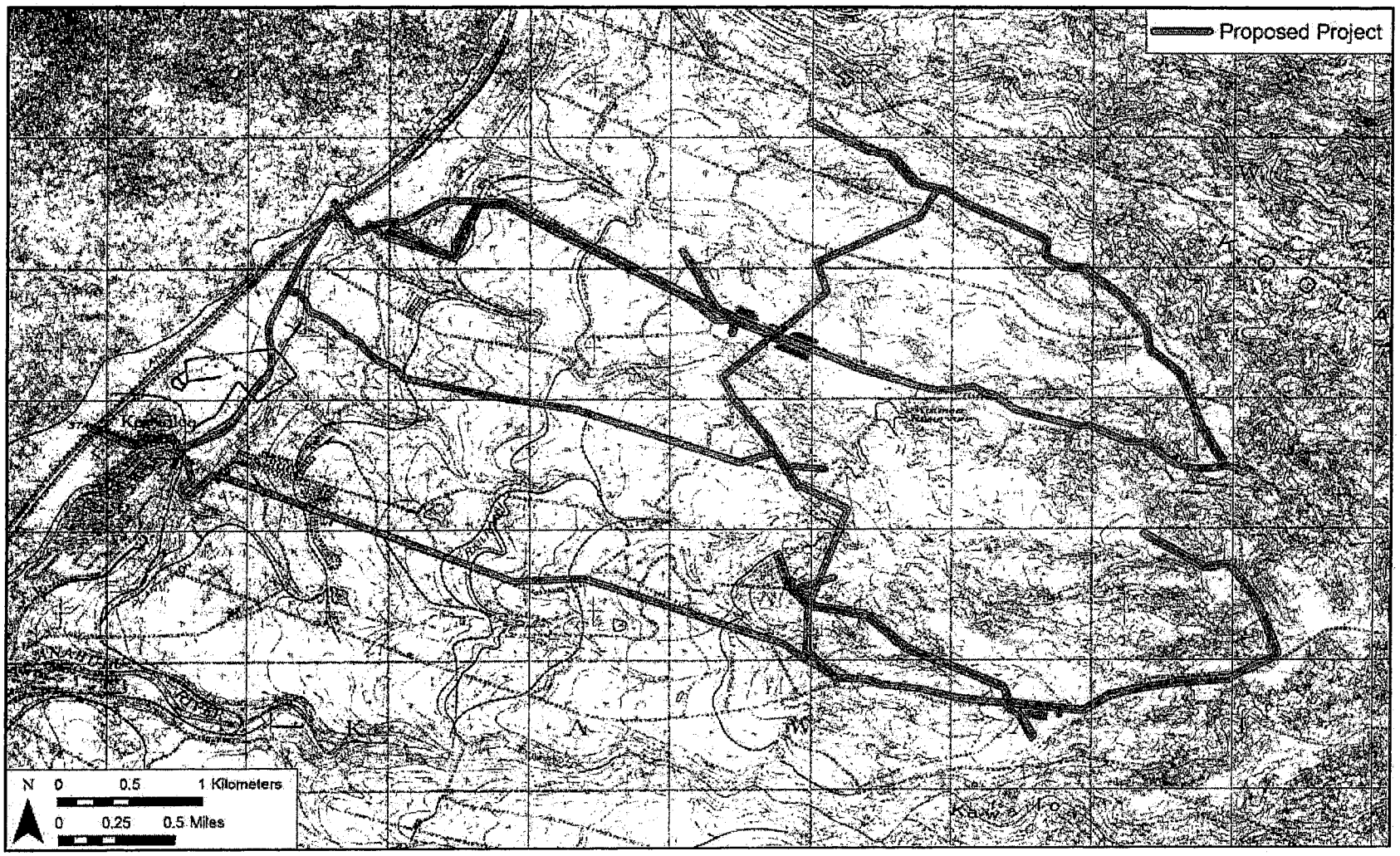

Figure 23. Portion of 1919 U.S. War Department map, Waialua quadrangle, showing the proposed Project

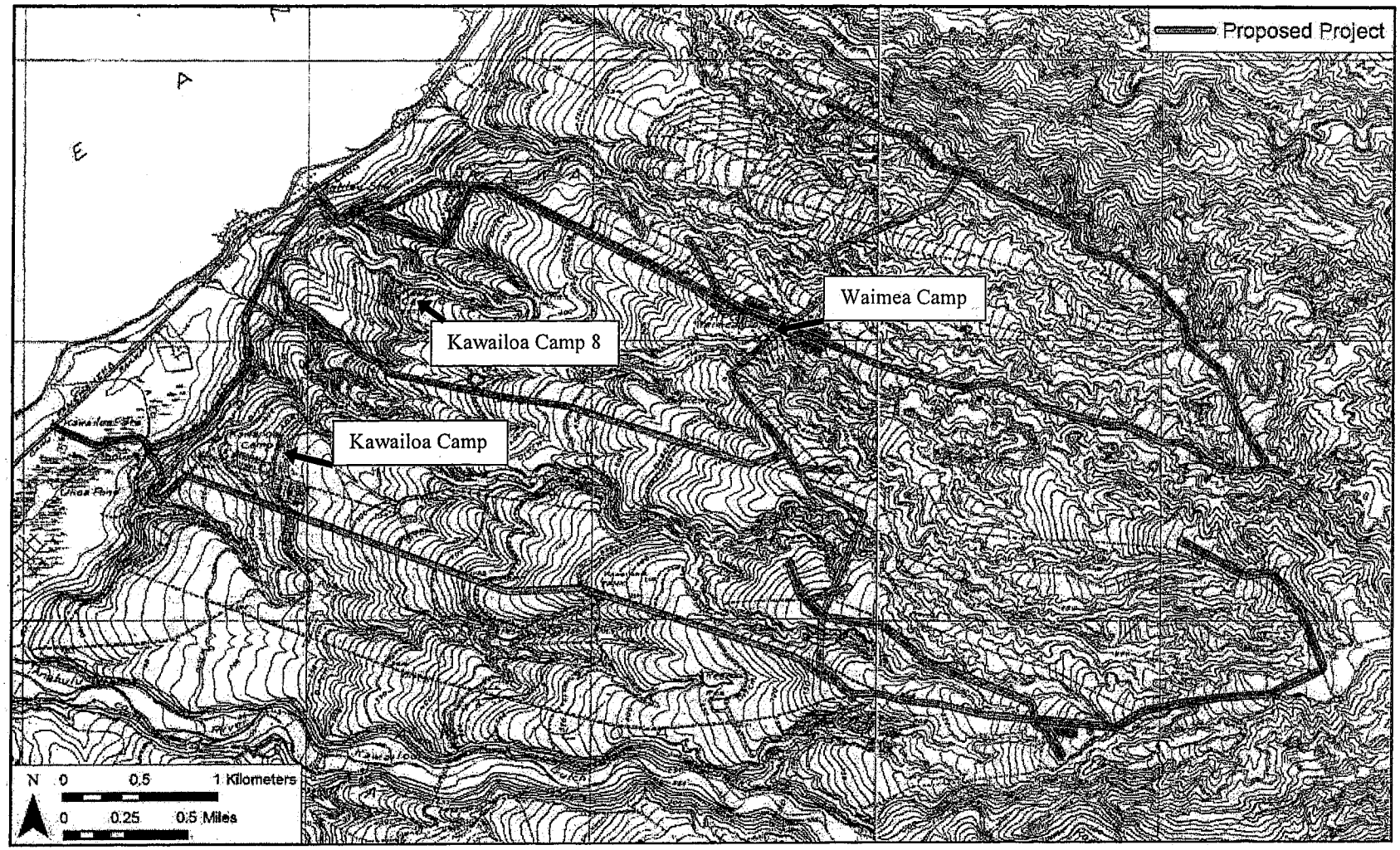

Figure 24. Portion of 1928–1930 USGS 7.5-minute topographic map, Kaipapau quadrangle and 1929 USGS 7.5-minute topographic map, Hale'iwa quadrangle, showing the proposed Project; note Kawailoa Camps and Waimea Camp

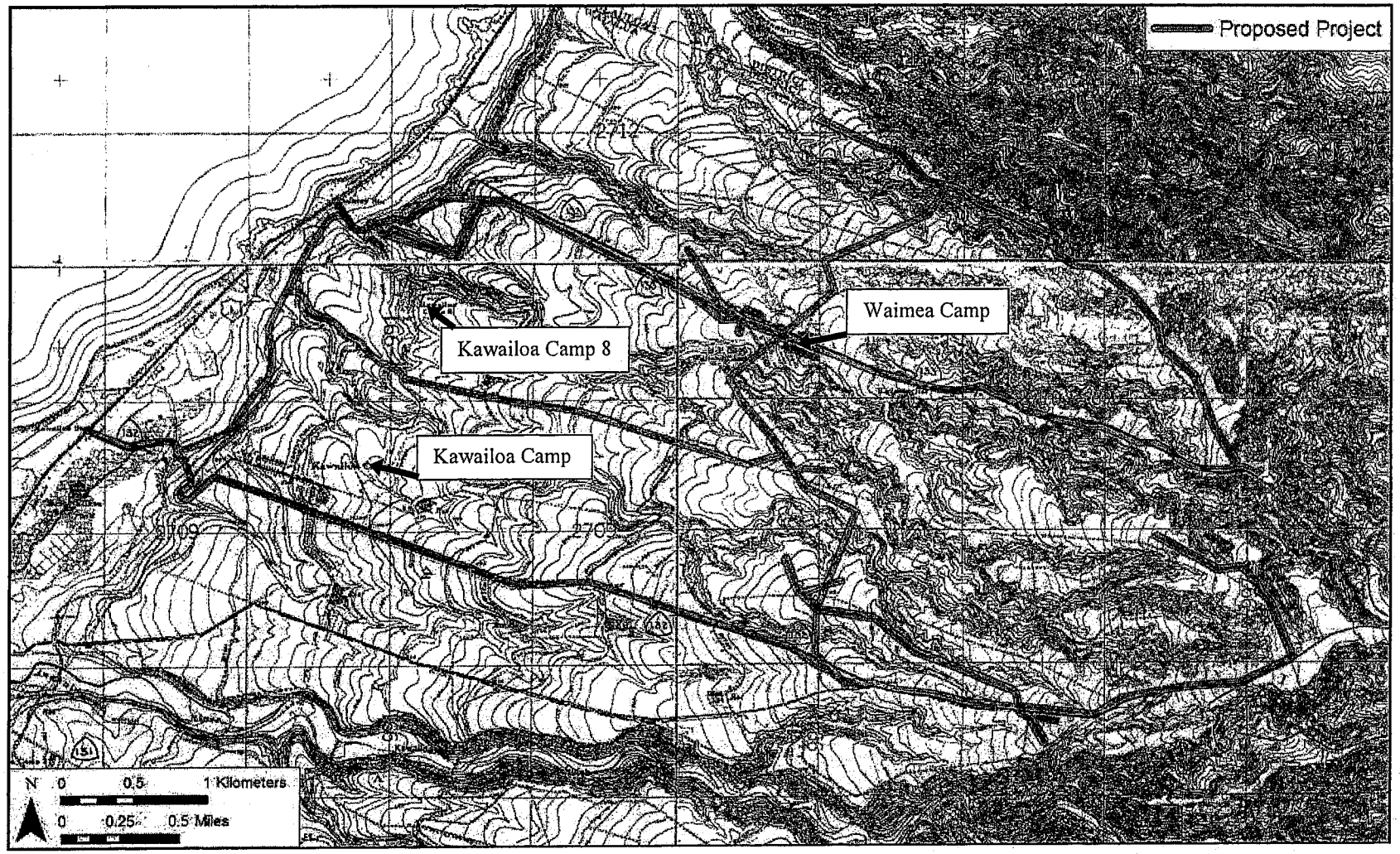

Figure 25. Portion of 1943 U.S. War Department map, Hale'iwa, Waimea, and Pa'ala'a quadrangles, showing the proposed Project; note that Kawailoa Camps and Waimea Camp are still present

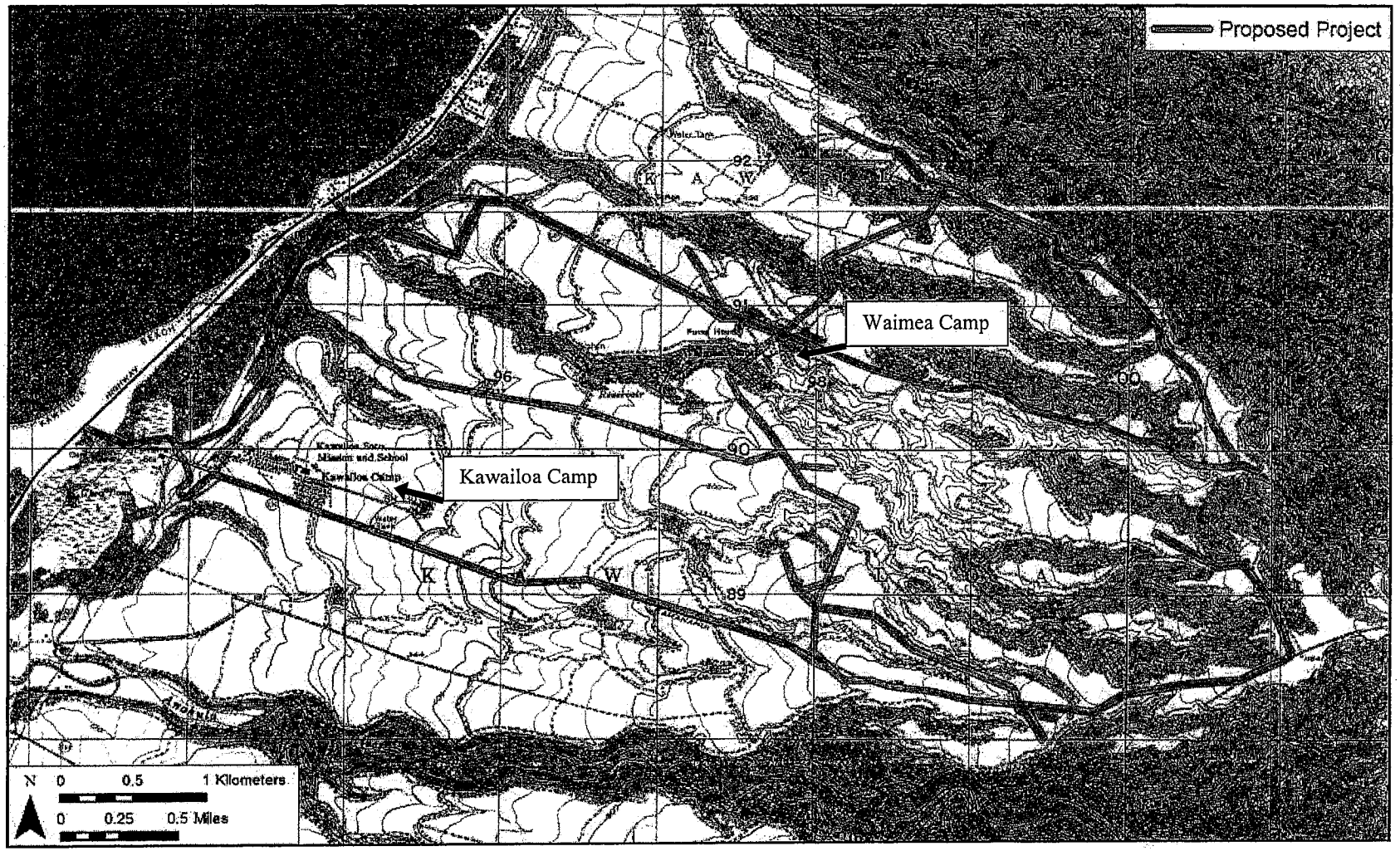

Figure 26. Portion of 1953 U.S. Army Mapping Service (AMS) map, Hale'iwa and Hau'ula quadrangles and 1954 AMS map, Waimea and Kahuku quadrangle, showing the proposed Project; note that Kawailoa Camp and Waimea Camp are still present

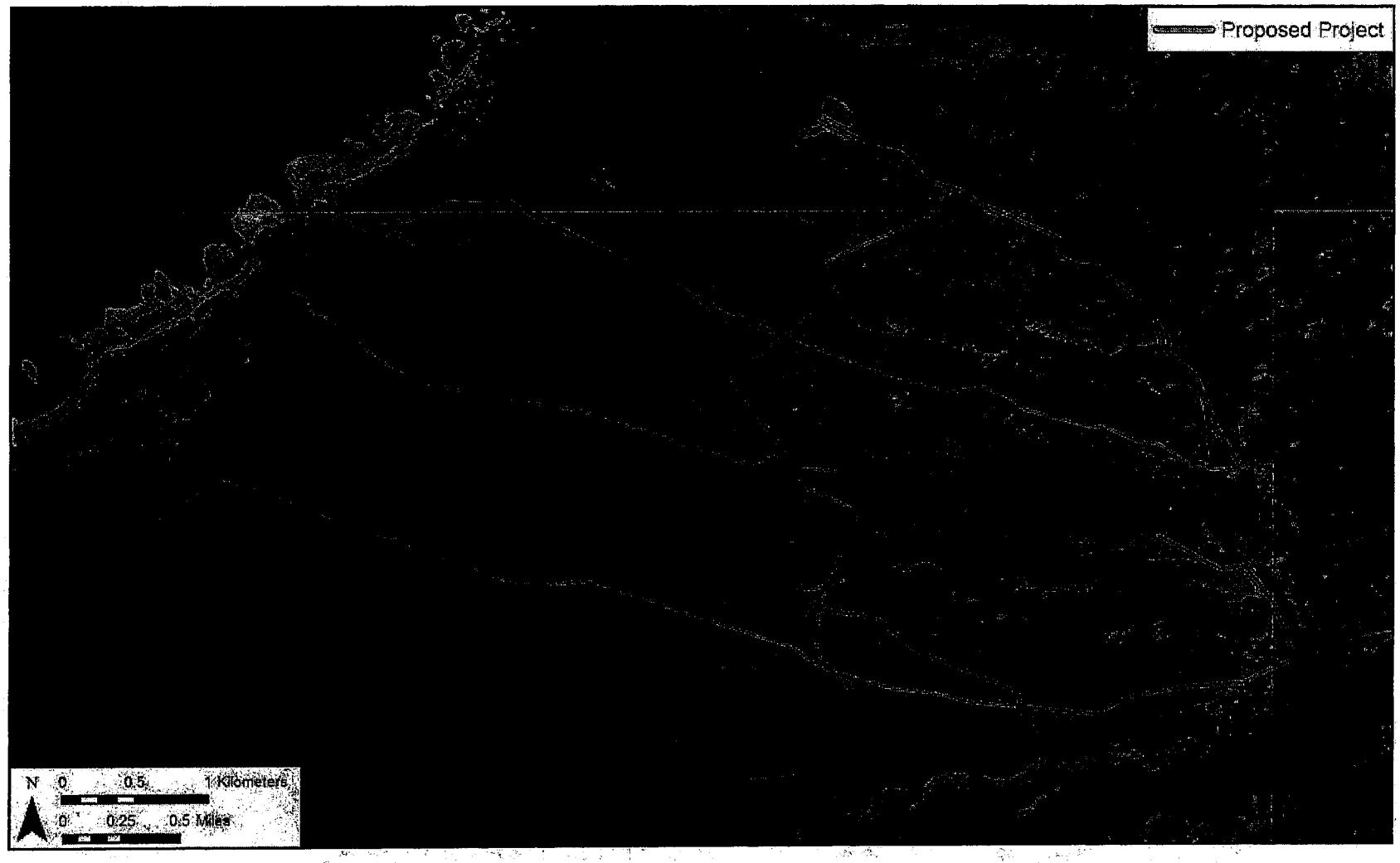

Figure 27. Portion of the orthoimagery of the 1977–1978 USGS 7.5-minute topographic map, Hale'iwa, Waimea, Kahuku, and Hau'ula quadrangles, showing the proposed Project

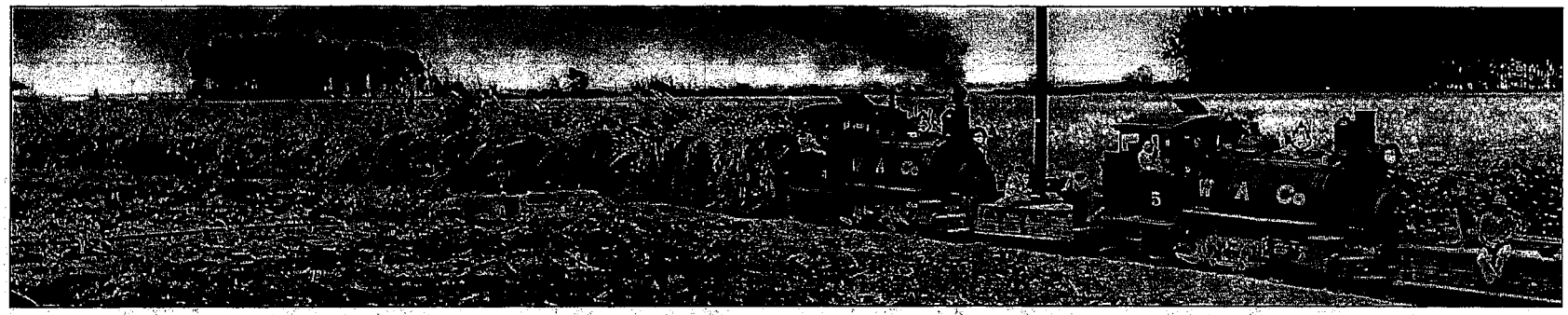

Figure 28. Waialua Agricultural Company railroad in field of sugarcane (Hawaiian Aviation Preservation Society 2011)

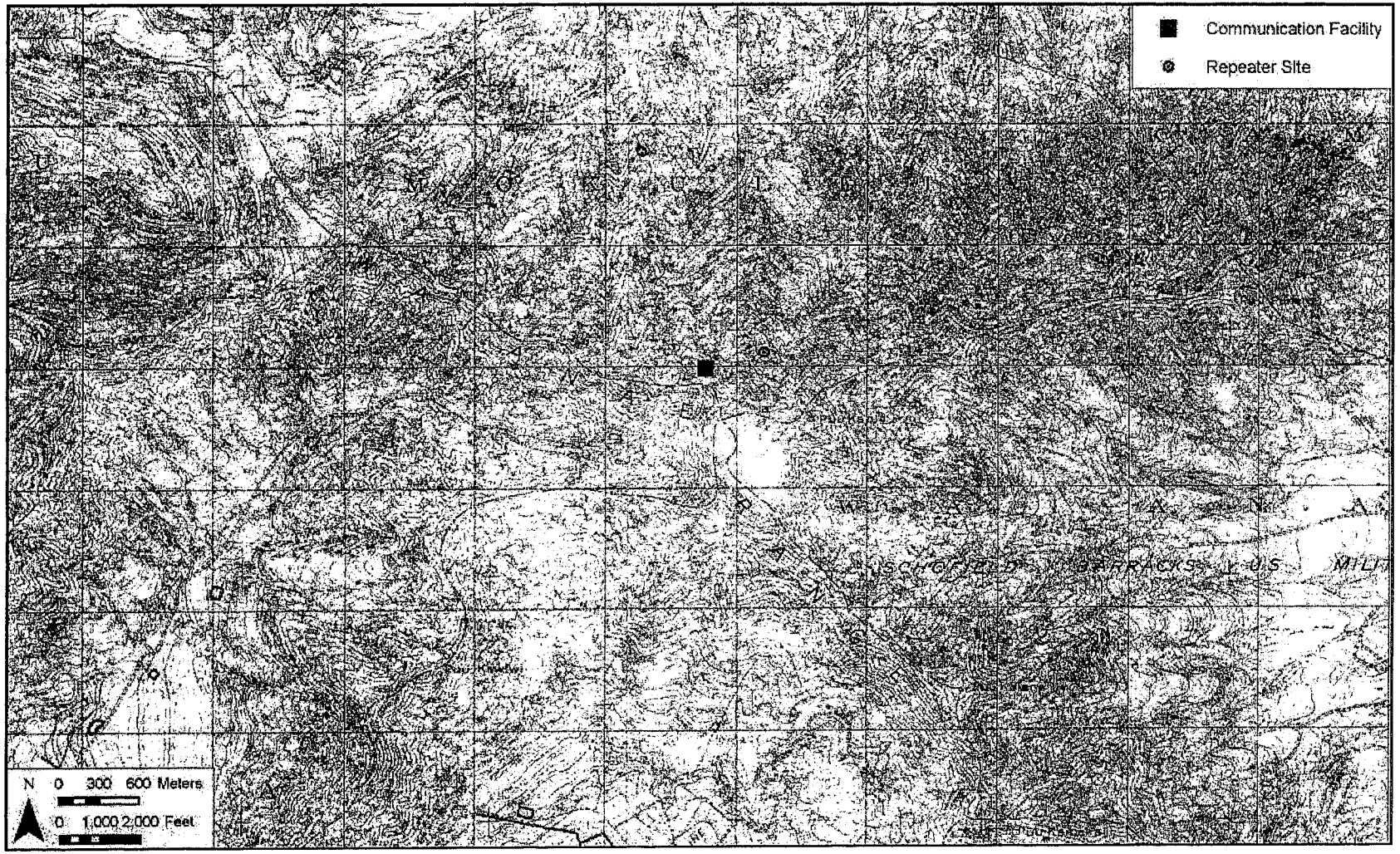

Figure 29. Portion of 1919 U.S. War Department map, Wai'anae quadrangle, showing the Project area

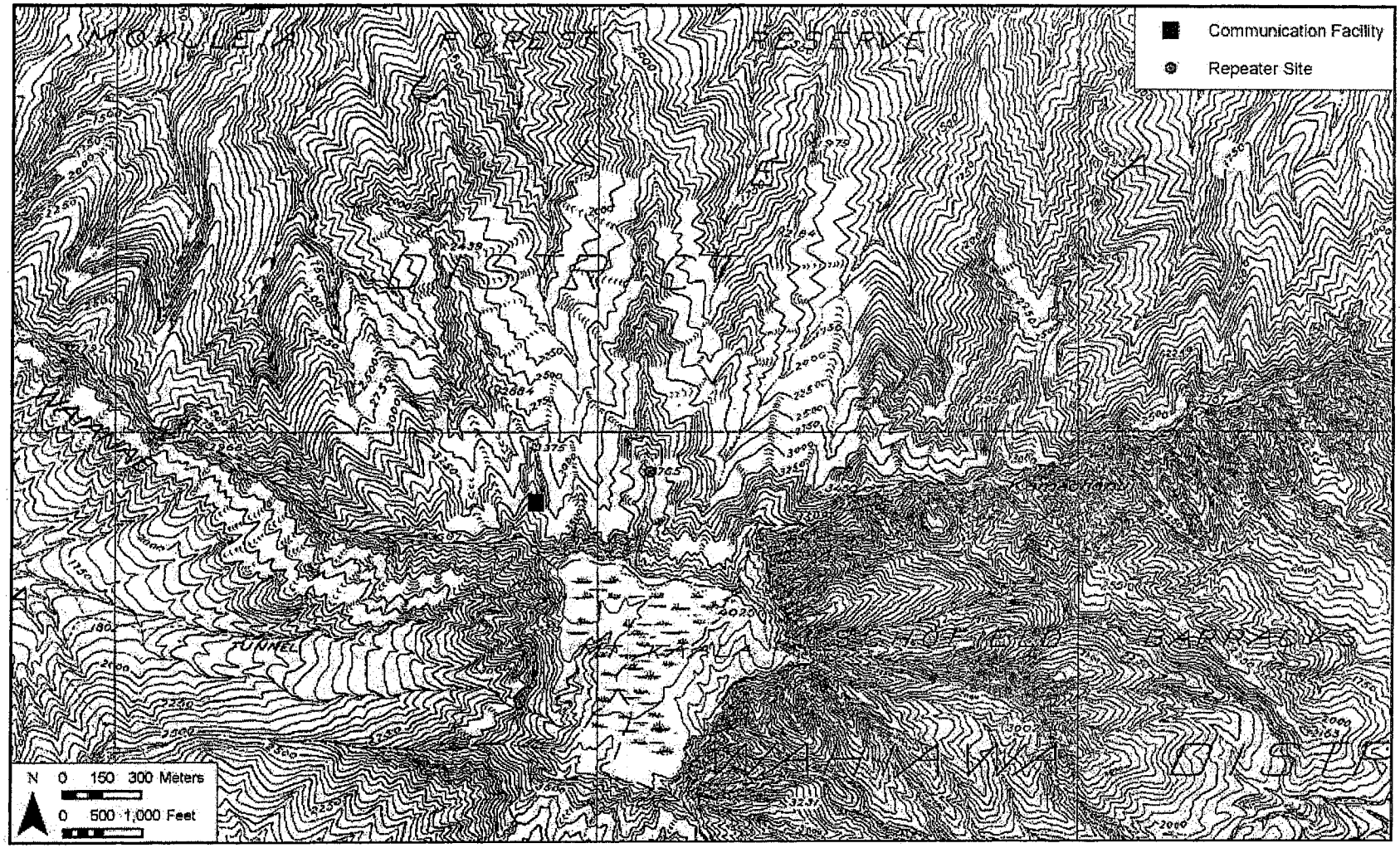

Figure 30. Portion of 1928–1929 USGS 7.5-minute topographic map, Schofield Barracks quadrangle, showing the Project area

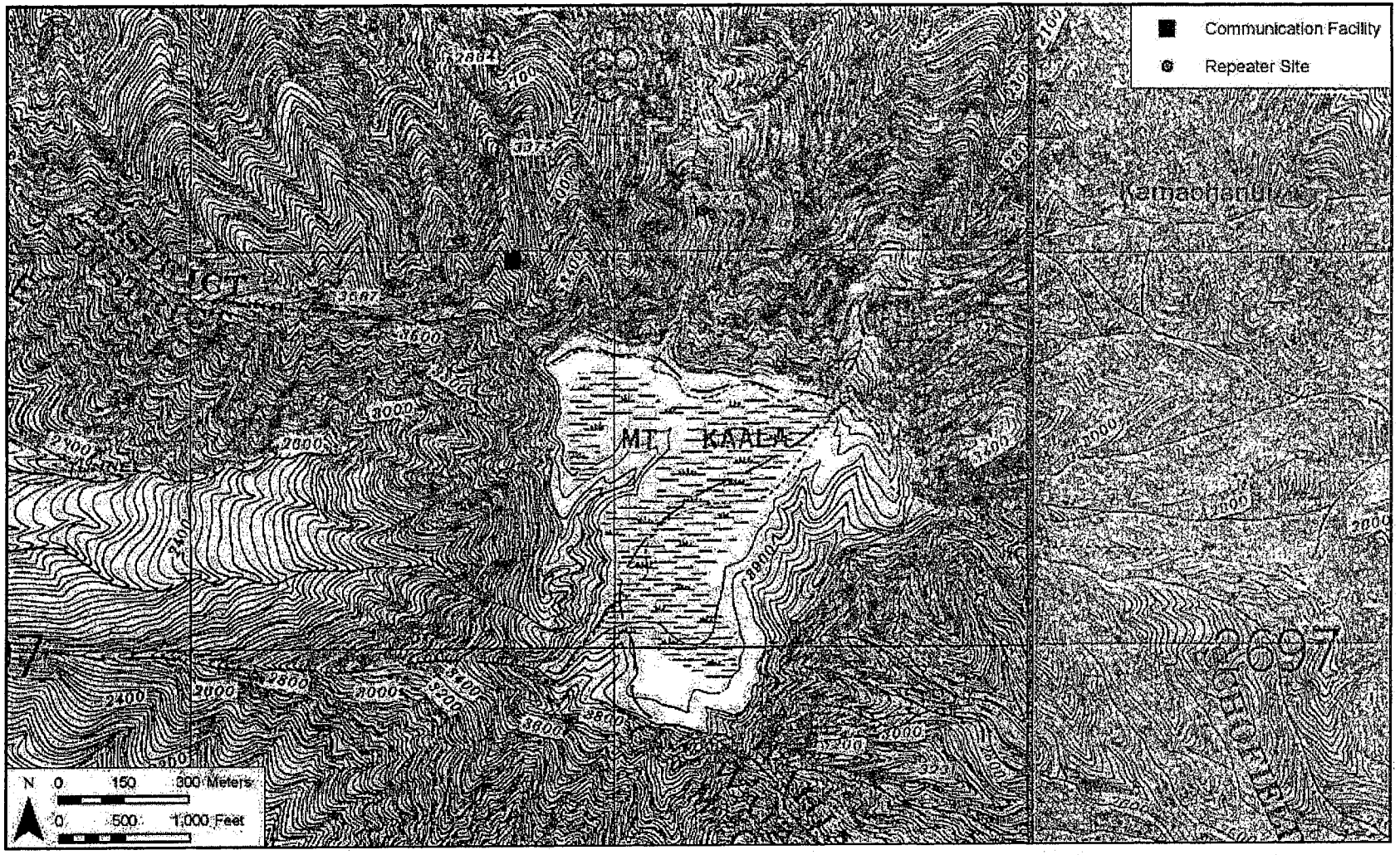

Figure 31. Portion of 1943 U.S. War Department map, Wai'anae and Schofield Barracks quadrangles, showing the Project area

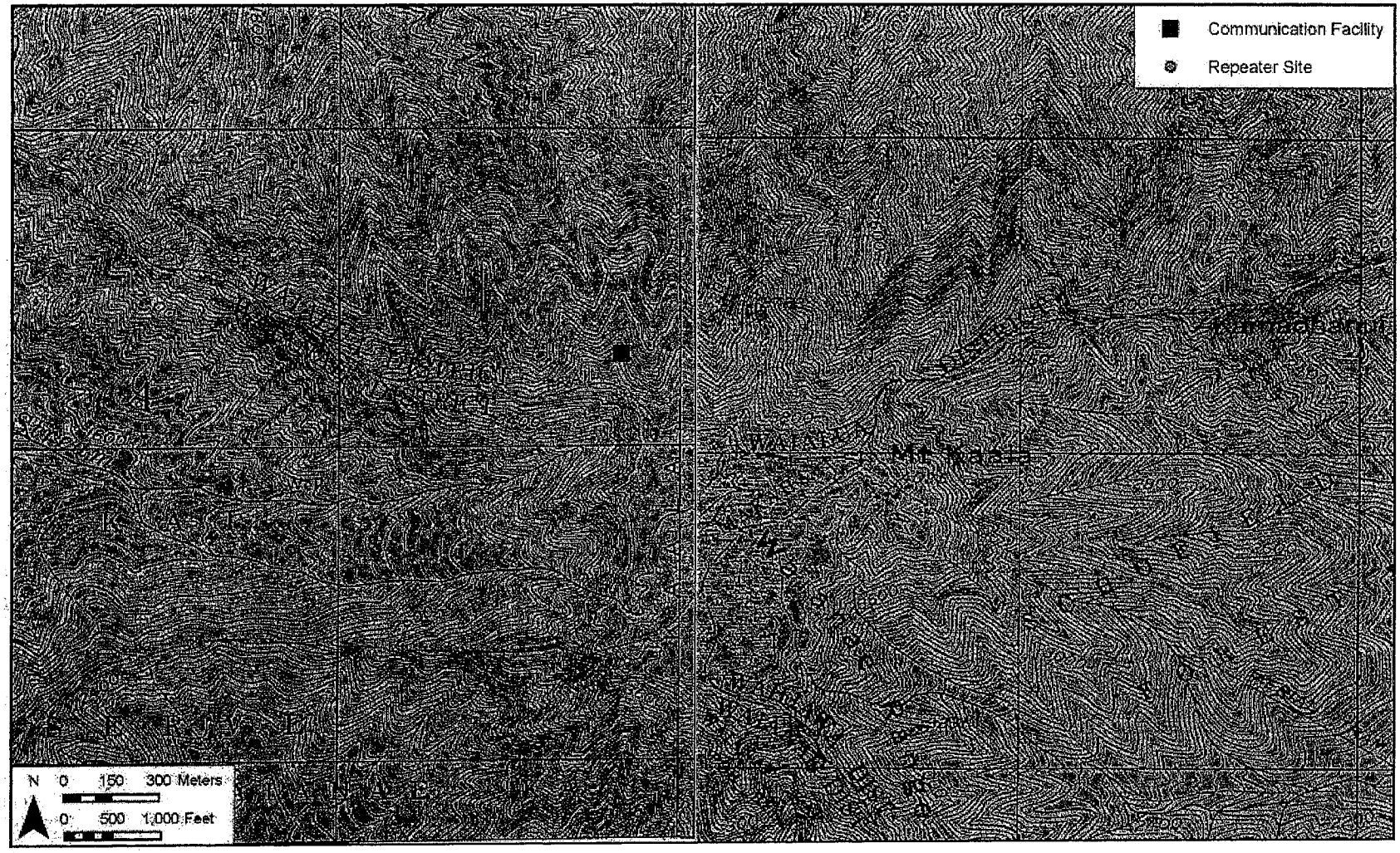

Figure 32. Portion of 1953 U.S. AMS map, Hale'iwa quadrangle and 1954 AMS map, Ka'ena quadrangle, showing the Project area

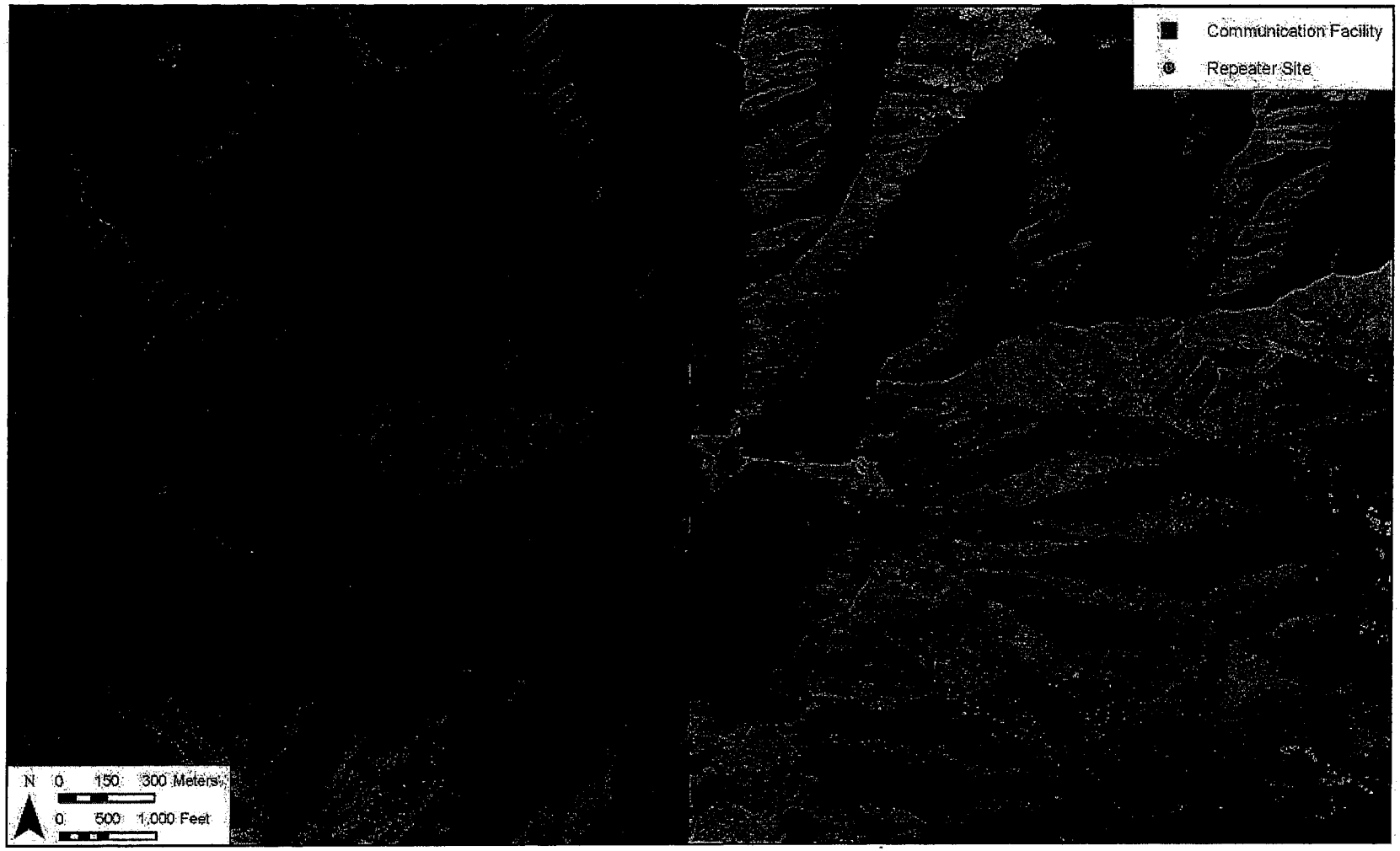

Figure 33. Portion of the orthoimagery of the 1977–1978 USGS 7.5-minute topographic map, Hale'iwa and Ka'ena quadrangles, showing the Project area

3.4.6 Previous Oral History Research

This section builds on the previous cultural and historical background by highlighting the voices of Japanese immigrants who worked on the sugar plantations in Waialua, including Philip Ninomiya and Manabu Nonaka (UH 1977). Their *mo'olelo* from a past generation colors the cultural and historical background with nuanced recollections and add a depth to the information provided by living *kūpuna* and *kama'āina* who were recently interviewed by CSH (detailed in Section 5).

Philip Ninomiya was born in Hale'iwa in 1906. His parents came from Japan to work on the Waialua sugar plantation. Manabu Nonaka was born in Honolulu in 1915 after his parents migrate from Japan, and grew up in Waialua. Philip Ninomiya recalls how the Japanese plantation workers caught *aji* (*akule*, big-eyed scad fish), and would tie them together with *akakai* (reeds) that grew along Anahulu Stream (UH 1977:277). The Japanese used *sampan* (a flat-bottomed skiff usually propelled by two short oars) to catch these fish (UH 1977:414). Philip Ninomiya and his childhood friends also constructed *akakai* rafts to go up and down the stream for recreation and for fishing:

> You know, I don't see *akakai* anymore, but it's a reed. It just grows straight, and it's very buoyant. So. You cut them with a sickle, and tie them with a cord, and make a raft. You made your own paddle. You'd go up and down Anahulu Stream. (UH 1977:302)

Manabu Nonaka describes a diet of mostly fish for the Japanese plantation workers and their families. As a teenager, he caught *pāpio* (young stage of *ulua*, crevalle, jack, or pompano), *āholehole* (young stage of *āhole*, Hawaiian flagtail), *moi* (threadfish), *'oama* (young stage of *weke*, goatfish), and *tako* (Japanese, squid, octopus), and gathered *ogo* (seaweed) (UH 1977:435–437).

Section 4 Community Consultation

Throughout the course of this assessment, an effort was made to contact and consult with Hawaiian cultural organizations, government agencies, and individuals who might have knowledge of and/or concerns about traditional cultural practices specifically related to the permanent Project footprint. This effort was made by letter, email, telephone and in-person contact. The initial outreach effort was started in January 2011 and completed in April 2011. In the majority of cases, aerial photographs (see Figure 1 and Figure 4), maps (see Figure 2 and Figure 5), and a letter (Appendix D) of the proposed Project were mailed.

In most cases, two to three attempts were made to contact individuals, organizations, and agencies apposite to the CIA for this Project. The results of the community consultation process are presented in Table 4. Written statements are presented in Section 4, and excerpts from interviews are presented in Section 5.

Table 4. Results of Community Consultation

Name	Affiliation, Background	Comments
Agadar, Lavina	Resident of Waialua	February 11, 2011 CSH sent letter by email February 28, 2010 Ms. Agader replied in an email that she and her husband are supportive of the wind farm since "it will be utilizing a good part of our natural resource" February 28, 2011 CSH replied by email with a list of questions March 22, 2011 CSH phoned Ms. Agadar to schedule an interview April 8, 2011 CSH conducted interview (see Section 5.7) April 12, 2011 Ms. Agadar approved interview summary
Aki, Buddy	Resident of Waialua	February 14, 2011 CSH called, but no answer and could not leave a message April 4, 2011 CSH called and at the request of Mr. Buddy, sent letter by mail
Ailā, William	Hui Mālama I Nā Kūpuna 'O Hawai'i Nei	February 11, 2011 CSH sent letter by email

Name	Affiliation, Background	Comments
Alameida, Jeff	Resident of Waialua	February 11, 2011 CSH sent letter by email February 16, 2011 CSH called and Mr. Alameida stated that he is not from Mokulē'ia and is not familiar with Kawailoa, but he referred Aunty Betty Jenkins
Anana, Manu	Resident of Waialua	February 11, 2011 CSH sent letter by email February 16, 2011 CSH called but no answer and could not leave a message April 4, 2011 CSH called but no answer and could not leave a message
Au, Kawika	President, Waialua Hawaiian Civic Club	February 10, 2011 CSH sent letter March 3, 2011 CSH conducted interview (see Section 5.6) and Mr. Au invited CSH to present the Project information at the next monthly meeting of the Waialua Hawaiian Civic Club March 10, 2011 Mr. Au approved interview April 11, 2011 Mr. Au sent email, stating that the Waialua Hawaiian Civic Club will not meet until May
Awai-Lennox, Gladys	*Kupuna*, Resident of Waialua	February 11, 2011 CSH sent letter by email February 16, 2011 CSH conducted a phone interview with Ms. Awai-Lennox, who gave permission to re-use portions of the previously conducted interview (see Section 5.2)
Awai, Kanani	Resident of Waialua	February 14, 2011 CSH called and left message March 24, 2011 CSH called and left message April 4, 2011 CSH called and left message

Name	Affiliation, Background	Comments
Awai, Keith	Resident of Waialua	April 19, 2011 Mr. Awai forwarded email to Hinaleimoana Kalu, stating that he spoke with *kupūna* from the area and they did not know of cultural sites in Kawailoa other than *heiau* in the Waimea area.
Ayau, Halealoha	Hui Mālama I Nā Kūpuna 'O Hawai'i Nei	February 11, 2011 CSH sent letter by email
Becket, Jan	Kamehameha Schools	February 11, 2011 CSH sent letter by email February 11, 2011 Mr. Becket invited CSH to meet at the Kamehameha Schools campus February 17, 2011 CSH interviewed Mr. Becket, he gave permission to re-use a previously conducted interview (see Section 5.4), and referred Tom Shirai February 28, 2011 Mr. Becket approved interview summary
Beime, Ululani	Ko'olauloa Hawaiian Civic Club	February 11, 2011 CSH sent letter by email
Cannon, Dianne	Resident of Waialua	February 14, 2011 CSH called and left message April 4, 2011 CSH called and left message
Causey, Emmaline	Resident of Waialua	February 10, 2011 CSH sent letter February 28, 2011 CSH conducted phone interview with Mrs. Causey, who gave permission to re-use a previously conducted interview (see Section 5.3)
Cayan, Phyllis Coochie	History and Culture Branch Chief, SHPD	February 10, 2011 CSH sent letter March 3, 2011 Ms. Cayan sent response letter, referring Tom Shirai and Leimaile Quiteves (see Section 4.1)

Name	Affiliation, Background	Comments
Chun, Janell	Resident of Waialua	February 11, 2011 CSH sent letter by email February 16, 2011 CSH called but no answer and could not leave a message April 4, 2011 CSH called but no answer and could not leave a message
Cypher, Mahealani	President, O'ahu Council of the Association of Hawaiian Civic Clubs	February 11, 2011 CSH sent letter by email February 11, 2011 Mrs. Cypher referred Kawika Au of the Waialua Hawaiian Civic Club and Ululani Beime of the Ko'olauloa Hawaiian Civic Club
Gamiao, Alma	Resident of Waialua	February 11, 2011 CSH sent letter by email March 22, 2011 CSH called and sent letter, questions, release forms via email
Helemano, Butch	Descendant of Hewahewa, Resident of Waialua	April 11, 2011 CSH conducted interview with Mr. Helemano, who gave permission to re-use a previously conducted interview (see Section 5.8) April 12, 2011 Mr. Helemano approved interview summary
Harvest, Dino	Resident of Waialua	February 11, 2011 CSH sent letter by email April 4, 2011 CSH called but no answer and could not leave a message
Hirota, John	Resident of Waialua	February 11, 2011 CSH sent letter by email April 4, 2011 CSH called but no answer and could not leave a message
Hookala, Maile	Resident of Waialua	February 14, 2011 CSH called and left message April 4, 2011 CSH called and left message

Name	Affiliation, Background	Comments
Jenkins, Kawohiokalani	*Kupuna*, Resident of Waialua	February 11, 2011 CSH sent letter by email February 25, 2011 CSH called Ms. Jenkins, who will try to arrange a meeting with other *kūpuna* whose *piko* (birthplace) lies in Kawailoa February 28, 2011 Ms. Jenkins replied by email after arranging a group interview with Kawika Au Moki Labra March 3, 2011 CSH conducted interview with Ms. Jenkins (see Section 5.6) March 10, 2011 Ms. Jenkins approved interview summary
Ka'ala Cultural Learning Center	n/a	March 30, 2011 CSH sent letter by email
Kalu, Hinaleimoana	Vice-President, OIBC	April 11, 2011 CSH sent letter by email April 12, 2011 Ms. Kalu responded by email and forwarded the Project information to her cousin Keith Awai, whose mother is Dorothy Kanani Awai
Kāne, Uncle Shad	OIBC, Nā Koa 'O Pālehua, Association of Hawaiian Civic Club's Historic Preservation Committee	February 11, 2011 CSH sent letter by email February 16, 2011 Mr. Kāne replied, stating that he is aware of undocumented cultural sites at the Causey property, and that the cultural landscape continues into Kamehameha Schools property
Labra, Moki	Resident of Waialua	March 3, 2011 CSH conducted interview with Mr. Labra (see Section 5.6) April 20, 2011 Mr. Labra approved interview summary

Name	Affiliation, Background	Comments
Lenchanko, Tom	Vice-President, Hawaiian Civic Club of Wahiawā, Spokesperson for 'Aha Kūkaniloko/Koa Mana, Hawaiian National Lineal Descendants	February 11, 2011 CSH sent letter by email February 17, 2011 CSH conducted interview and Mr. Lenchanko gave permission to re-use a previously conducted interview (see Section 5.5)
Lyons, Michael	Chair, North Shore Neighborhood Board	February 11, 2011 CSH sent letter by email March 30, 2011 CSH sent letter by email
McKeague, Kawika	President, OIBC	February 16, 2011 CSH sent letter by email March 30, 2011 CSH sent letter by email April 11, 2011 Mr. McKeague responded, stating that he is now working for Kamehameha Schools, the landowner of the Project, and requests contacting OIBC Vice-President Hinaleimoana Kalu and Waialua Representative Leimaile Quitevis
Nāmu'o, Clyde	Administrator, OHA	February 10, 2011 CSH sent letter April 11, 2011 Jerome Yasuhara sent the previous draft EIS for specific referrals, including the OIBC, members of the Hewahewa 'Ohana (e.g. Butch Helemano), cultural practitioners and caretakers at such sites as Pu'u o Mahuku and Kūkaniloko (e.g. Tom Lenchanko), Tom Shirai, the North Shore Community Land Trust, Native Hawaiian gathering and subsistence practitioners, management at Waimea Valley Falls Park, and various residents (see Section 4.2)
North Shore Community Land Trust	n/a	April 11, 2011 CSH sent letter by email
Osulivan, Lloyd	Resident of Waialua	February 11, 2011 CSH sent letter by email April 4, 2011 CSH called and left message

Name	Affiliation, Background	Comments
Quitevis, Leimaile	Waialua Representative, OIBC	March 4, 2011 CSH sent letter by email April 11, 2011 CSH sent letter by email
Souza, Aunty	Resident of Waialua	February 11, 2011 CSH sent letter by email April 4, 2011 CSH called and left message
Shirai, Thomas	OHA Native Hawaiian Historic Preservation Council, Past member OIBC, Lineal Descendant, Cultural and Historical Traditions of Waialua	February 11, 2011 CSH sent letter by email February 25, 2011 CSH called but no answer and could not leave a message March 30, 2011 CSH sent letter by email April 4, 2011 CSH called and Mr. Shirai stated that he is supportive of the Project and notes that there will not be any cultural impacts
Waimea Valley Hi'ipaka LLC (formerly Waimea Valley Falls Park)	n/a	April 12, 2011 CSH sent letter

4.1 State Historic Preservation Division

CSH contacted Phyllis "Coochie" Cayan, History and Culture Branch Chief of SHPD, on February 10, 2011, and Ms. Cayan responded to CSH on March 3, 2011 (**Error! Reference source not found.**). According to Ms. Cayan, the SHPD states that the proposed Project will have an impact on the area's well documented *mo'olelo*, historic sites, archaeological sites, and burials. She recommends that access and gathering rights should not be prevented, as certain families, practitioners, and groups continue to practice Hawaiian spirituality, traditional burials, and other activities, such as hunting and hiking. Ms. Cayan refers Tom Shirai and Leimaile Quiteves, as well as practitioners who gather resources, hunting associations, stewardship groups (e.g. Ka'ala Cultural Center), senior citizen groups, Hawaiian civic clubs, neighborhood boards, and hiking clubs.

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

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

GUY H. KAULUKUKUI
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
KAHUHIHEWA BUILDING
601 KAMOKILA BLVD, KAPOLEI HI 96706

March 3, 2011

Dr. Hal Hammatt, Ph.D.
Cultural Surveys Hawai'i, Inc.
P.O. Box 1114
Kailua, Hawai'i 96734

Log No.2011.0466
Doc.No.1102pc009

Dear Dr. Hammatt:

SUBJECT: KAWAILOA 8: A Cultural Impact Assessment (CIA) for the proposed Kawailoa Wind Farm Project, Ahupua'as of Kamananui, Kawailoa, Lauhulu, Kuikuiloloa,Punaue, and Kapaeloa, Waialua District, O'ahu Island.
Wind Farm Site TMK (1) 6-1-005:001; 6-1-006:001; 6-1-007:001; 6-2-009:001; 6-2-011:001. Traversed by Existing Onsite Access Roads: TMK (1)6-1-005:003,007,014,015,016, 019; 6-1-005:020, 021,022; 6-1-008:025; 6-2-002:001, 002, 003, 025. Mount Ka'ala Communication Sites: TMK (1) 6-7-003:024.

Thank you for the opportunity to offer some strategic insights to evaluate potential impacts to cultural practices and resources as a result of the aforementioned development in Kamananui Ahupua'a (the microwave communications facilities) and Kawailoa, Lauhulu, Kuikuiloloa, Punaue and Kapaeloa Ahupua'as (the wind power facility).

This is a huge undertaking in multiple ahupua'a that will have an impact on any traditional cultural practices and resources which include the area's well-documented mo'olelo, historic sites, archaeological sites and burials. **A vast project such as this will need full consultation by the immediate communities (and island wide users) on traditional cultural impacts for all of the ahupua'as mentioned above.** As you know, these areas continue to have natural resources and/or have a traditional cultural landscape that are still used by native Hawaiians and the general public. Therefore, access and gathering rights should not be prevented in any of the project's areas. Also, there are some areas in the above various ahupua'a that certain families, practitioners and/or groups continue to practice Hawaiian spirituality, traditional burials and as well as other non-western activities (i.e., hunting, hiking).

Some folks to begin your outreach may include but not limited to the following:

- Tom Shirai, core 'ohana from Waialua nei — Phone: 637-4690
- Leimaile Quiteves, OIBC rep for Waialua District — Phone: 381-1137

Other groups you may want to dialogue with may include practitioners who gather resources (i.e., wood, flora), hunting associations, stewardship groups (i.e., Ka'ala Cultural Center), senior citizens (kupuna) groups, Hawaiian civic clubs and/or societies, neighborhood boards, hiking clubs and so on not only on in those communities but island-wide to reach potential folks that may have information on the past and present land use of this proposed project area.

Sincerely,

Phyllis Coochie Cayan

Phyllis Coochie Cayan
History and Culture Branch Chief

Figure 34. SHPD response letter

4.2 Office of Hawaiian Affairs

CSH contacted Clyde Nāmu'o, Administrator of OHA, on February 10, 2011. Jerome K. Yasuhara, Compliance Specialist, forwarded OHA's previous comments on the Kawailoa draft EIS to CSH on April 11, 2011, with particular focus on referrals. This document states that OHA is concerned about known Hawaiian properties and sites in close proximity to the proposed Project, and acknowledges the ancient *ali'i* and *kahuna* foundations of Waialua. Specific referrals (in footnotes 16 and 18) include the OIBC, members of the Hewahewa 'Ohana (e.g. Butch Helemano), cultural practitioners and caretakers at sites such as Pu'u o Mahuku and Kūkaniloko (e.g. Tom Lenchanko), Tom Shirai, the North Shore Community Land Trust, Native Hawaiian gathering and subsistence practitioners, management at Waimea Valley Falls Park, and various residents.

Section 5 Interviews

Kama'āina and *kūpuna* with knowledge of the proposed Project and study area participated in semi-structured interviews from January 2011 to April 2011 for this CIA. CSH attempted to contact 37 individuals for this CIA report; of those, 17 responded and nine participated in formal interviews. CSH initiated the interviews with questions from the following five broad categories: *wahi pana* and *mo'olelo*, agriculture and gathering practices, freshwater and marine resources, cultural and historic properties, and burials. Participants' biographical backgrounds, comments, and concerns about the proposed development and permanent Project footprint are presented below.

5.1 Acknowledgements

The authors and researchers of this report extend our deep appreciation to everyone who took time to speak and share their *mana'o* (thoughts, opinions) with CSH whether in interviews or brief consultations. We request that if these interviews are used in future documents, the words of contributors are reproduced accurately and not in any way altered, and that if large excerpts from interviews are used, report preparers obtain the express written consent of the interviewee/s.

5.2 Gladys Awai-Lennox

CSH conducted phone interviews with Gladys Awai-Lennox, "Aunty Honey," on February 16, 2011 and previously on June 23, 2010. In 1929, Mrs. Awai-Lennox was the second of four children born to George Elama Ka'ele'makule Awai and Beatrice Chung-Hoon Awai in Honolulu. Her mother was from the Liliha area at School Street. Her father was a 1910 graduate of Kamehameha Schools and passed away in 1981 when he was 90 years of age. Mrs. Awai-Lennox, now 82 years old, is a retired secondary school principal. Throughout her life, she has lived part time in Hale'iwa, and about ten years ago she returned to her family's *kuleana* in Hale'iwa where she now resides full-time.

Mrs. Awai-Lennox shared her recollections of the area from Hale'iwa to Kawailoa during the 1930s and 1940s. She recalls Kawailoa as a thriving little plantation town that had a school, swimming pool, and Japanese temple. The Kawailoa area also has deeper cultural and historic significance. She describes that Kamehameha's warriors stopped at Waimea Bay and used the whole area on the mountain side, from Kawailoa to Waimea, for training centers. She recalls that she found remains of old stone walls that, because of the way they were situated, could have been part of an ancient training center. She describes that Queen Lili'uokalani had a home near Anahulu Stream, and explains that "We are certain the *ali'i* enjoyed the balmy weather and abundance of food [in the area]." In addition, her elder family members shared with her that several *heiau* were located in the uplands of Kawailoa, although she cannot specify their exact locations.

Other historical sites in the area she recalls include the OR&L railroad tracks that used to pass right in front of their family house. She explains that the railroad enabled people to come in and visit the area and she fondly remembers riding the trains and seeing them come over the track as she and her siblings swam in Anahulu Stream: "Back then, the water was clean and the men

would throw us pineapples from the train and we loved that! I know the waters were clean because the military who were stationed in Kawailoa would throw coins in the stream and we could see them all the way at the bottom, and we'd go dive for them!"

Mrs. Awai-Lennox's family *kuleana* can be found by following Hale'iwa Road past Ali'i Beach park and past the Japanese temple and school near where Kamehameha Schools has their preschool. There, a house with a big front lawn is the family house. It has ten bedrooms and was rebuilt in 1930. Mrs. Awai-Lennox lives near the taro in the agricultural lot behind the house and her cousin, Amy Kalili Asano, still lives in the big family home. The land was granted to her father's grandfather at the time of the Māhele and her family has been in the area ever since. Her father told her stories of their ancestors helping the early missionaries travel (circa 1830) because, "in those days, they knew about the currents, so they could get them to and from North Shore to Kauai'i." Since her father worked in Honolulu, their family's time was divided between town and Hale'iwa, yet her father ensured they religiously went back every weekend to return to the *'āina* (land) and tend their taro.

She explains that they had their taro lands, breadfruit, and bananas, which still exist to some extent but their supplies have diminished. She points out that although they still have many coconuts, little taro is available. Tending and eating taro was central to their life. "We never bought *poi* [pounded taro] for over fifty years!" she reminisces. They always harvested their own taro and prepared *pa'i'ai* (hard, pounded but undiluted taro). They would line the bowl with a *tī* leaf and, as needed, mix it with water to make *poi*, which was their staple. When her family needed a large quantity for a *pā'ina (*party with dinner), her father would take their taro to Mr. Matson's mill behind Kawaiha'o church in Honolulu to prepare the *poi*.

Important influences during her development included her family, the Congregational church they attended, education, Hawaiian language and culture, living off the land, and living off the ocean. Her mother was a teacher at Kawailoa elementary school and her uncle, James Awai, was a principal there, too. Her father worked for the Land Office and he was bilingual, fluent in his native Hawaiian and in English. One of his strengths was translating documents such as deeds, which were all in Hawaiian. Although she did not grow up speaking Hawaiian, her father was fluent and he created Hawaiian lessons for Mrs. Awai-Lennox and her siblings. They began with single words, then phrases, and then sentences. Music was another very important way they learned Hawaiian. Her father played music at the Hale'iwa Hotel with his brother and sister and they also were involved in music through their church. Memorizing Bible verses in Hawaiian also contributed to Mrs. Awai-Lennox's Hawaiian language development. "When I think back now, he was wanting us to retain our culture, not lose it. Mother was very supportive, too, you know, typical school teacher." Mrs. Awai-Lennox reflects that this was important for developing their self-esteem.

"Even though we weren't considered poor, we lived off the uplands and oceans. This was before [talk about] sustainability," she remarks. Fishing has been a significant activity. It was a group effort and a family activity that provided sustenance for everyday eating and for special occasions. She recalls that her grandmother who went to a seminary near Anahulu Stream was also a great fisher. "We fished from Hale'iwa up to Kawailoa and beyond, depending on the availability and the need," Mrs. Awai-Lennox explains. She recalls being woken up when it was still dark by her father and there were no questions asked about why he woke her, or where they

were going. She knew they were going fishing. They practiced a method called *pa'i pa'i* (to slap). Her father and uncle would take nets out and surround the area and when the fish were near, they would signal the kids to *pa'i pa'i* the water to scare the fish into the nets. They used old *tī* leaves and *haole koa* sticks to swap or slap the water, reef, or sand. Another method they practiced was the *hukilau* (to fish with a seine, literally meaning pulling ropes) and refers to a large group of people surrounding the fish with a net and pulling the net tied with dried *tī* leaves closer and closer together to trap the fish. She explains that this method was especially used for *akule* fishing, and it was practiced less frequently because it required a large group of people.

In addition to fishing, her family also gathered *wana* (spiny urchins). She also recalls using goggles made from cross-sections of bamboo to look for them underwater, exclaiming "I still have one pair!" They prepared the *wana* by shaking them in the bag or basket to loosen their spines, then they would crack the shells, and take the tongues out. While in San Francisco years later, Mrs. Awai-Lennox was surprised to "see Italians eating *wana* like a caviar!" She recalls that Kawailoa and Waimea were excellent for *wana* harvesting because "the rough water meant they were more plentiful." They also gathered many *pipipi* (pearl oysters) and *ha'uki'uki* (shingle urchins), which are round, stubby, and fat. Their juice was used for embellishing food. Now, she notes that these are all scarce around the Hale'iwa area. She also recalls eating special fish, like raw *nenue* (chub fish) and *kala* (surgeon fish), remarking that the *kala* from Hale'iwa area waters were particularly tasty. Her memory of eating *kala* from Manaloa Bay (Hawai'i Kai) was not as pleasant because "there the *kala* ate too much seaweed, so all you could taste was seaweed." Her family cooked *kala* in a fish stew. "My dad and family members knew how to clean the intestines really well, so some of the goodies were added to the flavor of the soup," she reminisces. For special holidays such as New Year's and birthdays it was her family's tradition to prepare squid *luau* (a stew made from squid, coconut milk, and luau or taro leaves). She also recalls stringing and drying all the *'oama* which she says were very abundant.

Mrs. Awai-Lennox's family gathered *limu* including: *wāwae'iole*, also called rat feet; *ogo*, a Japanese term for a kind of *limu*; *limu 'ele'ele,* which was found where fresh water came down from mountains in Kawailoa Ahupua'a in the area around Chun's reef, and *limu kohu*. She remembers these used to be plentiful and that even the old Hale'iwa IGA and Fujioka's grocery stores used to sell *limu kohu*. She adds that eventually they disappeared because they have become so scarce.

These days, "surfing has gobbled up all the attention" and fishing, especially family fishing, has fallen out of popularity, she says. She knows that some younger fishermen still visit Kawailoa area. They work individually and are often free diving for lobsters, which she has heard are becoming scarce, along with *limu*.

In addition to growing *taro* and other vegetables, her family also cultivated breadfruit, banana, and coconut trees. For special holidays such as New Year's and birthdays it was her family's tradition to prepare *kūlolo* (coconut pudding made of baked or steamed grated taro and coconut cream), *haupia* (pudding made of arrowroot, or *pia*, and coconut cream). Mrs. Awai-Lennox and her siblings also utilized the uplands for fruit. She recalls gathering guava and passion fruit which they used to make juice. Some would be stored in freezers for later use.

Another plant they collected was *kiawe* (Algaroba tree). Mrs. Awai-Lennox and her siblings collected the seed pods or beans as one of their chores. *Kiawe* was used for fodder for the cattle and pigs kept by her father's youngest sister who lived above Waimea Bay. Other plants her family valued for their aesthetic qualities including gingers (especially white but also red and yellow) and *hala* (pandanus). Their *hala* tree, which sadly died later, was particularly loved by Mrs. Awai-Lennox as she recounts how her father would make *hala* leis on special occasions for family members. The red *hala* lei (made from the pandanus fruit parts or phalanges) was very special, she recalls. She recently spoke with a *kupuna* from Kahuku, Roy Benim, who is in his late 80s, and he told her of the saying "you never leave Kahuku without a *hala* lei." The sentiment rings true for her and she adds, "same for us. We would make a red *hala* and it was very special." For celebrations they gathered other special flowers such as the *kukuna-o-ka-lā* for lei (which literally means ray of the sun and refers to how the stiff yellow to red calyxes, or outer parts of the flower, resemble the sun's rays [Pukui and Elbert1986:178]).

Mrs. Awai-Lennox relayed examples of how birds have been important in the area. The first is about the plover. Her father told stories about retrieving plover for Prince Kūhio, who was fond of hunting them. The second is about Peacock Flats. As a young girl, she asked her father about the lights on Mount Ka'ala at night and her father told her they were lights from people hunting for wild turkeys. Peacocks and wild turkeys are abundant there. The third bird reference she relays is about the *'alae 'ula* (Common Hawaiian Moorhen). It was present when she grew up and, to a lesser extent, she still sees them in the wetlands near their home. When it flew close to their family home and cried, they believed it meant that someone would pass away. Her cousin who is about 90 years old also remembers that. Her younger son who was a dedicated practitioner of *lua* did research on their genealogy, and learned that Ke'u, a family name, is an onomonopia for the call of the *'alae 'ula*. Their family feels connected to the bird. "We still have them here in the area," she added.

Mrs. Awai-Lennox supports the Project overall and does not have any concerns or recommendations.

5.3 Emmaline Causey

CSH interviewed Mrs. Emmaline Causey on the phone on February 28, 2011 and previously in her home at Diamond C. Ranch, LLC in Hale'iwa. Mrs. Causey was born in 1943 in Hale'iwa to Juliet (maiden name Souza) and Henry K. Plemer. Both of her parents came from large families who have lived in Hale'iwa for a long time and are well known as her family has been in Hale'iwa for generations. Her maternal grandfather, Mr. Souza, came from Madero, Portugal to Hale'iwa. He used to lease land where Jameson's By the Sea Restaurant now stands in Hale'iwa town up to Kawailoa Road nearby where she now lives. Mr. Souza was a chauffeur for the manager of Waialua Sugar. He was also a horse jockey. Mrs. Causey's maternal grandmother, Ms. Edith Achiu, was Hawaiian-Chinese and taught at what was then called Waialua Elementary. Mrs. Causey's paternal great-grandfather, Mr. Henry Plemer, was a judge at the Waialua Court House in Hale'iwa.

Mrs. Causey's mother, one of twelve children, was born in a house that is still standing outside of Hale'iwa town, past Thomson's corner at an area that was formerly known as Souza Corner, because of her family's presence in the area. Mrs. Causey's father had about half an acre

off Lokoea in Hale'iwa town between Kamehameha Highway and Hale'iwa Road behind what is now Jameson's By the Sea. He had a piggery there and now Mrs. Causey's brother has the property. Mrs. Causey remembers that her father worked as a mechanic for Waialua Sugar for 43 years before he retired. He also worked at a gas station to supplement his income and continued working there after his retirement to supplement his pension. In the 1950s and 1960s, her mother worked as a baker, chef, and school bus driver to help support their family. Because Mrs. Causey is the first born, she was delegated considerable responsibility for helping to raise her six younger siblings. Her father passed away in 1992 and her mother continued working as a butcher at the supermarket in Hale'iwa until she died in 2006 from leukemia.

Mrs. Causey's mother and her mother's youngest sister were brought by their father on a little boat from the water near Jameson's By the Sea to the marshy area near the old pump station at the ranch where she lives now. (The marsh is fed by artesian springs.) She reminisced that, "it used to be all clean and nice." They would fish and have a nice time. In particular she recalls they caught plenty of *āholehole* something that is no longer possible as the marsh is now managed by the DLNR and no one is allowed in it. Furthermore it is choked with reeds and the water is not passable by boat now, she adds.

The property used to be leased by Mr. Vasconsalles and then by Mr. George Q. Canon and Mr. James Causey (Mrs. Causey's husband, now deceased). Mr. Causey used to help Mr. Cannon with the ranch and in 1965 the ranch was turned over to her husband. They used to have 240 acres that went all the way to the Hale'iwa Beach Park but she now has only 120 acres. Mrs. Causey also leases 11 acres from Dole near the marsh. She has been on the property for 25 years and still keeps some cattle. The land *mauka* of her property is being used by Kamehameha Schools for diversified farming. Corn seed (from Monsanto), tuber rose, and papaya are a few of the crops grown there.

Her property contains a number of archaeological features of interest that are checked annually by Mr. Jan Becket of Kamehameha Schools. The old railroad track that used to transport sugar cane runs just behind her property. Sometime before 1961, the year Mrs. Causey graduated from high school, she recalls how Waialua Sugar stopped transporting their sugar cane on the railroad and began transporting it with large cane haulers on the road. They had no need for the railroad any longer, and she recalls how she and her other neighbors got to ride the rail on its last trip.

The property where she lives is located adjacent to the southwestern access roads of the permanent Project footprint. Two Japanese graveyards are located just *makai* and *mauka* of her property very close to Old Cane Haul Road and Kawailoa Road. Having previously noticed how the transport of wind turbines required the entire width of a two-lane road, she is concerned that the transport of wind turbines along Old Cane Haul Road and Kawailoa Road may disturb these two graveyards, which are only maintained twice a year and may thus be at times obstructed from view.

Mrs. Causey previously took CSH to an area to point out a lot that used to contain the beach house where her mother's family congregated throughout her childhood and continued to gather until about twenty or so years ago. At one time, Mrs. Causey had 39 cousins and they all used to meet at that beach house and spend time together, especially during the summer. She has fond

memories of swimming all day and eating her grandmother's yellow cake with watermelon. There was a big rock just off shore where she and her cousins learned to swim. No one surfed right there because it is too rocky and not good for surfing, she says, although she added that nearby is a surf spot known as Alligators. She and her cousins enjoyed snacking on sea grapes that grew along the coast. They also gathered *limu* including *ogo* and another thick kind of *limu* that was called *pokpokalo* (by the Filipinos), *wāwae 'iole* (in Hawaiian), and rabbit's foot. They prepared it by mixing it with tomato, onion, and vinegar. Mrs. Causey's uncles and older cousins would fish from this property and catch *akule*, *kūmū* (goatfish), *'āweoweo* (bigeye), *manini* (convict tang), and *āholehole*. She and her cousins also gathered *limu, 'ōpihi*, and *pipipi*. Her grandmother would boil the *pipipi* and give them a needle to scoop out the flesh to eat. They also gathered there for special occasions. For example, she recalls an Easter Egg hunt when she and her cousins found money hidden by her Grandmother's brother. They also had many *lū'au* (feasts) there. When Mrs. Causey was growing up, the property was owned by Kamehameha Schools. After her family gave up the lease it was taken over by her uncle, and then by a woman who worked for Kamehameha Schools who eventually gave it up because the property taxes became so high. Mrs. Causey's cousin, Ms. Diane Canon, still has a month-to-month lease on the house next door to where the family beach house stood.

The Waialua Sugar Plantation Camp was located about a ten minute walk from where she now lives. "It used to be the most beautiful plantation camp you saw," Mrs. Causey recalls. They had a gym, pool, store, and gas station. She has fond memories of climbing mango trees and roller skating with her friends and classmates who lived there. Hawaiian, Japanese, Filipino, and Portuguese families lived there. They also used to walk on old cans of Carnation evaporated milk by using the sticky Ganduli Bean sap to make them adhere to their feet for homemade stilts. She recalls the place as nice, safe, no problems and seems to contrast this with today's problems in the area like squatters and homelessness. In 1995, Waialua Sugar went out of business and the entire camp was bulldozed.

Pua'ena Point used to be an airfield. As a child, she rode go-carts there. She also recalls that people gathered seaweed there. Mrs. Causey notes how these days people do not cut seaweed as they should—they uproot and destroy it completely so it cannot continue to grow.

5.4 Jan Becket

Jan Becket lives in and grew up in Mānoa, and teaches photography at Kamehameha Schools. About 15 years ago, he began checking Kamehameha Schools' properties for archaeological structures, and it is then that he began visiting Mrs. Causey's property. He has co-written a book, *Pana O'ahu* (Becket and Singer 1999) that features interesting archaeological sites on O'ahu, including two sites on the Causey property. Several *kūpuna* have also shared information on many other cultural sites along the coast of Kawailoa. Mr. Becket showed CSH the locations of some of these sites, provided GPS coordinates for others, and also estimated some of their positions on maps (Figure 35).

Mr. Becket documented a buttressed platform on a rock outcrop (Becket and Singer 1999:98) (Figure 36). He describes it as having a "pre-Contact" look and estimates it may be a house site or a *heiau*. This is located close to the pond on the Ka'ena side of Mrs. Causey's home. About five years ago, Mr. Becket happened to meet a relative of Mrs. Causey while he was visiting. He

recalled that there was a respected elder Hawaiian man who used to live near the structure and that there used to be a large stone platform there, although it was not present at the time of their discussion. Mr. Becket also documented a large enclosure (Becket and Singer 1999:103) (Figure 37). On the *makai* side, adjacent to the 'Uko'a pond is a huge upright stone, built into the enclosure. 'Uko'a Pond, he explains, is associated with ceremonies to attract lightning according to one small reference in *Sites of Oahu* (Sterling and Summers 1978).

Mr. Becket and CSH previously visited Mrs. Causey's property in order to view some of the structures on that property and on the neighboring property (on the Hale'iwa side). At the time CSH toured the area with Mr. Becket, it was part of a 16-acre parcel being offered for sale by the George H. Holt estate, through Sterman Reality. Beyond that parcel lies a parcel that Mr. Dino Ventura is acquiring from Dole Corporation. Stretching from the Causey property through Mr. Ventura's land lies an extensive complex, with what appear to be *ahu* (shrine) (Figure 38 and Figure 39), walls (Figure 40), platforms (Figure 41), enclosures, and bell stones (a stone with a thin ledge and strike marks at one spot that rings when struck) (Figure 42 and Figure 43). Although there are no fences to mark property boundaries, it appears that an especially high concentration of sites lies on the Holt estate.

Mr. Andy Anderson (now deceased) knew a lot about the Kawailoa area and told Ms. Marian Kelly (emeritus faculty at UH from Cultural Studies), who, in turn, told Mr. Becket that one local tradition places Kapukapuākea Heiau *mauka* of 'Uko'a Pond and in the vicinity of Mrs. Causey's property. (Mr. Becket explains that many other references place Kapukapuākea Heiau at Kaiaka Bay.) Later Mr. Becket visited the adjoining Holt property with Mr. Thomas Shirai and they viewed the sites together. The counterpart to that *heiau* is Taputapuākea Heiau, located in Tahiti and built circa the twelfth century. These related *heiau* are said to demonstrate the contact between Hawai'i and Tahiti through voyaging. (Kapukapuākea is described as "destroyed" by Sterling and Summers [1978], but clearly some well respected community members believe this part of Kawailoa includes very important cultural sites).

Mr. Becket also learned about numerous cultural sites in Kawailoa from *kupuna* Rudy Mitchell, a cultural historian of Waimea Valley. Mr. Becket identifies, describes, locates, and references the following cultural sites based on site visits with and *mo'olelo* from Rudy Mitchell:

1. Fish stones on either side of Waimea Bay, where people used to watch for fish: Kū (below Pu'u o Mahuku Heiau) is an upright standing stone where people go to watch surf; and Ahuena (on the Hale'iwa side). Rudy Mitchell showed Mr. Becket these two stones. Other names for these stones are Kalaku and Kalakoi, respectively. They are referenced in Sterling and Summers (1978:131).
2. A pool next to Ahuena. This marks an area where taxes were paid and also marked the *ahupua'a* boundary. It is still there in the bushes and is located between Waimea Bay and a recent housing development (at Iliohu Street). It is referenced in Sterling and Summers (1978:129).
3. Keahuohāpu'u, a fish *heiau* accessible through private development off Iliohu Street.

4. Pōhaku Ho'ohanau, which means "self birthing stones." It is located off Pohakuloa Way and according to Joe Kennedy (former SHPD archaeologist) , it is still there. It is referenced in Sterling and Summers (1978:123).
5. Pele's Followers, natural features of rocks and coral heads offshore near Pohaku Loa Way.
6. Kūpōpolo Heiau, located on Kamehameha Schools land (see Figure 15).
7. A cave behind Kūpōpolo, which is connected with a famous upright stone (Kaneaukai, referenced in Sterling and Summers (1978:125) and petroglyphs located on Kamehameha Schools land.
8. An unmarked and unrecognized structure consisting of a wall, an even enclosure, and a platform (possibly a *heiau*) near Kamehameha Road on Meadow Gold property across from Laniakea. The City has expressed interest in turning that site into a parking lot or in realigning the present road to move all parking *makai* of the road.
9. 'Ili'ilikea Heiau. Mr. Mitchell showed this site to Mr. Becket. This *heiau* in Hale'iwa is also on the Meadow Gold property. Portions of it have deteriorated. Sterling and Summers describe it as "destroyed" (1978: 120). (The mapped location of 'Ili'ilikea Heiau, as demonstrated by Mr. Mitchell, is closer to the coast than the location identified by Sterling and Summers, which is on the Project's *makai* access roads; compare Figure 9 and Figure 35).
10. Pu'u o Mahuku Heiau (see Figure 17).
11. A *heiau* for Lono in Waimea Falls park (now called Waimea Valley), where Rudy Mitchell reconstructed an original *hale* of the *heiau* (see Figure 16).
12. A low enclosure next to 'Ili'ilikea Heiau, located toward Waimea Bay on Meadow Gold property.
13. Burials on Kamehameha Schools property in a swampy area.
14. A big wall and other structures in tall grass (unless it has been bulldozed since Mr. Becket was last there) located *mauka* of the Kawailoa transfer station.
15. An altar for Laniwahine, the Mo'o of 'Uko'a Pond. According to McAllister (1933) it is said to be "near pump #4" and Mr. Becket says this pump #4 is on the driveway leading up to the Causey property and it is also mentioned in Sterling and Summers (1978). Mr. Becket clarifies that "near" may even mean that it is on Causey's property, noting McAllister's use of the word "near" is subjective. Kamehameha Schools filled in the pond at Pump #4 connected with Laniwahine, according to Mrs. Causey. He has looked for but not seen the feature itself.
16. Kahōkūwelowelo Heiau, located across Cane Road and *mauka* of 'Ili'ilikea Heiau. It is on property owned by Kamehameha Schools and is referenced in McAllister (1933). It has a platform and large upright stone. Mr. Becket says the condition of the site has been significantly altered by the U.S. Army (see Figure 18).

17. Kahōkūwelowelo Hale is a site that may be where *kāhuna* lived or may be a women's *heiau* (*hale o papa*). It consists of an enclosure and other features that are in good condition. It is located on property owned by Kamehameha Schools.

18. A quarry site near pump #4 at a closed gate off Kawailoa Road has remnants of a pattern carved into stones. Mr. Becket calls the pattern the "*niho*" (tooth) pattern because it is made up of triangular notches alternating with straight line. He suggests that carving the pattern may have been a technique for splitting stone, but he is not sure.

19. Within the Causey and Holt properties there is a complex of features that seem to be related. These are on Kamehameha Schools and Dole land and consists of a long wall along 'Uko'a Pond, a platform (about 12 by 18 feet) on an outcrop, a rough enclosure (about 40 by 60 feet) with a prominent stone facing the pond, an *ahu* at the edge of an amorphous alignment, and an area with well organized walls.

20. Rudy Mitchell knew the locations of hundreds of burials in the cliff faces along the *makai* coastal strip of Kawailoa. These may have been from earlier epidemics. Rudy Mitchell also discovered *iwi* in caves in Waimea Valley and prevented their removal.

21. Mr. Becket describes a fishing shrine on the southern side of Waimea Bay and a *heiau* or *ali'i* residence and an upright stone farther back in the valley.

Mr. Becket also draws attention to intensive archaeological investigations in the upper Anahulu Valley (Kirch and Sahlins 1992) and suggests that parallel groupings of upper valley settlements may be located in the gulches in the northern *mauka* sections of Kawailoa, including the permanent Project footprint.

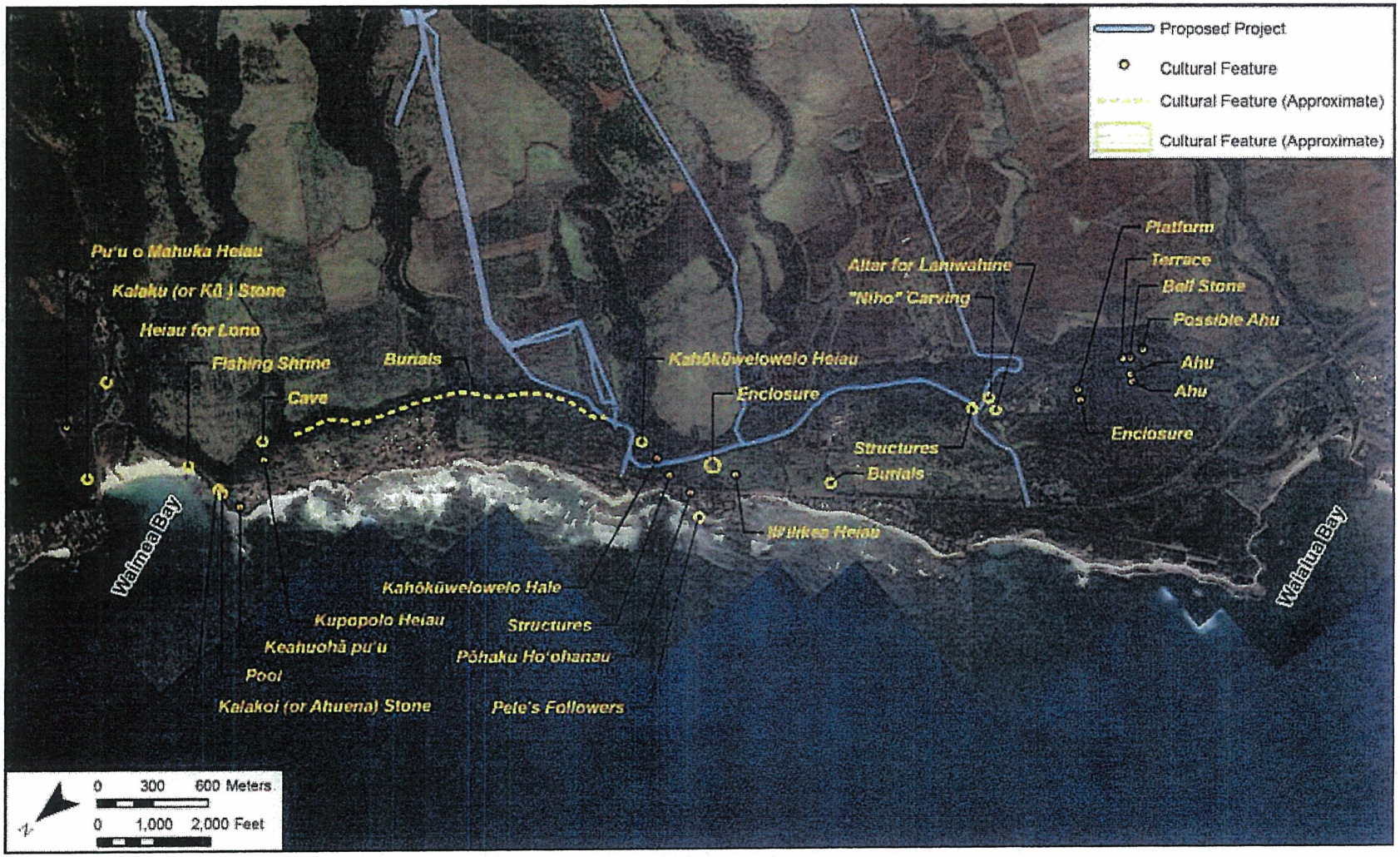

Figure 35. Cultural features in Kawailoa identified and estimated by Jan Becket

Figure 36. Rock-faced terrace with upright stone on the Causey property (Becket and Singer 1999:99)

Figure 37. Upright stone built into platform facing 'Uko'a Fishpond on the Causey property (Becket and Singer 1999:101)

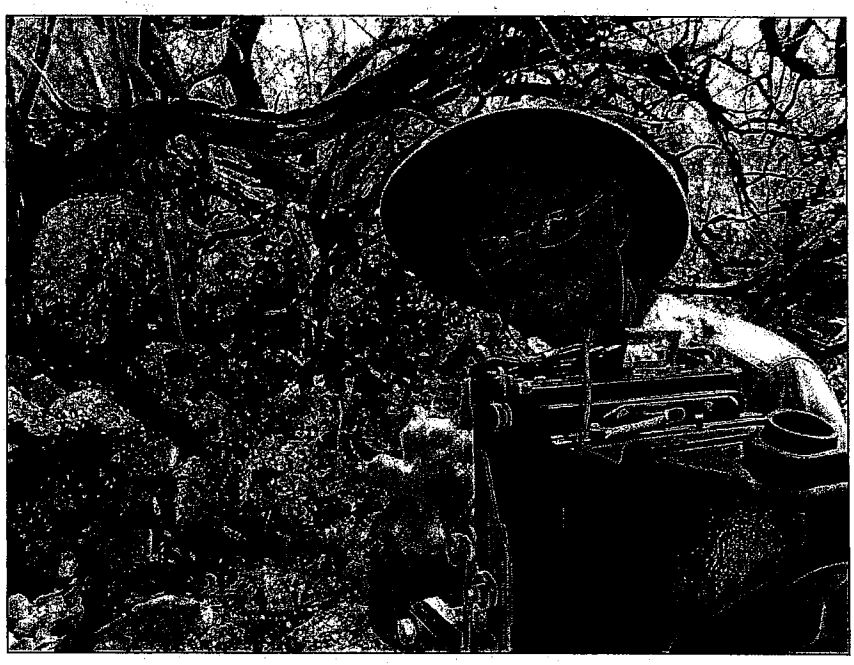

Figure 38. Mr. Becket photographs a cultural feature, possibly an *ahu*, on the Causey property (CSH July 20, 2010)

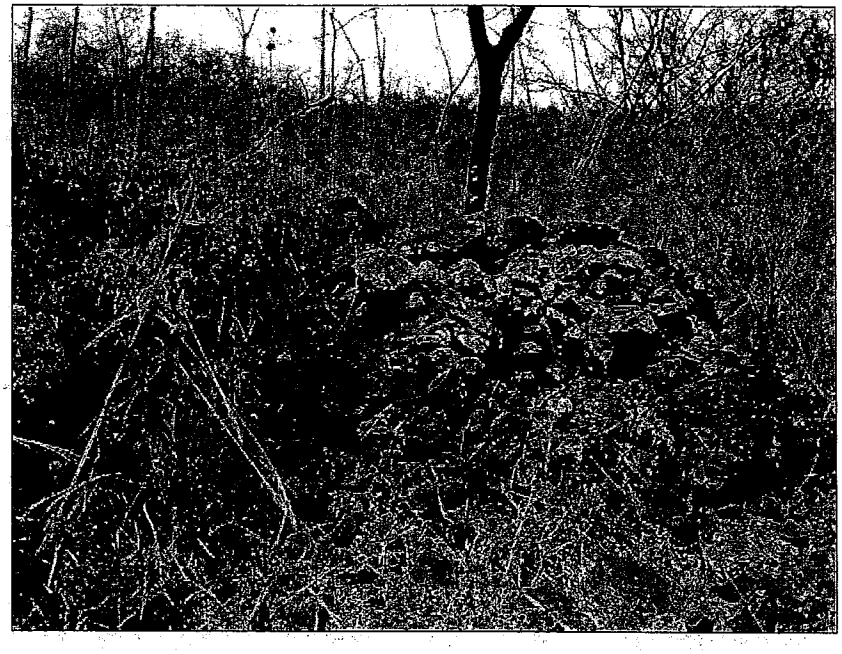

Figure 39. Possible *ahu* on Dean Ventura's property (CSH July 21, 2010)

Figure 40. Section of long wall on the Causey property (CSH July 20, 2010)

Figure 41. Platform on the Causey property (CSH July 20, 2010)

Figure 42. Possible Bell Stone on the Causey property (CSH July 20, 2010)

Figure 43. Mr. Becket testing the sound of another possible bell stone on the Causey property (CSH July 20, 2010)

5.5 Thomas Lenchanko[1]

Thomas Joseph Lenchanko, Spokesperson for 'Aha Kūkaniloko/Koa Mana, Hawaiian National Lineal Descendants, met with CSH on January 17, 2011 at the *ka'anani'au* (boundary markers that distinguish a beautiful period of time) O'ahu nui, ka lua a'a hu, Waikakalaua Stream, also known as Launani Valley, in Wahiawā, and on February 17, 2011 at Kūkaniloko to share his traditional comprehension, *mo'olelo*, and *mana'o* of the enduring cosmological, spiritual, and cultural significance of Kūkaniloko, since time eternal, time immemorial, the creation of the island of O'ahu, and the descent of the first people from the gods. Traditionally, Kūkaniloko extends geographically to encompass the island of O'ahu within (*iloko*) and without (*iwaho*) a network of ka'anani'au that are superimposed upon the six territorial *moku* land divisions of Kona, Ewa, Wai'anae, Waialua, Ko'olauloa and Ko'olaupoko.

"According to traditional practice and learning from our *kūpuna mā* (those we choose to follow), Kūkaniloko is the most sacred site on O'ahu; however, it is much larger in total land mass and traditional significance than the current State of Hawai'i five-acre park site noted to be Kūkaniloko Birthstones State Monument." Mr. Lenchanko shares a *mo'olelo* of the genesis of the island of O'ahu: "Two islands, Wai'anae, the *wahine* (woman), and Ko'olau, the *kāne* (man),

[1] Mr. Lenchanko intentionally deviates from the use of diacritical markings for some Hawaiian terms and the capitalization of some place names to highlight their antiquity, intentionally does not translate some Hawaiian terms because such translation would only be a superficial gloss of the layers of hidden meanings [*kaona*], and provides his own translations that sometimes differ from Pukui et al. (1974). While this interview was not audio-recorded, the summary is mostly Mr. Lenchanko's words after several revisions.

spiritually united, connecting and centering their issue at Kūkaniloko, the *piko* of our Nation, Ko Hawaii Pae Aina."

The land of O'ahu is divided by a concentric alignment of *ka'ānani'au* that demarcates the area of Kūkaniloko. Mr. Lenchanko describes that these series of rock pilings conservatively demarcates an area of 36,000 acres known to be Lihue, Wahiawā, Halemano... that somewhat resembles the constellation Orion. Through land navigation and the confirmation of their continued existence, the *ka'ānani'au* include, but are not limit to: O'ahu nui, Paupalai, Halawa, Hawea, Kou, Maunauna, Ku'ua, Kulihemo, Kānewai, Halahape, 'Ō'io, Halemano... "*Kūpuna mā* taught us that these lands are those of the Lo-Ali'i, whom were like gods, unseen, resembling men; for they lived here continually, guarded their *kapu* (sacredness, special privileges) and from whom a guaranteed *ali'i* (managers of people, land, and resources) could be obtained (*loa'a*)."

The *ka'ānani'au* O'ahu nui, located on the hill Wahiawā side of Waikakalaua Stream, is composed of several *ahu*, or rock pilings, totaling three thousand stones. Two large *pōhaku*, noted to be O'ahu nui and an associate named O'ahu iki are sill located within the stream and upon the bank Honolulu side of Waikakalaua stream (close to a Pele rock formation). *Mo'olelo* teach that O'ahu nui and O'ahu iki were brother and sister who once ruled in common. *Ali'i* who viewed upon the *ka'ānani'au* Oahu nui are said to have managed all of O'ahu. According to Mr. Lenchanko, the Kumulipo, a Hawaiian creation chant, describes how the people of O'ahu are originally descended from the gods at ka lua a'a hu, "the pit from where we descend." He elaborates the meaning of O'a-hu: *O'a* is the intertwining and interweaving of the blood lines of La'ila'i, the woman who stood down from the heavens, and Ki'i, which issued forth those people known to be the hu. Mr. Lenchanko shared photographs with CSH of O'ahu nui in a narrow section of the stream, O'ahu iki in a broad area overlooking the stream, and a rock formation resembling La'ila'i within the streambed. To Mr. Lenchanko, these stone features confirm the enduring validity of who we are. In fact, "someone attempted to air-drill the *pōhaku* O'ahu nui to destroy our Hawaiian National Treasure, our visual and spiritual connection and traditional comprehension to our epochal Kumulipo." Small holes can be seen in the photograph of *pōhaku* O'ahu nui, adversely impacted and broken, yet maintaining its *mana*... Noting testimony from *kūpuna mā*:

> ...a little pool somewhere up in Wahiawā, called ka lua a'a hu. If you bath in that pool you have seen O'ahu..." From the Kumulipo, ka wā ewalu (The Eighth Epoch), The Dawn of Day: "Born were men by the hundreds, Born was man for the narrow stream, Born was woman for the broad stream.

Mr. Lenchanko describes *ali'i* as managers of the people. The *ali'i* had divine status (*ikū pau*) and the highest genealogy (*hoa ali'i*), as they were descendant of "Kāne, *akua* (gods, spirits), *ali'i*, *ho'āno* (peacefulness, sacredness), *kapu*, *wela* (heat), *moe*, *ahi* (fire)..." Those special privileges were issued at the birth for those of divine descent whom are known to be Lo-Ali'i:

> Kūkaniloko since time immemorial, time eternal, begins with ka lua a'a hu at *ka'ānani'au* O'ahu nui, then to be found within kapa ahu (unapproachable, child only one of whose parents are *ali'i*) at *ka'ānani'au* Halemano and to the contemporary site kapa ahu awa (prescribed birth rite, unapproachable, child only of whose parents are *ali'i*) Kūkaniloko, also known as Kūkaniloko Birthstones

> State Monument. It is taught that A.D.1060, *ali'i kapu* Nanakaoko, *kāne*, and *ali'i kapu* Kahihiokalani, *wahine*, made kapa ahu awa Kūkaniloko for the birth of their son, Kapawa. This hallowed place remained in ceremonial rite until the liloe kapu birth of Kakuhihewa, the last such practiced at Kūkaniloko. Keopuolani and Kamehameha I were hopeful for the birth of his heir, Liloliho (Kamehameha II), at Kūkaniloko; however, a fate that some attribute to Kamehameha's practice of human sacrifice disallowed this distinguished birth rite to continue within the Kamehameha lineage.

The birth rite was one of a multiple of disciplines attributed to the region of Kūkaniloko. It is also the first learning center established within and beyond the *ka'anani'au* that is maintained by its *kāhuna*. According to Mr. Lenchanko, John Papa 'Ī'ī was the agent for the Department of Instruction under Kauikeaouli (Kamehameha III) and managed these Kingdom properties as traditional school lands.

To highlight the connectivity among cultural sites within the broad region of Kūkaniloko, Mr. Lenchanko describes how a trail runs from a site of several *pōhaku* close to the northern edge of Schofield Barracks across the plain toward a pool within Kaukonahua Stream, and ku uwaki uha keanianiulaokalani. From these *pōhaku*, one can view several peaks, including, in descending order from north to south, Ka'ala, Kalena, and Makali'i. The latter contains a corridor and view plane to sight the constellation Makali'i (Pleiades). An astronomical alignment between the *pōhaku* on the plain and Pu'u Makali'i illuminates the setting of the cluster of seven stars, of which are etched upon one *pōhaku*. Traditionally the land areas of Kamananui and Halemano were known to be the general locations for the *pahu heiau* 'Opuku and *pahu heiau* Hawea, respectively, sounded at the birth and during the purification ceremonial rites within the *waihau heiau* Ho'olonopahu, associate *heiau* of Kūkaniloko.

Mr. Lenchanko's expansive view of Kūkaniloko integrates the creation of land and people with land divisions, ceremonial practices, and instruction of *ali'i*. He summarily states that "O'ahu is the temple, Kūkaniloko its *mana*, and we are all connected to it." For Mr. Lenchanko, the *'āina* itself is the *heiau*, and every component of the land is contiguous to itself. From this perspective, every proposed development project will create an adverse impact, footprint, upon the land, and since the land is contiguous, the entire island of O'ahu is adversely impacted. Of critical note is that the *mana* of a traditional cultural site remains despite the removal of its physical features and structures:

> The *mana* within our land justifies the reason it was chosen to be O'ahu. They cleared our Hawaiian National Treasures from the land for affrontive industrialized farming, to buffer the military and affording the State of Hawai'i to minimize the land area of Kūkaniloko to five acres (Kūkaniloko Birthstones State Monument). How does the footprint of a development project adversely impact or disjoint Kūkaniloko from the temple of O'ahu? The land of Kūkaniloko, which is our inheritance, contains our family's *iwiawaloa*, ancestral burial places, its learning center, and its traditional comprehension. Any disturbance to the land will disrupt the perpetuation of our inheritance.

Mr. Lenchanko's greater concern with the proposed wind farm Project and all programmed developments are their "deliberate trespass upon our family's inheritance." He notes *Ke Au 'Oko'a*, Ka'aona 13, 1869:

> In old days the inheritance of the family burial place, the caves and secret burial places of our ancestors was handed down from these to their descendants without the intrusion of a single stranger unless by consent of the descendant, so that whenever a death occurred the body was conveyed to its inheritance. These immovable barriers belonged to burial rights for all time. The rule of kings and chiefs and their land agents might change, but the burial rights of the families survived on their lands...

Mr. Lenchanko asserts his belief that the massive wind turbines will forever impact the traditional cultural properties of the *mauka* sections of Kuokala, Kawaihapai, Waialua, Kawailoa, and Ka'ala. "These wind turbines and transmitters will not only impede our vision of our traditional natural landscape, but they will interfere with the view plane of those who are buried in our land, *he lani i luna* (heaven above) and *he honua i lalo* (earth below), who have secured a beautiful period of time, *ka'anani'au*."

The cosmological, spiritual, and cultural worldview articulated by Mr. Lenchanko derives from the erudition of the Hawaiian creation chant. From such a deep ancestral connection to the genesis of the land, Mr. Lenchanko questions how developers today claim land ownership. He politely queries whether the United States Federal Government, the State of Hawai'i, its agents and public citizens (i.e. First Wind) can demonstrate and prove their clear unbroken chain of land ownership and/or "exclusive territorial jurisdiction" for all land in Hawai'i. He summarily states "So it is, this is known, there it is... he pule hoolaa alii, nothing is older than Kūkaniloko and those whom are buried in our land, Ko Hawaii Pae Aina."

'a'e ku

ua 'a'e lako i luna o kahi la'a

ho'ohewahewa mauliauhonua malama o'pa 'oe

aloha pua pele pau mano

'oia ua 'ike a 'aia la

5.6 Kawohiokalani Jenkins, Kawika Au, and Moki Labra

CSH interviewed "Aunty Betty" Kawohiokalani Jenkins, Kawika Au, and Moki Labra at the Waimea Valley Center's Wahi Kupuna on March 3, 2011. Aunty Betty, a *kupuna*, has lived in the Kawailoa area for fifty years but the area is not her *piko*. She thus engaged Mr. Au, president of the Waialua Hawaiian Civic Club, and Mr. Labra, a *kama'āina* of Waimea and Kawailoa, to offer their *mana'o* on the proposed wind farm Project. Mr. Au is not from the area, but he knows the families who are. Mr. Labra's *'ohana* is from Waimea Valley, and as a child, Mr. Labra roamed throughout Kawailoa, from the coast to the mountains of Halemano.

Based on two previous excursions with archaeologists (not associated with this Project) on Kamehameha Schools land, Mr. Au is aware of numerous cultural sites in the *mauka* portions of

Kawailoa, including three heiau, several former habitation sites, and walls. Mr. Labra describes how the families that once lived in those *mauka* regions gave birth there, as opposed to traveling to a particular birthing site. Thus, the land was theirs to *mālama* (take care of) both physically and spiritually.

Aunty Betty, Mr. Au, and Mr. Labra concur that the proposed Project, which is massive in scale, must be done *pono* (in the right way). They agree that change, especially alternative forms of renewable energy are good, but only up to a point. For Mr. Au, this means ensuring that the wind-generated energy goes to local Hawaiian people. For Mr. Labra, this means re-assessing the cultural significance of the *makani* and *'āina*.

Mr. Labra is particularly concerned about the *makani*. He stresses that "Kawailoa" is not the name of the wind that blows through the *ahupua'a* and questions the company name, Kawailoa Wind. He notes that other places on O'ahu have much stronger winds, and questions why the Project is not proposed in those locations. He is knowledgeable of the wind that blows strongly through Kawailoa, but does not wish to reveal its name. For Mr. Labra, one of the consequences of not conducting this Project *pono* is that "the winds might not listen and could stop blowing altogether," a sure indication that the 30 wind turbines were not intended to be built in this area.

Mr. Labra elaborates that the ancestors used the winds for their journeys across the ocean, while this Project is something artificial imposed upon the landscape. As more development Projects impose upon the land, he and others can't use the land. When asked specifically about ongoing cultural practices in the area, Mr. Labra responded that "the land is alive, the land is *kūpuna*, there is always something going on." He elaborates that the land is continually used in the spiritual realm, from the mountains to the ocean, but that now the deceased are being disconnected from the land. He feels that "parts of the *ahupua'a* need to be rested" and that the *'āina* needs to "get balance." He translates a Hawaiian *'ōlelo no'eau* as "Be careful of your step, lest you fall."

Mr. Au adds a proverb from Ghandi to Mr. Labra's *mana'o*, paraphrased as "The Earth can create enough for people's need, but not enough for their greed." He summarily states that "if the wind farm Project can benefit local Hawaiian people, as opposed to increasing people's wealth, the Project area lands can be sacrificed." He reinforces Mr. Labra's concern by stating that "if not *pono*, no winds will come." He would rather "live by candlelight than sacrifice culture."

Mr. Au warns that more people will likely oppose this Project as the building stage gets closer. He recommends consulting the families that used to live in the *mauka* portions of Kawailoa. Regarding the proposed communication facility on Mount Ka'ala, Mr. Au recommends that the new structure be connected to existing structures as much as possible.

5.7 Lavina Agadar

CSH interviewed Lavina Mary Silva Agader, affectionately called "Aunty Maile or Maile Lauli'ili'i (lei of small *maile* [native shrub] leaves)," at the Hawaiki Tower in Honolulu on April 8, 2011. Born on March 15, 1950, Aunty Maile grew up in the plantation lifestyle in Waialua. In addition to her recollections as a child, she shares stories of her parents' involvement in the Waialua Sugar Company's plantation "camps," or settlements. Her mother, of Japanese descent, was a nurse at the plantation hospital and her father, of Hawaiian, Portuguese, and English

ancestry, was a hauler of sugarcane. Her husband was also the irrigation superintendent for Waialua Sugar. In addition to her in-depth knowledge of the Waialua Sugar Company's plantation system, Aunty Maile is currently mentoring under *kūpuna* Aunty Betty (Ms. Jenkins) and Aunty Honey (Ms. Awai-Lennox) for Native Hawaiian cultural understanding.

Aunty Maile recalls that several immigrant groups worked in the sugar plantation, forming distinctive Japanese, Korean, Filipino, and Chinese camps. The various ethnic groups interacted cohesively with each other. For example, Aunty Maile never knew the real names of many people, but had nicknames for them, such as "Thunder" and "Nine Toes." The most active and cohesive of these settlements was Kawailoa Camp (near the southern access roads of the permanent Project footprint). There were numerous activities and the camp contained a swimming pool, a Catholic church, and a Buddhist temple. The Japanese community, including her family, continued to maintain their traditions and culture, such as performing bon dances and pounding *mochi* (Japanese sweet rice).

While a certain cohesiveness pervaded the sugar plantation and connected the various camps, the plantation was also like a caste system, according to Aunty Maile. She describes how the *haole* (Caucasian, foreigner) held supervisory positions; the Portuguese were the *luna*, or bosses; and the rest of the groups labored. In her youth, Aunty Maile attended St. Michael's Elementary School. Even there, she felt a certain racial prejudice from the *haole* nuns. Now, Aunty Maile lives in a plantation house in the former Haole Camp.

When Aunty Maile's father was a child, the entire landscape of Waialua was covered in sugarcane. Aunty Maile's father took her and her two siblings to the more *mauka* regions of Kawailoa to show them dryland sugarcane. Aunty Maile remembers that at those higher elevations—the same as the proposed sites for the Project's wind turbines—the non-irrigated sugarcane produced low yields. The camps closed down over ten years ago with the termination of the Waialua Sugar Company, and the land has since been neglected and turned fallow. Within the last five years, Kamehameha Schools has planted some *koa* trees. Overall, Aunty Maile asserts that these *mauka* lands are not preferred agricultural lands. In fact, her husband has developed a very successful business under the name of Twin Bridge Farms with diversified agriculture in lands near the coast. In these highly productive and irrigated lands, her family cultivates asparagus on 40 acres of Kamehameha Schools land and other agricultural products on 210 acres, including sweet onions, potatoes, vine-ripened tomatoes, sunflowers, corn, and asparagus. She believes that if those *mauka* lands had the potential for similar diversified agriculture, it would have already happened. Because the lands are not being used, she is supportive of the wind farm Project.

Aunty Maile is currently learning about Native Hawaiian practices and cultural sites in Waialua, but she does not recall seeing Hawaiian practitioners or tangible structures, such as *heiau*, in her youth. She qualifies this observation, however, with the knowledge that such cultural practices would have been private affairs conducted within Hawaiian families. As her family oriented towards her Japanese ancestry, she would not have been privy to this Hawaiian cultural information. However, one of the original residents of the Kawailoa Camp, a Filipino man, recently told Aunty Maile about three burials near Kawailoa Camp. She asserts that if *iwi* are discovered during the Project, they should remain in place and not be relocated. This belief is based on a story about her grandmother and one of her daughters (Aunty Maile's mother's

sister). Her grandmother lost a child when she lived in Kahuku Camp prior to moving to Waialua. When her grandmother passed away in 1971, her burial was planned to take place in Nu'uanu. The family unearthed her daughter in Kahuku to reunite them, but when the family unearthed the grave, her bones were mixed with others due to a previous tidal wave. The family decided to leave the bones but take the grave marker to Nu'uanu, but they almost got into an accident. Aunty Maile shares this story to highlight that the *iwi* did not want to be taken, and to reiterate that any discovered bones be left in place.

5.8 Butch Helemano

CSH interviewed Butch Kauihimalaihi Helemano by phone on April 11, 2011 and previously at the Ka Papa 'Oihana (Traditional Knowledge Project) held in Waimea Valley on the North Shore of O'ahu on July 19, 2010. Mr. Helemano was born on O'ahu in 1950 to Ellamae Pua'ala and Kupau Kauihimalaihi. He grew up in Kalihi, lived on the North Shore for years, and currently resides in Mililani Mauka. Mr. Helelmano is the *kahu pule* (caretaker or guardian) of Pu'u o Mahuku Heiau (that overlooks Pūpūkea), and he is also a Kumu a'o (teacher, organizer) for the Ka Papa 'Oihana held in Waimea Valley, among many other teaching and community involvements.

Mr. Helemano's ties to the Waimea area run deep as he is a descendant of Hewahewa, the last *kahuna nui* (spiritual leader) in Waimea valley. From his *kūpuna*, Mr. Helemano was taught about Hawaiian history, culture, and practices including Hawaiian language, carving, weaponry, and the gathering of healing plants and *kino lau* (forms taken by a supernatural body) that exist in the area, especially in the ocean and along the shoreline.

He sees Waimea Valley as a critical feature with respect to Kawailoa: "Anything that went on out there [in Kawailoa] had something to do with Waimea Valley. There were traditional relationships between the valley and the *makai* areas." Mr. Helemano explains that the area was important for fishing and *kāhuna* practices. Several ancient *wahi pana* are also located in Kawailoa. The following *wahi pana* are located in the *makai* region of Kāpaeloa: Ke Ahu Hapu'u Heiau, a shark *heiau* that references the black sea bass or *hāpu'u* [Hawaiian black grouper, is another translation]; Kūpōpōlo Heiau; several ancient *honu ki'i pōhaku* (sea turtle petroglyphs) located on the *pali* above the site called *'pali poli'*; other cultural features which are thought to be *'awa* (*kawa*) pits, *'uala* pits or some other type of stone lined pits used by *kāhuna* in the area; and a famous *ilina* located below *pali poli* (now secured by a gate).

In terms of natural resources along the coast, Mr. Helemano explains that in ancient times the whole area "was well known for the abundance (*lē'ia*) of fish" and that today it is still valued for marine resources such as *wana* and *'uke'uke* (armored sea urchin), which he notes are still abundant in the area. People have also gathered certain *limu* for use in cleansing and *kuni* (sorcery) rituals. He notes that although terrestrial healing plants were likely gathered in the area in the past, most of them have been destroyed.

Mr. Helemano recounts the history of sacred people and things in the Waimea area beginning in A.D. 1090. "All the *kahuna nui* lived in Waimea valley all the way up until the time of Hewahewa. So, for well over 1000 years, the *kahuna nui* of this island resided here in this valley or at least had potential control, as *konohiki*, over the island." Well known figures in the area from this time include Ka'opulupulu, the officiating *kahuna* at Kūpōpolo, and his son Kahulupe.

Ka'opulupulu built Pu'u o Mahuku Heiau and later Kūpōpolo Heiau. Mr. Helemano explains that although many famous chiefs are associated with Waimea Valley after the time of Kahulupe, they came during the takeover of Kahekili and they weren't really *kama'āina* of O'ahu—athough they were uncles and nephews and cousins of *kama'āina*. "The sovereignty aspect is difficult to discuss because even though one came from Moloka'i and one came from Maui, and captured the others in 1895, they were uncles and aunts and sisters and brothers," he elaborates.

Mr. Helemano is well-versed about this storied landscape. He explained that Pu'u o Mahuku literally means "hill of escape" and was built about A.D. 1600 on the old site of a *heiau* that was previously built about A.D. 1400. From this point, he says that it is possible to see across the ocean toward Kaua'i. He explains that Kūpōpolo, which means "to see with eyes and mind" did not serve the purpose as a place where Ka'opulupulu could have visions. Off shore from Kūpōpolo Heiau, in front of Ke 'Ahu o Hapu'u is the small yet famous *moku* (island), Wānanapaoa, which means "unsuccessful prophecy" and refers to the "vision discarded." Across from this *moku* is Kāpaeloa, which means "to put aside, or cast out, as with rotten food" and refers to Kaopulupulu's visions that were not read correctly at Kūpōpolo Heiau. Mr. Helemano stressed that an important *mo'olelo* about the area is that of Kāne'aukai, a shark god and *'aumakua* (deified ancestor) who is related to the goddess Pele. Mr. Helemano says there are actually two *mo'olelo* about it, and the accepted concept is that the image of Kāne'aukai was set up in the *heiau* by the two *kāhuna* that lived there.

Mr. Helemano is aware of several *heiau* located in the more *mauka* lands of Kawailoa, and is concerned that the Project may impact them. In addition to these tangible aspects of Hawaiian culture that may be impacted by the Project, Mr. Helemano is opposed to the massive scale of development and the impact on the *'āina* from a cultural and spiritual perspective. In an email written on April 11, 2011, Mr. Helemano articulates his *mana'o*:

> As per our conversation today I still am amazed that a project of this magnitude is planned for the North Shore.
>
> As a native Hawaiian Minster and practitioner who has *'ohana* who not only lived in the region but have many generations of ancestors who dwelled in Waimea and Hau'ula, I find the project insulting and an abomination.
>
> The cultural impacts and scenic impacts our not only selfish but this project is not proven to be of any real asset to the power grid, only a deficit.
>
> I do not support this monstrosity. If Princess Puahi was alive today she would *uwē* [wail] and weep to see what her 'land stewards' (of her land and trust) are attempting to do on our sacred lands and fragile natural resources.
>
> Our people have to sit by and watch as the rich get richer and the developers continue to develop our ancestral lands as we watch the Western civilization desecrate our *kulāiwi* [native land].
>
> As far as cultural impacts and cultural practices, these things took place "everywhere" in the *pae 'āina* [these islands] of Hawai'i.

In closing I cannot find anything positive to say about this project (this is my opinion based on the upbringing that I had as a native and *kama'āina*). No where can I see in this proposal an alternative choice such as solar even being looked at.

eia au he kanaka 'oiwi, na'u Kahu, Butch Kauihimalaihi Helemano

Kahuna Pule, Hale o Lono Heiau Waimea nei

Section 6 Cultural Landscape

Discussions of specific aspects of traditional Hawaiian culture as they may relate to the permanent Project footprintare presented below. This section integrates information from Sections 3–5 in order to examine cultural resources and practices identified within or in proximity to the permanent Project footprint in the broader context of the encompassing landscape of Kawailoa (and Lauhulu, Kuikuiloloa, Punaue, Kāpaeloa) and Kamananui Ahupua'a.

6.1 Cosmological and Religious Significance

A network of trails once traversed O'ahu, connecting the *moku* of Waialua, Wai'anae, 'Ewa, and Kona ('Ī'ī 1959:99). These paths intersected at Kūkaniloko, a sacred ceremonial birthing place for the highest ranking chiefs, in the modern *ahupua'a* of Wahiawā (formerly part of Kamananui) in an area that Mr. Lenchanko considers the *piko* of O'ahu. Drawing from the Kumulipo, a cosmological creation chant, and teachings from *kūpuna*, Mr. Lenchanko articulates a view of Kūkaniloko that expands beyond the current State of Hawai'i five-acre Kūkaniloko Birthstones State Monument. Mr. Lenchanko explains that Kūkaniloko extends back in time to the creation of the island of O'ahu and the descent of the first people from the gods, and expands geographically to encompass at least 36,000 acres of land within a network of *ka'anani'au* that pre-dates the *moku* and *ahupua'a* territorial system. Thus, according to Mr. Lenchanko, the permanent Project footprint is part of Kūkaniloko, the most sacred site on O'ahu. According to Maly (1999:27), the core of Hawaiian spirituality is cultural attachment to the landscape. For Hawaiians, maintaining a sense of place and identity is fundamentally about keeping the integrity of this cultural landscape: "Thus, what we do on one part of the landscape has an affect on the rest of it" (Maly 2001:2). According to Mr. Lenchanko, the proposed wind turbines will alter not only the view of the cultural landscape, but the view plane of those ancestors buried in the land.

6.2 Settlement and Habitation

The earliest settlements along the northern coastal areas of O'ahu have yet to be recovered archaeologically, but a settlement complex in Anahulu Valley, which was most likely a peripheral extension of the core Waialua production lands, dates to A.D. 1300. Located near the southern portion of the permanent Project footprint in Kawailoa, rock shelters were used by coastal residents as intermittent camps for the extraction of mountain resources. Between A.D. 1600–1700, shifting cultivation and forest-product extraction supported several permanent household groups living in these rock shelters. With Kamehameha's conquest in 1795, he encouraged the expansion and intensification of agricultural production to sustain his invading forces when they returned to O'ahu in 1804, including the peripheral lands of the upper Anahulu Valley. The rock shelters were abandoned, and descendants of Kamehameha's conquering forces constructed a series of open house sites in association with intensive pond field irrigation of taro on the alluvial terraces at the bends of the main stream and adjacent *kula* lands, as well as made clearings in the smaller forested valleys and ravines (Kirch 1992).

Previous archaeological surveys and research, recent cultural resource management work, and community interviews indicate numerous cultural features and artifacts along the coastal strip of

Kawailoa Ahupua'a that are indicative of former habitation (Athens and Shun 1982; Borthwick et al. 2002; Borthwick et al. 1998; Cluff 1968; Hammatt and Shideler 2006; Moore et al. 1993; Welch 1981). Some of these sites are located near the *makai* boundary of the access road for the permanent Project footprint, including stacked basalt boulder walls (and a more recent historic bridge and segment of the OR&L track) (Masterson et al. 1995), 'Ili'ilikea Heiau (McAllister 1933:142), and a complex of partially enclosed terraces, platforms, and walls called Kahōkūwelowelo that has been variously described as a priestly dwelling, monastery, and *heiau* (*Advertiser* 1933; McAllister 1933:143; Thrum 1906). In addition, Mr. Becket maps the locations of Kahōkūwelowelo Heiau, Kahōkūwelowelo Hale, an enclosure, a wall and other rock structures, a rock carving, and an altar near the Project's *makai* access roads. Mr. Au, Mr. Helemano, and Ms. Awai-Lennox describe several *heiau* in the uplands of Kawailoa, and Mr. Helemano describes *heiau* near the coast of Kāpaeloa. The accompanying AIS has not identified any *heiau* or other cultural sites in the permanent Project footprint (Rechtman et al. 2011).

The *ahupua'a* system of territorial land units was established in approximately A.D. 1400 by Mā'ilikūkahi, an *ali'i kapu* who was born at Kūkaniloko in the uplands of Waialua, and whose chiefly title was consecrated at the *heiau* of Kapukapuākea (Kirch 2010:84–90). Mr. Helemano recounts that for well over 1000 years, the *kahuna nui* of this island resided in Waimea Valley or at least had potential control, as *konohiki*, over the island. Kamananui Ahupua'a was the political and ritual center of Waialua until the 1820s, when the ruling chief re-drew the *ahupua'a* boundaries with his shift in residence to Kawailoa Ahupua'a and when the Kawailoa-based Protestant mission of Waialua "usurped the ritual hegemony from the temples of human sacrifice [*po'okanaka*] that not long before had sanctified the landscape of Kamananui" (Sahlins 1992:21).

6.3 Cultivation, Fishing, and Gathering

The fertile coastal plains of Kamananui and Kawailoa Ahupua'a were watered from the streams flowing from the Ko'olau mountains, and dense settlements and large complexes of irrigated taro fields were located on the floodplains of these streams near the coast (Sahlins 1992:20). Other settlements along Anahulu Stream cultivated taro and extracted *wauke*, and later, after Kamehameha's conquest and occupation, expanded to cultivate bananas, yams, sweet potatoes, and dryland taro (Kirch 1992:57–59). In the high, level saddle region between the two mountain ranges of O'ahu in the former lands of Kamananui (now Wahiawā), extensive cultivation of taro, sweet potatoes, and yams took place (Handy and Handy 1972:464–465). The circular plateau of Mount Ka'ala is bounded by precipices 1,000–2,000 feet high. Small streams from the swampy plateau cascade as waterfalls into the lower valleys. *Mo'olelo* and *mele* suggest that the summit swamp was formerly a freshwater fishpond called Luakini that contained *hīnālea*, *wuwoa*, and freshwater crabs (Forndander 1916–1920, Vol. 4:390; McAllister 1933:133).

Claims for LCAs reveal that prior to 1850 Hawaiian households had multiple *'āpana* in different geographical locations, involving the cultivation of taro, bananas, bitter gourds, melon, corn, sugarcane, and sweet potatoes, and *pali* were exploited for the collection of *wauke* (Waihona 'Aina 2000). Rice cultivation, extension of the railroad system toward Waialua, and the development of commercial sugarcane cultivation led to the rise of the Waialua Agricultural

Company (later named the Waialua Sugar Company), which dramatically altered the landscape of Kawailoa and Kamananui Ahupua'a during the last two decades of the nineteenth century. Mrs. Agader relates that the entire landscape of Waialua was covered in sugarcane during the first half of the twentieth century. She remembers that at the higher elevations—the same as the proposed sites for the Project's wind turbines—the non-irrigated sugarcane produced low yields. Philip Ninomiya and Manabu Nonaka, descendants of Japanese immigrants, describe in previously recorded oral histories a diet of mostly fish for the Japanese plantation workers and their families, including *aji*, *pāpio*, *āholehole*, *moi*, *'oama*, and *tako*, as well as *ogo*. They also detail how they constructed rafts out of *akakai* that grew along Anahulu Stream (UH 1977).

Along the coast at Kāpaeloa, Mrs. Causey and her family used to gather *'ōpihi*, *pipipi*, and *limu*, including *ogo* and *wāwae'iole*, and catch *akule*, *kūmū*, *'āweoweo*, *manini*, and *āholehole*. Mr. Helemano recalls gathering *wana* and *'uke'uke* along the coast at Kāpaeloa. Near Hale'iwa, Ms. Gladys Awai-Lennox and her family used to cultivate taro, breadfruit, and bananas. Her family also fished extensively along the coast, catching *nenue*, *kala*, *'oama*, and gathered *wana*, *ha'uki'uki*, *pipipi*, and several kinds of *limu* including *wāwae'iole*, *ogo*, *ele'ele*, and *kohu*. Her family also collected the seed pods of *kiawe* for cattle and pig fodder, and made leis from the red *hala* fruit. In addition, she also describes the importance to her family of the *'alae 'ula*.

Most recently, 2,200 acres of land in Kawailoa have been managed by Kamehameha Schools for diversified farming of asparagus, wet and dryland taro, papaya, seed and feed corn, tuberose, banana, plumeria, *noni*, and lettuce (*Imua* 2005:15–16). Mrs. Agader also notes that within the last five years, Kamehameha Schools has planted some *koa* trees in the *mauka* lands of Kawailoa.

Overall, the historic research and community consultation suggests that a variety of cultivars were once grown in the *makai* portion of Kawailoa and numerous marine resources caught or gathered, but that the *mauka* lands of Kawailoa, including the permanent Project footprint (wind turbines and facilities), were mostly covered in sugarcane. Since those fields were left fallow after the termination of the Waialua Sugar Company in 1998, there does not appear to have been any recent use of the land for cultivation or gathering.

6.4 Storied Landscape

The Wind Gourd of La'amaomao tells the story of how Pāka'a and his son Kuāpāka'a, descendants of the wind goddess La'amaomao, control the winds of Hawai'i through a gourd that contains the winds and could be called forth by chanting their names (Nakuina 1992). Pāka'a's chant traces the winds of O'ahu and the *moku* of Waialua, including the wind that blows at Mount Ka'ala, called Pu'u-ka'ala. The chant does not name the specific wind that blows through Kawailoa, but Mr. Labra knows its name (although he does not intend to reveal it at this time). Other *mo'olelo* connect the gourd of La'amaomao to the god Lono, a cosmic gourd from whence came the winds, clouds, and rain (Handy and Handy 1972:220; *Ka Na'i Aupuni* 1906). A cultural connection can be made between the *mo'olelo* of the wind goddess La'amaomao and modern wind farms: Wind farms, just like the descendants of La'amaomao, involve the capturing and harnessing of wind energy. One difference is that while Pāka'a once malevolently summoned the winds to detain his *ali'i* on Moloka'i (Nakuina 1992), wind farms (such as First Wind) aim to benevolently use the wind as a means of renewable energy.

The summit of Ka'ala, the highest point on O'ahu, is considered a sacred place (Wai'anae Ecological Characterization 2011). Kāhuna described the summit plateau as being "clothed in the golden cloak of Kane," a resting place for spirits of the dead (McGrath et al. 1973:11). It is possible that this resting place was for souls heading down the spine of the Wai'anae mountains toward Kaena Point, a *leina 'uhane* (leap of the soul), or place where the souls of the dead leaped into the next world (McAllister 1933:125–126). Other *mo'olelo* relate the significance of the Ka'ala summit for weather forecasting and making prophecies (Kalākaua 1890:155–173; 455–480).

Mr. Helemano shares several other *mo'olelo* of *wahi pana* in Kawailoa that provide a broader perspective of the cultural traditions surrounding the permanent Project footprint. He explains that Kūpōpolo, which means "to see with eyes and mind" did not serve the purpose as a place where Ka'opulupulu could have visions, and Kāpaeloa, which means "to put aside, or cast out, as with rotten food," refers to Kaopulupulu's visions that were not read correctly at Kūpōpolo Heiau. Mr. Helemano stressed that an important *mo'olelo* about the area is that of Kāne'aukai, a shark god and *'aumakua* who is related to the goddess Pele.

6.5 Burials

Community consultation, historic documentation, previous archaeological research, and the accompanying AIS (Rechtman et al. 2011) have not identified any burials within the permanent Project footprint. However, numerous documented burials are located in the *ahupua'a* of Kamananui and Kawailoa, several of which are located in proximity to the permanent Project footprint.

Two burial caves are located about three miles north of the microwave communication facility Project area at the cliffs of Kaumoku Gulch beneath Pu'u Kaupakuhale in Kamananui Ahupua'a (Sites 198 and 200, McAllister 1933:130–131). Skeletal remains have also been discovered near the coastal area of Pu'uiki (Site 202, McAllister 1933:132). Hawaiians have also been recently buried in an area near an *akua* stone (Site 205) in the central *makai* portion of the *ahupua'a* (McAllister 133:105). Farther *mauka* about two miles northwest of the microwave communication facility Project area, two caves with skeletal remains are located along Kaukonahua Gulch (Sites 210 and 211, McAllister 1933:133).

In the southern coastal section of Kawailoa Ahupua'a, the point of Pua'ena was a place where the body of an *ali'i* named Elani was placed, and corpses of commoners were also placed on the rocks, such that "the fluids from the decaying body would seep into the sea and attract sharks, which the people killed" (Site 234, McAllister 1933:141–142). Two burial sites were discovered in this coastal area (SIHP No. 50-80-01-4670, Avery and Kennedy 1993; SIHP No. 50-80-01-5495, Borthwick et al. 1998). In the southern mountainous section of Kawailoa Ahupua'a, burials are located within and near the settlements in the upper Anahulu Valley, including stone burial crypts, a cliff burial, and a walled burial cave (Kirch 1992:88, 94,104, 112). Along the northern coastal strip of Kawailoa, the SHPD reported findings of human remains (SIHP No. 50-80-01-3724) on the inland side of Kamehameha Highway (Bath 1988). In addition, community participant Mr. Becket maps the location of burial caves in the Project's *makai* access roads, and Mrs. Causey describes the locations of two Japanese graveyards just *makai* and *mauka* of her property very close to Old Cane Haul Road and Kawailoa Road.

The estimated locations of the cliff burials mapped by Mr. Becket, which are based on teachings from *kupuna* Rudy Mitchell, are closest in proximity to the permanent Project footprint. This cliff section of Kawailoa is just *makai* of Ashley Road. Since Ashley Road (and other access roads for the transport of the wind turbines) are not being widened, it is unlikely that any burials would be uncovered. Although unlikely, there is the possibility that the transport or the construction of the wind turbines could result in the inadvertent discovery of burials.

Section 7 Summary and Recommendations

CSH undertook this CIA at the request of CH2M HILL. The cultural survey broadly included the entire *ahupua'a* of Kawailoa (and Lauhulu, Kuikuiloloa, Punaue, Kāpaeloa) and Kamananui including the following specific parcels:

- Wind Farm Site: TMK [1] 6-1-005:001; 6-1-006:001; 6-1-007:001; 6-2-011:001
- Traversed by Existing Onsite Access Roads: TMK [1] 6-1-005:003, 007, 014, 015, 016, 019, 020, 021, 022; 6-1-008:025; 6-2-002:001, 002, 025; 6-2-009:001
- Mount Ka'ala Communication Sites: TMK [1] 6-7-003:024

7.1 Results of Background Research

Background research for this Project yielded the following results (presented in approximate chronological order):

1. The *moku* (district) of Waialua contained a set of centrally located productive lands and peripheral areas that were ecologically marginal but that had access to abundant ocean resources. The fertile center consisted of the area surrounding Kaiaka and Waialua Bays located in the *makai* (seaward) regions of the *ahupua'a* of Kamananui, Pa'ala'a, and Kawailoa. This core productive region likely supported the majority of the Waialua population. In marked contrast, small fishing communities were located on marginal lands at the edges of Waialua, including Kāpaeloa.
2. The earliest settlements along the northern coastal areas of O'ahu have yet to be recovered archaeologically, but a settlement complex in Anahulu Valley, which was most likely a peripheral extension of the core Waialua production lands, dates to A.D. 1300. This complex, located next to the southern section of the Kawailoa permanent Project footprint, includes numerous habitation sites, rock shelters, irrigation systems, and dryland agricultural remains (Kirch 1992).
3. *Mo'olelo* (oral traditions) chronicle the rise of divine kingship in the uplands of Waialua. Located near what some people consider the *piko* (navel or center) of O'ahu, the site of Kūkaniloko was a birthing place of *ali'i kapu* (sacred chiefs), who were the *akua* (gods) of the land (Kamakau 1964:12). The *ahupua'a* system of territorial land units was established in approximately A.D. 1400 by Mā'ilikūkahi, an *ali'i kapu* who was born at Kūkaniloko in the uplands of Waialua, and whose chiefly title was consecrated at the *heiau* (sacred place of worship, temple) of Kapukapuākea (Kirch 2010:84–90)
4. *The Wind Gourd of La'amaomao* tells the story of how Pāka'a and his son Kuāpāka'a, descendants of the wind god La'amaomao, controlled the winds of Hawai'i through a gourd that contained the winds and could be called forth by chanting their names (Nakuina 1992). Pāka'a's chant traces the winds of O'ahu and the *moku* of Waialua, including the wind that blows at Mount Ka'ala, called Pu'u-ka'ala. Other *mo'olelo* connect the gourd of La'amaomao to the god Lono, a cosmic gourd from whence came the winds, clouds, and rain (Handy and Handy 1972:220; *Ka Na'i Aupuni* 1906). A cultural connection can be made between the *mo'olelo* of the wind goddess La'amaomao

and modern wind farms: Wind farms (such as First Wind), just like the descendants of La'amaomao, involve the capturing and harnessing of wind energy. One difference is that while Pāka'a once malevolently summoned the winds to detain his *ali'i* on Moloka'i (Nakuina 1992), wind farms (such as First Wind) aim to benevolently use the wind as a means of renewable energy.

5. The summit of Ka'ala, the highest point on O'ahu, is considered a sacred place (Wai'anae Ecological Characterization 2011). *Kāhuna* (priests) described the summit plateau as being "clothed in the golden cloak of Kane," a resting place for spirits of the dead (McGrath et al. 1973:11). It is possible that this resting place was for souls heading down the spine of the Wai'anae mountains toward Ka'ena Point, a *leina 'uhane* (leap of the soul), or place where the souls of the dead leaped into the next world (McAllister 1933:125–126). Other *mo'olelo* relate the significance of the Ka'ala summit for weather forecasting and making prophecies (Kalākaua 1890:155–173; 455–480).
6. The distant lands of the proposed Project, from the southwest mountainous peak of Ka'ala to the northeast coastal region of Kāpaeloa, were once connected culturally and politically prior to the introduction of private property with the Māhele of 1848. The proposed microwave communications facility Project area near the summit of Mount Ka'ala is part of Kamananui Ahupua'a, formerly the political and ritual center of Waialua. The *konohiki* (stewards) of Kamananui also managed detached, outlying lands, including the fishing community of Kāpaeloa at the eastern border of Waialua. Then, in the 1820s, the ruling chief of Kamananui Ahupua'a moved to Anahulu Valley in the *ahupua'a* of Kawailoa, which resulted in a redrawing of *ahupua'a* boundaries. Kāpaeloa and other outlying sections of Kamananui were thus subsumed into the land of Kawailoa (Sahlins 1992:20–21). The proposed wind power facility permanent Project footprint is located in this expanded region of Kawailoa.
7. Previous archaeological research and recent cultural resource management work indicate that the *ahupua'a* of Kawailoa and Kamananui contain numerous cultural sites and *wahi pana* (storied places) indicative of ancient settlement patterns. *Mo'olelo* suggest that the summit swamp of Mount Ka'ala near the microwave communication facility Project area was formerly a freshwater fishpond called Luakini. McAllister (1933) documented two sites in the vicinity of the *makai* access roads of the Kawailoa permanent Project footprint—a *heiau* called 'Ili'ilikea (Site 237), which was destroyed in 1916 by W. Harpham for the Waialua Agricultural Company (but according to Mr. Jan Becket, part of it is still standing, although not in the permanent Project footprint; see Results of Community Consultation), and a complex of partially enclosed terraces, platforms, and walls called Kahōkūwelowelo (Site 240) that has been variously described as a priestly dwelling, monastery, and *heiau* (*Honolulu Advertiser* 1933; McAllister 1933:143; Thrum 1906). The accompanying Archaeological Inventory Survey (AIS) (Rechtman et al. 2011) confirmed that there are not any *heiau* or other Native Hawaiian cultural sites in the permanent Project footprint.
8. Previous archaeological research and recent cultural resource management work indicate numerous burials in Kawailoa and Kamananui. In proximity to the Kawailoa permanent Project footprint are burials within and near the early settlements in the upper Anahulu

Valley (Kirch 1992:88, 94,104, 112) and along the coastal strip of Kawailoa on the inland side of Kamehameha Highway (State Inventory of Historic Properties [SIHP] No. 50-80-01-3724, Bath 1988; SIHP No. 50-80-01-4670, Avery and Kennedy 1993; SIHP No. 50-80-01-5495, Borthwick et al. 1998).

9. Land Commission Award documentation of the Māhele indicates a wide range of indigenous Hawaiian subsistence practices in the vicinity of the permanent Project footprint in Kawailoa prior to 1850. The land claims reveal that Hawaiian households had multiple *'āpana* (lots) in different geographical locations, involving the cultivation of taro, bananas, bitter gourds, melon, corn, sugarcane, and sweet potatoes, and *pali* (cliffs) were exploited for the collection of *wauke* (paper mulberry) (Waihona 'Aina 2000).
10. The landscape of Kawailoa and Kamananui Ahupua'a shifted dramatically during the last two decades of the nineteenth century with rice, sugar, and pineapple cultivation. The development of the Oahu Railway and Land Company (OR&L) led to the rise of the Waialua Agricultural Company, later named the Waialua Sugar Company. The Kawailoa Plantation, situated on the rolling ridges above Hale'iwa, included 6,000 acres of sugar cultivation. After the Waialua Sugar Company closed in 1998, Kamehameha Schools began managing the Kawailoa Plantation as a diversified farming operation (*Imua* 2005:15–16). The accompanying AIS (Rechtman et al. 2011) did identify 17 historic sites associated with the former plantation (and military) activities in the permanent Project footprint.
11. Philip Ninomiya and Manabu Nonaka, descendants of Japanese immigrants in Waialua, describe in previously recorded oral histories a diet of mostly fish for the Japanese plantation workers and their families, including *aji* (*akule*, big-eyed scad fish), *pāpio* (young stage of *ulua*, crevalle, jack, or pompano), *āholehole* (young stage of *āhole*, Hawaiian flagtail), *moi* (threadfish), *'oama* (young stage of *weke*, goatfish), and *tako* ([Japanese] squid, octopus), as well as *ogo* ([Japanese] seaweed). They also constructed rafts out of *akakai* (reeds) that grew along Anahulu Stream (UH 1977).

7.2 Results of Community Consultation

CSH attempted to contact 37 community members and government agency and community organization representatives. Of the 17 people that responded, nine *kūpuna* (elders) and/or *kama'āina* (Native-born) participated in formal interviews for more in-depth contributions to the CIA. This community consultation indicates:

1. Community participants share a range of *mana'o* (thoughts, opinions) and views on the proposed wind farm. Four participants support the Project. Mr. Thomas Shirai states that the Project will not have any cultural impacts, Ms. Gladys Awai-Lennox does not have any cultural concerns, Mrs. Lavina Agader believes that the wind farms will be a good use of the land since it is no longer supporting agriculture, and Mr. Kawika Au is supportive if the Project is done *pono* (in the correct way). Other participants articulated their *mana'o* as to how the Project may impact cultural sites, beliefs, and practices:
2. Community participants describe and map the locations of numerous cultural sites in the *makai* section of Kawailoa, several of which are located near the Project's access roads.

Based on the teaching of *kupuna* Rudy Mitchell, Mr. Jan Becket maps the locations of the following cultural sites in the vicinity of the permanent Project footprint: Kahōkūwelowelo Heiau, Kahōkūwelowelo Hale, burials, an enclosure, a wall, a rock carving, an altar, and other rock structures (see Figure 35). Mrs. Emmaline Causey describes the locations of two Japanese graveyards just *makai* and *mauka* of her property very close to Old Cane Haul Road and Kawailoa Road, and Mrs. Agader describes three burials at the former Kawailoa Camp. Having previously noticed how the transport of wind turbines required the entire width of a two-lane road, she is concerned that the transport of wind turbines along Old Cane Haul Road and Kawailoa Road may disturb these two graveyards, which are only maintained twice a year and may thus be at times obstructed from view. In addition, Ms. Coochie Cayan, the History and Culture Branch Chief of the SHPD, states that the proposed Project will have an impact on the area's well documented *mo'olelo*, historic sites, archaeological sites, and burials.

The accompanying AIS (Rechtman et al. 2011) has not identified any cultural sites in the permanent Project footprint; however, 17 historic sites associated with the former plantation activities or former military operations have been identified within the permanent Project footprint and archaeological monitoring is recommended.

3. Mr. Becket draws attention to intensive archaeological investigations in the upper Anahulu Valley (Kirch and Sahlins 1992) and suggests that parallel groupings of upper valley settlements may be located in the gulches in the northern *mauka* sections of Kawailoa, including the permanent Project footprint. Ms. Awai-Lennox and Mr. Butch Helemano also describe, in general terms, several *heiau* in the *mauka* lands of Kawailoa, and Mr. Au is aware of numerous cultural sites in the *mauka* portions of Kawailoa, including *three* heiau, several former habitation sites, and walls, although he does not specify their location.

   The accompanying AIS (Rechtman et al. 2011) has not identified any *heiau* or other cultural sites in the permanent Project footprint, and is avoiding the gulches and steep slopes where burials could be found.

4. The entire landscape of Waialua was covered in sugarcane during the first half of the twentieth century, according to Mrs. Agader. Immigrants settled in various "camps," including Japanese, Chinese, Korean, and Filipino laborers and their families at Kawailoa Camp near the southern access roads of the Project.

5. The *makai* and *mauka* lands of Kawailoa contain abundant ocean and forest resources. Along the coast at Kāpaeloa, Mrs. Causey and her family used to gather *'ōpihi* (limpet), *pipipi* (pearl oyster), and *limu* (seaweed), including *ogo* and *wāwae'iole*, and catch *akule*, *kūmū* (goatfish), *'āweoweo* (big eye), *manini* (convict tang), and *āholehole*. Near Hale'iwa, Ms. Gladys Awai-Lennox and her family used to cultivate taro, breadfruit, and bananas. Her family also fished extensively along the coast, catching *nenue* (chub fish), *kala* (surgeon fish), *'oama*, and gathered *wana* (spiny urchins), *ha'uki'uki* (shingle urchins), *pipipi*, and several kinds of *limu* including *wāwae'iole*, *ogo*, *ele'ele*, and *kohu*. Her family also collected the seed pods of *kiawe* (mesquite) for cattle and pig fodder, and made leis from the red *hala* (pandanus) fruit. In addition, she also describes the

importance to her family of the *'alae 'ula* (Common Hawaiian Moorhen). Mrs. Agader also relates that Kamehameha Schools recently planted *koa* in the *mauka* portions of Kawailoa. Ms. Cayan, as the History and Culture Branch Chief of the SHPD, recommends that access and gathering rights should not be prevented, as certain families, practitioners, and groups continue to practice Hawaiian spirituality, traditional burials, and other activities, such as hunting and hiking.

Although community members have not identified such cultural practices, First Wind will work with Kamehameha Schools to facilitate access in the wind farm permanent Project footprint and the *mauka* Kawailoa property for hiking, hunting, gathering, and cultural practices.

6. Drawing from the Kumulipo, a cosmological creation chant, and *kūpuna*, Mr. Tom Lenchanko articulates an expansive view of Kūkaniloko (the current State of Hawai'i five-acre park site noted to be Kūkaniloko Birthstones State Monument, a sacred site for the birth of *ali'i* [chiefs]) that extends geographically to encompass 36,000 acres of land within a network of *ka'anani'au* (boundary markers). This area, which has *mana* (divine power), includes the *mauka* portions of Kawailoa and Kamananui. Mr. Lenchanko is concerned that the proposed Project will trespass upon his family's *'āina* (land) and *iwiawaloa* (ancestral burial places). He also asserts his belief that the wind turbines will forever impact the traditional cultural properties of the *mauka* sections of Kawailoa and Mount Ka'ala—they will impede the vision of the traditional natural landscape and interfere with the view plane of those who are buried in the land.

   The accompanying AIS (Rechtman et al. 2011) has not identified any burial features in the permanent Project footprint. According to First Wind, the wind farm Project will not make a permanent change to the landscape—the wind turbine equipment will either be replaced or removed after 20 years.

7. Mr. Moki Labra and Mr. Helemano are concerned about the massive scale of development (30 wind turbines) in Kawailoa: Mr. Labra states that "parts of the *ahupua'a* need to be rested" and that the *'āina* (land) needs to "get balance," and Mr. Helemano criticizes land stewardship that enables the desceration of "our sacred lands and fragile natural resources." Mr. Au and Ms. Betty Jenkins concur with Mr. Labra that if the Project is not done in the correct way (*pono*), the "winds might not listen and could stop blowing altogether." Mr. Labra questions the company name, 'Kawailo Wind,' and the location of the Project—'Kawailoa' is not the name of the wind that blows through the *ahupua'a* and other places on O'ahu have much stronger winds. Mr. Au summarily states that he could support the Project if it benefits local Hawaiian people and is not only to make outsiders rich.

8. According to First Wind, the company will work with the Waialua community to seek input about the Project and how the wind farm should support community priorities in the area in order to create a balance to any perceived negative impacts. In addition, previous First Wind projects were blessed by *kahu* (guardians) at several stages during the construction process in accordance with cultural traditions.

7.3 Impacts and Recommendation

Based on the information gathered for the cultural and historic background and community consultation detailed in this CIA report, the proposed Project may potentially impact Native Hawaiian burials and cultural beliefs. CSH identifies these potential impacts and makes the following recommendations:

1. The accompanying AIS has not documented any burial features in the permanent Project footprint (Rechtman et al. 2011), and it is unlikely that burials will be encountered due to previous disturbance from former plantation activities and military operations. However, community participants Mr. Becket and Mrs. Causey express concerns of the proximity of the Project's *makai* access roads to cliff burials and Japanese graveyards, and Ms. Cayan, as the History and Culture Branch Chief of the SHPD, states that the Project will impact burials.

   Since land-disturbing activities may uncover presently undetected burials, personnel involved in the construction activities of the permanent Project footprint should be informed of the possibility of inadvertent cultural finds, including human remains. The accompanying AIS (Rechtman et al. 2011) recommends archaeological monitoring as appropriate mitigation to address (in part) the possibility of presently unidentified burials. Should burials (or other cultural finds) be identified during ground disturbance, the construction contractor should immediately cease all work and the appropriate agencies notified pursuant to applicable law.

2. Community participants Mr. Lenchanko, Mr. Labra, and Mr. Helemano express that the wind turbines will impact the visual landscape and the integrity of the cultural landscape of Kawailoa. Although these community participants did not describe visual impacts from any specific cultural sites, First Wind notes that some of the wind turbines will be visible from cultural sites, such as Pu'u o Mahuka Heiau, and culturally significant locations, including Waimea Valley, which was nominated as a Traditional Cultural Property (Monahan 2008), and Hale'iwa, which is a State Historic, Cultural, and Scenic District. Other community members, such as Mr. Shirai, Ms. Awai-Lennox, Mrs. Agader, and Mr. Au, are supportive of the Project for a variety of reasons if it is conducted *pono*.

   According to First Wind, the company aims to operate this wind energy Project in a way that is respectful to Native Hawaiian cultural beliefs. For other wind farm projects, First Wind has sought community input about the Project and how the wind farm should support community priorities so as balance the perceived negative impacts. For this Project, First Wind has already engaged the Waialua community and intends to form a long-term partnership with Waimea Valley to support their efforts to promote Hawaiian culture. First Wind should continue to brief and consult with community members and organizations as the Project design and construction progresses in order to inform the community of any changes that could result in unanticipated adverse cultural impacts and to better understand and incorporate the Hawaiian cultural worldview.

7.4 Mitigation and Outreach

At each of its wind projects in Hawai'i, First Wind works to study and understand the important environmental and cultural resources in and around the permanent Project footprint. First Wind's goal is to develop and operate wind energy projects in a way that is respectful to Hawai'i's unique cultural and natural resources while also contributing to the local communities where its wind farms are located. First Wind has conducted the following previous cultural and environmental mitigation and community outreach, and is planning on conducting the following mitigation and outreach for the Kawailoa wind farm:

- **Archaeological Surveys & Project Layout** – First Wind has designed the layout of each of its projects in order to avoid impacts to environmental and cultural resources. After on-site archaeological surveys, if any significant features are identified, the location of wind turbines, buildings, substations, utility poles and roads can be modified so that no resources are affected. Prior to clearing the land for the Kahuku and Maui projects, First Wind fenced off sensitive cultural areas so they would not be disturbed during construction. In keeping with cultural tradition, First Wind also had each of the projects blessed by Hawaiian *kahu* at several stages during the construction process. First Wind is applying these same practices on the Kawailoa wind farm Project.
- **Habitat Conservation Plan** –First Wind is developing a Habitat Conservation Plan (HCP) that provides a net benefit to the native species that may be impacted. As part of the HCP for the Kawailoa project, First Wind will be working with Kamehameha Schools to protect and restore Uko'a Pond, improving it as a habitat for native species.
- **Replanting Native Plants** – At First Wind's Kaheawa project, they have engaged with community groups and others to replant native plants in areas that were cleared during construction. Several species native to the dryland forest *mauka* of the project were propagated at a local plant nursery, and since 2006, First Wind staff and volunteers have replanted seedlings of thousands of native plants, including *pukiawe*, *a'ali'i* and *'ohia lehua*. For the Kawailoa Project, First Wind will replant areas with native plants.
- **Erosion Control Measures** –First Wind will install silt fencing and other temporary means to minimize erosion of areas that are cleared. After construction, First Wind will plant grass on the graded areas of turbine pads and along the sides of new project roads so that the new growth will establish a root system and prevent future soil runoff. In addition, First Wind will develop drainage measures to manage storm water flow along and across roadways which minimizes erosion during heavy rains through the life of the project.
- **Community Input** – Throughout the development of its projects, First Wind meets with community residents and organizations to share information about the project and seek input. In its Kahuku project, the community asked First Wind to site the project as much as possible to minimize the possibility of hearing sound from the project in Kahuku town, and First Wind adjusted the project accordingly. Residents in Mokulē'ia were concerned about a planned communications tower being built in their neighborhood, and First Wind found an alternate location for the communication antennas on an existing facility at Mount Ka'ala. In both cases, community feedback helped to improve the final project. First Wind also seeks residents' input about community priorities and what efforts the

wind farm should support in the area. In preparing for the Kahuku project, First Wind talked to hundreds of Kahuku residents who identified education, flood mitigation, and agriculture as the most important priorities for the local community. First Wind is working with schools, community associations, and local ranchers to contribute to these priorities over the life of the Kahuku project. For the Kawailoa Project, First Wind has consulted with the community and intends to continue the process of sharing information, seeking input, and making appropriate adjustments.

- **Support for Native Hawaiian Organizations** – Since beginning operations in Hawai'i, First Wind has been a strong supporter of Native Hawaiian organizations and cultural events, including 'Aha Punana Leo, Maui Cultural Lands, Hawaiian Homestead Associations on Moloka'i, Na Pua No'eau, Waimea Valley Music Festival, Waimea Valley Makahiki Festival, and the Council for Native Hawaiian Advancement's annual convention. For the Kawailoa project, First Wind intends to form a long-term partnership with Waimea Valley to support their efforts to promote Hawaiian culture and environmental awareness.
- **Access for Traditional Activities** – Kamehameha Schools is planning to expand its access opportunities to allow for safe, legal, and controlled access to and around the *mauka* Kawailoa property for hiking, hunting, gathering, and cultural practices. First Wind will work with Kamehameha Schools to facilitate safe access in and around the wind farm site for cultural practitioners.
- **Productive Use of Land** – The wind farm allows the land to be maintained in agriculture. By producing wind energy on the *mauka* section of Kawailoa, Kamehameha Schools will be able to use generated lease revenues to improve the access roads and water irrigation system which would directly benefit local farmers. Not unlike the traditional concept of the *ahupua'a*, this arrangement will make the most productive, sustainable use of the land while not depleting any resources. Wind energy does not require water nor does it have give off any harmful emissions into our atmosphere. The wind Project also will not make a permanent change to the landscape: Wind turbine equipment has a useful life of about 20 years, after which they would either be replaced with new turbines or removed.

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Appendix A Glossary

To highlight the various and complex meanings of Hawaiian words, the complete translations from Pukui and Elbert (1986) are used unless otherwise noted. In some cases, alternate translations may resonate stronger with Hawaiians today; these are placed prior to the Pukui and Elbert (1986) translations and marked with "(common)."

Diacritical markings used in the Hawaiian words are the *'okina* and the *kahakō*. The *'okina*, or glottal stop, is only found between two vowels or at the beginning of a word that starts with a vowel. A break in speech is created between the sounds of the two vowels. The pronunciation of the *'okina* is similar to saying "oh-oh." The *'okina* is written as a backwards apostrophe. The *kahakō* is only found above a vowel. It stresses or elongates a vowel sound from one beat to two beats. The *kahakō* is written as a line above a vowel.

Hawaiian Word	English Translation
ahupua'a	Land division usually extending from the uplands to the sea, so called because the boundary was marked by a heap (*ahu*) of stones surmounted by an image of a pig (*pua'a*), or because a pig or other tribute was laid on the altar as tax to the chief.
āholehole	Young stage of *āhole*, Hawaiian flagtail.
ahu	Heap, pile, collection, mound, mass; altar, shrine, cairn.
'āina	Land, earth.
akakai (Japanese)	Reeds (UH 1977).
ao	Light, day, daylight, dawn; to dawn, grow light; enlightened; to regain consciousness.
'āpana	Piece, slice, portion, fragment, section, segment, installment, part, land parcel, lot, district, sector, ward, precinct.
aji (Japanese)	*Akule*, big-eyed scad fish (UH 1977).
akua	God, goddess, spirit, ghost, devil, image, idol, corpse.
akule	Big-eyed scad.
'alae 'ula	Common Hawaiian Moorhen.

Hawaiian Word	English Translation
ala hele	Pathway, route, road, way to go, itinerary, trail, highway, means of transportation.
ali'i	Chief, chiefess, officer, ruler, monarch, peer, headman, noble, aristocrat, king, queen, commander.
ali'i kapu	Sacred chief (common).
'aumakua	Deified ancestor.
'auwai	Ditch, canal.
'āweoweo	Bigeye.
hala	Pandanus.
hale	House, building, institution, lodge, station, hall.
haole	Caucasian, foreigner.
ha'uki'uki	Shingle urchins.
heiau	Pre-Christian place of worship, shrine; some *heiau* were elaborately constructed stone platforms, others simple earth terraces. Many are preserved today.
hīnālea	Wrasses.
'ili	Land section, next in importance to an ahupua'a and usually a subdivision of an *ahupua'a*.
ilina	Grave, tomb, sepulcher, cemetery, mausoleum, plot in a cemetery.
iwi kūpuna	Ancestral bone remains (common).
ka'anani'au	Boundary markers (Tom Lenchanko)
kahuna	Priest, sorcerer, magician, wizard, minister, expert in any profession. *Kāhuna*—plural of *kahuna*.
kahuna nui	Supreme spiritual leader (common). High priest and councilor to a high chief.

Hawaiian Word	English Translation
kala	Surgeon fish.
kama'āina	Native-born, one born in a place, host; native plant; acquainted, familiar, Lit., land child.
kāne	Man.
kaona	Hidden meaning, as in Hawaiian poetry; concealed reference, as to a person, thing, or place; words with double meanings that might bring good or bad fortune.
kapu	Taboo, prohibition; special privilege or exemption from ordinary taboo; sacredness; prohibited, forbidden; sacred, holy, consecrated; no trespassing, keep out.
kiawe	Algaroba tree.
konohiki	Headman of an *ahupua'a* land division under the chief.
kula	Dryland agriculture (common). Plain, field, open country, pasture.
kuleana	Native Hawaiian land rights (common). Right, privilege, concern, responsibility, title, business, property, estate, portion, jurisdiction, authority, liability, interest, claim, ownership, tenure, affair, province.
kūmū	Goatfish.
kupuna	Elders (common). Grandparent, ancestor, relative or close friend of the grandparent's generation, grandaunt, granduncle. *Kūpuna*—plural of *kupuna*.
lehua	The flower of the *'ōhi'a* tree.
limu	Seaweed.
lo'i	Irrigated terrace, especially for taro, but also for rice; paddy.
loko	Pond, lake, pool.
loko i'a	Fishpond (common).

Hawaiian Word	English Translation
lua	A type of dangerous hand-to-hand fighting in which the, fighters broke bones, dislocated bones at the joints, and inflicted severe pain by pressing on nerve centers.
maka'āinana	Commoners.
makai	Seaward.
makani	Wind, breeze.
mana	Supernatural or divine power.
mana'o	Thought, idea, belief, opinion, theory, thesis, intention, meaning, suggestion, mind, desire, want; to think, estimate, anticipate, expect, suppose, mediate, deem, consider.
manini	Convict tang.
mauka	Inland.
mele	Song, anthem, or chant of any kind.
moi	Threadfish.
mō'ī	King, sovereign, monarch, majesty, ruler, queen.
moku	District, island, islet, section.
mo'olelo	Story, tale, myth, history, tradition, literature, legend, journal, log, yarn, fable, essay, chronicle, record, article; minutes, as of a meeting. (From *mo'o 'ōlelo*, succession of talk; all stories were oral, not written).
nenue	Chub fish.
noni	Indian mulberry.
'oama	Young stage of *weke*, goatfish.
ogo (Japanese)	Seaweed.
'ohana	Family.

Hawaiian Word	English Translation
'ōlelo no'eau	Proverb, wise saying, traditional saying.
oli	Chant that was not danced to, especially with prolonged phrases chanted in one breath, often with a trill at the end of each phrase; to chant thus.
'ōpihi	Limpet.
pahu	Drums.
pa'i pa'i	To slap.
pali	Cliff, precipice, steep hill or slope.
pāpio	Young stage of *ulua* (crevalle, jack, or pompano).
piko	Naval, center, birthplace.
pipipi	Pearl oyster.
pō	Night, darkness, obscurity; the realm of the gods; pertaining to or of the gods, chaos, or hell; dark, obscure, benighted; formerly the period of 24 hours beginning with nightfall (the Hawaiian "day" began at nightfall.
pōhaku	Rock, stone, mineral, tablet.
poi	Pounded taro.
pono	Goodness, uprightness, morality, moral qualities, correct or proper procedure, excellence, well-being, prosperity, welfare, benefit, behalf, equity, sake, true condition or nature, duty.
po'okanaka	Class of *heiau* for human sacrifice (common).
pūnāwai	Fresh-water springs.
tako (Japanese)	Squid, octopus (UH 1977).
tī (kī)	A woody plant in the lily family.
'uala	Sweet potatoe.

Hawaiian Word	English Translation
'uke'uke	Armored sea urchin.
'ulu maika	Ball for bowling game.
wā	epoch, time period.
wana	Spiny urchins.
wauke	Paper mulberry.
wahine	Woman.
wahi pana	Storied place (common). Legendary place.
wuwoa	A kind of mullet.

Appendix B Common and Scientific Names for Plants and Animals Mentioned by Community Participants

Common Names		Possible Scientific Names		Source
Hawaiian	Other	Genus	Species	
āholehole	juvenile *āhole* (Hawaiian flagtail)	*Kuhlia*	*xenura*	Hoover 2003
akule	big-eyed scad	*Selar*	*crumenophthalmus*	Hoover 2003
'alae 'ula	Hawaiian common moorhen	*Gallinula*	*chloropus*	Pukui and Elbert 1986
'awa	kava	*Piper*	*methysticum*	Wagner et al. 1999
'āweoweo	bigeye	*Heteropriacanthus*	*cruentatus*	Hoover 2003
hala	pandanus	*Pandanus*	spp.*	Wagner et al. 1999
haole koa	(none)	*Leucaena*	spp.*	Wagner et al. 1999
hāpu'u	Hawaiian black grouper	*Epinephelus*	*quernus*	Randall 1996
kala	surgeon fish	*Naso*	spp.*	Randall 1996
kiawe	Algaroba tree	*Prosopis*	*pallida*	Wagner et al. 1999
koa	(none)	*Acaia*	*koa*	Wagner et al. 1999

kūmū	goatfish	*Parupeneus*	*porphyreus*	Hoover 1993
limu 'ele'ele	seaweed, algae	*Entermorpha*	*prolifera*	Abbott and Williamson 1974
limu kohu	seaweed, algae	*Asparagopsis*	*taxiformis*	Abbott and Williamson 1974
limu wāwae'iole **	seaweed, algae	*Codium*	*edule*	Titcomb 1972
manini	convict tang	*Acanthurus*	*triostegus*	Hoover 2003
nenue	chub fish	*Kyphosus*	spp.*	Hoover 2003
'oama	goatfish under 7 inches long	*Mulloidichthys*	spp.*	Hoover 1993
ogo (Japanese)	seaweed	*Gracil*	*parvispora*	Guiry and Guiry 2010
'opihi	limpet	*Cellana*	spp.*	Pukui and Elbert 1986
pipi (or *pipipi*)	pearl oysters	*Pinctada*	*radiata* and other spp. from family Pteriidae	Pukui and Elbert 1986
tī (or *kī*)	(none)	*Cordyline*	*fruticosa*	Wagner et al. 1999
'uala	sweet potato	*Ipomoea*	*batatas*	Wagner et al. 1999
'uke'uke (or *hā'uke'uke*)	armored sea urchin	*Colobocentrotus*	*atratus*	Pukui and Elbert 1986
wana	spiny sea urchin	*Echinothrix*	*diadema*	Pukui and Elbert 1986

*spp. = multiple species

** Corrected Hawaiian spelling by Pukui and Elbert 1986

Appendix C Authorization and Release Form

Cultural Surveys Hawai'i, Inc.
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AUTHORIZATION AND RELEASE FORM

Cultural Surveys Hawai'i appreciates the generosity of the *kūpuna* and *kama'āina* who are sharing their knowledge of cultural and historic properties, and experiences of past and present cultural practices for the Cultural Impact Assessment for the *ahupua'a* of Kamananui.

We understand our responsibility in respecting the wishes and concerns of the interviewees participating in our study. Here are the procedures we promise to follow:

1. You will have the opportunity to review the written transcript of our interview with you. At that time you may make any additions, deletions or corrections you wish.
2. You will be given a copy of the interview notes for your records.
3. You will be given a copy of this release form for your records.

For your protection, we need your written confirmation that:

1. You consent to the use of the complete transcript and/or interview quotes for reports on cultural sites and practices, historic documentation, and/or academic purposes.
2. You agree that the interview shall be made available to the public.

I, _____, agree to the procedures outlined above and, by my
(Please print your name here)
signature, give my consent and release for this interview to be used as specified.

_____
(Signature)

_____
(Date)

Appendix D Community Consultation Letter

Cultural Surveys Hawai'i, Inc.
Archaeological and Cultural Impact Studies
Hallett H. Hammatt, Ph.D., President

P.O. Box 1114 Kailua, Hawai'i 96734 Ph: (808) 262-9972 Fax: (808) 262-4950

Job code: KAWAILOA 8 jgenz@culturalsurveys.com www.culturalsurveys.com

February 10, 2011

Aloha e Kāua,

At the request of CH2M HILL, Cultural Surveys Hawai'i, Inc. is conducting a Cultural Impact Assessment (CIA) for the proposed Kawailoa Wind Farm Project, Multiple Ahupua'a, Waialua District, O'ahu Island and includes the following parcels:

- Wind Farm Site: TMK [1] 6-1-005:001; 6-1-006:001; 6-1-007:001; 6-2-009:001; 6-2-011:001
- Traversed by Existing Onsite Access Roads: TMK [1] 6-1-005:003, 007, 014, 015, 016, 019; 6-1-005:020, 021, 022; 6-1-008:025; 6-2-002:001, 002, 003, 025
- Mount Ka'ala Communication Sites: TMK [1] 6-7-003:024

This CIA focuses on the Project area (see aerial images and USGS maps) as well as the entire *ahupua'a* of Kamananui, Kawailoa, Lauhulu, Kuikuiloloa, Punaue, and Kāpaeloa.

Kawailoa Wind, LLC (Kawailoa Wind) was formed by First Wind, LLC (First Wind), a Boston-based wind energy company, for the express purpose of developing a wind power facility at the former Kawailoa Plantation on the North Shore of O'ahu in order to supply clean, renewable energy for the State of Hawai'i. First Wind is currently operating Kaheawa Wind Power I on Maui (Hawai'i's largest wind farm) and has begun construction of Kaheawa Wind Power II. First Wind's Kahuku Wind Power on O'ahu was recently constructed and is in the process of being commissioned for connection into the electrical grid of Hawaiian Electric Company (HECO).

Kawailoa Wind is proposing to construct, operate, and maintain a wind farm with a generating capacity of up to 70 megawatts on Kamehameha Schools (KS) property located on the North Shore of O'ahu. The proposed wind farm facilities would be located on KS land at the former Kawailoa Plantation (Kawailoa, Lauhulu, Kuikuiloloa, Punaue, and Kāpaeloa Ahupua'a). Lands owned by other entities are included as existing onsite access roads traverse these properties. KS currently has reciprocal agreements with these landowners for access through their properties; it is anticipated that these rights would be extended to Kawailoa Wind for construction and operation of the project. Microwave communication facilities for the Project will be installed at existing communication sites on State-owned land, leased to Hawaiian Telcom, on Mount Ka'ala (Kamananui Ahupua'a).

1

Specific Project components would include 30 wind turbine generators (turbines), underground and overhead electrical collector lines to carry the electrical power from each wind turbine generator to an electrical substation, a battery energy storage system, electrical switching station facilities and sub-transmission lines, an operations and maintenance building, HECO control buildings, a communication tower with microwave dishes, meteorological monitoring equipment, and onsite roads to facilitate access to each of these facilities. The Project would also include installation of additional communication equipment on Mount Ka'ala in order to provide a dedicated communication link between the wind farm and existing HECO substations in Waialua and Wahiawā.

The purpose of this CIA is to evaluate potential impacts to cultural practices and resources as a result of the proposed development in Kamanamū Ahupua'a (the microwave communications facilities) and Kawailoa, Lauhulu, Kuikuiloloa, Punaue, and Kāpaeloa Ahupua'a (the wind power facility). We are seeking your *kōkua* and guidance regarding the following aspects of our study:

- **General history and present and past land use of the Project area.**
- **Knowledge of cultural sites which may be impacted by future development of the Project area - for example, historic sites, archaeological sites, and burials.**
- **Knowledge of traditional gathering practices in the Project area both past and ongoing.**
- **Cultural associations of the Project area, such as *mo'olelo* and traditional uses.**
- **Referrals of *kūpuna* and *kama'āina* who might be willing to share their cultural knowledge of the Project area and the surrounding *ahupua'a* lands.**
- **Any other cultural concerns the community might have related to Hawaiian cultural practices within or in the vicinity of the Project area.**

I invite you to contact me, Joe Genz, at 262-9972 or send me an email at jgenz@culturalsurveys.com if you have any information you would like to share.

Mahalo nui,

Joe Genz, Ph.D.
Cultural Specialist

2

DAVID Y. IGE
GOVERNOR OF HAWAII

CARTY S. CHANG
ACTING CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

FIRST DEPUTY

WILLIAM M. TAM
INTERIM DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 22, 2015

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Oahu District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Application for a Special Use Permit, Solar Energy Facility, Kawailoa, North Shore, Oahu
LOCATION: Kawailoa, North Shore, Oahu; Tax Map Key: 6-1-005: Portion of 001 and 6-1-006: Portion of 001
APPLICANT: Kawailoa Solar, LLC by its consultant CH2M Hill

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document which can be found here:

1. Go to: https://sp01.ld.dlnr.hawaii.gov/LD
2. Login: Username: LD\Visitor Password: 0pa$$word0 (first and last characters are zeros)
3. Click on: Requests for Comments. Click on the subject file "Application for a Special Use Permit, Solar Energy Facility, Kawailoa, North Shore, Oahu", then click on "Files" and "Download a copy". (Any issues accessing the document should be directed to Jonathan Real, Applications/Systems Analyst at 587-0427 or Jonathan.C.Real@hawaii.gov)

Please submit any comments by February 12, 2015. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

( ) We have no objections.
(✓) We have no comments.
( ) Comments are attached.

Signed: T Chee
Print Name: Trinh Chee
Date: 1/27/2015

EXHIBIT 15A

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY AND COUNTY OF HONOLULU
1000 ULUOHIA STREET, SUITE 308, KAPOLEI, HAWAII 96707
TELEPHONE: (808) 768-3486 • FAX: (808) 768-3487 • WEBSITE: http://envhonolulu.org

KIRK CALDWELL
MAYOR

LORI M.K. KAHIKINA, P.E.
DIRECTOR

TIMOTHY A. HOUGHTON
DEPUTY DIRECTOR

ROSS S. TANIMOTO, P.E.
DEPUTY DIRECTOR

IN REPLY REFER TO
PRO 15-010

January 30, 2015

MEMORANDUM

TO: George I. Atta, FAICP, LEED AP, CEI, Director
Department of Planning and Permitting

FROM: Ross S. Tanimoto
Lori M.K. Kahikina, P.E., Director

SUBJECT: Application for a Special Use Permit
Solar Energy Facility, Kawailoa, North Shore, Oahu
Tax Map Key: 6-1-005: Portion of 001 and 6-1-006: Portion of 001

We have reviewed the subject document as transmitted to us by your memo dated January 16, 2015, reference number 2014/SUP-6 (RY). Based on our review, we do not foresee any significant impacts to our facilities or services from this project.

Should you have any questions, please call Marisol Olaes, Civil Engineer at 768-3467.

EXHIBIT 15B

File No.: 2014/SUP-6

DEPARTMENT OF PLANNING AND PERMITTING
SUMMARY DESCRIPTION

APPLICANT	:	Kawailoa Solar, LLC
LANDOWNER	:	B. P. Bishop Trust Estate
REQUEST	:	A Special Use Permit to establish a solar energy facility on lands classified by the Land Study Bureau as Class A, B, and C, pursuant to Sections 205-2 and 205-4.5, Hawaii Revised Statutes
LOCATION	:	In the vicinity of Ashley Road, approximately 6,000 feet south of Waimea Beach Park and 4 miles northeast of Haleiwa Town, at Kawailoa, North Shore, Oahu, Hawaii
TAX MAP KEY	:	6-1-005: Portion of 1 and 6-1-006: Portion of 1
LAND AREA	:	Approximately 384.1 Acres
NORTH SHORE SUSTAINABLE COMMUNITIES PLAN LAND USE MAP	:	Agriculture
STATE LAND USE DISTRICT	:	Agricultural
EXISTING USE	:	Open space
SURROUNDING LAND USE	:	Wind turbine renewable energy generation system, open space, diversified agriculture, military training and preservation lands

RECEIVED
'15 FEB -3 A8:40
DEPT OF PLANNING AND PERMITTING
CITY & COUNTY OF HONOLULU

DEPARTMENT:

Honolulu Police Department

COMMENTS:

Thank you for the opportunity to review and comment on the subject application.

This project should have no significant impact on the services or operations of the Honolulu Police Department.

If there are any questions, please call Major Kerry Inouye of District 2 (Wahiawa) at 723-8703.

2-2-15
By Date
MARK TSUYEMURA, Management Analyst
Office of the Chief

EXHIBIT 16C

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 3RD FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8305 • Fax: (808) 768-4730 • Internet: www.honolulu.gov

KIRK CALDWELL
MAYOR

MICHAEL D. FORMBY
DIRECTOR

MARK N. GARRITY, AICP
DEPUTY DIRECTOR

TP1/15-595784R

February 13, 2015

MEMORANDUM

TO: George I. Atta, FAICP, Director
Department of Planning and Permitting

FROM: Michael D. Formby, Director
Department of Transportation Services (DTS)

SUBJECT: Application for a Special Use Permit, Solar Energy Facility, Kawailoa, North Shore, Oahu, Project Number 2014/SUP-6, TMK: 6-1-005: Portion of 001 and 6-1-006: Portion of 001

This responds to your correspondence of January 16, 2015, regarding the subject project. Based on our review, we have no comments to offer at this time. However, the DTS recommends that prior to the start of the project, the affected Neighborhood Board, residents, and businesses should be regularly apprised of the status of the project and implementation actions.

Thank you for the opportunity to review this matter. Should you have any further questions on the matter, you may contact Virginia Sosh of my staff at 768-5461.

EXHIBIT 15 D

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843

February 25, 2015

TO: GEORGE I. ATTA, FAICP, DIRECTOR
DEPARTMENT OF PLANNING AND PERMITTING

FROM: ERNEST Y. W. LAU, P.E. MANAGER AND CHIEF ENGINEER

SUBJECT: YOUR MEMORANDUM DATED JANUARY 16, 2015 REQUESTING COMMENTS ON THE APPLICATION FOR A SPECIAL USE PERMIT FOR THE SOLAR ENERGY FACILITY, 2014/SUP-6 (RY)
TAX MAP KEY: 6-1-005: 001; 6-1-006: 001

Water service cannot be made available to the proposed solar energy facility. The development is located above the service limit of our North Shore 225' water system.

We understand that the proposed project will not require water service from the Board of Water Supply.

If you have any questions, please contact Robert Chun, Project Review Branch of our Water Resources Division at 748-5443.

EXHIBIT 15E

HONOLULU FIRE DEPARTMENT

CITY AND COUNTY OF HONOLULU

636 South Street
Honolulu, Hawaii 96813-5007
Phone: 808-723-7139 Fax: 808-723-7111 Internet: www.honolulu.gov/hfd

KIRK CALDWELL
MAYOR

MANUEL P. NEVES
FIRE CHIEF

LIONEL CAMARA JR.
DEPUTY FIRE CHIEF

February 3, 2015

TO: GEORGE ATTA, FAICP, DIRECTOR
DEPARTMENT OF PLANNING AND PERMITTING

FROM: SOCRATES D. BRATAKOS, ASSISTANT CHIEF

SUBJECT: SPECIAL USE PERMIT APPLICATION NO. 2014/SUP-6
SOLAR ENERGY FACILITY
KAWAILOA, NORTH SHORE, OAHU
TAX MAP KEYS: 6-1-005: PORTION OF 001
6-1-006: PORTION OF 001

In response to your memorandum dated January 16, 2015, regarding the above-mentioned subject, the Honolulu Fire Department requires that the provisions of the Fire Code of the City and County of Honolulu be complied with in respect to photovoltaic systems and fire department access and water supply requirements.

Should you have questions, please contact Battalion Chief Terry Seelig of our Fire Prevention Bureau at 723-7151 or tseelig@honolulu.gov.

Socrates D. Bratakos

SOCRATES D. BRATAKOS
Assistant Chief

SDB/SY:bh

EXHIBIT 15F

DAVID Y. IGE
GOVERNOR OF HAWAII

CARTY S. CHANG
INTERIM CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DANIEL S. QUINN
INTERIM FIRST DEPUTY

W. ROY HARDY
ACTING DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

Date: February 3, 2015
DAR # 5065

MEMORANDUM

TO: Carty S. Chang, Interim Chairperson 2/6/15
DATE: _____

FROM: Paul Murakawa, Aquatic Biologist Paul M mac 2/5/15
SUBJECT: Application for a Special Use Permit, Solar Energy Facility, Kawailoa, North Shore, Oahu: TMK 6-1-005:Portion of 001 and 6-1-006:Portion of 001

Comment	Date Request	Receipt	Referral	Due Date
	1/22/15	1/23/15	1/28/15	2/12/15

Requested by: Russell Y. Tsuji, Land Division Administrator

Summary of Proposed Project

Title: Application for a Special Use Permit, Solar Energy Facility, Kawailoa, North Shore, Oahu

Project by: Kawailoa Solar, LLC.

Location: In the vicinity of Ashley Road, Kawailoa, North Shore, Oahu: TMK 6-1-005: Portion of 001 and 6-1-006: Portion of 001

Brief Description:

The applicant is seeking a Special Use Permit to create a solar energy facility on 384 acres of land owned by the B.P. Bishop Trust Estate in Kawailoa, Oahu. This project has two components, solar panels and sheep grazing.

Comments:

The Division of Aquatic Resources (DAR) reviewed the application and has the following comments. In the application, it states:

"*Storm water runoff would be appropriately addressed through design features that incorporate best management practices (BMPs) to minimize the quantity and water quality*

EXHIBIT 15G

impacts of the runoff. Areas that are temporarily disturbed during construction would be vegetated using grass species suitable for soil stabilization and erosion control, as well as for grazing stock."

#1 The BMPs were not included with the application. DAR requests that the BMPs be included in the application so that DAR has the opportunity to review the BMPs prior to the start of the project.

#2 This project also includes a sheep grazing component where sheep are able to graze between and under the solar panels. There is no mention of the BMPs that the applicant proposes to implement to mitigate for the negative impacts as a result of the sheep grazing. Additionally, there is no mention of BMPs proposed to mitigate for soil exposure, erosion and resulting soil runoff from reaching the river in the valley below. DAR recommends that BMPs be developed for the grazing portion of the project and requests the opportunity to review these BMPs.

Thank you for providing DAR the opportunity to review and comment on the proposed project. Should there be any changes to the project plans; DAR requests the opportunity to review and comment on those changes.

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Russell Y. Tsuji
REF: Special Use Permit Application for Solar Energy Facility, Kawailoa, North Shore Oahu.005

COMMENTS

(X) **We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone D, an area where flood hazards are undetermined.**

( ) Please take note that the project site according to the Flood Insurance Rate Map (FIRM), is located in Zone ___.

( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ___.

( ) Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

- ( ) Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting.
- ( ) Mr. Frank DeMarco at (808) 961-8042 of the County of Hawaii, Department of Public Works.
- ( ) Mr. Carolyn Cortez at (808) 270-7253 of the County of Maui, Department of Planning.
- ( ) Mr. Stanford Iwamoto at (808) 241-4896 of the County of Kauai, Department of Public Works.

( ) The applicant should include project water demands and infrastructure required to meet water demands. Please note that the implementation of any State-sponsored projects requiring water service from the Honolulu Board of Water Supply system must first obtain water allocation credits from the Engineering Division before it can receive a building permit and/or water meter.

( ) The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.

( ) Additional Comments: _____

_____

( ) Other: _____

_____

Should you have any questions, please call Mr. Dennis Imada of the Planning Branch at 587-0257.

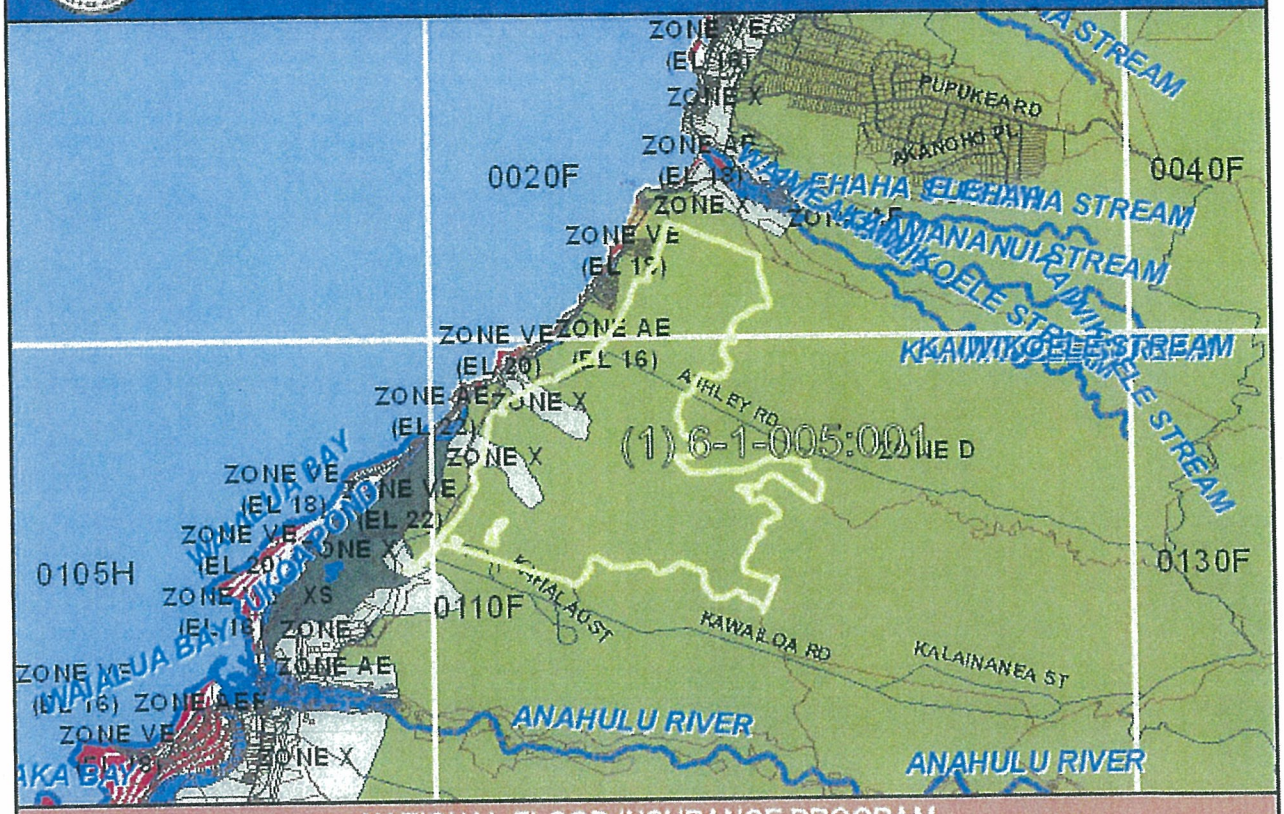
Signed: _____
CARTY S. CHANG, CHIEF ENGINEER

Date: 2/9/15

EXHIBIT 15 H

State of Hawaii

FLOOD HAZARD ASSESSMENT REPORT



NATIONAL FLOOD INSURANCE PROGRAM

FLOOD ZONE DEFINITIONS

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD – The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard 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 requirements apply, but coverage is available in participating communities.

PROPERTY INFORMATION

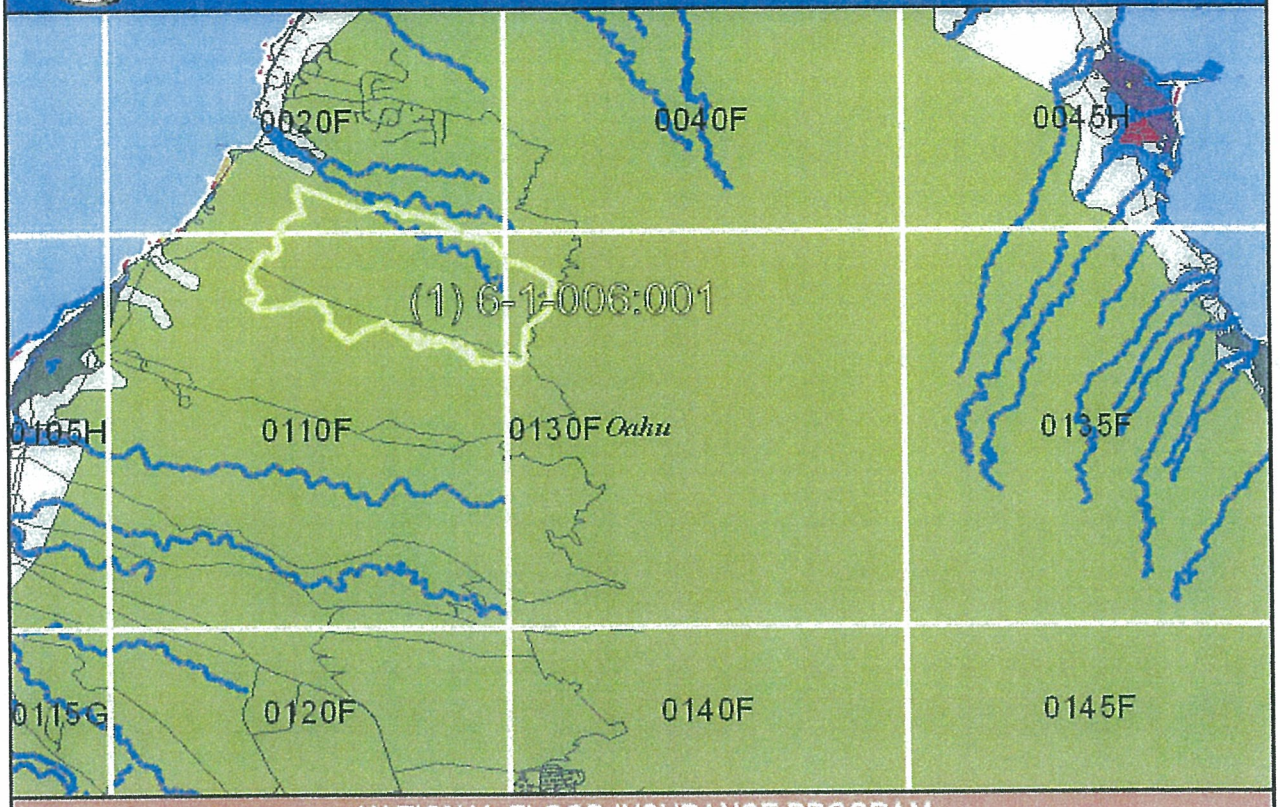
COUNTY:	HONOLULU
TMK NO:	(1) 6-1-005-001
PARCEL ADDRESS:	62-350 KAWAILOA DR WAHIAWA, HI 96786
FIRM INDEX DATE:	NOVEMBER 05, 2014
LETTER OF MAP CHANGE(S):	NONE
FEMA FIRM PANEL(S):	15003C0105H-JANUARY 19, 2011 15003C0110F-SEPTEMBER 30, 2004 15003C0020F-SEPTEMBER 30, 2004
PARCEL DATA FROM:	APRIL 2014
IMAGERY DATA FROM:	MAY 2006

IMPORTANT PHONE NUMBERS

County NFIP Coordinator	
City and County of Honolulu	
Mario Siu-Li, CFM	(808) 768-8098
State NFIP Coordinator	
Carol Tyau-Beam, P.E., CFM	(808) 587-0267

State of Hawaii

FLOOD HAZARD ASSESSMENT REPORT



NATIONAL FLOOD INSURANCE PROGRAM

FLOOD ZONE DEFINITIONS

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD – The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard 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 requirements apply, but coverage is available in participating communities.

PROPERTY INFORMATION

COUNTY:	HONOLULU
TMK NO:	(1) 6-1-006-001
PARCEL ADDRESS:	
FIRM INDEX DATE:	NOVEMBER 05, 2014
LETTER OF MAP CHANGE(S):	NONE
FEMA FIRM PANEL(S):	15003C0110F-SEPTEMBER 30, 2004 15003C0020F-SEPTEMBER 30, 2004 15003C0130F - PANEL NOT PRINTED
PARCEL DATA FROM:	APRIL 2014
IMAGERY DATA FROM:	MAY 2006

IMPORTANT PHONE NUMBERS

County NFIP Coordinator	
City and County of Honolulu	
Mario Siu-Li, CFM	(808) 768-8098
State NFIP Coordinator	
Carol Tyau-Beam, P.E., CFM	(808) 587-0267

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

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

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:
EPO 15-011

February 10, 2015

Mr. George I. Atta, FAICP
Director, Department of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813
Via email only to: rcsyoung@honolulu.gov

Dear Mr. Atta:

SUBJECT: Application for a Special Use Permit
Solar Energy Facility, Kawailoa, North Shore, Oahu
TMK: 6-1-005: Portion of 001 and 6-1-006: Portion of 001

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your letter to our office on January 16, 2015. Thank you for allowing us to review and comment on the proposed project. EPO recommends that you review the standard comments and available strategies to support sustainable and healthy design provided at: http://health.hawaii.gov/epo/home/landuse-planning-review-program/. Projects are required to adhere to all applicable standard comments.

We encourage you and project applicants to examine and utilize the Hawaii Environmental Health Portal. The portal provides links to our e-Permitting Portal, Environmental Health Warehouse, Groundwater Contamination Viewer, Hawaii Emergency Response Exchange, Hawaii State and Local Emission Inventory System, Water Pollution Control Viewer, Water Quality Data, Warnings, Advisories and Postings. The Portal is continually updated. Please visit it regularly at: https://eha-cloud.doh.hawaii.gov

You may also wish to review the revised Water Quality Standards Maps that have been updated for all islands. The Water Quality Standards Maps can be found at:
http://health.hawaii.gov/cwb/site-map/clean-water-branch-home-page/water-quality-standards/.

We request that you utilize all of this information on your proposed project to increase sustainable, innovative, inspirational, transparent and healthy design.

Mahalo nui loa,

Laura Leialoha Phillips McIntyre, AICP
Program Manager, Environmental Planning Office

EXHIBIT 15 I

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawai'i 96850

In Reply Refer To:
2015-TA-0154

Mr. George I. Atta
FAICP, Director
Department of Planning and Permitting
City and County of Hawai'i
650 South King Street, 7th Floor
Honolulu, Hawai'i 96813

FEB 17 2015

Subject: Technical Assistance for the Special Use Permit for the Kawailoa Solar Farm Project, O'ahu

Dear Mr. Atta:

The U.S. Fish and Wildlife Service received your letter on January 22, 2015, requesting our comments on the Application for a Special Use Permit for First Wind's (d.b.a. Kawailoa Solar, LLC) proposed development of the Kawailoa Solar Farm Project, a 55 megawatt (MW) solar energy facility on approximately 384.1 acres[2] on the north shore of O'ahu [TMK: (1) 6-1-005:001 (por.) and 6-1-006:001 (por.)]. The proposed solar farm would be co-located with the existing Kawailoa wind farm. By interconnecting to the same electrical switchyards and transmission lines as the existing wind farm, the proposed solar project builds on work that was done to support the wind farm and enables connection to Hawaiian Electric Company, Inc.'s electrical grid without the need for new interconnection infrastructure.

The solar farm would be comprised of a horizontal single-axis tracking, ground-mounted photovoltaic system, designed to maximize the use of the terrain, with the panels facing approximately due south. Each panel would generate power at 1,000 volts and on average, are expected to extend approximately 4 feet 6 inches to 9 feet 6 inches off the ground. Electrical equipment including combiner boxes, collector lines, inverters, weather monitoring stations, and switch gear would be installed in the vicinity of the panels, as needed to increase the electrical voltage and aggregate the generated electricity for transmittal via the collector system. The proposed Kawailoa Solar Farm would produce clean, low-cost renewable energy for the island of O'ahu.

The area was historically part of a large sugar plantation, and is comprised of agricultural fields located atop a series of tablelands interspersed with gulches formed by intermittent drainages. First Wind intends to lease the proposed site for sheep ranching. Except for the transformers,

EXHIBIT 165

most of the fenced area would be available to support 100-200 head of sheep on a year-round basis.

We have reviewed the information you provided and pertinent information in our files, including data compiled by the Hawai'i Biodiversity and Mapping Program as it pertains to listed species and designated critical habitat in accordance with section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*). Our data indicate that the endangered Hawaiian stilt (*Himantopus mexicanus knudseni*), Hawaiian gallinule (*Gallinula chloropus sandvicensis*), Hawaiian coot (*Fulica alai*), Hawaiian duck (*Anas wyvilliana*) (collectively referred to as Hawaiian waterbirds), endangered Hawaiian goose (*Branta sandvicensis*), threatened Newell's shearwater (*Puffinus auricularis newelii*), and federally endangered Hawaiian petrel (*Pterodroma sandwichensis*) could transit the area and be impacted by components of your project. The federally endangered Hawaii hoary bat (*Lasiurus cinereus semotus*) may forage and roost in the project area. There is no proposed or designated critical habitat located in the vicinity of the proposed project area. We offer the following comments to assist the Planning Commission and First Wind.

The Hawaiian hoary bat roosts in both exotic and native woody vegetation and, while foraging, will leave young unattended in "nursery" trees and shrubs when they forage. If trees or shrubs suitable for bat roosting are cleared during the breeding season, there is a risk that young bats could inadvertently be harmed or killed. To minimize impacts to the endangered Hawaiian hoary bat, woody plants greater than 15 feet (4.6 meters) tall should not be disturbed, removed, or trimmed during the bat birthing and pup rearing season (June 1 through September 15). Site clearing should be timed to avoid disturbance to Hawaiian hoary bats in the project area. Additionally, Hawaiian hoary bats have been snagged on barbed wire fencing while flying. We recommend that the solar facility fence design be designed to avoid the use of barbed wire.

Please note that some photovoltaic systems on the continental United States are resulting in impacts to migratory waterfowl and shorebirds. This source of mortality has been described previously (McCrary et. al. 1986), and recent impacts are being observed at solar facilities in California, including the Desert Sunlight Solar Farm and Genesis Solar Energy Project. Birds have been inadvertently attracted to these sites due to solar panels' resemblance to water and their proximity to important migratory flyways (Donnelly-Shores 2013 and Clarke 2013). Once attracted, collisions with the solar arrays have resulted in injuries and mortalities; once grounded, birds are also subject to predation (Kagan et. al. 2014). While attraction to solar arrays has not yet been documented in Hawai'i, the State harbors a significant diversity of waterbird and shorebird species. We recommend that personnel at the solar site be educated about the potential for birds to be attracted and inadvertently harmed. If monitoring indicates that species are occurring at the photovoltaic system, or additional information about the facility's impacts to native Hawaiian species becomes available, please contact us so we may assist you in avoiding and minimizing impacts.

We hope this information assists the Planning Commission with their approval process. We appreciate your efforts to conserve listed species. If you have questions about our comments,

please contact Jiny Kim, Island Team Biologist; O'ahu, Kaua'i, North Western Hawaiian Islands, and American Samoa Geographic Team (phone: 808-792-9400, fax: 808-792-9581).

Sincerely,

Aaron Nadig
Island Team Manager
O'ahu, Kaua'i, North Western Hawaiian Islands,
and American Samoa

OFFICE OF PLANNING
STATE OF HAWAII

DAVID Y. IGE
GOVERNOR

LEO R. ASUNCION
ACTING DIRECTOR
OFFICE OF PLANNING

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: http://planning.hawaii.gov/

Ref. No. P-14652

February 17, 2015

Mr. George I. Atta, Director
Department of Planning and Permitting
City and County of Honolulu
650 S. King Street, 7th Floor
Honolulu, Hawaii 96813

RECEIVED
'15 FEB 19 P2:04

Dear Mr. Atta:

Subject: Kawailoa Solar Farm
Project No.: 2014/SUP-6
Tax Map Keys: 6-1-006:001 and 6-1-005:001
Location: Kawailoa, Oahu, Hawaii

Thank you for the opportunity to review the subject application for a Special Use Permit to establish a 50-megawatt (MW) solar photovoltaic (PV) system in Kawailoa, Oahu. The proposed project would consist of solar panels and appurtenant facilities on approximately 384.1 acres of land located within the State Agricultural District and in the City and County of Honolulu AG-1 Restricted Agriculture zone. The PV system would be comprised of a horizontal single-axis tracking, ground-mounted PV system and would connect to existing Hawaiian Electric Company, Inc. (HECO) switchyards. In combination with the solar energy facility, the Applicant intends to lease the project area for the pasturage of sheep. The project would be located on approximately 332.3 acres (87%) of Class B land and 37.9 acres (10%) of Class C land, as rated by the Land Study Bureau (LSB) productivity rating system. Under the Agricultural Lands of Importance to the State of Hawaii (ALISH) system, the soils on the property are classified as Prime. The project area also includes approximately 1.9 acres (0.5%) of existing roadway on Class A land, and would involve installation of approximately 550 linear feet of underground electrical line beneath the roadway.

The Office of Planning (OP) notes the landowner of the subject property, Kamehameha Schools, has petitioned the Land Use Commission (LUC) to designate the subject project area, as well as 8,787 acres of the adjacent land in Kawailoa, as Important Agricultural Land (IAL). The LUC is expected to decide on the petition at a hearing on February 18, 2015. OP further notes that neither the subject application for the solar energy facility nor the petition to designate IAL state whether the power generated by the solar farm will be used for on-site agricultural activities. Instead, the application for the solar energy facility states that "the proposed project involves installation of a...solar energy facility to provide...renewable power to HECO for

EXHIBIT 15K

integration into their electrical distribution system for delivery to customers on the island of Oahu" (p. 4).

The guidelines for Special Permits are contained within Hawaii Administrative Rules (HAR) § 15-15-95 which allow certain "unusual and reasonable" uses within Agricultural and Rural Districts other than those for which the district is classified. HAR § 15-15-95 lists six (6) guidelines for determining whether a proposed use is "unusual and reasonable." The following assesses the proposed project relative to the Special Permit guidelines:

1. **The use shall not be contrary to the objectives sought to be accomplished by Chapters 205 and 205A, HRS, and the rules of the Commission.**

   Hawaii Revised Statutes (HRS) Chapter 205 seeks to protect agricultural lands and ensure their continued availability for agricultural use. It provides that the Agricultural District shall include lands with a high capacity for agricultural production, grazing, or other agricultural uses. Chapter 205 also recognizes, however, that some lands in the Agricultural District may not be suitable for the uses permitted in the Agricultural District and, therefore, other uses may be allowed with a Special Permit.

   Pursuant to HRS §§ 205-2 and 205-4.5, as amended by Act 55 and Act 52, solar energy facilities may be permitted on land with Class B or C soils. More specifically, HRS §§ 205-2 and 205-4.5 state the following:

   - HRS § 205-2(6)(A) and (B): Solar energy facilities may be permitted on land with soil classified by the LSB as overall (master) productivity rating class B, C, D, or E. Solar energy facilities placed within land rated Class B or C, however, shall not occupy more than ten percent of the acreage of the parcel, or 20 acres of land, whichever is lesser, unless a special use permit is granted.

     Under this statute, the proposed project requires a Special Permit as it would occupy approximately 332.2 acres (greater than 20 acres) of Class B soils and 37.9 acres of Class C soils.

   - HRS § 205-4.5(a)(3): Within the Agricultural District, the raising of livestock, including poultry, bees, fish, or other animal or aquatic life that are propagated for economic or personal use are permitted.

     Under this statute, the proposed pasturage of sheep, in combination with the solar energy facility, is an allowable use.

- HRS § 205-4.5(a)(2l)(A),(B) and (C): Solar energy facilities on land rated Class B or C for which a special use permit is granted are permitted provided that:

  (A) The area occupied by the solar energy facilities is also made available for compatible agricultural activities at a lease rate that is at least fifty per cent below the fair market rent for comparable properties;
  (B) Proof of financial security to decommission the facility is provided to the satisfaction of the appropriate county planning commission prior to date of commencement of commercial generation; and
  (C) Solar energy facilities shall be decommissioned at the owner's expense and according to certain requirements.

  The Applicant represents that each of the above criteria would be met upon approval of the Special Permit or prior to beginning commercial operation.

Regarding the objectives of HRS Chapter 205A, the application sufficiently addresses the project's compliance with applicable Coastal Zone Management (CZM) program objectives and policies and it appears that the proposed use is not contrary to the objectives of the program.

Additionally, an archaeological inventory survey (AIS) has been provided. The results of the survey indicate that there are two historic sites that could potentially be affected by the project. The application states that a draft report has been submitted to the State Historic Preservation Division (SHPD) for their review and concurrence. It further states that **no ground-altering activities will occur prior to obtaining approval of the AIS from SHPD**.

2. **The desired use would not adversely affect surrounding property.**

According to the application, the proposed project is not anticipated to directly or indirectly affect adjacent uses. With the exception of the existing Kawailoa wind farm, the areas immediately surrounding the project site are undeveloped, but they support a variety of uses, including agriculture, conservation, and military operations. The existing 69-megawatt (MW) Kawailoa wind farm consists of 30 2.3 MW wind turbines, some of which are located within the vicinity of the proposed solar farm. (Refer to Applicant's Figure 4).

Construction of the solar facilities would result in short-term impacts that are temporary, intermittent, and localized. Long-term impacts related to operations and maintenance, including glare, noise, ambient temperature, and electric and magnetic fields would be minimal.

As noted above, the landowner of the subject property has petitioned the LUC to designate the subject project area, as well as 8,787 acres of the surrounding property, as IAL. Pursuant to HRS § 205-42, in order to achieve the objectives for the identification of important agricultural lands, the State shall:

(1) Promote agricultural development and land use planning that delineates blocks of productive agricultural land and areas of agricultural activity for protection from the encroachment of nonagricultural uses; and
(2) Establish incentives that promote:
    (A) Agricultural viability;
    (B) Sustained growth of the agriculture industry; and
    (C) The long-term agricultural use and protection of these productive agricultural lands.

OP finds that the existing wind turbines and the proposed solar energy facility, alone, do not further the State's objective for the identification of IAL because they are non-agricultural activities that do not promote agricultural development, nor do they promote the incentives listed above. OP notes the project area would also be leased for the pasturage of sheep, which OP does recognize as a viable agricultural activity if implemented appropriately.

3. **The use would not unreasonably burden public agencies to provide streets, sewers, water, drainage, schools, fire, and police resources.**

According to the application, the proposed project would not require infrastructure support from public agencies due to the following:

- Access to the site is provided by a private agricultural road (Ashley Road), which extends from Kamehameha Highway through the project area, and is maintained as part of the existing wind farm. There is no public access to the site.
- No permanent wastewater facilities would be required.
- Small amounts of water would be required for occasional cleaning of the solar panels and to support co-located ranching operations. Water would be available either from rainwater catchment equipment, onsite irrigation ponds, or transported in via truck. No hook-up to the municipal water system is planned.
- Drainage across the site currently exists in the form of surface runoff based on the natural topography; the proposed project would not significantly alter the existing drainage patterns.
- It would be unlikely to use fire or police protection services.

4. **Unusual conditions, trends, and needs have arisen since the district boundaries and rules were established.**

   OP recognizes the State interest in reducing our islands' dependency on fossil fuels and increasing efficiency measures, with a goal to generate 40 percent clean energy by 2030. OP also recognizes the State interest in conserving the State's agricultural land resource base and assuring the long-term availability of agricultural lands for agricultural use. OP acknowledges the proposed project seeks to balance these interests by providing both renewable energy generation and agricultural production at below-market value rent.

5. **The land upon which the proposed use is sought is unsuited for the uses permitted within the district.**

   The land upon which the proposed use is sought is suited for the uses permitted within the district. As noted above, the project would be located on approximately 332.3 acres (87%) of Class B land, as rated by the LSB productivity rating system. The project area also includes approximately 1.9 acres (0.5%) of existing roadway on Class A land. Under the ALISH system, the soils on the subject property are classified as Prime.

Having reviewed the application and applied the available information to the applicable Special Permit guidelines, OP supports the intent of the proposed project to provide renewable energy for the island of Oahu and offers the following comments:

- Concerns will remain with regard to the statewide challenge in seeking a balance of maintaining the availability of high quality agricultural lands while promoting renewable energy sources such as solar facilities on lands within the Agricultural District.

- OP also has concerns that while "agri-voltaic" projects such as this one are technically feasible, the agricultural aspect of these projects is sometimes not implemented as represented by the applicant, i.e. the number of sheep or other grazing animals co-located within the solar facility is negligible. The proposed project would be located on soils rated ALISH Prime; the proposed solar facility would, therefore, preclude productive agricultural land from being used for agricultural purposes and contributing to the State's goal of assuring the long-term availability of agricultural lands for agricultural use if the pasturage of sheep does not occur.

- Similarly, the subject property is under consideration by the LUC to be designated as IAL. OP notes the project area would be leased for the pasturage of sheep, which OP does recognize as a viable agricultural activity if implemented appropriately. OP also notes the proposed project is expected to have an operational life of approximately 25-30 years, following which the lands may restored to conditions comparable to their existing conditions, such that future agricultural use may occur.

- OP supports the State Department of Agriculture's (DOA) comment from a letter dated January 29, 2015 to the Office of Planning regarding Kamehameha Schools' petition to designate IAL that "the DOA would support the IAL designation for the area proposed for the solar energy facility on the Kawailoa lands if the Petitioner commits to using a substantial portion of the energy generated by the solar energy facility directly for agricultural purposes, and/or commits to using a substantial portion of the income derived from the selling of electricity to the utility for agricultural activities within the petitioned area" (p. 7). (Refer to the attached Exhibit A).

- Should the Special Permit be granted, OP recommends that the requirements of HRS § 205-4.5(a)(21)(A), (B), and (C), relating to: 1) compatible agricultural activities; 2) proof of financial security for decommissioning; and 3) decommissioning requirements, be included as specific conditions of approval.

If you have any questions, please contact Katie Mineo of our Land Use Division at (808) 587-2883.

Sincerely,

Leo R. Asuncion
Acting Director

Attachment

c: Land Use Commission

Exhibit A

DAVID Y. IGE
Governor

SHAN S. TSUTSUI
Lt. Governor

SCOTT E. ENRIGHT
Chairperson, Board of Agriculture

PHYLLIS SHIMABUKURO-GEISER
Deputy to the Chairperson

State of Hawaii
DEPARTMENT OF AGRICULTURE
1428 South King Street
Honolulu, Hawaii 96814-2512
Phone: (808) 973-9600 FAX: (808) 973-9613

January 29, 2015

Mr. Daniel Orodenker
Executive Officer
Land Use Commission
235 South Beretania Street, Suite 406
Honolulu, Hawaii 96813

Dear Mr. Orodenker:

Subject: Docket No. DR14-52
Petition for Declaratory Order to Designate Important Agricultural Lands in Kawailoa and Punaluu, Oahu
Tax Map Keys: Kawailoa (9,171.161 acres): 6-1-05: 1(Por.); 6-1-06: 1(Por.); 6-1-07: 1; 6-2-09: 1(Por.); 6-2-10: 1(Por.); 6-2-11: 1(Por.); 6-2-11: 21. Punaluu (420.887 acres): 5-3-01: 41 (Por.); 5-3-03: 1 (Por.); 5-3-04: 5; 5-3-04: 7; 5-3-04- 13; 5-3-04: 18(Por.); 5-3-04: 19; 5-3-07: 23(Por.)
Total Area: 9,592.048 acres

Thank you for the opportunity to comment on this important petition. The Department of Agriculture (DOA) expresses its appreciation to the petitioner for their interest in and effort to identify potential Important Agricultural Lands (IAL). We note that the petitioner is not seeking a reclassification of land pursuant to Section 205-45(b), Hawaii Revised Statutes (HRS) in conjunction with this petition to designate IAL. The petitioner is also voluntarily waiving all rights to claim any credits due pursuant to Section 205-45(h), HRS (Petition, page 23). This is the third IAL petition involving agricultural lands on the island of Oahu and the ninth IAL petition statewide.

In the following, we provide responses to the petitioner's statements as to how the petitioned area meets the eight criteria for identifying IAL (Section 205-44, HRS).

Island Fresh

Land Currently Used for Agricultural Production

Past agricultural production
According to the Agricultural Land Assessment (ALA) found in Appendix G of the petition, the lands of Kawailoa were used for taro and other various agricultural crops in the 1800's. (ALA, p. 2). Starting in the mid-1800's, sugar cultivation was the primary agricultural crop that was being cultivated by Castle and Cooke and later managed by Waialua Sugar Company. Upon further review by Department staff, sugarcane appears to have been planted throughout Kawailoa with the exception of the middle section where pineapple also appeared to be cultivated.

Punaluu was also used for taro and other various agricultural crops in the 1800's. (ALA, p. 3). Sugar cultivation was the primary agricultural crop in early 1900's to 1970. Upon further review by Department staff, sugarcane appears to have been planted throughout Punaluu. Taro and pineapple were also produced in smaller quantities. (ALA, p. 3).

Current Agricultural Production
According to the petition, only around 11% of the land in Kawailoa is currently in agricultural production. Approximately 722 acres (7.8%) of land is utilized for diversified agriculture and include seed corn, banana, taro, papaya, mango, and hydroponic lettuce. (ALA, p. 4). The location of current diversified agricultural production appears to be on the lower half of Kawailoa (ALA, Figure 1A). Other agricultural uses include approximately 60-80 head of cattle on 297 acres (3%), and 0.7 acres of koa windbreak (Petition, Exhibit H). The livestock use appears to be in the middle of the Kawailoa area abutting Anahulu Valley (ALA, Figure 1A). All current agricultural uses appear to be on lands that are near existing irrigation infrastructure (ALA, Figure 6A). Approximately 30 wind turbines for electrical generation occupy a portion of the property above 600 feet elevation (Petition, Exhibit H).

According to the petition, around 36% of the land in Punaluu is currently in agricultural production (ALA, p. 5). Approximately 120 acres (29%) of land is utilized for diversified agriculture and include banana, papaya, mango, cucumber, mixed vegetable, taro, and cacao. There also exists approximately 22 acres (5%) of livestock, 11 acres (3%) of aquaculture, and several nurseries. Additional research by Department staff determined that the location of the existing agricultural uses indicated in ALA Figure 1B is generally consistent with the location of past sugarcane cultivation on the land.

Future agricultural production
For Kawailoa, diversified agriculture will remain the primary focus. (ALA, p. 4). The mauka unirrigated lands are designated for multiple uses consisting of livestock, orchard, forestry and renewable energy (Petition, p. 9). These planned future uses appear to be in consonance with the Moku O Waialua North Shore Plan (Exhibit C, p. 2).

Petitioner plans to increase renewable energy development by increasing the amount of wind turbines on the land, and is considering a 50MW facility on 500 acres of land which includes sheep grazing. (ALA, p. 4). The DOA notes that according to the Moku O Waialua North Shore Plan, alternative energy development is designated to be located in the eastern region of Kawailoa (Exhibit C, p. 2). Petitioner also plans to increase the availability of lands to farmers and provide long term leases (ALA, p. 4).

For Punaluu, diversified agriculture will remain the primary focus (see ALA, Figure 2B). The petitioner's "Punaluu Ahupuaa Plan" (Petition, Exhibit D) states that 175 acres of agricultural use will be added to what we presume to be the existing 133 acres of diversified agriculture, livestock, and aquaculture. This will bring the total area in agriculture to 308 acres, or 73 percent of the petitioned area. Petitioner also plans renovate the agricultural water system in the area, develop an overall agriculture production and land conservation plan, establish longer term leases with tenants, and construct a central agricultural baseyard facility (ALA, p. 5). These planned future uses appear to be in consonance with the Punaluu Ahupuaa Plan (Petition, Exhibit D).

Land with soil qualities and growing conditions that support agricultural production of food, fiber, or fuel- and energy-producing crops

According to the Land Study Bureau's Detailed Land Classification (LSB) for the Island of Oahu, 3,034.663 acres (33.3%) in Kawailoa is rated "A", 1,632.211 acres (17.8%) is rated "B", 1,134.423 acres (12.4%) is rated "C", 241.536 acres (2.6%) is rated "D", and 3,054.79 acres (33.3%) is rated "E" (see ALA, Figure 3A). Additional research by Department staff indicates that the majority of "C", "D", and "E" rated lands in Kawailoa would not improve in rating if irrigation was available. Soil rockiness and/or unfavorable slope severely limits agricultural use of these lands.

According to the LSB, 39.44 acres (9.4%) in Punaluu is rated "B", 146.313 acres (34.7%) is rated "C", 51.859 acres (12.3%) is rated "D", and 183.257 acres (43.5%) is rated "E" (see ALA, Figure 3B). Additional research by Department staff indicates that the majority of "D" and "E" rated lands in Punaluu would not improve if irrigation was available. The majority of "C" rated lands in Punaluu is already irrigated.

Lands identified under agricultural productivity ratings systems, such as the Agricultural Lands of Importance to the State of Hawaii (ALISH) system adopted by the Board of Agriculture on January 28, 1977

According to the Agricultural Lands of Importance to the State of Hawaii (ALISH) classification system, the Kawailoa site is comprised of 5,852.319 acres (63.8%) in "Prime", 198.572 acres (2.2%) is in "Other Important", and 3,120.27 acres (34%) is not classified according to ALISH (see ALA, Figure 5A). The lands in Kawailoa that are not in ALISH are generally consistent with the lands designated as "E" by the LSB.

For the Punaluu site, 25.243 acres (6%) is in "Prime", 262.547 acres (62.4%) is in "Other Important", and 133.097 (31.6%) is not classified according to ALISH (see ALA, Figure 5B). Some of lands in Punaluu that are not in ALISH are not consistent with the lands designated as "E" by the LSB.

Land types associated with traditional native Hawaiian agricultural uses, such as taro cultivation, or unique agricultural crops and uses, such as coffee, vineyards, aquaculture, and energy production

The Kawailoa and Punaluu areas have been historically associated with traditional native Hawaiian agricultural uses. In Kawailoa, archaeological surveys indicate that traditional native Hawaiian agricultural uses were limited to the lower lands and gulches, while the upper table lands did not exhibit any traditional sites (Petition, p. 14). Historic native Hawaiian uses included taro pond fields, water courses/ditches, and dry planting fields for cultivation of taro, awa, hala, ipu, kukui, koa, banana, sugarcane, sweet potato, and wauke (Petition, p. 14).

In Punaluu, archaeological surveys and cultural impact assessments indicated that traditional native Hawaiian uses were prevalent in (Petition, p. 15). Historic native Hawaiian uses include taro pond fields, water courses/ditches, and dry planting fields for cultivation of taro, awa, hala, ipu, kukui, koa, banana, noni, olona, sweet potato, and wauke (Petition, p. 15). Approximately 11 acres (Petition, Exhibit I) is currently being used to cultivate taro, and approximately 11 acres is in aquaculture (ALA, p. 5).

Lands with sufficient quantities of water to support viable agricultural production

Along with good quality soil, a reliable and sufficient supply of irrigation water is critical for maximal agricultural production. Irrigation water should be available in a quantity that meets the maximum daily demand over a sustained period of time which usually occurs during the summer months. Information on the location and total acreage of irrigated lands, the existing and estimated future irrigation water demands, and the available amount of water for irrigation per day is necessary to determine whether or not lands have sufficient quantities of water to support viable agricultural production.

The existing irrigation system services all of the southern portion (Opae'ula) of the Kawailoa area, but only services approximately 2/5ths of the makai half of the northern portion (Kawailoa). The irrigation system in Kawailoa connects Waimea River, Ka'alaea Stream, Kawailoa Stream, Laniakea Stream, and Anahulu River with ditches, pipelines and reservoirs (see ALA, Figure 6A). Petitioner plans to maintain and fix aging irrigation infrastructure and has recently expended over $13 million to improve agricultural water resources for current and planned future irrigation needs (ALA, p. 7). Kawailoa receives between 35 to 80 inches of rain per year (see ALA, Figure 6A).

The petition states that the proposed IAL lands in Punaluu are primarily irrigated by the Punaluu Stream and ditches that are connected to the stream. Petitioner has upgraded the existing water system by piping over 5,000 linear feet of the former Punaluu irrigation ditch (ALA, p. 8). Petitioner states that from 2009 to 2014, approximately $1.5 million has been invested in upgrading the irrigation system in Punaluu, and plans to invest another $5 million for stream restoration work (ALA, p. 8). Punaluu receives between 65 to 120 inches of rain per year.

The DOA notes that for both the Kawailoa and Punaluu areas, the petitioner may need to petition the Commission on Water Resource Management to amend the interim instream flow standard for any new or expanded diversions of surface water.

Land whose designation as Important Agricultural Lands is consistent with general, development, and community plans of the County

The petition area is fully within the State Agricultural District. The Kawailoa area is zoned as AG-1 (Restricted Agriculture) by the City and County of Honolulu, and the Punaluu area is zoned as AG-2 (General Agriculture). The Kawailoa area is primarily designated as Agricultural in the North Shore Sustainable Communities Plan, except for the streams and fringes of the streams which are designated as Preservation. The Punaluu area is largely designated as "Agricultural" in the Koolau Loa Sustainable Communities Plan, except for the streams and fringes of streams which is in Preservation. The Punaluu lands appears to abut the Urban District on the makai edges of the petition area.

Land that contributes to maintaining a critical land mass important to agricultural operating productivity

The Kawailoa/Opaeula area (9,171.161 acres) has a history of sugarcane and pineapple cultivation on the lands that were level enough to support agricultural activity. The lower two-fifths of Kawailoa contains nearly all the "A" and "B" rated land and is relatively unbroken by gulches. Similarly, the makai two-thirds of Opaeula possesses all the "A" and "B" rated lands and is relatively unbroken by gulches. The upper reaches of both Kawailoa and Opaeula appear to have more land area in gulches which makes it difficult for agricultural use in both areas above the ditch system. Further, the Kawailoa area is entirely separated from the Opaeula area by Opaeula Gulch. We note what appears to be a large number of kuleana properties within the Gulch. With the exception of Drum Road on the mauka edge of both areas, there are no roadways connecting Kawailoa and Opaeula.

The petitioner's "North Shore Plan – Paalaa to Kapaeloa" states that the upper reaches of Kawailoa and Opaeula are to be used for "Establish alternative energy uses" such as solar energy, wind, and hydro-power (Petition, Exhibit C), and leaves the lower lands for diversified agriculture. There are 30 wind turbine operating in upper Kawailoa, on

plateaus between the gulches. Given the agricultural history and the land use plan for Kawailoa/Opaeula, the "critical land mass" criterion would clearly apply to the lower elevations where the petitioner identifies "Diversified Agriculture" as the primary use of the land (Petition, Exhibit C).

The Punaluu area (420.887 acres) appears to have been the eastern terminus of the former Kahuku Plantation Company. Unlike the Kawailoa/Opaeula site, Punaluu has a substantial acreage classified as Preservation along the branches of the Punaluu Stream, according to the Koolauloa Sustainable Communities Plan (Petition, Exhibit G, Figure 7B). The property also abuts the Urban District along the makai edge (Petition, Exhibit G, Figure 8B). The current agricultural operations (Petition, Exhibit G, Figure 1B) is largely verified by recent satellite imagery. There appears to be agricultural activity in lands adjacent and to the northwest of the Punaluu site. There is a relatively steep area along the southern boundary that forms an arc.

The petitioner's "Punaluu Ahupuaa Plan" (Petition, Exhibit D) states that 175 acres of agricultural use will be added to what we presume to be the existing 133 acres of diversified agriculture, livestock, and aquaculture. This will bring the total area in agriculture to 308 acres, or 73 percent of the petitioned area. The Punaluu stream is fundamental to the agricultural activities in the area and is appropriate to be included in the petition. Given the agricultural history and the agricultural land use plan for the Punaluu site, the "critical land mass" criterion would to most of the petitioned area.

Land with or near support infrastructure conducive to agricultural productivity, such as transportation to markets, water, or power

Kawailoa is near Kamehameha Highway and Haleiwa Village. In the future, petitioner plans to increase the residential and commercial areas in Haleiwa Village. (Petition, Exhibit C). The service area for the existing irrigation system in the northern Kawailoa area (Kawailoa) appears to be limited to approximately 2/5ths of the makai half of the proposed designation.

CONCLUSION

The DOA supports the majority of the petitioner's request to have 9,592 acres of agricultural land in the Kawailoa/Opaeula and Punaluu areas designated as Important Agricultural Land.

In the Kawailoa/Opaeula site, the petitioner's plan for the eastern part of the property is to undertake alternative energy uses such as wind, hydro, and solar energy. Specifically, the petitioner states that 500 acres will be set aside for a 50MW solar energy facility with compatible sheep grazing. This area is also the most poorly suited to agricultural use because of the numerous gulches, poorer soil quality, and lack of

supplemental irrigation water supply. Further, we do not recall any other request for IAL designation that included acreage for a utility-scale solar energy facility.

Notwithstanding our concerns, if the petitioner confirms and commits to using a substantial portion of the energy generated by the proposed solar energy facility directly for agricultural purposes, and/or confirms and commits to using a substantial portion of the income derived from the selling of electricity to the utility for agricultural activities within the petitioned area, the Department would support IAL designation for the area proposed for the solar energy facility as described in the petition (Exhibit C, "Plan Map and Projects").

Also for the Kawailoa/Opaeula site, the petitioner should provide the Commission with information showing that the irrigation water system and improvements will provide a quantity of irrigation water sufficient to maintain plant and animal health during dry periods.

In the Punaluu site, there appears to be abundant irrigation water supply, fairly productive soils, and 120 acres of existing diversified agricultural activities. We note from Exhibit I of the petition that there is existing agricultural activity on some of the LSB "E" rated land that is also not classified by the Agricultural Lands of Importance to the State of Hawaii. There appears to be agricultural land to the north of the petitioned area that are in crop production. The Department believes that the Punaluu site, in its entirety, should be designated as IAL.

Sincerely,

Scott E. Enright, Chairperson
Board of Agriculture

c: Office of Planning

DAVID Y. IGE
Governor

SHAN S. TSUTSUI
Lt. Governor

SCOTT E. ENRIGHT
Chairperson, Board of Agriculture

PHYLLIS SHIMABUKURO-GEISER
Deputy to the Chairperson

State of Hawaii
DEPARTMENT OF AGRICULTURE
1428 South King Street
Honolulu, Hawaii 96814-2512
Phone: (808) 973-9600 FAX: (808) 973-9613

February 19, 2015

Mr. George I. Atta, FAICP
Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street 7th Floor
Honolulu, Hawaii 96813

Dear Mr. Atta:

Subject: Application for Special Use Permit (2014/SUP-6)
First Wind (d.b.a. Kawailoa Solar, LLC)
Solar Energy Facility, Kawailoa, North Shore, Oahu
Tax Map Key: 6-1-005:001(por.) and 6-1-006:001(por.)
Total Area: 384.1 acres

The Department of Agriculture (DOA) has reviewed the subject application and offers the following comments and a recommendation.

Background
A solar energy facility is proposed for a 384.1-acre site that is entirely within the State Agricultural District and outside the City's Urban Community Boundary (North Shore Sustainable Communities Plan, May 2011, Land Use Map). The project site has Land Study Bureau (LSB) Overall Productivity Ratings of "B" (332.3 acres), "C" (37.9 acres), and "E" (12 acres) (Detailed Land Classification – Island of Oahu, Land Study Bureau, December 1972). Department staff did a cursory review of the project site using the original LSB maps (22, 23). They determined that the Overall Productivity Ratings of B21 and B121 both would have improved to "A" with very good productivity potential for most agricultural uses if irrigation was available at the time of the study. The potential productivity of the "C" and "D" rated lands further mauka do not improve with irrigation.

For the "B" and "C" rated lands, the proposed facility in combination with a compatible agricultural activity may be permitted by special permit, pursuant to Act 55, Session Laws of Hawaii (SLH) 2014, now codified as Section 205-4.5(a)(21), HRS. The compatible agricultural activity contemplated is raising of sheep. The project will also include 550 linear feet of underground electrical lines on 1.9 acres of "A" rated soils of

EXHIBIT 15 L

which is entirely comprised of an existing roadway. At the end of the solar energy facility's operational life, the facility may be re-powered with new equipment, subject to permitting, or decommissioned and the land area returned to its pre-solar energy facility state (Application, page 5).

Recommendation
The DOA strongly supports existing farming operations and those seeking to start new farming enterprises. The DOA also supports solar energy operations in combination with compatible local food production on "B" and "C" rated agricultural land as provided for in Act 55, SLH 2014. "B" rated agricultural lands are a scarce and valuable resource with good capacity to contribute substantially to food self-sufficiency. Notwithstanding the law, the Department encourages proponents of utility-scale solar energy facilities to consider sites on "D" and "E" rated agricultural land that does not have acreage limitations or special use permit requirements.

The DOA notes that the landowner of the project site, Kamehameha Schools (KS), has just received approval by the Land Use Commission (LUC) to have the entire project site and surrounding agricultural land designated as Important Agricultural Lands (IAL) (Docket No. DR14-52). Representatives of KS indicated that they will use the revenue generated from the proposed solar farm facility to make improvements in support of agriculture development at Kawailoa, which is in accordance with their agricultural plan for the area. We also understand that the photovoltaic modules will be installed four to seven feet off the ground and be spaced apart to allow sunlight through.

This is the first Special Use Permit (SUP) application on the 100,000+ acres of IAL designated agricultural lands in the State. State law provides for a SUP to allow solar energy facilities in excess of what is allowed in Section 205-4.5(a)(20) (10 percent of the acreage of the parcel or 20 acres whichever is less). The permissible uses on IAL in State law are the same as those currently allowed on non-IAL agricultural land. Nevertheless, utility-scale solar energy facilities on agricultural land designated as IAL appears inconsistent with the IAL objective of maintaining "...a strategic agricultural land resource base that can support a diversity of agricultural activities and opportunities that expand agricultural income and job opportunities and increase agricultural self-sufficiency for current and future generations." (Section 205-42(b), HRS) Additionally, IAL designation indicates that the project site is well suited for intensive agricultural production, which appears to be contrary to one of the LUC's guidelines in determining an "unusual and reasonable use" – that the land upon which the proposed use is sought is unsuited for the uses permitted within the (Agricultural) district.

Therefore, the DOA believes this large-scale project with lands that have been designated as IAL should comply fully with the purpose and intent of Act 55, SLH 2014, Section 1 which is to "...enable the complementary uses of utility scale solar energy generation and local food production..." (emphasis added) on "B" and "C" rated agricultural land. We recommend the City impose a condition to the effect that the

applicant and its successors and/or assigns shall have established a sheep pasture operation or other agricultural enterprise on the property in compliance with Act 55, 2014 Session Laws of Hawaii for the duration of the operation of the solar energy generation facility.

Demand for sheep and lambs
The DOA reviewed the statewide sheep and lamb statistics as found in the 2012 Census of Agriculture. From 2007 to 2012, there were decreases in the total number of farms, the total number of sheep and lambs, the total number of sheep and lambs sold, and the number of small (1-24 head) sheep farms. The number of farms selling sheep and lambs was stable.

The 2007 to 2012 statistics for sheep and lamb farms on Oahu show that the island represents a very small fraction of the statewide numbers. However, there have been increases in nearly every category. The total number of sheep and lambs sold is an indication of demand, and sales increased from 13 in 2007 to 75 in 2012. However, this represents less than 2 percent of the total statewide sales of sheep and lamb. This small number of sales is surprising as 67 percent of Hawaii's de facto population (residents and visitors) in 2013 are on Oahu.

We also note there have been no sheep farms on Oahu with more than 100 sheep since 2007. There were 5 farms with a total of 266 sheep in 2012, or an average of 53 sheep per farm.

Proposed sheep operation
The lease rent to be charged to a local ranching business will be about $10.00 per acre/year, or about 50 percent below the fair market rent for similar agricultural properties (Application, Attachment 5). The lease of 5 years or longer would commence after the solar farm is operational and will allow the tenant the use of the property's perimeter fencing, roadways, and other infrastructure (Application, pages 7-8). The applicant will work with the rancher, as needed, to facilitate watering systems, electrified fencing, pens, and loading facilities (Application, page 8). We believe the applicant's assistance in establishing the aforementioned infrastructure is very important for the sheep ranching operation to succeed.

The project site is said to possess adequate forage to support 100-200 head of sheep (Application, page 7). If the envisioned sheep pasture operation takes full advantage of the carrying capacity of the property, this would result in a 50 percent increase over Oahu's 2012 sheep population (2012 Census of Agriculture, Sheep and Lambs, Oahu). We note that the sheep operation analysis and recommendations are identical to that made for the Waiawa solar energy facility (2014/SUP-3). The subject Kawailoa project and the Waiawa proposal together would double the sheep population on Oahu.

Kualoa Ranch has signed a letter of intent with the applicant to pasture sheep on the property (Application, Attachment 5). Kualoa Ranch has a 4,000 acre ranch on windward Oahu and manages around 500 head of cattle. The Ranch does not manage any sheep; however, Kualoa Ranch has stated that their management team has experience with sheep (Phone call with Mr. David Morgan on February 13, 2015).

The key to selling local lamb meat is quality and supply (Application, Attachment 5, page 3). It appears that a large sheep pasture operation would be more likely to provide a consistent quality and supply that retailers and restaurants prefer. We agree with the summary in Attachment 5 (page 9-10) that "[c]areful planning in advance, establishing goals for the entire enterprise as well as those that will be keeping the sheep, a clear understanding what inputs are available, the costs of the infrastructure and inputs in the expected outcomes are all necessary for this enterprise to succeed."

Other agricultural operations
If the sheep operation is not successful, other agricultural activities compatible with a solar farm will be considered such as beekeeping, aquaponics, aquaculture, or other livestock (Application, page 8). With the exception of beekeeping, the other agricultural options will require a reliable and sufficient supply of clean water.

Water supply
The water supply for the project site will be by rainwater catchment, onsite irrigation ponds, or delivered by water truck (Application, page 8). Water delivery may become costly during dry periods. Adult sheep require up to 4 gallons of fresh water per day, so a 200-head sheep operation may require up to 800 gallons per day and distributed throughout the grazing area. Larger livestock may require more water. Aquaponic systems appear to require the least amount of water for replenishment. An aquaculture pond requires a million gallons per acre to fill and another million gallons per year to replace water lost due to evaporation and seepage (Model Aquaculture Recirculation System, Engineering and Operations Manual; National Council for Agricultural Education; Alexandria, Virginia; 1995, page 5).

Thank you for the opportunity to provide our input. Should you have any questions, please contact Earl Yamamoto at 973-9466 or email at earl.j.yamamoto@hawaii.gov.

Sincerely,

Scott E. Enright
Chairperson, Board of Agriculture

c: Office of Planning

DAVID Y. IGE
GOVERNOR

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:

STP 8.1756

February 23, 2015

Mr. George I. Atta, FAICP
Director
City and County of Honolulu
Department of Planning and Permitting
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Mr. Atta:

Subject: Kawailoa Solar Farm Project
State Special Use Permit Application (2014/SUP-6)
Kawailoa, North Shore, Oahu, Hawaii
TMK: (1) 6-1-005: Portion of 001 and 6-1-006: Portion of 001

Our Department of Transportation's (DOT) comments on the subject project are as follows:

Airports Division

Photovoltaic (PV) systems can create a hazardous condition for a pilot due to possible glint and glare reflected from the PV array. We acknowledge a glint and glare analysis was conducted for typical flight paths used by aircraft approaching and departing Wheeler Army Airfield and Dillingham Airfield and other aircraft flights within the vicinity of the project area. However, the possibility of glint and glare could still occur under certain conditions.

If glint or glare from the PV array creates a hazard condition for pilots, the applicant must be prepared to immediately mitigate the hazard, upon notification by the DOT Airports Division or the Federal Aviation Administration (FAA).

Highways Division

The DOT Highways Division is still conducting its review and has not yet provided comments. The Statewide Transportation Planning Office will inform you of any further DOT comments once received.

If there are any questions, please contact Mr. Norren Kato of the DOT Statewide Transportation Planning Office at telephone number (808) 831-7976.

Sincerely,

FORD N. FUCHIGAMI
Director of Transportation

c: Gordon Wong, Federal Aviation Administration

DAVID Y. IGE
GOVERNOR OF HAWAII

CARTY S. CHANG
INTERIM CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DANIEL S. QUINN
INTERIM FIRST DEPUTY

W. ROY HARDY
ACTING DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD, STE 555
KAPOLEI, HAWAII 96707

February 25, 2015

Russell Y. Tsujii, Land Administer
Land Division
Department of Land and Natural Resources
P.O. Box 621
Honolulu, HI 96809

LOG NO: 2015.00284
DOC NO: 1502GC09
Archaeology

Mr. George I. Atta, Director
City and County of Honolulu
Department of Planning and Permitting
650 South King Street, 7th Floor
Honolulu, HI 96813

Dear Mr. Sirs:

SUBJECT: **Chapter 6E-42 Historic Preservation Review**
Application for a Special Use Permit-Solar Energy Facility (2014/SUP-6)
Kawailoa Ahupua'a, Waialua District, Island of O'ahu
TMK: (1) 6-1-005:001 portion, (1) 6-1-006:001 portion

Thank you for the opportunity to review and comment on the subject application for a special use permit to develop a 50 MW solar farm on approximately 304 acres of 3,492 acres owned by Kamehameha Schools. The proposed solar farm will be co-located with the existing Kawailoa wind farm. We received this application on January 26, 2015, along with a link to the Department of Land and Natural Resources, Land Division website for the permit submittal documentation. The applicant, First Wind, indicates the proposed solar farm will include a series of ground-mounted single axis photovoltaic panels, various electrical distribution systems, two on-site *Mauka* and *Makai* substations, connectors to existing switchyards, and a series of interior service roads.

A review of our records indicate that an archaeological inventory survey (AIS) was conducted adjacent to and within portions of the proposed solar farm project area (Rechtman et al. 2012). The AIS report identifies seventeen archaeological sites dating to the historic period within the project area. The sites were likely associated with WWII military communication and fire control networks (Sites 50-80-14-7155 through 7158), and plantation-era activities (Sites 50-80-14-7157 and 7159 through 7171). The SHPD Architecture Branch determined that reasonable and adequate information was collected during the AIS to warrant a determination of no further work; however project proponents recommended and conducted archaeological monitoring (Log No. 2012.0600, Doc. No. 1203RS17, 1112NN05). An archaeological monitoring report was submitted and accepted by SHPD on June 24, 2013 (Log No. 2012.3352, Doc. No. 1305NN19). The archaeological monitoring work resulted in the identification and documentation of an historic refuse pit dating to the mid-twentieth century. No other historic properties were encountered, and no further work was recommended (Log No. 2012.3352, Doc. No. 1305NN19).

Further review of our records indicate that an AIS was conducted in support of the present project. The report was submitted and accepted by SHPD on February 2, 2015 (Log No. 2014.05215, Doc. No. 1502SL02). The AIS further documented previously-recorded Site 50-80-04-7171, and newly recorded Site 50-80-04-7716, both of which are within the *makai* Collector Line Corridor. These two sites were assessed as significant pursuant to Hawaii

EXHIBIT 15 N

Administrative Rules (HAR) §13-284-6 under Criterion "d" (has yielded, or is likely to yield, information important for research on prehistory or history). The project effect recommendation was "no historic properties affected" as both historic properties were sufficiently documented. However, mitigation in the form of archaeological monitoring was recommended to address possible inadvertent finds.

Based on the above information, we concur with an archaeological monitoring program during the construction phases of this project to ensure proper documentation and treatment of any inadvertent finds, including possible additional features related to Sites 7171 and 7716. We request on-site archaeological monitoring of all ground disturbing activities associated with this project and **request that an archaeological monitoring plan** be submitted to our office for review and acceptance pursuant to HAR §13-279-4 prior to any ground disturbing activities.

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

Aloha,

Susan A. Lebo

Susan A. Lebo, PhD
Oahu Lead Archaeologist
Acting Archaeological Branch Chief

cc: Steve Molmen, DLNR Land Division (Steve.L.Molmen@hawaii.gov)
Raymond Young, City and County of Honolulu, DPP (rcsyoung@honolulu.gov)

DAVID Y. IGE
GOVERNOR OF HAWAII

CARTY S. CHANG
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BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

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LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

March 4, 2015

MEMORANDUM

To: Russell Y. Tsuji, Land Administrator
DLNR, Land Division

From: Lisa J. Hadway, Administrator
DLNR, Division of Forestry and Wildlife (DOFAW)

Subject: Comments on Application for a Special Use Permit, Solar Energy Facility, Kawailoa, North Shore, Oahu

Thank you for the memo received on January 22, 2015 and the opportunity to comment on the proposed Kawailoa Solar, LLC facility. Apologies for the delayed response to your request. The proposed action includes the construction of a 384.1 acre solar energy facility by SunEdison on land owned by Kamehameha Schools. The project is located on land that is zoned for agricultural use, and is currently a combination of cultivated agricultural land and open space.

There are a few small wetlands within the proposed project area that have been delineated by the National Wetlands Inventory, and we believe that there are more in the project area that have yet to be delineated. Associated with these and other nearby wetlands are known populations of state and federally-listed threatened and endangered waterbirds including the Hawaiian coot (*Fulica alai*), Hawaiian Stilt (*Himanoptus mexicanus knudseni*), Hawaiian moorhen (*Gallinula chloropus*), and Hawaiian duck (*Anas wyvilliana*). Additionally, nearby efforts to restore Ukoa Pond and other wetland sites have the potential to increase the local populations of these species. It is not known how Hawaiian waterbirds interact with solar panels, but solar projects on the mainland have documented impacts to waterfowl and shorebirds. DOFAW recommends a wildlife education program that informs site personnel of species that may occur in the vicinity and could potentially be harmed by solar panels. Site personnel should document sightings of threatened or endangered species, as well as immediately report any mortality or injury of these species to DOFAW so that we may assist in avoiding and minimizing impacts.

The Hawaiian hoary bat (*Lasiurus cinereus semotus*) also has the potential to occur in the vicinity of the proposed project. Hawaiian hoary bats roost in both exotic and native trees. If

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any trees are planned for removal during the bat breeding season there is a risk of injury or mortality to juvenile bats. To minimize the potential for impacts to this species, removal of woody plants greater than 15 feet in height should not occur between June 1 and September 15, which encompasses the bat birthing and pupping season. Although bat collisions with solar panels have not been documented in Hawaii, there has been some literature generated on the mainland that indicates that bats may perceive all smooth surfaces as water (Greif and Siemers 2010), which indicates a potential for bats to view the smooth, reflective surface of solar panels as resembling water. Any observations of Hawaiian hoary bats in the project area should be reported to DOFAW. DOFAW also recommends avoiding use of barbed wire, as Hawaiian hoary bat mortalities have been documented as a result of becoming entangled on barbed wire during flight.

DOFAW recommends that Kawailoa Solar consult with DOFAW and the US Fish & Wildlife Service (USFWS) throughout the planning process to determine if a threatened or endangered species is likely to be impacted by this project. DOFAW appreciates the opportunity to provide comments on this project and requests that Land Division continue to seek input from DOFAW on impacts to wildlife.

If you have any questions, please contact John P. Vetter, Acting Wildlife Program Manager, at 808-587-4158.

cc: Dave Cowan, SunEdison

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

March 4, 2015

REF: RFD.4126.3

TO: Russell Tsuji, Administrator
Land Division

FROM: W. Roy Hardy, Acting Deputy Director
Commission on Water Resource Management

SUBJECT: Application for a Special Use Permit, Solar Energy Facility, Kawailoa, North Shore

FILE NO.:
TMK NO.: 6-1-005: Portion of 001 and 6-1-006: Portion of 001

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://www.hawaii.gov/dlnr/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 EPA 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://hawaii.gov/dbedt/czm/initiative/lid.php.

☐ 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

EXHIBIT 15P

☐ 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 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.

Permits required by CWRM:
Additional information and forms are available at http://hawaii.gov/dlnr/cwrm/info_permits.htm.

☐ 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) required before any well construction work begins.

☒ 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(s) can be made to the bed and/or banks of a stream channel.

☐ 16. A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is (are) 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:
Planning: The application states that water needs will be met from either a rainwater catchment system, onsite irrigation ponds, or transported via truck. What is the source of water for the onsite irrigation ponds? The application should provide estimates of water quantities needed to support the proposed solar farm and sheep watering systems.

Ground Water: Our records show there is an existing deep monitor well, Well No. 3604-001, located at TMK 6-1-005:001. It was drilled in 1994 by the U.S. Geological Survey. There is no pump installed in the well. No pump may be installed and the well may not be used for water production purposes unless the proper permits are obtained from the Commission. If this well will be impacted in any way by the proposed construction or operational activities, a plan to protect the well head or abandon/seal this well should be developed.

If there are any questions, please contact Lenore Ohye of the Planning Branch at 587-0216 or Ryan Imata of the Ground Water Regulation Branch at 587-0225.

CH2MHILL

1132 Bishop Street
Suite 1100
Honolulu, HI
96813
Tel 808.943.1133
Fax 808.954.4400

March 10, 2015

Mr. Raymond Young
City and County of Honolulu
Department of Planning and Permitting
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Subject: Kawailoa Solar Farm Project, Application for a Special Use Permit; Response to Agency Comments (2014/SUP-6)

Dear Mr. Young,

Based on the application for a Special Use Permit for the proposed Kawailoa Solar Farm, the City and County of Honolulu Department of Planning and Permitting (DPP) has requested comments and recommendations from various public agencies, neighborhood boards and the public. This letter is intended to provide responses to the comments received as of 3/9/15, as provided by DPP. Please note that First Wind was acquired by SunEdison in January 2015; these responses are being provided on behalf of SunEdison (d.b.a Kawailoa Solar, LLC).

Letters received from the State of Hawaii Department of Land and Natural Resources (DLNR) Land Division, City and County of Honolulu Department of Environmental Services, Honolulu Police Department, and City and County of Honolulu Department of Transportation Services either indicated that their facilities/services would not be impacted or the agency has no comment; as such, these letters are not further addressed.

Comments received from other agencies are replicated below (according to the comment numbers, as indicated on the attached copies), followed by SunEdisons's response to each.

DLNR Engineering Division

Comment #1:

> *We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone D, an area where flood hazards are undetermined.*

The information provided in the comment letter is consistent with the information provided in the Special Use Permit application. Specifically, Section 3.2 states "The project site is classified as Flood Zone D, which includes areas where flood hazards are undetermined. Several intermittent waterways run alongside the project site; however, these features are located within steep gulches, such that flooding of the project site is not expected."

EXHIBIT 16

City and County of Honolulu Fire Department

Comment #1:

In response to your memorandum dated January 16, 2015, regarding the above-mentioned subject, the Honolulu Fire Department requires that the provisions of the Fire Code of the City and County of Honolulu be complied with in respect to photovoltaic systems and fire department access and water supply requirements.

Based on previous discussions with the Honolulu Fire Department for similar projects, it is understood that an access road/turnaround and water supply for fire flow would not be required if no buildings would be constructed within the project site. SunEdison will work with Honolulu Fire Department to meet their requirements for grading and building permits.

DLNR Division of Aquatic Resources

Comment #1:

The BMPs were not included with the application. DAR requests that the BMPs be included in the application so that DAR has the opportunity to review the BMPs prior to the start of the project.

The specific best management practices (BMPs) that are expected to be implemented as part of the proposed solar farm project are detailed in the Preliminary Civil Engineering Report. This report has been shared directly with the DLNR Division of Aquatic Resources, and is attached for your reference.

Comment #2:

This project also includes a sheep grazing component where sheep are able to graze between and under the solar panels. There is no mention of the BMPs that the applicant proposes to implement to mitigate for the negative impacts as a result of the sheep grazing. Additionally, there is no mention of BMPs proposed to mitigate for soil exposure, erosion and resulting soil runoff from reaching the river in the valley below. DAR recommends that BMPs be developed for the grazing portion of the project and requests the opportunity to review these BMPs.

As described in the Special Use Permit application, the area occupied by the solar panels would be made available for compatible agricultural activities at a lease rate that is at least fifty per cent below the fair market rent for comparable properties, consistent with the requirements of HRS 205-4.5(a)(21)(A). Within one year of the start of the commercial operation of the solar farm, SunEdison will establish, or will be actively seeking to establish a compatible agricultural operation, and will seek to have such compatible agricultural operations on the land for the duration of commercial energy generation operations. Specifically, SunEdison plans to lease the project area to a tenant for the pasturage of sheep, which is widely recognized as a compatible use with solar panels. SunEdison would provide the tenant with use of the fencing and roadways and other infrastructure at the project site. However, the tenant would be responsible for all aspects of the agricultural operation, including any required permit approvals and implementation of appropriate BMPs. The ranching tenant will be expected to work with the Natural Resource Conservation Service and develop a Conservation Plan for the ranching activities with the Soil and Water Conservation District.

State of Hawaii Department of Health (DOH) Environmental Planning Office

Comment #1:

EPO recommends that you review the standard comments and available strategies to support sustainable and healthy design provided at: http://health.hawaii.gov/epo/home/landuse-planning-review-program/. Projects are required to adhere to all applicable standard comments.

The standard comments provided on EPO's website have been reviewed and the project is expected to be in compliance with the requirements. In particular, Section 4.3 of the Special Use Permit application references potential impacts relating to air quality, water quality and noise, and states that BMPs would be implemented to address those impacts. In addition, the project would comply with all necessary permit requirements prior to construction, including NPDES permit coverage for construction-related stormwater.

Comment #2:

> *We encourage you and project applicants to examine and utilize the Hawaii Environmental Health Portal. The portal provides links to our e-Permitting Portal, Environmental Health Warehouse, Groundwater Contamination Viewer, Hawaii Emergency Response Exchange, Hawaii State and Local Emission Inventory System, Water Pollution Control Viewer, Water Quality Data, Warnings, Advisories and Postings. The Portal is continually updated. Please visit it regularly at: https://eha-cloud.doh.hawaii.gov*

The information contained in the Hawaii Environmental Health Portal has been considered as part of project development, and will be referenced as needed throughout the permitting process.

Comment #3:

> *You may also wish to review the revised Water Quality Standards Maps that have been updated for all islands. The Water Quality Standards Maps can be found at: http://health.hawaii.gov/cwb/site-map/clean-water-branch-home-page/water-quality-standards/.*

The revised Water Quality Standard Maps have been reviewed, and the information will be considered as part of the permitting process, as appropriate.

U.S. Fish and Wildlife Service

Comment #1:

> *The federally endangered Hawaiian hoary bat (Lasiurus cinereus semotus) may forage and roost in the project area. There is no proposed or designated critical habitat located in the area. We offer the following comments to assist the Planning Commission and First Wind [SunEdison]. The Hawaiian hoary bat roosts in both exotic and native woody vegetation and, while foraging, will leave young unattended in "nursery" trees and shrubs when they forage. If trees or shrubs suitable for bat roosting are cleared during the breeding season, there is a risk that young bats could inadvertently be harmed or killed. To minimize impacts to the endangered Hawaiian hoary bat, woody plants greater than 15 feet (4.6 meters) tall should not be disturbed, removed, or trimmed during the bat birthing and pup rearing season (June 1 through September 15). Site clearing should be timed to avoid disturbance to Hawaiian hoary bats in the project area. Additionally, Hawaiian hoary bats have been snagged on barbed wire fencing while flying. We recommend that the solar facility fence design be designed to avoid the use of barbed wire.*

Project staff met with representatives from both the USFWS and the State of Hawaii Department of Forestry and Wildlife (DOFAW) on November 5, 2014 regarding the proposed Waipio Solar Farm project. Additional follow-up was conducted to confirm that the previous discussion also applied to the proposed Kawailoa Solar Farm project. SunEdison has received concurrence from USFWS on this point, and is actively seeking DOFAW's concurrence. Based on these discussions, SunEdison concurs with USFWS' recommendation and agrees to not disturb, remove or trim woody plants greater than 15 feet (4.6 meters) tall during the bat birthing and pup rearing season (June 1 through September 15). In addition, the perimeter fence will not include barbed wire to avoid the potential for bats to be inadvertently snagged.

Comment #2:

We recommend that personnel at the solar site be educated about the potential for birds to be attracted and inadvertently harmed. If monitoring indicates that species are occurring at the photovoltaic system, or additional information about the facility's impacts to native Hawaiian species becomes available, please contact us so we may assist you in avoiding and minimizing impacts.

Operations personnel at the site will be trained to document and report any downed wildlife (i.e., birds and bats) encountered during routine (ca. bi-weekly) site inspections. Training will include recognizing protected species, and establishing standardized protocols for documenting and reporting occurrences of downed wildlife. Protocols will include contacting USFWS and DOFAW if protected species are found to determine appropriate measures for avoiding and minimizing further impacts.

State of Hawaii Office of Planning

Comment #1:

Concerns will remain with regard to the statewide challenge in seeking a balance of maintaining the availability of high quality agricultural lands while promoting renewable energy sources such as solar facilities on lands within the Agricultural District.

SunEdison is committed to the complementary uses of utility scale solar energy generation and local food production on agricultural land, and will make the area occupied by the solar panels available for compatible agricultural activities at a lease rate that is at least fifty per cent below the fair market rent for comparable properties, consistent with the requirements of HRS 205-4.5(a)(21)(A). Within one year of the start of the commercial operation of the solar farm, SunEdison will establish, or will be actively seeking to establish a compatible agricultural operation, and will seek to have such compatible agricultural operations on the land for the duration of commercial energy generation operations.

Comment #2:

OP also has concerns that while "agri-voltaic" projects such as this one are technically feasible, the agricultural aspect of these projects is sometimes not implemented as represented by the applicant, i.e. the number of sheep or other grazing animals co-located within the solar facility is negligible. The proposed project would be located on soils rated ALISH Prime; the proposed solar facility would, therefore, preclude productive agricultural land from being used for agricultural purposes and contributing to the State's goal of assuring the long-term availability of agricultural lands for agricultural use if the pasturage of sheep does not occur.

It is SunEdison's full intention to facilitate a successful sheep ranching operation on the project site, not only for the agricultural benefits, but also for vegetation management around the solar panels. As such, a significant number of sheep will be required to effectively and consistently control the growth of grasses on 384 acres of pasture land, which a nominal number of animals could not accomplish. In addition to making the project site available for compatible agricultural activities at a lease rate below fair market value, SunEdison will provide the tenant with use of the fencing and roadways and other infrastructure at the project site, as needed to support the tenant's efforts to maximize agricultural production. In the case that no lessees can succeed at sheep ranching, alternative agricultural activities would be considered, such as beekeeping, aquaponics, aquaculture or other livestock.

Comment #3:

Similarly, the subject property is under consideration by the LUC to be designated as IAL. OP notes the project area would be leased for the pasturage of sheep, which OP does recognize as a viable agricultural activity if implemented appropriately. OP also notes the proposed project is expected to

have an operational life of approximately 25-30 years, following which the lands may restored to conditions comparable to their existing conditions, such that future agricultural use may occur.

As noted above, SunEdison will establish, or will be actively seeking to establish a compatible agricultural operation within one year of the start of the commercial operation of the solar farm, and will seek to have such compatible agricultural operations on the land for the duration of commercial energy generation operations. At the end of the project's operational life (approximately 25-30 years), the facility may be re-powered with new equipment (under subsequent permits/approvals) or decommissioned. Decommissioning will involve removal of all aboveground structures, and the property will be returned to substantially the same condition as existed prior to the solar farm use, such that future agricultural uses may occur.

Comment #4:

OP supports the State Department of Agriculture's (DOA) comment from a letter dated January 29, 2015 to the Office of Planning regarding Kamehameha Schools' petition to designate IAL that "the DOA would support the IAL designation for the area proposed for the solar energy facility on the Kawailoa lands if the Petitioner commits to using a substantial portion of the energy generated by the solar energy facility directly for agricultural purposes, and/or commits to using a substantial portion of the income derived from the selling of electricity to the utility for agricultural activities within the petitioned area" (p. 7). (Refer to the attached Exhibit A).

It is SunEdison's understanding that Kamehameha Schools intends to use a substantial portion of the income they derive from the solar farm for agricultural activities on the lands designated as IAL.

Comment #5:

Should the Special Permit be granted, OP recommends that the requirements of HRS § 205-4.5(a)(21)(A), (B), and (C), relating to: 1) compatible agricultural activities; 2) proof of financial security for decommissioning; and 3) decommissioning requirements, be included as specific conditions of approval.

SunEdison is in agreement with this comment.

State of Hawaii Department of Agriculture

Comment #1:

Therefore the DOA believes this large-scale project with lands that have been designated as IAL should comply fully with the purpose and intent of Act 55, SLH 2014, Section 1 which is to "...enable the complementary uses of utility scale solar energy generation and local food production..." (emphasis added) on "B" and "C" rated agricultural land. We recommend the City impose a condition to the effect that the applicant and its successors and/or assigns shall have established a sheep pasture operation or other agricultural enterprise on the property in compliance with Act 55, 2014 Session Laws of Hawaii for the duration of the operation of the solar energy generation facility.

SunEdison is committed to the complementary uses of utility scale solar energy generation and local food production on agricultural land, and will make the area occupied by the solar panels available for compatible agricultural activities at a lease rate that is at least fifty per cent below the fair market rent for comparable properties, consistent with the requirements of HRS 205-4.5(a)(21)(A). Within one year of the start of the commercial operation of the solar farm, SunEdison will establish, or will be actively seeking to establish a compatible agricultural operation, and will seek to have such compatible agricultural operations on the land for the duration of commercial energy generation operations.

Comment #2:

The applicant will work with the rancher, as needed, to facilitate watering systems, electrified fencing, pens, and loading facilities (Application, page 8). We believe the applicant's assistance in establishing the aforementioned infrastructure is very important for the sheep ranching operation to succeed.

As described in the Special Use Permit application, SunEdison is committed to working with the tenant to facilitate the infrastructure needed for a successful agricultural operation, including watering systems, electrified fencing, pens, and loading facilities.

State Historic Preservation Division

Comment #1:

Further review of our records indicate that an AIS was conducted in support of the present project. The report was submitted and accepted by SHPD on February 2, 2015 (Log No. 2014.05215, Doc. No. 1502SL02). The AIS further documented previously-recorded Site 50-80-04-7171, and newly recorded Site 50-80-04-7716, both of which are within the makai Collector Line Corridor. These two sites were assessed as significant pursuant to Hawaii Administrative Rules (HAR) §13-284-6 under Criterion "d" (has yielded, or is likely to yield, information important for research on prehistory or history). The project effect recommendation was "no historic properties affected" as both historic properties were sufficiently documented. However, mitigation in the form of archaeological monitoring was recommended to address possible inadvertent finds.

Based on the above information, we concur with an archaeological monitoring program during the construction phases of this project to ensure proper documentation and treatment of any inadvertent finds, including possible additional features related to Sites 7171 and 7716. We request on-site archaeological monitoring of all ground disturbing activities associated with this project ***and request that an archaeological monitoring plan*** *be submitted to our office for review and acceptance pursuant to HAR §13-279-4 prior to any ground disturbing activities.*

As requested by the State Historic Preservation Division (SHPD), an archaeological monitoring plan will be submitted for review and acceptance prior to any ground disturbing activities.

We appreciate your efforts in support of processing the Special Use Permit application for the Kawailoa Solar Farm project. Please contact me if you have any questions regarding the responses provided above, or if you require further information.

Sincerely,

CH2M HILL
Paul Luersen, AICP
Agent for SunEdison

Enclosures: Agency comment letters; Preliminary Civil Engineering Report

cc: Wren Wescoatt, SunEdison (Kawailoa PV, LLC)

CH2MHILL

1132 Bishop Street
Suite 1100
Honolulu, HI
96813
Tel 808.943.1133
Fax 808.954.4400

March 17, 2015

Mr. Raymond Young
City and County of Honolulu
Department of Planning and Permitting
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Subject: Kawailoa Solar Farm Project, Application for a Special Use Permit; Response to Agency Comments (2014/SUP-6)

Dear Mr. Young,

Based on the application for a Special Use Permit for the proposed Kawailoa Solar Farm, the City and County of Honolulu Department of Planning and Permitting (DPP) has requested comments and recommendations from various public agencies, neighborhood boards and the public. This letter is intended to provide responses to the additional comments received subsequent to our last correspondence on 3/10/15.

Comments received from the State of Hawaii Division of Forestry and Wildlife (DOFAW) and Commission on Water Resource Management (CWRM) are replicated below (according to the comment numbers, as indicated on the attached copies), followed by SunEdison's response to each.

State of Hawaii Division of Forestry and Wildlife (DOFAW)

Comment #1:

> *It is not known how Hawaiian waterbirds interact with solar panels, but solar projects on the mainland have documented impacts to waterfowl and shorebirds. DOFAW recommends a wildlife education program that informs site personnel of species that may occur in the vicinity and could potentially be harmed by solar panels. Site personnel should document sightings of threatened or endangered species, as well as immediately report any mortality or injury of these species to DOFAW so that we may assist in avoiding and minimizing impacts.*

Operations personnel at the site will be trained to document and report any downed wildlife (i.e., birds and bats) encountered during routine (ca. bi-weekly) site inspections. Training will include recognizing protected species, and establishing standardized protocols for documenting and reporting occurrences of downed wildlife. Protocols will include contacting USFWS and DOFAW if protected species are found to determine appropriate measures for avoiding and minimizing further impacts.

EXHIBIT 17

Comment #2:

The Hawaiian hoary bat (Lasiurus cinereus semotus) also has the potential to occur in the vicinity of the proposed project. Hawaiian hoary bats roost in both exotic and native trees. If any trees are planned for removal during the bat breeding season there is a risk of injury or mortality to juvenile bats. To minimize impact the potential for impacts to this species, removal of woody plants greater than 15 feet in height should not occur between June 1 and September 15, which encompasses the bat birthing and pupping season. Although bat collisions with solar panels have not been documented in Hawaii, there has been some literature generated on the mainland that indicates that bats may perceive all smooth surfaces as water (Greif and Siemers 2010), which indicates a potential for bats to view the smooth, reflective surface of solar panels as resembling water. Any observations of Hawaiian hoary bats in the project area should be reported to DOFAW. DOFAW also recommends avoiding use of barbed wire, as Hawaiian hoary bat mortalities have been documented as a result of becoming entangled on barbed wire during flight.

SunEdison concurs with USFWS' recommendation and agrees to not disturb, remove or trim woody plants greater than 15 feet (4.6 meters) tall during the bat birthing and pup rearing season (June 1 through September 15). As part of the training program described in response to Comment #1 (above), observations of Hawaiian hoary bats will be reported to DOFAW. In addition, the perimeter fence will not include barbed wire to avoid the potential for bats to be inadvertently snagged.

Comment #3:

DOFAW recommends that Kawailoa Solar consult with DOFAW and the US Fish & Wildlife Service (USFWS) throughout the planning process to determine if a threatened or endangered species is likely to be impacted by this project.

SunEdison will keep USFWS and DOFAW apprised of any changes in the proposed project, as needed to determine if there could be potential impacts to a threatened or endangered species.

Commission on Water Resource Management

Comment #1:

A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.

No ground water will be developed as a source of supply for the proposed project.

Comment #2:

Planning: The application states that water needs will be met from either a rainwater catchment system, onsite irrigation ponds, or transported via truck. What is the source of water for the onsite irrigation ponds? The application should provide estimates of water quantities needed to support the proposed solar farm and sheep watering systems.

The onsite irrigation ponds that are referenced in the Special Use Permit application are existing features that are managed by Kamehameha Schools. As noted in Section 3.2 of the Special Use Permit application, a minimal amount water would be required for the solar farm operation, primarily for washing the panels. It is expected that rain will minimize the need for washing the panels, but if required, washing would likely occur no more than once per year and would use roughly 50,000 gallons of water. The exact requirements of the agricultural operation are not yet known, but the rancher would be responsible for obtaining any permits needed to support the operation, including those needed for water use.

Comment #3:

> *Ground Water: Our records shown there is an existing deep monitor well, Well No. 3604-001, located at TMK 6-1-005:001. It was drilled in 1994 by the U.S. Geological Survey. There is no pump installed in the well. No pump may be installed and the well may not be used for water production purposes unless the proper permits are obtained from the Commission. If this well will be impacted in any way by the proposed construction or operational activities, a plan to protect the well head or abandon/seal this well should be developed.*

The existing well is not expected to be impacted by the proposed project.

We appreciate your efforts in support of processing the Special Use Permit application for the Kawailoa Solar Farm project. Please contact me if you have any questions regarding the responses provided above, or if you require further information.

Sincerely,

CH2M HILL
Paul Luersen, AICP
Agent for SunEdison

Enclosures: Agency comment letters

cc: Wren Wescoatt, SunEdison (Kawailoa PV, LLC)

From: Luann Casey <luann@tinroofranch.org>
Date: March 9, 2015 at 9:42:45 PM HST
To: "Young, Raymond" <rcsyoung@honolulu.gov>
Subject: Letter in Support of SunEdison's Special Use Permit Application

Mr. Raymond Young
Staff Planner, Community Plans Branch
Department of Planning and Program
650 S. King St., 7th Flr.
Honolulu, Hawaii 96813
Email: rcsyoung@honolulu.gov

RE: Letter in Support of SunEdison's Special Use Permit Application for Kawailoa Solar

Dear Mr. Young,

We own and operate Tin Roof Ranch, an environmentally-friendly, organic, and sustainable farm located on the North Shore of O'ahu in beautiful Haleiwa. Tin Roof Ranch produces organic, pasture raised chickens, grass fed lamb. organic fruit, and veggies for purchase at local farmers' markets.

We also raise sheep and lambs that we sell to individuals, local butchers, stores and restaurants. Demand for lamb and sheep products is so high we cannot keep up with the requests and many times we have to turn down offers to buy our lamb and sheep products.

We support SunEdison's Special Use Permit Application because this project will open up more agricultural land for sheep farming and other agricultural activities. The solar energy operation will help to subsidize segments of the sheep farming operation including lease rent and fencing, making farming more cost-effective.

Sheep farming needs large tracts of land to be successful because sheep forage in herds within blocks of pasture and then are moved through cross fencing to other sections of the land to allow for regrowth of grass.

Because we pride ourselves on running a farm that utilizes sustainable practices, we also like the idea that our sheep operations would coexist with renewable energy and our sheep could help with grass maintenance for the solar panels.

We respectfully request that this application be approved as a show of support for renewable energy and farming.

Aloha,
Gary and Luann Gunder
Tin Roof Ranch
Haleiwa, Hawaii

EXHIBIT 18

blue planet FOUNDATION

November 24, 2014

Raymond Young
Staff Planner, Community Plans Branch
City and County of Honolulu, Department of Planning and Permitting
650 South King Street, 7th Floor
Honolulu, Hawai'i 96813
rcsyoung@honolulu.gov

Re: Kawailoa Solar Farm

Dear Mr. Young,

Blue Planet Foundation is Hawai'i-based nonprofit organization. We work to clear the path for local, clean, renewable power. We want to make our communities stronger, our energy more secure, our environment healthier, and our economy more robust.

In the past decade, Hawai'i has sent more than $40 Billion out of the state to pay for imported fossil fuels like oil and coal. Thankfully, cost-effective renewable energy is slowing this drain. Solar projects like the proposed Kawailoa solar farm can supply power to Hawai'i's people for less than 13.5 cents per kWh – substantially better than the 22 cents per kWh we pay for oil in existing power plants. These savings benefit all residents and sectors.

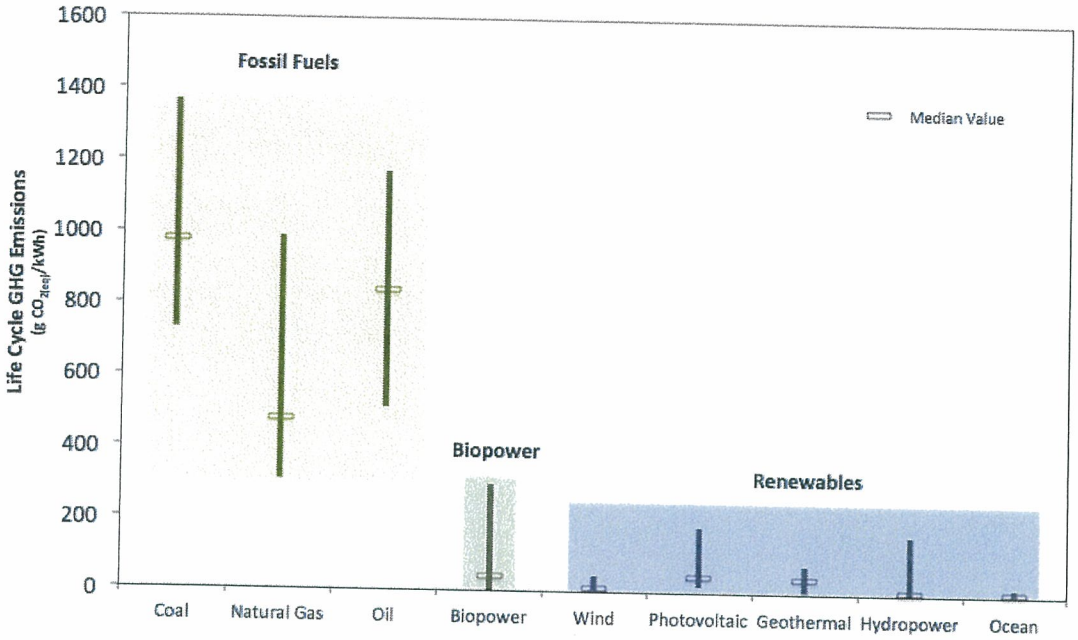
New solar projects are also vital for achieving the state's clean energy goals and mandates. Our analysis indicates that O'ahu will require hundreds more megawatts of cost-effective solar power added to the grid, both as distributed rooftop generation and centralized utility-scale solar farms.

Timing is critical. Federal support for renewable energy projects is currently scheduled to terminate in 2016. If we fail to approve and install the pending renewable energy projects before that deadline, Hawai'i residents and businesses stand to lose hundreds of millions in federal dollars.

In addition to these broad economic benefits, using more solar power will mean cleaner power

EXHIBIT 19

and a healthier environment. Life cycle greenhouse gas emissions analysis, accounting for emissions at each step of production, show that solar photovoltaic power is far cleaner than fossil fuel-fired power:[1]



Solar energy projects enjoy a low profile, silent operation, and lack of significant moving parts. This can render solar projects appropriate for a variety of environments. Solar projects are also, by their nature, an interim use of land; unlike large power plant buildings, solar panels can be more readily removed at the end of their useful or contractual life.

The potential for dual-use of land also makes solar power a smart choice, because this strategy can protect the long-term value and possible uses of farmland. In the nearer term, dual-use energy generation can also improve the viability of land for agriculture by providing infrastructure and subsidizing land costs for complementary agricultural uses. Together, these benefits can promote both food and energy sustainability.

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[1] These data were compiled by the National Renewable Energy Laboratory's (NREL) Life Cycle Assessment (LCA) Harmonization project. NREL experts systematically reviewed thousands of estimates of LCA GHG emissions published between 1970 and 2011. LCA estimates presented consider emissions from all stages in the lifecycle of an energy source, from component manufacturing, to operation of the generation facility to its decommissioning, and including acquisition, processing and transport of any required fuels. Note that for natural gas, the methane leakage rate implied by these estimates is much lower than leakage measured by some scientists. Thus, the total climate impact of natural gas emissions may be even greater than reflected in this chart.

We believe that these characteristics should render solar projects far less objectionable than large, polluting, fossil fuel generating stations. **Indeed, a recent poll of Hawai'i residents by the University of Hawaii Center on the Family found overwhelming support solar power. 92% of respondents favored solar power for Hawai'i, with only 4% opposing.**[2]

With aloha,

Richard Wallsgrove
Program Director

[2] *See* http://uhfamily.hawaii.edu/publications/brochures/9314e_14101012_COF_Renewable Energy_Report-FINAL.pdf.

EXHIBIT 20

BEFORE THE PLANNING COMMISSION
OF THE CITY AND COUNTY OF HONOLULU

In the Matter of the Application of KAWAILOA SOLAR, LLC For a New Special Use Permit To Allow Development of a 50-megawatt photovoltaic (PV) Energy Generation Facility and Accessory Uses and Structures On Lands Rated Class A, B and C by the Land Study Bureau, Ashley Road, Kawailoa Ahupua'a, Waialua District, Oahu, Hawai'i, Portions of Tax Map Key Nos.: (1) 6-1-005:001 and (1) 6-1-006:001, Part of Kamehameha School's Kawailoa Plantation	FILE NO. 2014/SUP-6(RY) CERTIFICATE OF SERVICE

CERTIFICATE OF SERVICE

THE UNDERSIGNED HEREBY CERTIFIES that on this date, a true and correct copy of the aforementioned document was duly served upon the following by hand-delivery, addressed as set forth below:

PLANNING COMMISSION
Department of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawai'i 96813

DATED: Honolulu, Hawai'i, MAR 2 3 2015.

RANDALL F. SAKUMOTO
MARGUERITE S. NOZAKI

Attorneys for Applicant
KAWAILOA SOLAR, LLC