DAVID Y. IGE
Governor

JOSH GREEN
Lieutenant Governor

LAND USE COMMISSION
State of Hawai`i

DANIEL E. ORODENKER
Executive Officer

SCOTT A.K. DERRICKSON AICP
Chief Planner

RILEY K. HAKODA
Planner

NATASHA A. QUIÑONES
Chief Clerk

FRED A. TALON
Drafting Technician

ARIANA KWAN
Administrative Assistant

November 2, 2021

Mary Alice Evans, Director
State of Hawai'i
Office of Planning and Sustainable Development
Environmental Review Program
235 South Beretania Street, Room 702
Honolulu, Hawai'i 96813

RE: LUC Docket No. A19-809 Pūlama Lāna'i
2nd Draft Environmental Assessment (DEA)
Proposed Miki Basin Industrial Park
Tax Map Key No. (2)4-9-002:061 (por.)

Dear Ms.Evans:

The State Land Use Commission is submitting this 2nd Draft EA for publication in the next Environmental Review Program Environmental Notice. The Applicant, Lāna'i Resorts LLC, a Hawai'i Limited Liability Company doing business as Pūlama Lāna'i, has prepared this 2nd Draft EA to seek additional public review and comment. Attached to this letter is the original anticipated finding of no significant impact ("AFONSI") determination letter for the subject project.

In addition to this letter, we have also submitted the electronic version of the Environmental Review Program Publication Form and a searchable PDF-formatted copy of the 2nd DEA-AFONSI through the online submission platform.

235 SOUTH BERETANIA STREET ❁ SUITE 406 ❁ HONOLULU, HAWAI'I 96813 ❁ TEL (808) 587-3822 ❁ Fax (808) 587-3827 ❁ EMAIL: luc@dbedt.hawaii.gov
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

If there are any questions, please contact LUC Staff at (808) 587-3822 or Tessa Munekiyo Ng at (808) 268-4346 or Chris Sugidono at (808) 244-2015 of Munekiyo Hiraga.

Sincerely,

Daniel E. Orodenker
Executive Officer

cc: Applicant Representative - Keiki-Pua Dancil, Pūlama Lānaʻi
Applicant Representative - Chris Sugidono, Munekiyo Hiraga
Applicant Representative - Calvert Chipchase, Esq., Cades Schutte LLP
Rodney Funakoshi, State Office of Planning
Michele McLean, County of Maui Planning Department

DAVID Y. IGE
Governor

JOSH B. GREEN
Lieutenant Governor

MIKE MCCARTNEY
Director

LAND USE COMMISSION
Department of Business, Economic Development & Tourism
State of Hawai`i

DANIEL E. ORODENKER
Executive Officer

BERT SARUWATARI
Planner

SCOTT A.K. DERRICKSON AICP
Planner

RASMI AGRAHARI
Planner

RILEY K. HAKODA
Planner/Chief Clerk

FRED A. TALON
Drafting Technician

November 14, 2019

Office of Environmental Quality Control
Attn: Tom Eisen
State Department of Health
235 South Beretania Street, Room 702
Honolulu, Hawai'i 96813

Dear Mr. Eisen:

Subject: Docket No. A19-809 Pūlama Lāna'i
Draft Environmental Assessment (DEA) and AFONSI
Proposed Miki Basin Industrial Park
Lāna'i Airport, Lāna'i, State of Hawai'i
Tax Map Key No. (2) 4-9-002:061 (por.)

On September 25, 2019, the Land Use Commission made a determination at its hearing that the subject project triggered the requirement for HRS Chapter 343 review and that the LUC would be the accepting authority. In addition, the LUC made a determination that the applicant's DEA, at this time, warranted an anticipated finding of no significant impact ("AFONSI").

With this letter, the State Land Use Commission ("LUC") hereby transmits the draft environmental assessment (DEA) for the State Land Use District Boundary Amendment situated at TMK No. (2) 4-9-002:061 (por.), near the Lāna'i Airport, on the island of Lāna'i, for publication in the next available edition of the Environmental Notice.

Enclosed is a completed OEQC Publication Form, one hard copy of the DEA-AFONSI, two copies of an Adobe Acrobat PDF file of the same, and an electronic copy of the publication form in MS Word. Simultaneous with this letter, we have submitted the summary of the action in a text file by electronic mail to your office.

235 SOUTH BERETANIA STREET ❁ SUITE 406 ❁ HONOLULU, HAWAI`I 96813 ❁ TEL (808) 587-3822 ❁ Fax (808) 587-3827 ❁ EMAIL: luc@dbedt.hawaii.gov
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Should you have any questions, please contact Scott A.K. Derrickson, AICP, of my staff at 587-3921.

Sincerely,

for Scott A.K. Derrickson

Daniel E. Orodenker
Executive Officer

cc: Applicant Representative – Peter Young, Ho`okuleana LLC
Applicant Representative – Lynn McCrory, Pūlama Lānaʻi
Mary Alice Evans, State Office of Planning
Rodney Funakoshi, State Office of Planning
Michele McLean, County of Maui Planning Department

From: webmaster@hawaii.gov
To: DBEDT OPSD Environmental Review Program
Subject: New online submission for The Environmental Notice
Date: Friday, November 12, 2021 1:54:53 PM

Action Name

Miki Basin Industrial Park

Type of Document/Determination

Draft environmental assessment and anticipated finding of no significant impact (DEA-AFNSI)

HRS §343-5(a) Trigger(s)

- (1) Propose the use of state or county lands or the use of state or county funds

Judicial district

Lānaʻi, Maui

Tax Map Key(s) (TMK(s))

(2) 4-9-002:061 (por.)

Action type

Applicant

Other required permits and approvals

Numerous - See Chapter VII

Discretionary consent required

District Boundary Amendment (Land Use Commission); Change of Zoning (County of Maui)

Approving agency

State of Hawaii, Land Use Commission

Agency contact name

Dan Orodenker

Agency contact email (for info about the action)

dbedt.luc.web@hawaii.gov

Email address or URL for receiving comments

dbedt.luc.web@hawaii.gov

Agency contact phone

(808) 587-3822

Agency address

P. O. Box 2359
Honolulu, Hawaii 96804-2359
United States
Map It

Applicant

Lanai Resorts, LLC, a Hawaii limited liability company doing business as Pulama Lanai

Applicant contact name

Keiki-Pua Dancil

Applicant contact email

kdancil@pulamalanai.com

Applicant contact phone

(808) 237-2001

Applicant address

733 Bishop Street
Suite 1500
Honolulu, Hawaii 96813
United States
Map It

Was this submittal prepared by a consultant?

Yes

Consultant

Munekiyo Hiraga

Consultant contact name

Chris Sugidono

Consultant contact email

planning@munekiyohiraga.com

Consultant contact phone

(808) 244-2015

Consultant address

305 High Street
Suite 104
Wailuku, HI 96793
United States
Map It

Action summary

Pūlama Lānaʻi seeks to develop the Miki Basin Industrial Park, a 200-acre master-planned light and heavy industrial development on land adjoining the Lānaʻi Airport, the Maui Electric Company power plant, and the existing Miki Basin Industrial Condominium. The project implements the vision for placement of industrial land uses on Lānaʻi and expands upon the much-needed industrially zoned land area called for in the Lānaʻi Community Plan. The project will include 127 acres for renewable energy projects, 20 acres for infrastructure purposes, 12.5 acres for the relocation of an existing asphalt plant, and 26 acres for new industrial uses. The remaining 14.5 acres will be used for the relocation of an existing concrete recycling and rock crushing operation, and for the storage/stockpiling of aggregate and construction materials. Possible new future industrial uses include warehouse space for cold storage, laboratory/testing facilities, automotive services, animal hospital and other uses.

Reasons supporting determination

Refer to Chapter VI, Significance Criteria, of the Draft Environmental Assessment

Attached documents (signed agency letter & EA/EIS)

- Miki_Basin_Industrial_Nov_2021.2nd_Draft_EA.pdf
- Miki_Basin_Industrial_LUC_A_FNSI_Letter.11.02.211.pdf

Action location map

- Miki_Basin_Industrial_TMKs_shape.shp1.zip

Authorized individual

Chris Sugidono

Authorization

- The above named authorized individual hereby certifies that he/she has the authority to make this submission.

2ND Draft Environmental Assessment

MIKI BASIN INDUSTRIAL PARK
LĀNAʻI, MAUI, HAWAIʻI
(TMK No. (2)4-9-002:061(por.))

Prepared for:

Lanai Resorts LLC, a Hawaii Limited Liability Company doing business as Pūlama Lānaʻi

November 2021

Copyright © 2021
by Munekiyo Hiraga

MUNEKIYO HIRAGA

Planning. Project Management. Sustainable Solutions.

REF-1

2ND Draft Environmental Assessment

MIKI BASIN INDUSTRIAL PARK
LĀNAʻI, MAUI, HAWAIʻI
(TMK No. (2)4-9-002:061(por.))

Prepared for:

Lanai Resorts LLC, a Hawaii Limited Liability Company doing business as Pūlama Lānaʻi

November 2021

**Copyright © 2021
by Munekiyo Hiraga**

MUNEKIYO HIRAGA

REF-2

CONTENTS

Page

Executive Summary v
List of Acronyms viii
Summary of Existing Conditions and Potential Impacts and Mitigation Measures x

I. PROJECT OVERVIEW 1

A. PROJECT LOCATION, EXISTING USE, AND LAND OWNERSHIP 1

B. PROPOSED ACTION 1

C. PROJECT PURPOSE AND NEED 4

D. CHAPTER 343, HAWAI'I REVISED STATUTES 6

E. OTHER REGULATORY CONSIDERATION 6

F. PROJECT COST AND TIME SCHEDULE 6

II. DESCRIPTION OF THE EXISTING ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION MEASURES 7

A. PHYSICAL SETTING 7
1. Surrounding Land Uses 7
2. Climate 7
3. Agriculture 8
4. Topography and Soils Characteristics 12
5. Flood, Tsunami Hazards and Sea Level Rise 13
6. Streams and Wetlands 16
7. Flora and Fauna 16
8. Archaeological Resources 19
9. Cultural Resources 20
10. Air Quality 22
11. Greenhouse Gas Considerations 23
12. Noise 24
13. Hazardous Materials 25
14. Scenic and Open Space Resources 26
15. Beach and Mountain Access 27

B. SOCIO-ECONOMIC ENVIRONMENT 27
1. Population and Demography 27
2. Economy 28

C. PUBLIC SERVICES 30
1. Police and Fire Protection 30
2. Medical Services 31
3. Solid Waste 31

REF-3

4. Education 32
5. Recreational Resources 33

D. INFRASTRUCTURE 33
1. Roadways 33
2. Water 35
3. Wastewater 43
4. Drainage 44
5. Electricity, Telephone Systems, and Cable Television Services 46

E. CUMULATIVE AND SECONDARY IMPACTS 46

III. RELATIONSHIP TO GOVERNMENTAL PLANS, POLICIES, AND CONTROLS 49

A. STATE LAND USE DISTRICTS 49

B. HAWAIʻI STATE PLAN 53

C. STATE FUNCTIONAL PLAN 61

D. GENERAL PLAN OF THE COUNTY OF MAUI 66
1. Countywide Policy Plan 66
2. Lānaʻi Community Plan 68

E. COUNTY ZONING 73
1. Important Agricultural Lands 77
2. Agriculture Functional Plan 77
3. Lānaʻi Community Plan 77
4. Impacts on Agriculture 77

F. HAWAIʻI COASTAL ZONE MANAGEMENT PROGRAM 78
1. Recreational Resources 78
2. Historic Resources 79
3. Scenic and Open Space Resources 80
4. Coastal Ecosystems 80
5. Economic Uses 81
6. Coastal Hazards 82
7. Managing Development 82
8. Public Participation 83
9. Beach Protection 83
10. Marine and Coastal Resources 84

IV. UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES 86

V. ALTERNATIVES TO THE PROPOSED ACTION 88

A. PREFERRED ALTERNATIVE 88

B. NO ACTION ALTERNATIVE 88

C. DEFERRED ACTION ALTERNATIVE 88

D. SITE PLAN ALTERNATIVES 89
VI. SIGNIFICANCE CRITERIA ASSESSMENT 90
VII. LIST OF PERMITS AND APPROVALS 95
VIII. PARTIES CONSULTED DURING THE PREPARATION OF THE DRAFT ENVIRONMENTAL ASSESSMENT; LETTERS RECEIVED AND RESPONSES TO SUBSTANTIVE COMMENTS 96
A. PRECONSULTATION COMMENTS RECEIVED PRIOR TO THE PUBLICATION OF THE NOVEMBER 23, 2019 DRAFT EA AND RESPONSES PROVIDED 97
B. NOVEMBER 23, 2019 DRAFT EA COMMENTS AND RESPONSES 97
IX. REFERENCES i

K:\DATA\Pulama Lanai\MikiBasinExp 1769\Applications\Draft EA\2ndDraft EA Report.docx

LIST OF FIGURES

Page
Figure 1. Regional Location Map 2
Figure 2. Project Area Map 3
Figure 3. Conceptual Site Plan 5
Figure 4. Agricultural Lands of Importance to the State of Hawai‘i Map 9
Figure 5. Land Study Bureau Map 11
Figure 6. Soil Classification Map 14
Figure 7. Flood Insurance Rate Map 15
Figure 8. State Land Use Designation Map 50
Figure 9. Lāna‘i Community Plan Map 70
Figure 10. Maui County Zoning Map 74

LIST OF TABLES

Page
Table 1. Lana‘i Monthly Pumpage Chart 37
Table 2. Summary of Estimated Water Demand at Miki Basin Industrial Park 38
Table 3. Average Day Demand for PWS 238 with Full Buildout of Miki Basin Industrial Park 39
Table 4. Forecasted Cumulative Water Demand for Island of Lāna‘i 42
Table 5. Hawai‘i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies (Chapters 226-1 to 226-27) 54
Table 6. Hawai‘i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies (Chapters 226-101 to 226-109) 60
Table 7. Relationship Between the Proposed Miki Basin Industrial Project and the State Functional Plans 62
Table 8. Countywide Policy Plan 67

REF-5

LIST OF APPENDICES

Appendix A.	Market Assessment
Appendix B.	Impacts on Agriculture Report
Appendix C.	Flora and Fauna Study
Appendix D-1.	Archaeological Inventory Survey
Appendix D-2.	State Historic Preservation Division Archaeological Inventory Survey Acceptance Letter
Appendix D-3.	Supporting Documentation on Cultural Impact Assessment Requirement
Appendix E.	Phase I Environmental Site Assessment
Appendix F.	Economic, Population and Fiscal Impacts Report
Appendix G.	Traffic Impact Analysis Report
Appendix H-1.	Water Master Plan
Appendix H-2.	New Well Supply Alternatives for the Mānele Bay Water System, Public Water System No. 238
Appendix I.	Wastewater Master Plan
Appendix J.	Drainage Report
Appendix K-1.	Hawai‘i State Plan – Assessment of Project Applicability to Goals, Objectives, and Policies
Appendix K-2.	Countywide Policy Plan – Assessment of Project Applicability to Goals, Objectives, and Policies

Executive Summary

Project Name:	Miki Basin Industrial Park
Type of Document:	Draft Environmental Assessment
Legal Authority:	Chapter 343, Hawai‘i Revised Statutes
Anticipated Determination:	Anticipated Finding of No Significant Impact (AFNSI)
Applicable Environmental Assessment review “Trigger”:	Use of State lands
Location:	Lāna‘i Island Lāna‘i City TMK No. (2) 4-9-002:061(por.)
Landowner:	Lanai Resorts LLC, a Hawaii Limited Liability Company doing business as Pūlama Lāna‘i 733 Bishop Street, Suite 1500 Honolulu, HI 96813
Applicant:	Lanai Resorts LLC, a Hawaii Limited Liability Company doing business as Pūlama Lāna‘i 733 Bishop Street, Suite 1500 Honolulu, HI 96813 Contact: Keiki-Pua Dancil Phone No.: (808) 237-2216
Approving Agency:	State of Hawai‘i, Land Use Commission Department of Business, Economic Development and Tourism Leiopapa A Kamehameha 235 South Beretania Street, Room 406 Honolulu, Hawai‘i 96804-2359
Consultant:	Munekiyo Hiraga 305 High Street, Suite 104 Wailuku, Hawai‘i 96793 Contact: Chris Sugidono Phone: (808) 244-2015

REF-7

Project Summary:

Lanai Resorts LLC, a Hawai‘i Limited Liability Company doing business as Pūlama Lāna‘i (“Pūlama Lāna‘i” or “Applicant”) is proposing the Miki Basin Industrial Park, a 200-acre master-planned light and heavy industrial development on land adjoining the Lāna‘i Airport, the Maui Electric Company (MECO) 5-acre power plant, and the existing 20-acre Miki Basin Industrial Condominium.

The project site is located on a portion of Tax Map Key (TMK) (2)4-9-002:061, approximately 3.2 miles south of Kaumālapa‘u Highway in Lāna‘i City, Maui County, Hawai‘i. This project implements the vision for placement of industrial land uses on the island and expands upon the much-needed industrially zoned land area called for in the Lāna‘i Community Plan.

The project will include 127 acres for renewable energy projects (e.g., photovoltaic plus battery energy storage), 20 acres for infrastructure purposes (10 percent of the project area, which will be used for roads, common areas, and other related uses), 12.5 acres for the relocation of an existing asphalt plant, and 26 acres for new industrial uses. The remaining 14.5 acres will be used for the relocation of an existing concrete recycling and rock crushing operation, and for the storage and stockpiling of aggregate and construction materials. Possible new future industrial uses include a slaughterhouse, warehouse space for cold storage, laboratory/testing facilities, niche product development, automotive services, multi-media facility, animal hospital, and other uses.

The subject property is designated “Agricultural” by the State Land Use Commission and “Light Industrial” and “Heavy Industrial” by the Lāna‘i Community Plan. The project site is also designated “Agricultural”, with a small portion designated “Interim” by Maui County Zoning. The Applicant will seek a District Boundary Amendment from the State of Hawai‘i Land Use Commission (SLUC) to designate the subject property “Urban,” as well as a Change of Zoning (CIZ) from “Agricultural” and “Interim” to “M-1, Light Industrial” and “M-2, Heavy Industrial” from the Maui County Council.

Intersection improvements at Kaumālapa‘u Highway in the vicinity of Miki Road will be required. Kamālapa‘u Highway is a State roadway. The use of State lands triggers the need to prepare an Environmental Assessment (EA) pursuant to Chapter 343, Hawai‘i

Revised Statutes (HRS). The State of Hawai‘i, Land Use Commission will serve as the Approving Agency for the EA. It is noted that a Draft EA was published for the Miki Basin Industrial Park on November 23, 2019. However, since the original publication of the Draft EA, additional information on the proposed project has been developed, including greater detail about the proposed uses within the project. The additional detail on proposed uses within the Miki Basin Industrial Park allowed for updated technical studies to be prepared. In light of the foregoing, a second Draft EA has been prepared for the proposed project.

List of Acronyms

12MAV	12 month moving average
ac-ft.	Acre-feet
AFNSI	Anticipated Finding of No Significant Impact
AIS	Archaeological Inventory Survey
ALISH	Agricultural Lands of Importance to the State of Hawaiʻi
ASTs	above ground storage tanks
BMPs	Best Management Practices
CBP	Concrete Batch Plant
cf	Cubic Feet
cfs	Cubic Feet per Second
CIA	Cultural Impact Assessment
CIZ	Change of Zoning
CO2 EQ	Carbon dioxide equivalent
CPA	Community Plan Amendment
CWRM	Commission on Water Resource Management
DBA	District Boundary Amendment
DEM	Department of Environmental Management
DLNR	Department of Land and Natural Resources
DOE	Department of Education
DOH	State Department of Health
EA	Environmental Assessment
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
FEMA	Federal Emergency Management Agency
FOIA	Freedom of Information Act
GHG	Greenhouse Gases
GPD	Gallons per day
GPM	gallons per minute
HAR	Hawaiʻi Administrative Rules
HCZMP	Hawaiʻi Coastal Zone Management Program
HDOT	Hawaiʻi Department of Transportation
HECO	Hawaiian Electric Company, Ltd
HRECs	Historical Recognized Environmental Conditions
HRS	Hawaiʻi Revised Statutes
IAL	Important Agricultural Lands
IPCC	Intergovernmental Panel on Climate Change
IWS	Individual Wastewater Systems
LCP	Lānaʻi Community Plan
LOS	Level of Service

REF-10

LSB	Land Study Bureau
m	meters
MCC	Maui County Code
MECO	Maui Electric. Co.
MG	Million Gallons
mgd	Million Gallons per Day
mph	miles per hour
NPDES	National Pollutant Discharge Elimination System
PCBs	polychlorinated biphenyls
PRV	pressure reducing valve
PWS	Public Water System
RECs	recognized environmental conditions
SHPD	State Historic Preservation Division
SLUC	State of Hawai‘i Land Use Commission
SMA	Special Management Area
SY	sustainable yield
TIAR	Traffic Impact Analysis Report
TMK	Tax Map Key
TRC	TRC Environmental Corporation
UGB	Urban Growth Boundary
UH	University of Hawai‘i
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USTs	underground storage tanks
WSS	Water System Standards
WUDP	Water Use and Development Plan
WWRD	Wastewater Reclamation Division
WWRF	Wastewater Reclamation Facility
WWTP	Wastewater Treatment Plant

Summary of Existing Conditions and Potential Impacts and Mitigation Measures

Section	Category	Existing Conditions	Potential Impacts and Mitigation Measures
A	**PHYSICAL SETTING**		
A.1	Surrounding Land Uses	• The proposed Miki Basin Industrial Park will be located in an area that is approximately four (4) miles southwest of Lānaʻi City on land adjoining the Lānaʻi Airport, the Maui Electric Company (MECO) 5-acre power plant and the existing 20-acre Miki Basin Industrial Condominium.	• The proposed Miki Basin Industrial Park will be compatible with existing industrial uses on neighboring properties and has been designated by the Lānaʻi Community Plan for industrial use. • Building the industrial park will allow existing industrial facilities currently scattered in business and residential areas in Lānaʻi City to relocate to more appropriate locations having the infrastructure and buffers necessary for industrial uses.
A.2	Climate	• The climate of Lānaʻi is stable and relatively uniform year-round. • Daily temperatures in the region range between an average low of 67.8 degrees and a high of 75.1 degrees Fahrenheit.	• The proposed project will not adversely impact climatic conditions in and around the area.
A.3	Agricultural Lands	• Plasch Econ Pacific Inc. and Munekiyo Hiraga prepared an Impacts on Agriculture report, analyzing potential impacts the project has on agricultural resources. • The project area and surrounding fields were used for a pineapple plantation from the 1920s to 1992. Since then, the project area and the surrounding fields have been fallow. • Agricultural issues are primarily due to a lack of irrigation water. • The proposed site is located on lands designated as "Unique" by the Agricultural Lands of Importance to the State of Hawaiʻi (ALISH). • The underlying land for the proposed site is characterized by a low productivity rating of "D" for agriculture by the University of Hawaiʻi (UH) Land Study Bureau (LSB) soils rating system. A small portion of the project area has the lowest LSB soils rating of "E."	• Although the development of the proposed project will result in a loss of 200 acres of agricultural lands on Lānaʻi, the lands are characterized by a low productivity rating and have not been cultivated since the pineapple plantation closed in 1992. • The 200-acre site amounts to only 1.1 percent of the approximately 18,000 acres of former plantation lands on Lānaʻi that remain available for agricultural use. • The loss of agricultural land will be offset by the benefits of the project, including: 1) employment generated by construction activity and onsite commercial and industrial activity; 2) offsite economic activity generated by the purchases of goods and services by construction companies and the families of construction workers; 3) tax revenues derived from County property taxes and State taxes (excise, personal income, and corporate income); and 4) goods and services provided by businesses of the project.

REF-12

Section	Category	Existing Conditions	Potential Impacts and Mitigation Measures
A.4	Topography and Soils Characteristics	• The project area is situated on gently to moderately sloping lands that were part of a large pineapple plantation. • The soils in and around the project area are generally well drained and the soils can be expected to be low in organic matter. Further, the soil is not ideal for the growing of most commercially viable crops due to poor soil.	• Grubbing and grading will be required for project implementation. • An erosion control plan will be prepared to minimize soil erosion from wind and rain, and, if applicable, a grading plan will be prepared and submitted for review and approval to the Development Services Administration, County of Maui, and Department of Public Works. • No impacts on geological resources are noted. • Implementation of BMPs will ensure that the alterations to the terrain minimize erosion, water quality degradation and other environmental impacts. • Upon completion of construction, significant adverse impacts to topography or soil characteristics are not anticipated.
A.5	Flood, Tsunami, and Sea Level Rise Hazards	• The project site is located approximately 3.5 miles inland from the shoreline and is not within the tsunami inundation zone, as well as outside of the projected 3.2-foot sea level rise exposure area.	• The proposed action does not present any risks of flooding, tsunami or sea level rise hazards.
A.6	Streams and Wetlands	• Although historical evidence suggests the existence of perennial streams, no surface water resources currently exist on the island. There are also no wetlands located on or in the immediate vicinity of the proposed project site.	• The proposed action presents no impacts to streams or wetlands.
A.7	Flora and Fauna	• Robert Hobdy prepared a Flora and Fauna Study for the proposed project. • The entire project area has lain fallow from agricultural use for 25 years, with some grazing occurring during a few of these years. The vegetation was a dense growth of grasses and shrubs. • **Flora:** ➢ The vegetation within the project area is dominated by hardy, invasive non-native species. ➢ Just three (3) common native plant species were found, ‘ilima (*Sida fallax*), ‘uhaloa (*Waltheria indica*) and ‘a‘ali‘i (*Dodonaea viscosa*), all of which are widespread and common throughout Hawai‘i, causing no conservation concern. ➢ No special habitats for native plants were found.	• **Flora:** ➢ It is determined that there is nothing of special botanical concern with regard to this project. No recommendations with reference to plants were deemed necessary by the Flora and Fauna Study. • **Fauna:** ➢ No Endangered Hawaiian bats were detected in the project area during the survey. ➢ The Flora and Fauna Study recommended that any significant outdoor lighting associated with the proposed project be hooded to direct the light downward to mitigate this threat. ➢ The U.S. Fish and Wildlife Service provided recommended more specific avoidance and minimization measures as it relates to the

REF-13

Section	Category	Existing Conditions	Potential Impacts and Mitigation Measures
		• **Fauna:** ➢ The fauna recorded in this project area is largely non-native in character, and the habitat is unsuitable for Hawai‘i’s native forest birds or seabirds. ➢ Just one (1) mammal species (axis deer) was observed in the project area. No Hawaiian hoary bats were detected. ➢ Other non-native mammals likely to frequent this area include rats (*Rattus spp.*), mice (*Mus domesticus*), feral cats (*Felis catus*) and occasionally domestic dogs (*Canis familiaris*). ➢ Eight (8) non-native bird species were recorded. ➢ Two (2) native bird species were recorded, the indigenous and migratory kōlea or Pacific golden-plover and the endemic pueo or Hawaiian owl (*Asio flammeus sandwichensis*). ➢ Insect life was sparse in this habitat and no native insect species were seen.	endangered Hawaiian petrel that may occur in the vicinity to pass through the project area.
A.8	Archaeological Resources	• T. S. Dye & Colleagues, Archaeologists prepared an Archaeological Inventory Survey (AIS) with subsurface testing. • The State Historic Preservation Division (SHPD) accepted the AIS on August 4, 2020. • A 100 percent pedestrian survey of the area was conducted and 31 backhoe trenches were excavated. No artifacts were collected from any of the trenches excavated. • The pedestrian and survey subsurface testing resulted in the identification and documentation of two (2) historic properties, designated Site 50-40-98-1980 and Site 50-40-98-1981. • Both historic properties are evaluated as significant for the important information on Hawaiian history and prehistory that they have yielded.	• The AIS recommended that a data recovery plan be developed for Sites 50-40-98-1980 and 50-40-98-1981, and that this plan be implemented prior to proposed construction activities within the parcel. SHPD concurred with this recommended mitigation. • The Applicant will prepare a Data Recovery Plan for submittal and review by SHPD. • The Applicant will comply with all applicable County, State and Federal laws and rules regarding the treatment of archaeological and historic sites.
A.9	Cultural Resources	• Attestation letters, interviews with lineal descendants of Lana‘i and a Ka Pa‘akai Analysis and Determination were conducted to provide cultural background and research for the proposed project. • The AIS prepared for the proposed project also included research compliant with guidelines for development of a Cultural Impact Assessment (CIA) study.	• The Ka Pa‘akai Analysis and Determination conducted for the project determined that the availability and accessibility of cultural resources in the region will not be significantly impacted. Therefore, the project will not have any significant negative impact on traditional and customary practices.

Section	Category	Existing Conditions	Potential Impacts and Mitigation Measures
		• The AIS includes descriptions of traditional knowledge of place, and traditional and customary practices as documented in Hawaiian language accounts from Lānaʻi. It also cited important historical accounts penned by foreign residents and visitors, documenting the changes in land use, access and residency from the 1840s to the 1950s. • No native tenant kuleana (property rights) or Royal Patent Grants were issued for lands within the project area.	
A.10	Air Quality	• Air quality in the region is generally good due to the prevailing trade winds.	• Appropriate dust control measures and Best Management Practices (BMPs) will be implemented during construction to minimize the effects of fugitive dust. • From a long-term perspective, activities which may have air quality impacts will be regulated by the State Department of Health (DOH). • The Miki Basin Industrial Park includes the relocation of an existing, asphalt plant, the relocation of an existing concrete recycling, and rock crushing operation, and materials storage and stockpiling of building and construction materials. BMPs will be employed for these uses including dust control measures and storage and transportation practices that minimize particulate emissions into the air. Inasmuch as these facilities are relocations of existing facilities, new air quality impacts are not anticipated. • More than half the 200-acre project is planned for renewable energy projects (127 acres), which will not generate adverse air quality impacts. • While specific uses for the 26 acres of new industrial space have not been solidified, many of the potential uses contemplated generally do not represent noxious uses, such as warehouses and testing facilities, and would not be a source of air pollution. It is noted that before any air pollution sources can be built, an application must be filed with the DOH with detailed information on such sources. If deemed appropriate, the DOH may require the applicant to assess the air quality impact of the proposed

Section	Category	Existing Conditions	Potential Impacts and Mitigation Measures
			emissions. A permit from the DOH will be required for air pollution sources.
A.11	Greenhouse Gas Considerations	• The Federal Greenhouse Gas Reporting Program requires mandatory reporting of GHG emissions from sources that emit 25,000 metric tons or more of carbon dioxide equivalent (C02 EQ) per year in the United States. • On Lānaʻi, there are no facilities operating at or above the 25,000 metric ton level.	• The proposed project will include 127 acres for renewable energy projects, including photovoltaic equipment with battery storage, which will reduce the island's dependence on fossil fuels and GHG emitting infrastructure. • The proposed action is not anticipated to create significant direct and indirect foreseeable GHG emissions, and does not fall within the threshold of mandatory GHG reporting.
A.12	Noise	• The existing noise environment in and around the project study area is dominated by noise from airport-related activities, including roadway use and aircraft taxiing, taking off, and landing at the airport. • No noise-sensitive areas are present within the project study area, and no incompatible land uses are present within the project study area.	• Sound attenuating construction equipment will be used where practicable and necessary, to mitigate noise impacts caused by construction. • Night-time construction activity is not anticipated for the proposed project. • Future uses include the relocation of existing facilities, which do not represent new noise impacts. The Applicant will work to minimize noise emissions at the concrete recycling and rock crushing operation, including the maintenance and operation of all combustion powered equipment and vehicles. • Future new industrial users will also be responsible for complying with all applicable DOH rules and regulations relating to noise impacts. • The proposed project site was selected, in part, due to its close proximity to similar industrial uses, as well as its distance from noise-sensitive areas.
A.13	Hazardous Materials	• TRC Environmental Corporation (TRC) prepared a Phase I Environmental Site Assessment (ESA) of the approximately 200-acre proposed project site. • No transformers were observed on the • site. Utility owned pole-mounted transformers are located adjacent to the property area. • No underground storage tanks (USTs) or above ground storage tanks (ASTs) are located on the site. • DOH records did not indicate any concerns associated with the site.	• Cement processed at the concrete recycling and rock crushing operation will be free of paint or other hazardous products. Any rebar will be removed and shipped off-island for appropriate disposal in a landfill. • Future industrial uses at the project site will be regulated by applicable federal and state law and industry standards. • Wastewater generated by the concrete recycling and rock crushing operation will be recycled back into production via a fully integrated system and

Section	Category	Existing Conditions	Potential Impacts and Mitigation Measures
		• The Phase I ESA has also revealed no evidence of de minimis conditions in connection with the site. • The Phase I ESA has revealed no evidence of both, Recognized Environmental Conditions (RECs) and Historical Recognized Environmental Conditions (HRECs) in connection with the site.	conform to rules and regulations of the Clean Water Act.
A.14	Scenic and Open Space Resources	• The proposed project is located approximately four (4) miles southwest of Lāna'i City and abuts the southeast end of Lāna'I Airport. Additionally, the proposed project is not located near traditional access or walking trails between the coast or upland areas.	• The proposed Miki Basin Industrial Park will have complementary uses to the neighboring facilities and no significant adverse impacts to open space or scenic resources are anticipated as a result of the project.
A.15	Beach and Mountain Access	• The project is located approximately six (6) miles from the nearest beach and approximately ten (10) miles from the peak of Lānaʻihale.	• There are no traditional access trails identified in close proximity to the proposed project area. Accordingly, there are no anticipated adverse impacts to beach and mountain access from the proposed project.
B	**SOCIO-ECONOMIC ENVIRONMENT**		
B.1	Population and Demography	• Maui County's population in 2019 is estimated at approximately 167,400 according to the U.S. Census Bureau, an increase of approximately 8.0 percent since 2010, when the population stood at 154,924. • The population on Lāna'i has fluctuated over the decade. In 2019, the five-year population estimate for the island was 2,730 residents. • The Lānaʻi Community Plan notes that an additional 885 residents are forecasted to live on the island by the year 2030, for a total population of 4,020. It was noted that increased economic activity and development plans on the island may result in population growing beyond the original forecast to up to 6,000.	• The proposed project is not a direct population generator and, thus, not anticipated to have a significant adverse impact on population or demographic trends on Lānaʻi.
B.2	Economy	• Since the 1990s, the two (2) resorts on Lānaʻi have been the primary driving forces for the economy. The purchase of goods and services by visitors, retirees, part-time residents, the hotel, and hotel employees generate most of the jobs on Lānaʻi. • According to the data from the State Department of Labor and Industrial Relations, there were 1,500 (annual average) non-agricultural jobs on Lānaʻi in 2020 (Department of Labor and Industrial Relations, 2020). Jobs in the leisure and hospitality industry accounted for 600 (annual average) jobs, or 40 percent.	• An Economic, Population and Fiscal Impacts Report was prepared for the project by Plasch Econ Pacific Inc. • Over the initial 10-year development period, when most of the development is expected to occur, total construction expenditures are estimated at $78.8 million, or an average of $7.9 million per year. Construction expenditures plus indirect sales related to construction expenditures are expected to average $12.9 million per year based on State economic multipliers.

Section	Category	Existing Conditions	Potential Impacts and Mitigation Measures
		• In July 2021, unemployment on Lānaʻi was 3.8 percent. • Sensei Farms was established in recent years and has been providing produce to the resorts, restaurants, and businesses on island. In 2020, it began exporting produce to every island in Hawaiʻi. This new enterprise provides diversity for the economy.	• Construction employment is expected to average about 19 jobs per year with direct payroll of $1.7 million per year. • During construction, the State will net approximately $5.6 million in tax revenues, largely comprised of general excise taxes and corporate and personal income taxes. The County derives negligible income from development activity. • By 2030, new economic activities at the Miki Basin Industrial Park are expected to generate about $17.1 million per year in revenues and approximately 60 new jobs with total payroll estimated at $2.8 million. • The project is expected to have a net positive fiscal impact for the State and County of $670,000 per year and $380,000 per year, respectively.
C	**PUBLIC SERVICES**		
C.1	Police and Fire Protection	• The project site is within the service area of the Maui Police Department's District II Lānaʻi patrol district which services the island of Lānaʻi. • Fire prevention, suppression, and protection services for the island of Lānaʻi are provided by the County Department of Fire and Public Safety's Lānaʻi Fire Station.	• The proposed activity is not anticipated to adversely impact public services or facilities and utilities, and will not expand the service limits for public services and infrastructure.
C.2	Medical Services	• The Lānaʻi Community Hospital is the only hospital on the island of Lānaʻi. It has limited 24-hour emergency care, acute care and diagnostic imaging. It also provides long-term care (including skilled and intermediate nursing care).	• The proposed project will not adversely affect medical services in the area.
C.3	Solid Waste	• The Lānaʻi Landfill on Kaumālapaʻu Highway accepts municipal solid waste and construction debris dropped-off from commercial and residential customers. In addition, personal delivery to the landfill of municipal solid waste, green waste, and trash is available. • Pūlama Lānaʻi sponsors rural recycling collection events for hard to recycle items including: appliances, small scrap metal and vehicle batteries and tires. The County has recycling programs for computers/electronics and household batteries.	• During the initial short-term construction phase of the project, the contractor will develop and implement a construction-generated waste disposal plan. Appropriate construction debris will be taken to the landfill. • Individual users at the Miki Basin Industrial Park will be responsible for disposing of solid waste, recyclables, and green waste consistent with State and County regulations and programs. • By-products from the concrete crushing operation will be recycled as much as possible.

REF-18

Section	Category	Existing Conditions	Potential Impacts and Mitigation Measures
			• Inasmuch as the concrete crushing operation represents a relocation of an existing use, significant new solid waste generation is not anticipated.
C.4	Education Facilities	• Lāna'i High and Elementary School reported the enrollment of 565 students for the 2020 to 2021 school year. It is the only school that serves educational needs on the island of Lāna'i.	• The proposed Miki Basin Industrial Park is not a population generator and, as such, adverse impacts on educational facilities are not anticipated.
C.5	Recreational Resources	• The Maui County Department of Parks and Recreation and Lāna'i public schools maintain a number of recreation resources on the island of Lāna'i. County parks and facilities in Lāna'i City include: the Lāna'i Community Center, the Lāna'i Gym and Tennis Courts; and the Lāna'i Little League Field; Fraser Avenue Park and Kāumālapā'u Highway/Fraser Avenue Park. • Pūlama Lāna'i also owns and maintains a number of recreational facilities that are available to public use including Dole Park, Olopua Woods Park, Waialua Park, Hulopoe Beach Park, and the Lāna'i Recreational Center.	• The proposed action is not expected to adversely impact existing recreational facilities or generate a need for additional facilities.
D	**INFRASTRUCTURE**		
D.1	Roadways	• A Traffic Impact Analysis Report (TIAR) was prepared by Austin, Tsutsumi, and Associates, Inc. (ATA), to evaluate the traffic impacts resulting from the proposed 200-acre Miki Basin Industrial Park. • The report studied the following existing roadways: ➢ Kaumālapa'u Highway ➢ Miki Road • The Kaumālapa'u Highway/Miki Road intersection currently operates with all movements at Level of Service (LOS) B or better during the AM and PM peak hours of traffic. • No significant delays or queuing were observed at the intersection during either peak hour of traffic.	• It is assumed that at least two (2) driveway access points to the project site will be provided along Miki Road. Project Driveway 1 provides access to the light and heavy industrial areas west of Miki Road and Project Driveway 2 provides access to the light industrial area east of Miki Road. • The proposed project is anticipated to generate 161 trips during the AM peak hour of traffic and 163 trips during the PM peak hour of traffic. • The TIAR recommendations are to widen Miki Road between its intersection with Kaumālapa'u Highway to the project driveway(s) and provide an exclusive westbound left-turn deceleration lane. • Upon completion of the project, all intersection movements are forecast to operate at LOS B or better during the AM and PM peak hours of traffic.

REF-19

Section	Category	Existing Conditions	Potential Impacts and Mitigation Measures
D.2	Water	**Water System** • Akinaka & Associates, Ltd. prepared a Water Master Plan to analyze the condition of the existing water distribution system and provide a plan for the new project water demands. • Water for Miki Basin is currently provided by the Mānele Water System (Public Water System 238 ("PWS 238")) which is owned, operated, and maintained by the Lānaʻi Water Company. • PWS 238 is interconnected with the Lānaʻi City Water System (Public Water System 237 ("PWS 237")). During emergencies, PWS 237 can be connected to PWS 238 by opening a valve. • The existing average daily water usage of PWS 238 is currently estimated at 433,000 gallons per day (GPD). • Existing water demand for the Concrete Batch Plant (CBP) is 3,500 GPD, which is currently provided by PWS 238. • Existing water demand for the asphalt plant is 1,000 GPD, which is currently provided by PWS 237. **Water Availability** • There are two (2) aquifers on Lānaʻi, the Leeward Aquifer system and Windward Aquifer system, each with a sustainable yield of 3.0 million gallons per day (MGD). Together, the total sustainable yield for the island of Lānaʻi is 6.0 MGD.	**Water System** • The estimated water demand for the full buildout of the Miki Basin Industrial Park is 163,125 GPD, which includes the existing and new or incremental estimated water demand. • The Water Master Plan provided a list of improvements that will be required to support full buildout of the industrial park. These improvements include modifying or replacing the existing PRV, drilling a new source or multiple sources to obtain an additional minimum pump capacity of 426 gallons per minute (GPM), and evaluating the condition of sections of the Pālāwai Irrigation Grid, to determine the need for pipe repair, replacement, or possible abandonment. • A New Well Supply Alternatives study was prepared by Tom Nance Water Resource Engineering to evaluate potential well sites for the new water source requirement identified in the Water Master Plan. Three (3) potential well sites were evaluated. The study recommended development of a new well 2,000 feet northwest of existing Well No. 2. • Pūlama Lānaʼi will conform with the requirements of the Hawaiʻi Safe Drinking Water Branch and County of Maui Water System Standards in developing a safe drinking water system, and any other associated regulatory entity as it relates to installation, inspection, and maintenance of water systems on the site. **Water Availability** • The New Well Supply Alternatives report prepared by Tom Nance Water Resource Engineering concluded that a new well to supply the Miki Basin Industrial Park project can be accommodated within the Leeward Aquifer System's 3.0 MGD sustainable yield. • The total forecasted water demand for Lānaʻi (summation of current water demand, full buildout of Miki Basin Industrial Park and other proposed or approved projects) is 1.936 MGD, which is less than the Leeward Aquifer's 3.0

Section	Category	Existing Conditions	Potential Impacts and Mitigation Measures
			MGD sustainable yield and the island's sustainable yield of 6.0 MGD. • Based on the foregoing, significant adverse impacts to water resources are not anticipated as a result of the proposed project.
D.3	Wastewater	• Akinaka & Associates, Ltd. prepared a Wastewater Master Plan to identify and review the condition of the existing systems and analyze the existing systems for projected wastewater estimates for the project. • There is currently no existing County or privately owned or operated wastewater treatment system in the vicinity of the proposed project.	• The construction of onsite Individual Wastewater Systems (IWS), decentralized Wastewater Treatment Plants (WWTP) and collection systems will be required to support development activity. • Each development within the industrial park will be required to provide its own wastewater treatment system and associated wastewater collection system. • The proposed design average wastewater flow for full buildout of the industrial park is 80,179 GPD, with a design peak flow of 333,688 GPD. • The wastewater system for the Miki Basin Industrial Park will be designed in conformance with the requirements of the DOH and the County of Maui to ensure proper handling and treatment of wastewater generated by the project.
D.4	Drainage	• R.M. Towill Corporation prepared a Drainage Report to determine that the offsite and onsite drainage system requirements for the proposed Miki Basin Industrial Park meet the County of Maui Storm Drainage Standards. • Offsite runoff generated from the area north of Miki Road sheet flows and is intercepted by an unlined ditch along Miki Road. Once in the unlined ditch, the runoff flows towards the southeast direction to a low point in Miki Road, near the existing MECO facility. • There is no existing storm drain system within the project area. • Offsite runoff, including runoff generated from the MECO facility, is diverted around the Miki Basin Industrial Condominium site and is discharged into an existing drainageway. Runoff generated within the existing Miki Basin Industrial Condominium site is	• The development of the proposed industrial parcels will increase the runoff onsite by 141.36 cubic feet per second (cfs). • The additional flow generated within the proposed parcels can be accommodated by the existing Miki Basin and Pālāwai Basin. • Existing drainage patterns will be maintained by discharging intercepted offsite runoff to its original flow path. Offsite runoff will be collected by interceptor ditches located on the perimeter of the site that discharge to existing drainageway and ultimately to Miki Basin. The additional runoff volume is negligible compared to the available basin capacity. Stormwater treatment will not be provided for this project since the runoff flows into an existing offsite sump with no outlet to the ocean. Applicable law will be followed to minimize soil

REF-21

Section	Category	Existing Conditions	Potential Impacts and Mitigation Measures
		collected by an onsite drainage system and is discharged offsite.	movement, erosion and compaction during all project actions.
D.5	Electricity and Telephone Systems	• The MECO powerplant is adjacent to the proposed project and provides energy to Lānaʻi Airport operations. The electrical service lines to the Airport are underground, running from Kaumālapaʻu Highway along the Airport access road to the Airport.	• The Miki Basin Industrial Park will include 127 acres for renewable energy projects, including photovoltaic equipment with battery energy storage. • The project is not anticipated to have an adverse impact on existing electrical, telephone, or cable television systems, nor is it expected to extend existing service area limits.

PROJECT OVERVIEW

I. PROJECT OVERVIEW

A. PROJECT LOCATION, EXISTING USE, AND LAND OWNERSHIP

Lānaʻi Resorts LLC, a Hawaiʻi Limited Liability Company doing business as Pūlama Lānaʻi ("Pūlama Lānaʻi" or "Applicant") is proposing the Miki Basin Industrial Park, a 200-acre master-planned light and heavy industrial development. The project is located on a portion of Tax Map Key (TMK) (2)4-9-002:061, approximately 3.2 miles south of Kaumālapaʻu Highway in Lānaʻi City, Maui County, Hawaiʻi. See **Figure 1**.

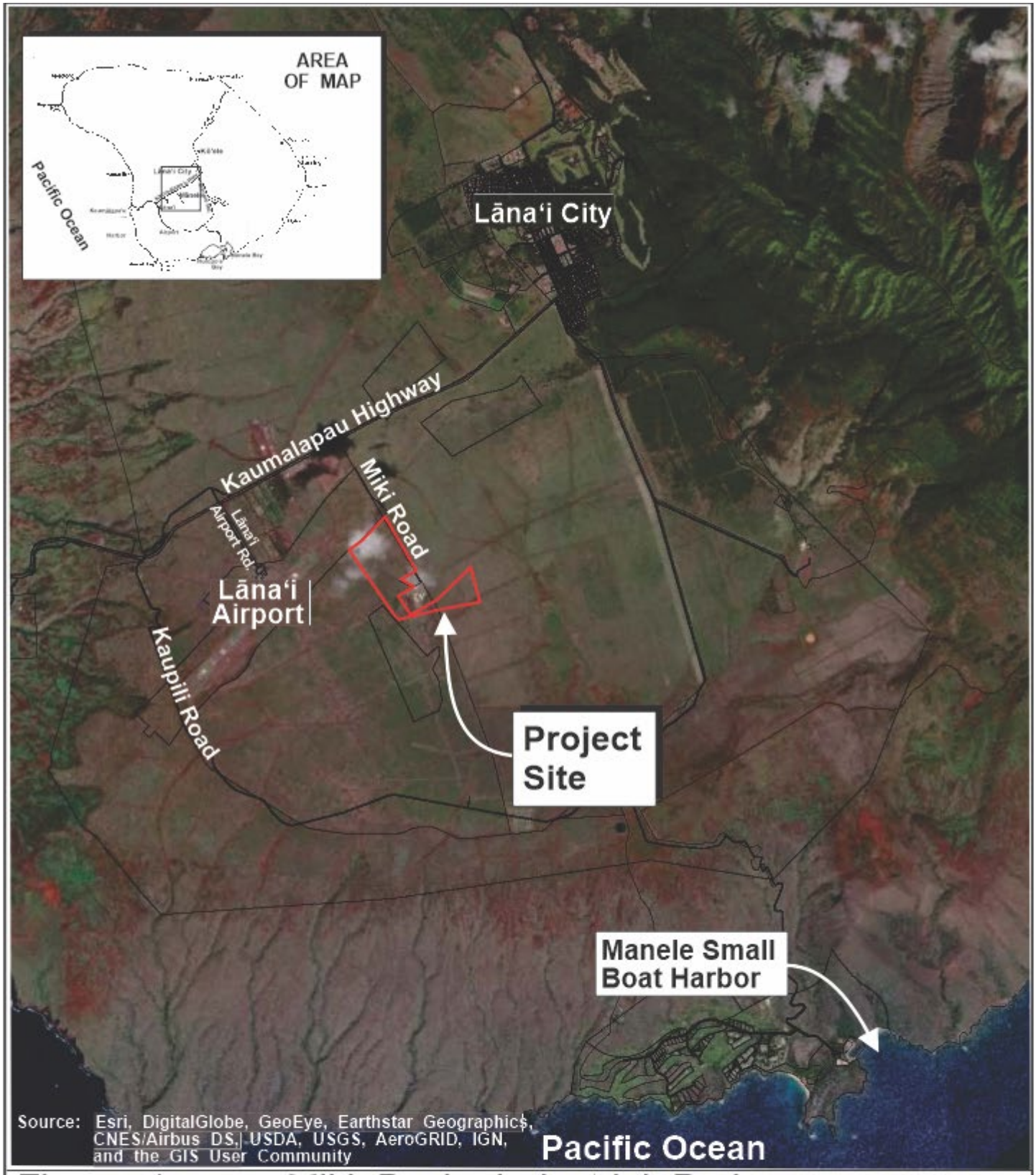
The project site is on land adjoining the Lānaʻi Airport, the Maui Electric Company (MECO) 5-acre power plant and the existing 20-acre Miki Basin Industrial Condominium. See **Figure 2**. This project implements the vision for placement of industrial land uses on the island and expands upon the much-needed industrially zoned land area called for in the Lānaʻi Community Plan.

The approximately 200-acre subject property is largely vacant and is owned by Pūlama Lānaʻi. The subject property is designated "Agricultural" by the State Land Use Commission and "Light Industrial" and "Heavy Industrial" by the Lānaʻi Community Plan. The project site is also designated "Agricultural", with a small portion designated "Interim" by Maui County Zoning.

An approximately 14.5-acre interim staging area has been established for industrial stockpiling and storage on a portion of the project area that borders the western side of the Miki Basin Industrial Condiminium. The Applicant has applied for a Land Use Commission Special Permit (SUP2 2021-0008) for the temporary area in advance of obtaining a District Boundary Amendment (DBA) and Change of Zoning (CIZ) for the proposed Miki Basin Industrial Park. The SUP2 application also includes the relocation of an existing concrete recycling and rock crushing operation.

B. PROPOSED ACTION

The proposed Miki Basin Industrial Area will include 127 acres for renewable energy projects (e.g., photovoltaic plus battery energy storage), 20 acres for infrastructure purposes (10 percent of the project area which will be used for roads, common areas, and other related uses), 12.5 acres for the relocation of an existing asphalt plant, and 26 acres for new industrial uses. The remaining 14.5 acres will be used for the relocation of an esixting concrete recycling and rock crushing operation, and for the storage and stockpiling of aggregate and construction materials. The concrete recycling and rock crushing operation would involve the use of equipment to crush demolished concrete and rock into various sizes for use as an aggregate base course for roadways, sidewalks, or similar, as well as backfill material throughout the island for current and future construction



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure 1 Miki Basin Industrial Park
Regional Location Map

0 2500 Feet
1250 5000

Prepared for: Lanai Resorts LLC, a Hawaii Limited Liability Company doing business as Pūlama Lānaʻi

MUNEKIYO HIRAGA

Pulama Lanai\MikiBasinExp 1769\Applications\Figures\Reg Location

REF-25

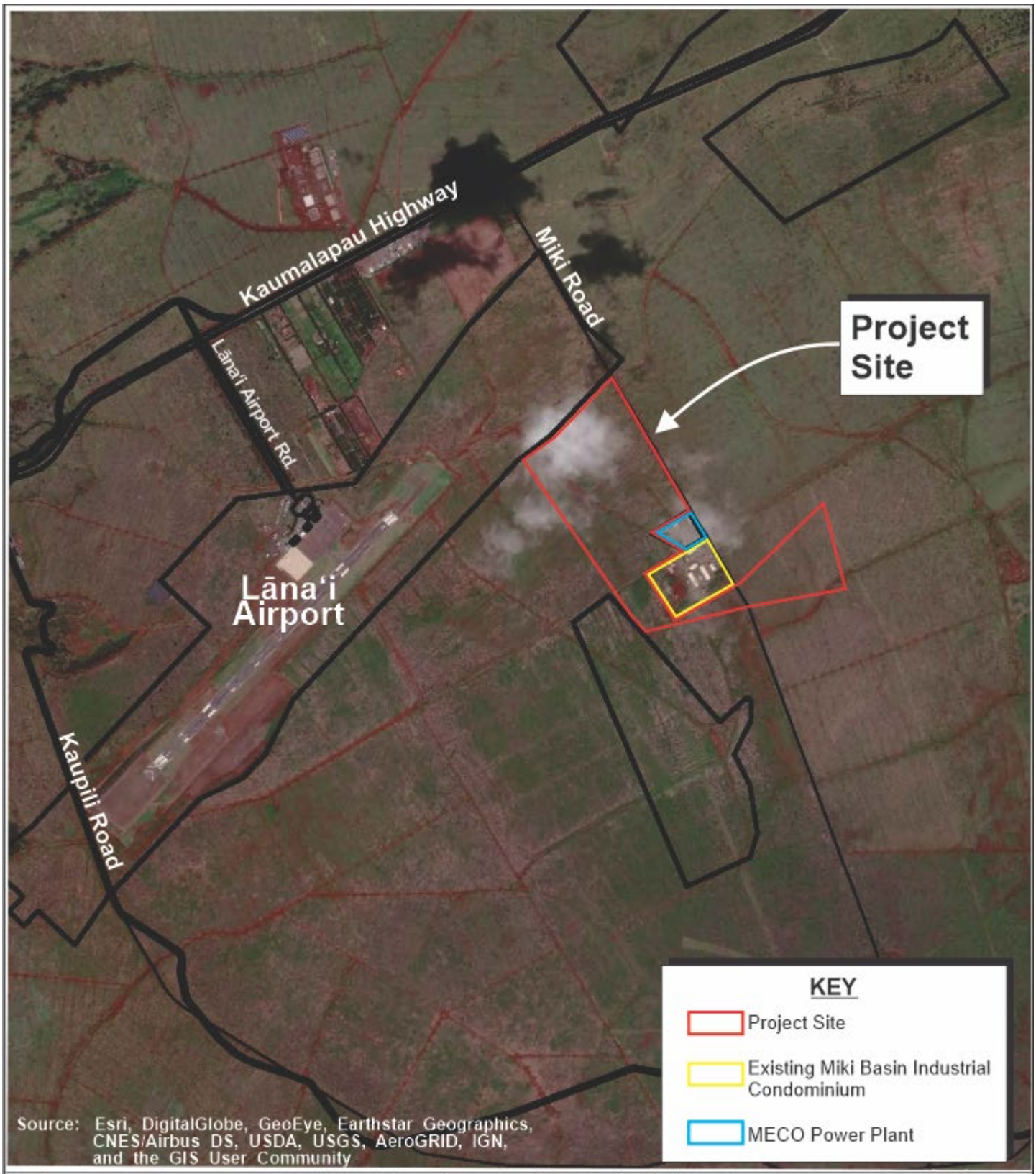


Figure 2 Miki Basin Industrial Park
Project Area Map

0 500 1000 2000 Feet

Prepared for: Lanai Resorts LLC, a Hawaii Limited Liability Company doing business as Pūlama Lānaʻi

MUNEKIYO HIRAGA

Pulama Lanai\MikiBasinExp 1769\Applications\Figures\Project Area

REF-26

projects. The source of these materials is from Pūlama Lānaʻi construction projects. See **Figure 3**.

Over 85 percent of the project area has been allocated for specific uses. Possible new future industrial uses include a slaughterhouse, warehouse space for cold storage, laboratory/testing facilities, niche product development, automotive services, multi-media facility, animal hospital, and other uses.

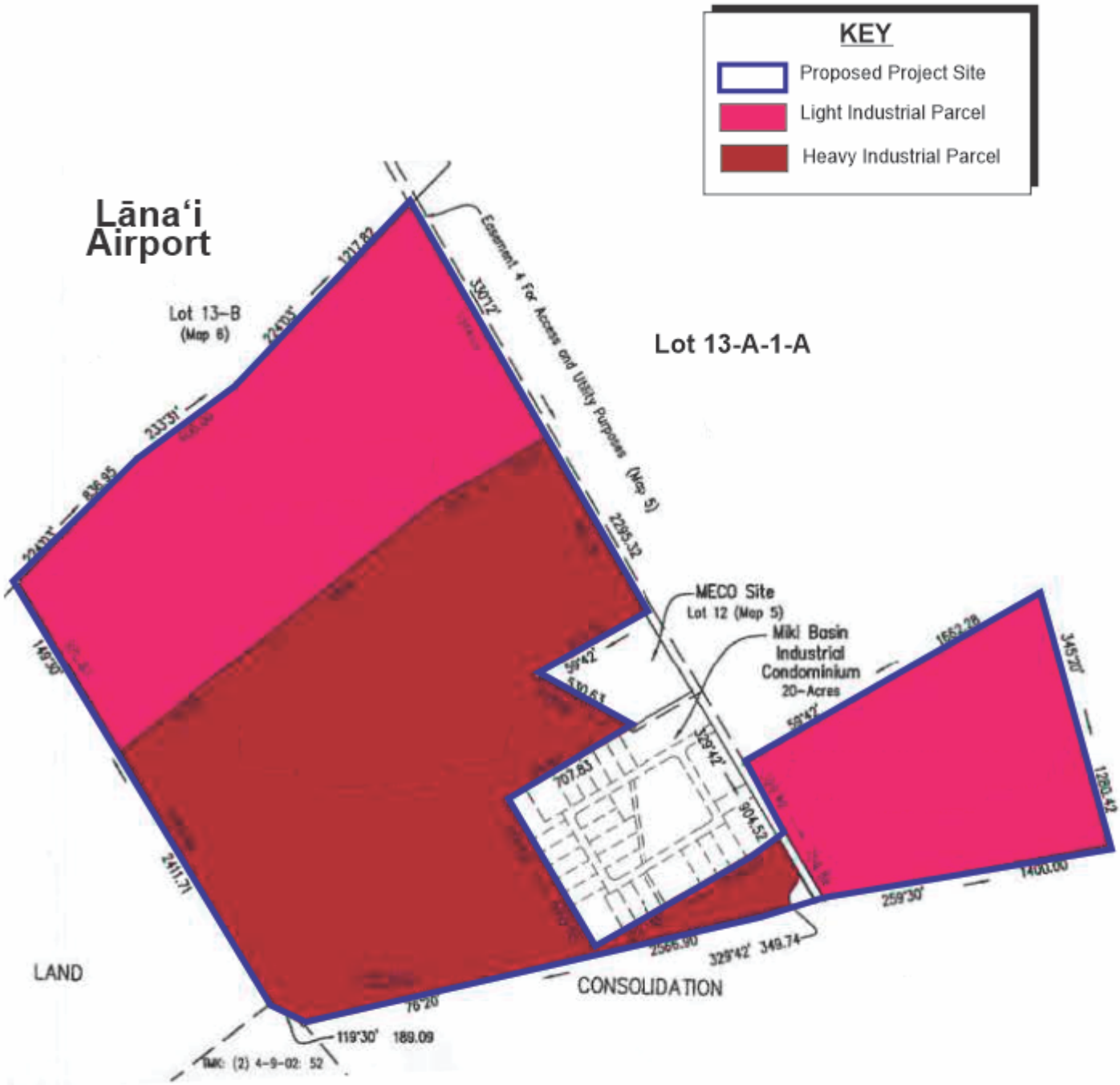
As a master-planned project, Pūlama Lānaʻi will develop the major common infrastructure, such as roads and electric and water utility lines. Individual tenants within the Miki Basin Industrial Park will be responsible for vertical development on their particular properties and for compliance with applicable regulatory requirements associated with their individual developments.

C. PROJECT PURPOSE AND NEED

The proposed Miki Basin Industrial Park will provide much needed industrial land on Lānaʻi, and a much needed industrial park. Currently, vacant industrial land is not available on the island. The project will provide space for the relocation and/or expansion of existing industrial activities on Lānaʻi, land and warehouses for storing goods and equipment, and land and buildings to accommodate industrial activities new to Lānaʻi. Readily available industrial land is important to take immediate advantage of any new economic opportunities which may arise.

According to the Market Assessment prepared for the project, pent-up demand for industrial land and industrial space to accommodate "typical industrial activities" (i.e., manufacturing, warehouses, base yards, etc.) is readily apparent on Lānaʻi. Many businesses in Lānaʻi City are operated from homes, partly because there are no industrial parks on Lānaʻi that serve smallscale tenants. Yards and rooms are used for operations and to store equipment and supplies. In some cases, inadequate space may be limiting local companies' ability to expand. For some of these businesses, an industrial park may be a more suitable location because of more space, visual impacts, noise, odors, dusts, etc. Many of these home businesses provide a second source of income for workers employed elsewhere on Lānaʻi. If industrial space were available, some business owners might opt to expand their companies into full-time operations. In other cases, businesses are operated from vans and residences, and some might benefit from a permanent location in an industrial park. In addition, some industrial activities may fail to develop on Lānaʻi due to a lack of a suitable location.

Commitments are in place for 174 acres of the Miki Basin Industrial Park, representing over 85 percent of the project area. The Market Assessment anticipates additional demand for 7.6 acres for "typical industrial activities" (such as manufacturing, warehouses,



Source: Pūlama Lānaʻi

Figure 3 Miki Basin Industrial Park
Conceptual Site Plan

Prepared for: Lanai Resorts LLC, a Hawaii Limited Liability Company doing business as Pūlama Lānaʻi

MUNEKIYO HIRAGA

Pulama Lanai\MikiBasinExp 1769\Applications\Figures\Conceptual Site Plan

REF-28

baseyards, etc.) by 2030. The remaining 18.4 acres will provide land to take advantage of unforeseen new economic opportunities which may arise, and to accommodate the demand for industrial land beyond 2030. See **Appendix "A"**.

D. CHAPTER 343, HAWAIʻI REVISED STATUTES

Intersection improvements at Kaumālapaʻu Highway in the vicinity of Miki Road will be required. Kamālapaʻu Highway is a State roadway. The use of State lands triggers the need to prepare an Environmental Assessment (EA) pursuant to Chapter 343, Hawaiʻi Revised Statutes (HRS). The State of Hawaiʻi, Land Use Commission will serve as the Approving Agency for the EA. It is noted that a Draft EA was published for the Miki Basin Industrial Park on November 23, 2019. However, since the original publication of the Draft EA, additional information on the proposed project has been developed, including greater detail about the proposed uses within the project. The additional detail on proposed uses within the Miki Basin Industrial Park has allowed for updated technical studies to be prepared. In light of the foregoing, a second Draft EA has been prepared for the proposed project.

This EA has been prepared pursuant to Chapter 343, HRS and Chapter 11-200.1, Hawaiʻi Administrative Rules (HAR), and evaluates the potential impacts of the proposed relocation, describes proposed mitigation measures as required, discloses cumulative and secondary impacts, and describes alternatives to the proposed action considered.

E. OTHER REGULATORY CONSIDERATION

The subject property is designated "Agricultural" by the State Land Use Commission and "Light Industrial" and "Heavy Industrial" by the Lānaʻi Community Plan. The project site is also designated "Agricultural", with a small portion designated "Interim" by Maui County Zoning. The Applicant will seek a District Boundary Amendment (DBA) from the State of Hawaiʻi Land Use Commission (SLUC) to designate the subject property "Urban", as well as a Change of Zoning (CIZ) request to the Maui County Council for "M-1, Light Industrial" and "M-2, Heavy Industrial" designation. The EA will serve as the primary supporting document for the DBA and CIZ processes.

F. PROJECT COST AND TIME SCHEDULE

Full buildout of the proposed 200-acre Miki Basin Industrial Park will be developed incrementally over a period of 20 years. The first half of the potential development timeline includes the relocation of the existing concrete recycling and rock crushing operation and existing asphalt plant, as well as the construction of renewable energy projects. The new industrial uses will be implemented throughout the duration of the project. Over the initial 10-year development period, the estimated development cost for the Miki Basin Industrial Park is $78.8 million.

DESCRIPTION OF THE EXISTING ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION MEASURES

II

II. DESCRIPTION OF THE EXISTING ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION MEASURES

A. PHYSICAL SETTING

1. Surrounding Land Uses

a. Existing Conditions

The proposed Miki Basin Industrial Park will be located in an area that is approximately four (4) miles southwest of Lānaʻi City on land adjoining the Lānaʻi Airport, the Maui Electric Company (MECO) 5-acre power plant and the existing 20-acre Miki Basin Industrial Condominium. Kaumālapaʻu Highway is located to the north, while Miki Road runs through the project area. Beyond Kaumālapaʻu Highway and along Miki Road are largely vacant, undeveloped lands that were formerly used for pineapple cultivation.

b. Potential Impacts and Mitigation Measures

The Miki Basin Industrial Park will be located on lands formerly part of a large pineapple plantation. The lands have lain fallow since the plantation closed in 1992, and are now overgrown with a dense grassland and shrubs. The proposed Miki Basin Industrial Park will be compatible with existing industrial uses on neighboring properties and has been designated by the Lānaʻi Community Plan for industrial use. In this regard, the proposed action is not anticipated to have significant adverse effects on the neighboring facilities or the Lānaʻi Airport. Building the industrial park will allow existing industrial facilities currently scattered in business and residential areas in Lānaʻi City to relocate to more appropriate locations having the infrastructure and buffers necessary for industrial uses.

2. Climate

a. Existing Conditions

Like most areas of Hawaiʻi, the climate of Lānaʻi is relatively uniform year round. The tropical latitude of Lānaʻi, its position relative to storm tracts and the Pacific anticyclone, and the surrounding ocean combine to produce this stable climate. Variation in climate among different regions on Lānaʻi is largely left to local terrain. Daily temperatures in the region range between

an average low of 67.8 degrees and a high of 75.1 degrees Fahrenheit. Temperature data collected at the Lānaʻi Airport station show that on average, January is the coolest month and August as the warmest month (County of Maui, Office of Economic Development, 2019).

Recent rainfall gauge data was not available for Lānaʻi Airport, however, past data shows that rainfall in the region is seasonal, with the wettest month being January and the driest month being July. Precipitation data for Lānaʻi shows an average annual rainfall of 15.59 inches (County of Maui, Office of Economic Development, 2019).

b. Potential Impacts and Mitigation Measures

The proposed Miki Basin Industrial Park involves a 200-acre master-planned light and heavy industrial development. The proposed project is not anticipated to adversely impact climatic conditions in and around the area.

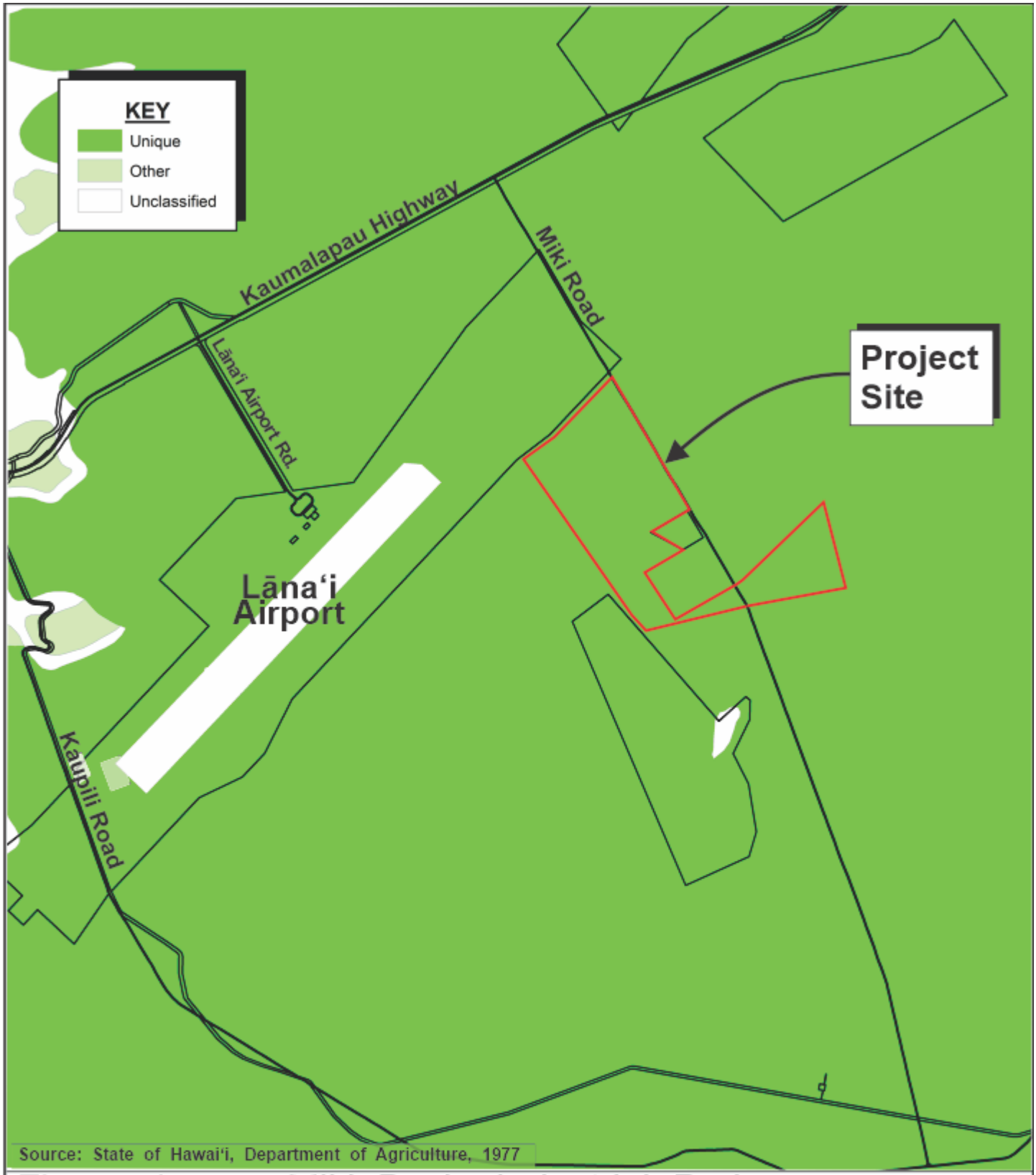
3. Agriculture

a. Existing Conditions

In 1977, the State of Hawaiʻi, Department of Agriculture developed a classification system to identify Agricultural Lands of Importance to the State of Hawaiʻi (ALISH), based primarily, though not exclusively, on soil characteristics of the underlying land. The three (3) classes of ALISH lands are “Prime”, “Unique”, and “Other Important” agricultural land, with the remaining non-classified lands termed “Unclassified”. When utilized with modern farming methods, “Prime” agricultural lands have soil quality, growing season, and moisture supply needed to produce sustained crop yields economically; while “Unique” agricultural lands contain a combination of soil quality, growing season, and moisture supply to produce sustained yields of a specific crop. “Other Important” agricultural lands include those important agricultural lands that have not been rated as “Prime” or “Unique”.

The proposed Miki Basin Industrial Park site is located on lands designated as “Unique” given its historic use for pineapple cultivation. See **Figure 4**.

Additionally, the University of Hawaiʻi (UH) Land Study Bureau (LSB) developed the Overall Productivity rating, which classified soils according to five (5) levels, with “A” representing the class of highest productivity soils and “E” representing the lowest. The underlying land for the proposed Miki Basin Industrial Park is characterized by a low productivity rating of “D” for



Source: State of Hawaiʻi, Department of Agriculture, 1977

Figure 4

Miki Basin Industrial Park
Agricultural Lands of Importance to the State of Hawaiʻi Map

0 500 1000 2000 Feet

Prepared for: Lanai Resorts LLC, a Hawaii Limited Liability Company doing business as Pūlama Lānaʻi

MUNEKIYO HIRAGA

Pulama Lanai\MikiBasinExp 1769\Applications\Figures\ALIGH

REF-33

agriculture by the LSB soils rating system. Furthermore, a small portion of the project area has the lowest LSB soils rating of "E." See **Figure 5**.

Plasch Econ Pacific Inc. and Munekiyo Hiraga prepared an Impacts on Agriculture report, analyzing potential impacts the project has on agricultural resources. See **Appendix "B"**.

The report considers the agricultural conditions of the proposed project area, past agricultural uses of the land, the impact of the project on existing agricultural operations in and near the project area, the impact of the project on the growth of diversified-crop farming, benefits of the project that would offset adverse agricultural impacts, and consistency of the project with State and County agricultural policies.

Land in the project area exhibits a number of favorable characteristics for farming, including gently sloping and well drained soils. However, due to the lack of available irrigation water, the project area is not suitable for intensive field farming. The project area and surrounding fields were used for a pineapple production, which only requires relatively little water, from the 1920s to 1992. Since then, the project area and the surrounding fields have been fallow.

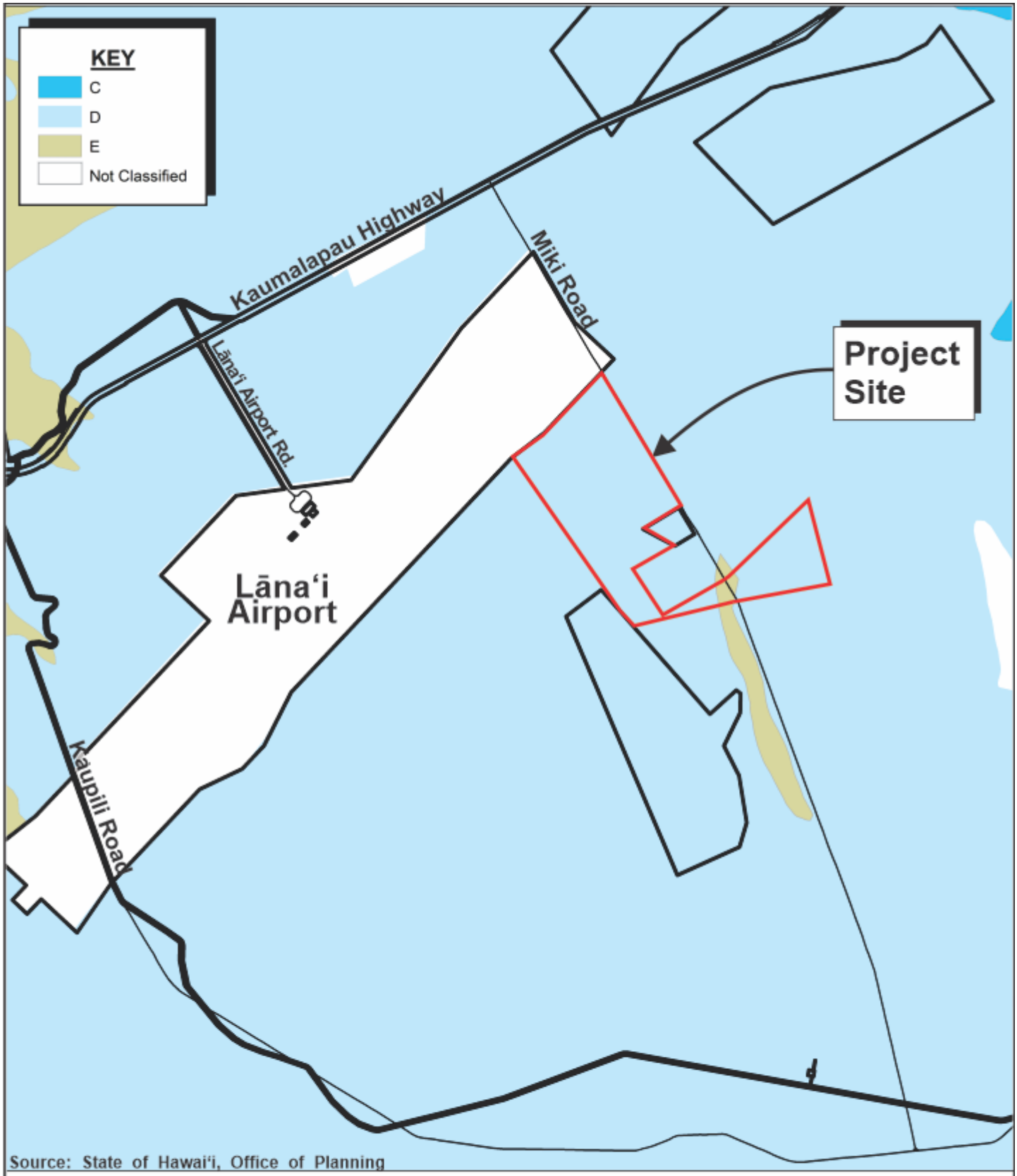
The report, prepared in February 2019, identified only one (1) commercial farmer operating on Lānaʻi and noted some part-time farmers who grow crops for personal consumption, and some sell to grocery stores. Since that time, Sensei Farms Lānaʻi has commenced operations of a hydroponic farm and is currently providing fresh produce to businesses on island and exporting to all the major Hawaiian Islands.

b. <u>Potential Impacts and Mitigation Measures</u>

Although the development of the proposed project will result in a loss of 200 acres of agricultural lands on Lānaʻi, the lands are characterized by a low productivity rating and have not been cultivated since the pineapple plantation closed in 1992.

Furthermore, the 200-acre site amounts to only 1.1 percent of the approximately 18,000 acres of former plantation lands on Lānaʻi that remain available for agricultural use.

The lack of significant growth of diversified crops reflects increased competition resulting from technology and other advances that have improved the delivery of fresh produce (faster, less spoilage, better coordination of supply to demand), along with trade agreements which



Source: State of Hawaiʻi, Office of Planning

Figure 5

Miki Basin Industrial Park
Land Study Bureau Map

0 500 1000 2000 Feet

Prepared for: Lanai Resorts LLC, a Hawaii Limited Liability Company doing business as Pūlama Lānaʻi

MUNEKIYO HIRAGA

Pulama Lanai\MikiBasinExp 1769\Applications\Figures\LSB

REF-35

increased food exports to the U.S. from low-cost producers in Mexico, Central America, South America, and elsewhere. While trucking distances to Lānaʻi City and Mānele Resort are short, Lānaʻi farmers are at a competitive disadvantage in supplying the Oʻahu and mainland markets because of shipping costs. Refer to **Appendix "B"**.

The loss of 200 acres of agriculture land on Lānaʻi, plus the loss of agricultural land due to other projects (i.e., the cumulative impact), is too small to affect the growth of diversified agriculture on Lānaʻi or Statewide.

Sensei Farms Lānaʻi has developed a hydroponic farm to supply fresh produce to local markets, and to off-island markets. There are currently six (6) greenhouses in operation, which are powered by an off grid photovoltaic and battery energy storage system. There are plans to expand the operations.

The loss of 200 acres of agricultural land will be offset by the benefits of the project, including:

(1) employment generated by construction activity and onsite commercial and industrial activity;

(2) offsite economic activity generated by the purchases of goods and services by construction companies and the families of construction workers;

(3) tax revenues derived from County property taxes and State taxes (excise, personal income, and corporate income); and

(4) goods and services provided by businesses of the project.

The project will not have any adverse effects on any existing onsite agricultural operations since the land has not been cultivated since the pineapple plantation closed in 1992. Therefore, the impacts on agriculture will be less than significant.

4. Topography and Soils Characteristics

a. Existing Conditions

The project area is situated on gently to moderately sloping lands that were part of a large pineapple plantation. These lands have lain fallow since the plantation closed in 1992, and are now overgrown with a dense grassland and shrubs.

Soils consist of three (3) series characterized as Waikapū silty clay loam (WRA, 0 to 3 percent slopes), Molokai silty clay loam (MuA, 0 to 3 percent slopes; MuB, 3 to 7 percent slopes; MuC, 7 to 15 percent slopes and Uwala silty clay loam (UwB, 2 to 7 percent slopes; UwC, 7 to 15 percent slopes), which are all variants of deep, well-drained soils of the upland plateau of Lānaʻi (U.S. Department of Agriculture (USDA), 1972). See **Figure 6**.

b. <u>Potential Impacts and Mitigation Measures</u>

Grubbing and grading will be required for project implementation. The project will comply with Chapter 20.08, Soil Erosion and Sediment Control, of the Maui County Code. An erosion control plan will be prepared to minimize soil erosion from wind and rain, and, if applicable, a grading plan will be prepared and submitted for review and approval to the Development Services Administration, County of Maui, Department of Public Works. No significant impacts on geological resources are noted.

Both short-term construction and long-term maintenance Best Management Practices (BMPs) will be included in any permit conditions. Implementation of BMPs will ensure that the alterations to the terrain minimize erosion, water quality degradation and other environmental impacts. Upon completion of construction, significant adverse impacts to topography or soil characteristics are not anticipated.

5. <u>Flood, Tsunami Hazards and Sea Level Rise</u>

a. <u>Existing Conditions</u>

As indicated by the Flood Insurance Rate Map for the County of Maui, the project site is located within Zone X. The Zone X designation corresponds to areas of minimal flood hazard, which are the areas outside the Special Flood Hazard Area and higher than the elevation of the 0.2-percent annual chance flood. See **Figure 7**.

The proposed project is approximately 3.5 miles inland from the shoreline and at a significantly high elevation, thus, the project site is not subject to any foreseeable negative impacts from tsunamis or sea level rise. The proposed improvements are located outside of the projected 3.2-ft. sea level rise hazard area as identified in the Hawaiʻi Sea Level Rise Vulnerability and Adaptation Report published in 2017 by the Hawaiʻi Climate Change Mitigation and Adaptation Commission.

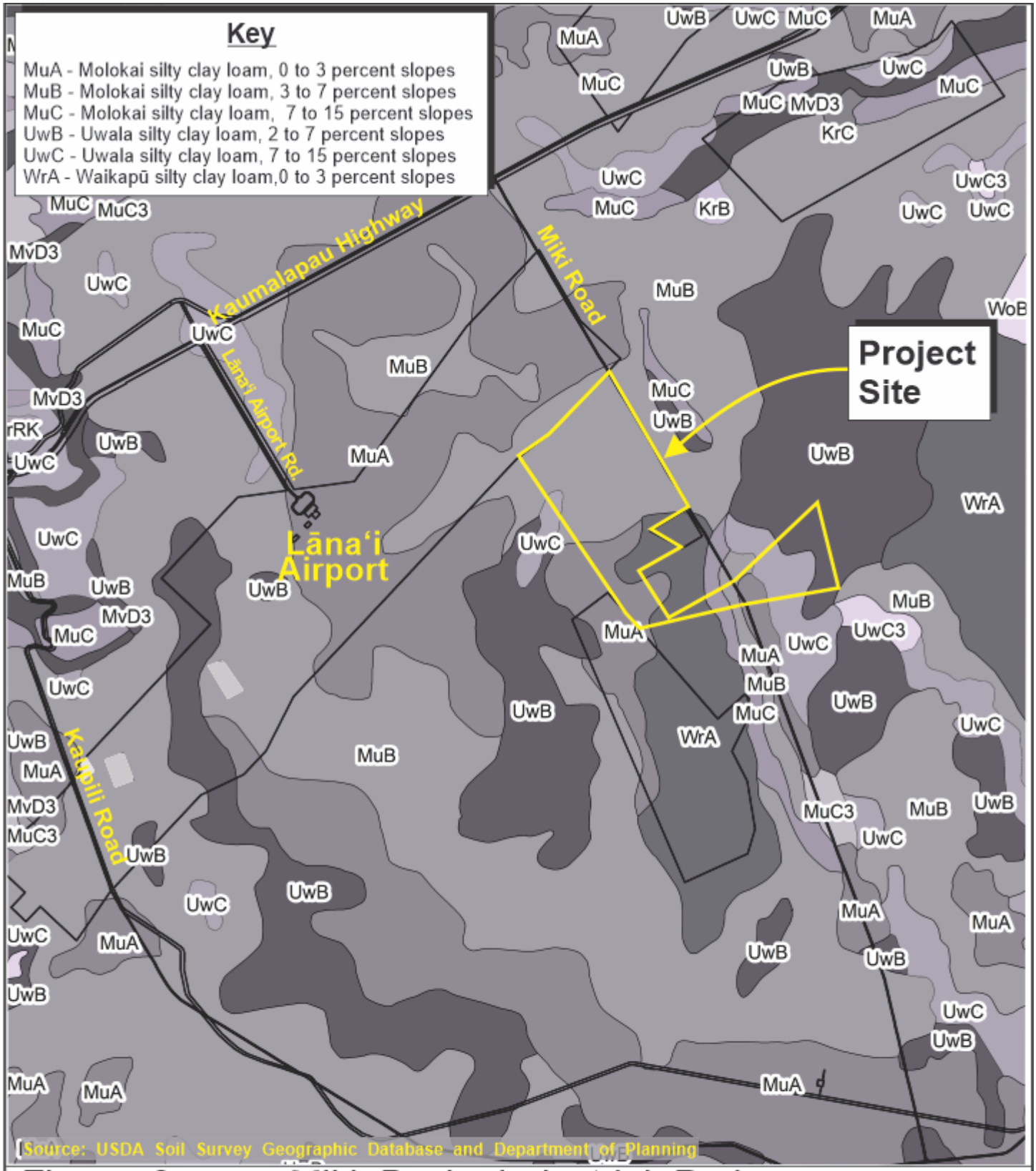


Figure 6

Miki Basin Industrial Park
Soil Classification Map

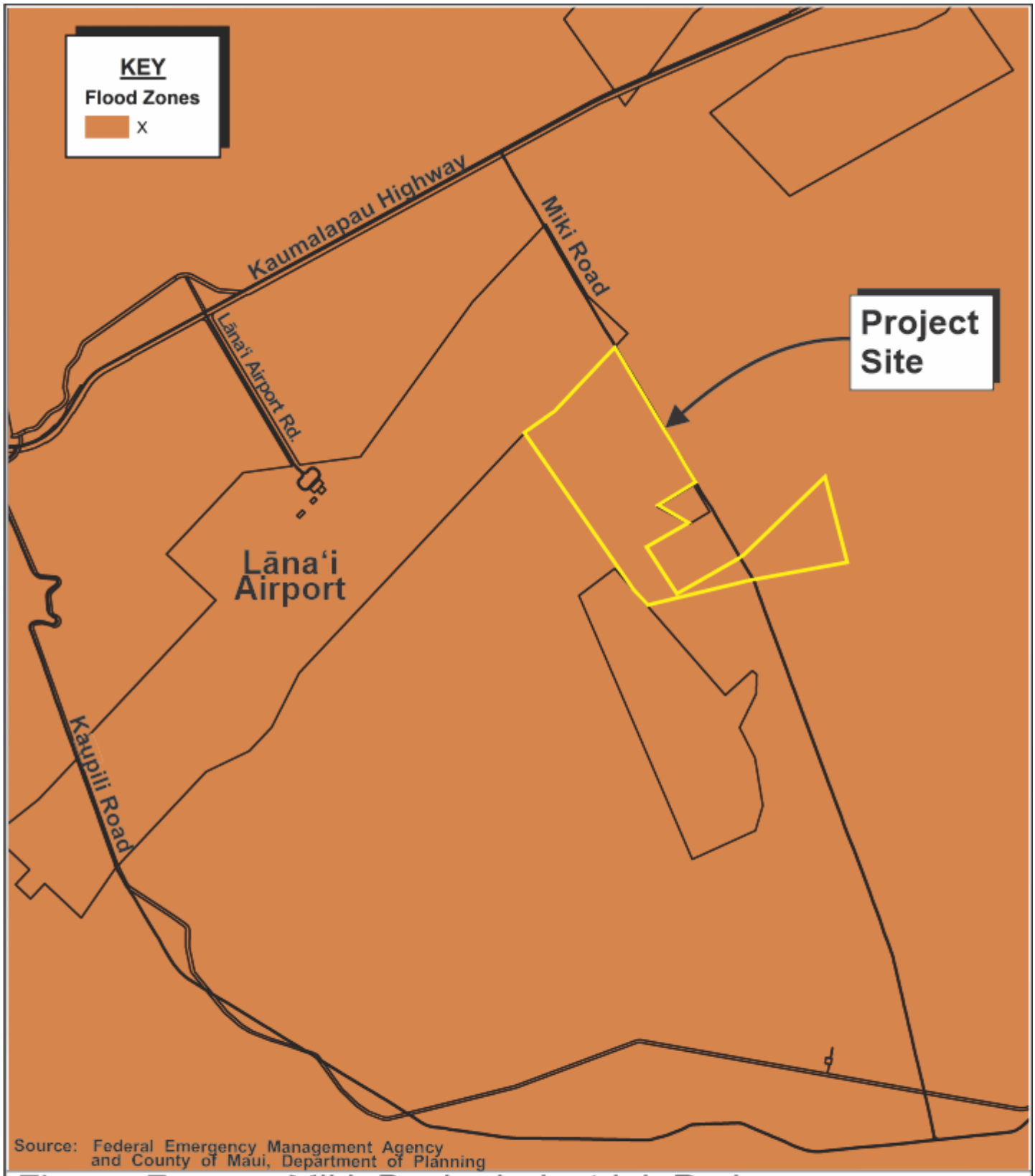
0 500 1000 2000 Feet

Prepared for: Lanai Resorts LLC, a Hawaii Limited Liability Company doing business as Pūlama Lānaʻi

MUNEKIYO HIRAGA

Pulama Lana'i\MikiBasinExp 1769\Applications\Figures\SOILS

REF-38



Source: Federal Emergency Management Agency and County of Maui, Department of Planning

Figure 7 Miki Basin Industrial Park
Flood Insurance Rate Map

0 500 1000 2000 Feet

Prepared for: Lanai Resorts LLC, a Hawaii Limited Liability Company doing business as Pūlama Lānaʻi

MUNEKIYO HIRAGA

Pulama Lanai\Miki Basin\Exp 1759\Applications\Figures\FIRM

REF-39

b. **Potential Impacts and Mitigation Measures**

Due to the project location, significant adverse impacts related to flood hazards, tsunamis, or sea level rise are not anticipated.

6. Streams and Wetlands

a. **Existing Conditions**

Although historical evidence suggests the existence of perennial streams, no surface water resources currently exist on the island. There are also no wetlands located on or in the immediate vicinity of the proposed project site (County of Maui, Department of Water Supply, 2011).

b. **Potential Impacts and Mitigation Measures**

No surface water resources currently exist on Lānaʻi, thus there will be no impacts to streams or wetlands.

7. Flora and Fauna

a. **Existing Conditions**

Robert Hobdy prepared a Flora and Fauna Study for the proposed project in April 2018. See **Appendix "C"**.

(1) **Flora**

The entire project area has lain fallow from agricultural use for 25 years, with some grazing occurring during a few of these years. The vegetation was a dense growth of grasses and shrubs. Thirty-nine (39) plant species were recorded during the survey. Two (2) species were abundant throughout the project area, Guinea grass (*Megathyrsus maximus*) and lantana (*Lantana camara*). Another two (2) species were common, sourgrass (*Digitaria insularis*) and Madagascar fireweed (*Senecio madagascariensis*). The remaining 35 species were either of uncommon or rare occurrence.

Just three (3) common native plant species were found, ʻilima (*Sida fallax*), ʻuhaloa (*Waltheria indica*) and ʻaʻaliʻi (*Dodonaea viscosa*), all of which are widespread and common throughout Hawaiʻi. These have persisted here in small numbers due to their hardy nature.

(2) Fauna

Just one (1) mammal species was observed in the project area. A herd of about 20 axis deer was seen and trails, tracks and feeding damage were everywhere. A special effort was made to look for evidence indicating the presence of ōpeʻapeʻa, or Hawaiian hoary bat, by conducting an evening survey at two (2) locations within the project area. A bat detecting device was employed, set to frequency of 27,000 Hertz that these bats are known to use when echolocating for flying insects. No bats were detected with the use of this device.

Other non-native mammals likely to frequent this area include rats (*Rattus spp.*), mice (*Mus domesticus*), feral cats (*Felis catus*) and occasionally domestic dogs (*Canis familiaris*).

Birdlife was of moderate occurrence in the project area. Twelve (12) species were noted in the Flora and Fauna Study. Eight (8) bird species were of modest occurrence, cattle egret (*Bubulcus ibis*), zebra dove (*Geopelia striata*), nutmeg mannikin (*Lonchura punctulata*), gray francolin (*Francolinus pondicerianus*), northern mockingbird (*mimus polyglottos*), common myna (*Acridotheres tristis*), Eurasian sky lark (*Alauda arvensis*), and Pacific golden-plover (*Pluvialis fulva*). The other four (4) species were of rare occurrence.

Two (2) native bird species were recorded, the indigenous and migratory kōlea or Pacific golden-plover and the endemic pueo or Hawaiian owl (*Asio flammeus sandwichensis*). A few other non-native bird species may occasionally occur in this area, but this habitat is unsuitable for Hawaiʻi's native forest birds or seabirds.

Insect life was rather sparse in this habitat and no native insect species were seen.

b. Potential Impacts and Mitigation Measures

(1) Flora

According to the Flora and Fauna Study, the vegetation in the project area is dominated by hardy, invasive non-native species. Just three (3) common native plant species, ʻilima, ʻuhaloa and ʻaʻaliʻi, were found, none of which are of any conservation concern. No special habitats for native plants were found. Because of the above information, it is determined that there is nothing of special

REF-41

botanical concern with regard to this project. No recommendations with reference to plants were deemed necessary. Refer to **Appendix "C"**.

(2) <u>Fauna</u>

The fauna recorded in this project area is largely non-native in character. Axis deer are abundant throughout the area and have significantly modified the habitat by reducing plant species to a few hardy dominants. This in turn has a somewhat limiting effect on resource availability for other mammals, birds and insects.

Two (2) indigenous seabirds, the endangered 'ua'u and the threatened 'a'o, while not nesting in the project area, do fly over it during dusk to access their burrows high in the mountains and again at dawn to head out to sea. Young birds taking their first fledging flights are inexperienced fliers. They often are disoriented by bright lights and crash into light structures where they become vulnerable to injury and predators. The Flora and Fauna Study recommended that any significant outdoor lighting associated with the proposed project be hooded to direct the light downward to mitigate this threat.

No other recommendations with reference to fauna were deemed necessary in the study. Refer to **Appendix "C"**.

The U.S. Fish and Wildlife Service (USFWS) was consulted for the proposed project and recommended avoidance and minimization measures be implemented for the project as it relates to the endangered Hawaiian petrel (*Pterodroma sandwichensis*) which may occur in the vicinity or pass through the project area:

- The proposed project will use appropriate lighting so as not to unnecessarily attract seabirds.
- The project will not have nighttime construction occurring during the fledging season (September 15 through December 15).
- Use of lower-power (180 Watt) monochromatic and low-pressure sodium lighting (as opposed to the more common full-spectrum and high-pressure sodium lighting), which provides high contrast with sharply reduced brightness and

glare, yet the yellow light does not attract insects and is not believed to be used for avian navigation.

- Use of light fixtures with "top-visor" shielding to minimize the potential for stray light up-scatter and side-scatter, so that the bulb is not visible at lamp height from the side.

- Installation of automatic motion sensor switches and controls on all outdoor lights or turn off lights when human activity is not occurring in the lighted area.

- Limiting light levels and hours of use to the minimum levels allowable under Occupational Safety and Health Administration (OSHA) worker safety and security.

8. Archaeological Resources

a. Existing Conditions

T. S. Dye & Colleagues, Archaeologists prepared an Archaeological Inventory Survey (AIS) with subsurface testing, for the Miki Basin Industrial Park on May 9, 2018. See **Appendix "D-1"**. The State Historic Preservation Division (SHPD) accepted the AIS on August 4, 2020. See **Appendix "D-2"**.

A 100 percent pedestrian survey of the area was conducted and 31 backhoe trenches were excavated. No artifacts were collected from any of the trenches excavated.

The pedestrian and survey subsurface testing resulted in the identification and documentation of two (2) secondarily deposited historic scatters and two (2) historic properties, designated Site 50-40-98-1980 and Site 50-40-98-1981. Site 50–40–98–1980 is comprised of two (2) features including a lithic scatter and an eroded exposed fire-pit. Site 50-40-98-1981 is a subsurface truncated fire-pit feature. Both historic properties are evaluated as significant for the important information on Hawaiian history and prehistory that they have yielded.

b. Potential Impacts and Mitigation Measures

The AIS recommended that a data recovery plan be developed for Sites 50-40-98-1980 and 50-40-98-1981, and that this plan be implemented prior to proposed construction activities within the parcel. SHPD concurred with

this recommended mitigation. Refer to **Appendix "D-2"**. The Applicant will prepare a Data Recovery Plan for submittal and review by SHPD.

The AIS also noted that the two (2) secondary artifact scatters lack integrity of setting, location, and association with other sites and features, and thus do not represent historic properties. No further investigations of the scatters are warranted.

The Applicant will comply with all applicable County, State and Federal laws and rules regarding the treatment of archaeological and historic sites. Should evidence of archaeological or cultural resources be encountered during site preparation work or during drilling, then activities at the site will be suspended and Pūlama Lānaʻi and the SHPD will be contacted immediately for review, evaluation, and recommendations on how to preserve or avoid damage to the resources.

9. Cultural Resources

a. Existing Conditions

Attestation letters, interviews with lineal descendants of Lānaʻi, and a Ka Paʻakai Analysis and Determination were conducted to provide cultural background and research of the proposed project area. See **Appendix "D-3".**

The AIS prepared for the proposed project included research compliant with guidelines for development of a Cultural Impact Assessment (CIA) study. Two (2) letters from Kepā Maly confirmed the requirements required under the Hawaiʻi Supreme Court's holding in Ka Paʻakai O Ka ʻAina v. Land Use Commission, State of Hawaiʻi, 7 P.3d 1068, 94 Hawaiʻi 31 (2000). Information from these letters is provided below. Refer to **Appendix "D-3"**.

The AIS includes descriptions of traditional knowledge of place, and traditional and customary practices as documented in Hawaiian language accounts from Lānaʻi. There are also cited important historical accounts penned by foreign residents and visitors, documenting the changes in land use, access and residency from the 1840s to the 1950s.

As a result of the rapid decline of the native Hawaiian population on Lānaʻi, and early control of nearly all the land on the island by non-native business interests, little documentation pertaining to the extent to which traditional and customary native Hawaiian rights might be exercised in the project area survived the passing of time. No native tenant kuleana (property rights) or Royal Patent Grants were issued for lands within the project area.

By the 1870s, control of the petition area lands was held under one (1) individual, who also posted notices advising against trespass. By the 1920s, the entire area was dedicated to cultivation of pineapple. Through the 1930s, the project area included a residential field camp for Japanese employees of the plantation and their families.

Cultivation of pineapple and maintenance of support infrastructure, such as roadways, waterlines and stockpile sites, were the only land uses in the area until the close of the plantation in 1992. The project area was completely cleared and cultivated in pineapple for nearly 70 years. The land was bulldozed, plowed, graded, and planted with pineapples multiple times during that period. Because of the heavy use of pesticides and growth hormones, it would have been highly unlikely that plants of medicinal or other cultural uses would have been gathered across these fields.

Since the close of the pineapple plantation over 30 years ago, a few native plant species have volunteered across the nearly 20,000 acres of former pineapple fields. Most notable are the indigenous ‘a‘ali‘i (*Dodonaea viscosa*), ‘ilima (*Sida fallax*), naio (*Myoporum sandwicense*), and the ‘uhaloa (*Waltheria indica*). While each of the plants have cultural value and uses, none are rare, and all grow throughout the Pālāwai-Miki Region of Lāna‘i.

b. <u>Potential Impacts and Mitigation Measures</u>

The Ka Pa‘akai Analysis and Determination consisted of three (3) parts in evaluating the proposed site for the Miki Basin Industrial Park:

(1) The identification of valued cultural, historical, or natural resources in the project area, including the extent to which traditional and customary native Hawaiian rights are exercised in the project area.

(2) The extent to which those resources—including traditional and customary native Hawaiian rights—will be affected or impaired by the proposed action.

(3) The feasible action, if any, to be taken to reasonably protect native Hawaiian rights if they are found to exist.

There were references to gathering of ‘a‘alii and ‘uhaloa in the project area for adornments and la‘au lapa‘au by one of the interviewees. Therefore, per the Ka Pa‘akai analysis, the first test identified cultural resources and traditional practices in the project area.

The second test considers potential impacts to these resources and practices resulting from the proposed project. Both ʻaʻalii and ʻuhaloa are common throughout the Pālāwai-Miki Region of Lānaʻi and prevalent in the surrounding areas of the project, which is also noted by Kepā in his letter dated September 24, 2019. The project is not anticipated to affect the availability of these cultural resources and the project will not affect access to these resources in the region. Therefore, the project is not anticipated to have an impact on this practice in the ahupuaʻa.

Both interviewees also mentioned deer hunting for subsistence. Although not a traditional cultural practice due to the lack of deer present in pre-contact Hawaiʻi, it should be noted that Pūlama Lānaʻi manages hunting in the area and deer is abundant in the vicinity of the project area. The project will not affect access to deer for subsistence hunting.

One of the interviewees mentioned a cave in the project area and the use as a lookout for canoes. In the AIS, the extensive research did not reveal either a cave or the use of the area as a lookout for canoes.

Due to the project's lack of impact to traditional or customary practices, feasible action to be taken to reasonably protect native Hawaiian rights is not required.

10. Air Quality

a. Existing Conditions

Air quality in the region is generally good due to the prevailing trade winds. There are no major sources of air pollution in the immediate vicinity and vehicular traffic volumes are low.

b. Potential Impacts and Mitigation Measures

In the short term, construction related activities for the proposed project will be the primary source of airborne pollutants affecting the surrounding area. Site work involving clearing, grubbing, and grading operations will generate fugitive dust. Appropriate BMPs, such as frequent watering of exposed surfaces and regular maintenance of construction equipment, will be utilized to minimize air quality impacts associated with project construction.

From a long-term perspective, any future industrial activities which may have air quality impacts will be regulated by the State Department of Health (DOH). As previously noted, 127 acres of the Miki Basin Industrial Area will be utilized for renewable energy projects (photovoltaic plus battery

storage), which will not generate adverse air quality impacts. Other future uses include the relocation of an exisiting concrete recycling and rock crushing operation, and for the storage and stockpiling of aggregate and construction materials.

Stockpile sites are generally left uncovered based on the need to transfer aggregate materials into and out of storage frequently. The generation of dust is the primary emission or by-product associated with the stockpile site. Dust can be generated during the process of building the stockpile when the materials are subject to being moved, and from strong wind, and when the material is moved from the stockpile into waiting trucks.

BMPs employed at the site to address these problems would principally consist of adhering to environmental regulations for the storage and use of the aggregate stockpiles. The stockpile sites will be separated from each other to ensure against inadvertent mixing of dissimilar materials, and moisture will be controlled to prevent degradation of the different aggregate grades stored onsite.

Dust control would be handled by use of regular wetting of the crushed concrete and rock, and materials storage areas with a sufficient amount of water to saturate the area without causing runoff. The water for the water truck will be supplied by the Lānaʻi Water Company.

While specific uses for the 26 acres of new industrial space have not been solidified, many of the potential uses contemplated generally do not represent noxious uses such as warehouses and testing facilities, and would not be a source of air pollution. It is noted that before any air pollution sources can be built, an application must be filed with the DOH with detailed information on such sources. If deemed appropriate, the DOH may require the applicant to assess the air quality impact of the proposed emissions. A permit from the DOH will be required for air pollution sources.

11. Greenhouse Gas Considerations

a. Existing Conditions

Greenhouse gases (GHG) (carbon dioxide, methane, nitrous oxide, and fluorinated gases) trap heat in the earth's atmosphere. In the context of climate and ocean warming, increases in levels of atmospheric GHG have been attributed to human activity (IPCC, 2017). Within the State of Hawaiʻi, the energy sector (including fossil fuel burning to produce electricity, transportation, waste incineration, and natural gas systems) is identified as the source of 89.7 percent of GHG emissions (Hawaiʻi Department of

REF-47

Health, 2019). Other sources of GHG emissions include industrial facilities, agriculture and forestry, and waste treatment, such as landfills, composting, and wastewater treatment.

The Federal Greenhouse Gas Reporting Program (40 CFR Part 98) requires mandatory reporting of GHG emissions from sources that emit 25,000 metric tons or more of carbon dioxide equivalent (CO2 EQ) per year in the United States. Categories of use which are generally associated with this level of reporting include power plants, petroleum and natural gas systems, refineries and other heavy manufacturing processes. On Lānaʻi, there are no facilities operating at or above the 25,000 metric ton level (U.S. EPA, 2019).

b. Potential Impacts and Mitigation Measures

The proposed project will include 127 acres for renewable energy projects, including photovoltaic equipment with battery energy storage. This action is in line with Pūlama Lānaʻi's goal to reduce its dependence on fossil fuels and GHG emitting infrastructure. Furthermore, future plans for the relocation of an existing concrete recycling and rock crushing operation, and existing asphalt plant will not generate new sources of GHG emissions on the island.

In the context of the GHG Reporting Program (25,000 metric tons of CO2 EQ), the relative effects GHG emissions (CO2 EQ) during construction from earthmoving equipment and transportation of materials to and from the project site, will be short term and are not considered significant. Based on the foregoing, the proposed action is not anticipated to create significant direct and indirect foreseeable GHG emissions. This action does not fall within the threshold of mandatory GHG reporting.

12. Noise

a. Existing Conditions

The existing noise environment in and around the project study area is dominated by noise from airport-related activities, including roadway use and aircraft taxiing, taking off, and landing at the airport. Operations at the bordering Miki Basin Industrial Condominium and MECO power plant also contribute noise to the surrounding area. The nearest noise-sensitive areas to the project study area are located in Lānaʻi City, approximately two (2) miles to the northeast of the airport. No noise-sensitive areas are present within the project study area, and no incompatible land uses are present within the project study area.

b. Potential Impacts and Mitigation Measures

Ambient noise conditions may be temporarily affected by construction activities. Heavy construction machinery, such as backhoes, dump trucks, front-end loaders, paving equipment, and material-transport vehicles are anticipated to be the dominant noise-generating sources during the construction period of the proposed improvements. Sound attenuating construction equipment will be used where practicable and necessary, to mitigate noise impacts caused by construction. Night-time construction activity is not anticipated for the proposed project.

Although the proposed Miki Basin Industrial Park will create additional noise from vehicular use and repair work, this will pale in comparison to the sound of aircraft engines and will only marginally affect the existing environment. The distance between the proposed Miki Basin Industrial Park and existing noise sensitive areas also mitigates potential impacts.

Future individual users will also be responsible for complying with all applicable DOH rules and regulations relating to noise impacts. Any activity that exceeds the State noise levels established by Chapter 11-46, Hawai‘i Administrative Rules (HAR) “Community Noise Control” will seek a Noise Permit.

The Applicant will work to minimize noise emissions at the concrete recycling and rock crushing operation, including the use of all combustion powered equipment and vehicles. Any equipment found to be in poor condition will be repaired or replaced, and mufflers shall be used in accordance with federal and state laws and regulations. Furthermore, the relocation site was selected, in part, due to its close proximity to similar industrial uses, as well as its distance from noise-sensitive areas.

13. Hazardous Materials

a. Existing Conditions

TRC Environmental Corporation (TRC) prepared a Phase I Environmental Site Assessment (ESA) of the approximately 200-acre proposed project site. See **Appendix “E”**. The Phase I ESA notes that the site is believed to always have been undeveloped and utilized for agricultural purposes associated with pineapple cultivation.

No transformers were observed on the site. Utility owned pole-mounted transformers are located adjacent to the property area. It is unknown if the transformers may contain polychlorinated biphenyls (PCBs).

Based on information obtained from the site reconnaissance and available information, no underground storage tanks (USTs) or above ground storage tanks (ASTs) are located on the site.

Freedom of Information Act (FOIA) record reviews were completed by TRC of Hawaiʻi DOH's available records. DOH records did not indicate any concerns associated with the site.

The Phase I ESA has revealed no evidence of Recognized Environmental Conditions (RECs) in connection with the site. RECs are defined as the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property. The assessment has revealed no evidence of Historical Recognized Environmental Conditions (HRECs) in connection with the site.

b. Potential Impacts and Mitigation Measures

The Phase I ESA did not identify RECs, HRECs, or de minimis conditions which require mitigation. From a long-term perspective, it is noted that operations of future industrial activities are regulated by applicable federal and state law and industry standards.

At the concrete recycling and rock crushing operation, the types of materials processed include different types of cement that are free of paint or other hazardous coatings or products. The size of any individual piece must be three (3) inches in diameter (across any dimension) or less.

If there is rebar embedded in the concrete, it will be broken up onsite, and the rebar removed. The rebar will be shipped off-island for appropriate disposal in a landfill. The size of the rocks collected would be similar in dimension.

14. Scenic and Open Space Resources

a. Existing Conditions

The proposed project is located approximately four (4) miles southwest of Lānaʻi City and abuts the southeast end of Lānaʻi Airport. Additionally, the proposed project is not located near traditional access or walking trails between the coast or upland areas.

b. Potential Impacts and Mitigation Measures

The proposed Miki Basin Industrial Park will have complementary uses to the neighboring facilities and no significant adverse impacts to open space or scenic resources are anticipated as a result of the project. The project is also not within or a part of a scenic corridor. As such, the proposed project will not adversely affect scenic views.

15. Beach and Mountain Access

a. Existing Conditions

The project is located approximately six (6) miles from the nearest beach and approximately ten (10) miles from the peak of Lānaʻihale, the highest point on the island.

b. Potential Impacts and Mitigation Measures

There are no traditional access trails identified in close proximity to the proposed project area. Accordingly, there are no anticipated adverse impacts to beach and mountain access from the proposed project.

B. SOCIO-ECONOMIC ENVIRONMENT

1. Population and Demography

a. Existing Conditions

Maui County's population in 2019 is estimated at approximately 167,400 according to the U.S. Census Bureau, an increase of approximately 8.0 percent since 2010, when the population stood at 154,924. The population on Lānaʻi has fluctuated over the decade. In 2010, the islandʻs population was 3,135 residents. Throughout most of the decade, the U.S. Census Bureau's five-year population estimate for Lānaʻi ranged from approximately 3,100 residents to 3,500 residents.[1] However, in 2018 and 2019, the five-year population estimate dipped below 3,000 residents; in 2019, the U.S. Census Bureau's five-year population estimate was 2,730 residents (U.S. Census Bureau, 2019).

---

[1] Five-year population estimates are reported by the U.S. Census Bureau through its American Community Survey, which is an ongoing survey that provides data every year. The five-year estimates are "period" estimates that represent data collected over a five-year period of time.

The Lānaʻi Community Plan, which was updated and approved by the Maui County Council in 2016, notes that the island's population was forecast to be 4,020 by 2030. It was noted that increased economic activity and development plans on the island may result in population growing beyond the original forecast to up to 6,000 residents (County of Maui, Department of Planning, 2016).

b. Potential Impacts and Mitigation Measures

The proposed project is not a direct population generator and, thus, not anticipated to have a significant adverse impact on population or demographic trends on Lānaʻi. Building the proposed Miki Basin Industrial Park will allow existing industrial facilities currently scattered in business and residential areas in Lānaʻi City to relocate to more appropriate locations having the infrastructure and buffers necessary for industrial uses.

2. Economy

a. Existing Conditions

Hawaiʻi's economy through 2019 was strong, with record-setting visitor arrivals and low unemployment. However, the COVID-19 pandemic has had far reaching impacts on the economy on Lānaʻi, in Hawaiʻi, and across the nation and world. Stay-at-home regulations and travel quarantines aimed to curb the spread of COVID-19 virus in Hawaiʻi caused many businesses to shut down or drastically reduce operations. Unemployment in Lānaʻi and the State reached record levels in 2020 but has improved in 2021. In November 2020, unemployment in Lānaʻi stood at 29.3 percent. In July 2021, unemployment in Lānaʻi stood at 3.8 percent (Department of Labor and Industrial Relations, 2021).

Since the 1990s, the two (2) resorts on Lānaʻi have been the primary driving forces for the economy. Four Seasons Resort Lānaʻi and Sensei Lānaʻi, a Four Seasons Resort, feature 213 and 96 luxury rooms and suites, respectively. In addition, both resorts include single-family homes and multi-family homes for retirees, part-time residents, visitors and managers. The purchase of goods and services by visitors, retirees, part-time residents, the hotel, and hotel employees generate most of the jobs on Lānaʻi. Sensei Farms was established in recent years and has been providing produce to the resorts, restaurants, and businesses on island. In 2020, it began exporting produce to every island in Hawaiʻi. This new enterprise provides diversity for the economy. See **Appendix "F"**.

According to data from the State Department of Labor and Industrial relations, there were 1,500 (annual average) non-agricultural jobs on Lānaʻi in 2020, compared to 1,600 (annual average) jobs in 2019. Jobs in the leisure and hospitality industry accounted for 600 (annual average) jobs (State Department of Labor and Industrial Relations, 2020).

b. Potential Impacts and Mitigation Measures

An Economic, Population and Fiscal Impacts Report was prepared for the project by Plasch Econ Pacific Inc. See **Appendix "F"**.

i. Development Period

Over the initial 10-year development period, total construction expenditures for the project are estimated at about $78.8 million. This translates to an average of about $7.9 million per year, though it is noted that in practice, construction expenditures will vary from year to year. Development activities will generate indirect sales associated with supplying goods and services to construction companies and to the families of construction workers. Construction expenditures, plus indirect sales related to construction, are expected to average about $12.8 million per year based on State economic multipliers. During the development period, construction employment is expected to average about 19 jobs per year with direct payroll of $1.7 million per year. In addition to direct construction and related jobs, project development will support indirect jobs associated with supplying goods and services to construction companies and to families of construction workers.

During construction, the State will net approximately $5.6 million in tax revenues, or about $560,000 per year. Most of the revenues will be derived from general excise taxes and corporate and personal income taxes. The County derives negligible tax revenues from development activity. Pūlama Lānaʻi will provide or finance its fair share of infrastructure and facilities to support the project. As such, State and County expenditures to support the project are expected to be negligible.

ii. Operational Period

By 2030, new economic activities at the Miki Basin Industrial Park are expected to generate about $17.1 million per year in revenues. Industrial activities will generate approximately 60 new jobs with total payroll estimated at $2.8 million.

The project is estimated to generate additional property tax revenues to the County of Maui in the amount of about $380,000 per year by 2030. Increased State tax revenues at operations is estimated at $670,000 per year, including excise taxes and corporate and personal income taxes. Inasmuch as the project is expected to be developed in conjunction with forecasted population growth for Lānaʻi, neither the State nor the County are anticipated to be required to realize increased expenditures to support operations of the project. As such, the project would have a net positive fiscal impact for the State and County. Refer to **Appendix "F"**.

C. PUBLIC SERVICES

1. Police and Fire Protection

a. Existing Conditions

The project site is within the service area of the Maui Police Department's District II Lānaʻi patrol district which services the island of Lānaʻi. The Lānaʻi Police Station is located at 855 Fraser Avenue in Lānaʻi City, which is approximately three (3) miles to the northeast of the project site. The district includes two (2) motorized beats, each patrolled by one (1) officer. There are 11 full-time officers on Lānaʻi including one (1) Lieutenant and two (2) Sergeants and a School Resource Officer. They work out of an 8,000 square-foot facility that includes three (3) jail cells, a juvenile cell, and office space.

Fire prevention, suppression, and protection services for the island of Lānaʻi are provided by the County Department of Fire and Public Safety's Lānaʻi Fire Station. The Lānaʻi Station is located at 1345 Fraser Avenue in Lānaʻi City, which is approximately three (3) miles to the northeast of the project site. The station includes a total staffing of 18 personnel. Three (3) captains, six (6) Firefighter III, and nine (9) Firefighter I. Lānaʻi Station houses one (1) engine company and one (1) tanker. There are six (6) personnel on duty daily (County of Maui, Department of Fire and Public Safety, 2014-2015). Lānaʻi City is approximately four (4) miles from the project site.

b. Potential Impacts and Mitigation Measures

The proposed activity is not anticipated to adversely impact public services or facilities and utilities, and will not expand the service limits for public services and infrastructure.

2. Medical Services

a. Existing Conditions

On July 1, 2017, Maui Memorial Medical Center, Maui Memorial Medical Center Outpatient Clinic, Kula Hospital, Kula Clinic, and Lānaʻi Community Hospital became part of Maui Health System, which is affiliated with Kaiser Permanente. These facilities operate as vital community hospitals, open to everyone regardless of health coverage.

Lānaʻi Community Hospital is the only hospital on the island of Lānaʻi. It is the sister hospital to Kula Hospital and Maui Memorial Medical Center. It has limited 24-hour emergency care, acute care and diagnostic imaging. It also provides long-term care (including skilled and intermediate nursing care).

b. Potential Impacts and Mitigation Measures

The proposed project will not adversely affect medical services in the area. During project construction, detour routes will not be necessary. As such, medical responders and services will continue to have access to the areas surrounding the project site.

3. Solid Waste

a. Existing Conditions

The Lānaʻi Landfill on Kaumālapaʻu Highway accepts municipal solid waste and construction debris dropped-off from commercial and residential customers. In addition, personal delivery to the landfill of municipal solid waste, green waste, and trash is available.

Pūlama Lānaʻi sponsors rural recycling collection events for hard to recycle items including: appliances, small scrap metal and vehicle batteries and tires. The County has recycling programs for computers/electronics and household batteries.

Pūlama Lānaʻi provides green waste recycling with subsequent compost available to residents. Hawaiʻi DOH, in conjunction with Maui Disposal, provides refundable glass and can recycling.

The County, through the Department of Environmental Management (DEM), provides residential application-based refuse pick up and disposal services on Lānaʻi.

b. Potential Impacts and Mitigation Measures

During the initial short-term construction phase of the project, the contractor will develop and implement a construction-generated waste disposal plan. Appropriate construction debris will be taken to the landfill.

A large proportion of the Miki Basin Industrial Park, 127 acres, is proposed for renewable energy uses such as photovoltaic plus battery energy storage, which would not be a generator of new solid waste. Appropriate decommissioning practices in compliance with federal, state, and local regulations will be implemented at the end of the useful life of the renewable energy project. Individual users at the Miki Basin Industrial Park will be responsible for disposing of solid waste, recyclables, and green waste consistent with State and County regulations and programs.

With respect to the concrete recycling and crushing operation, the operator will manage solid waste disposal consistent with the County programs on the island. Most of the materials and by-products would consist of rock, aggregate, and concrete cement that is planned to be recycled as much as possible to reduce the need for costly importation of building materials. Materials that are considered construction and demolition debris waste would be handled and disposed of in accordance with State and County regulations and laws. Inasmuch as the concrete crushing operation represents a relocation of an existing use, significant new solid waste generation is not anticipated.

Based on the foregoing, the proposed Miki Basin Industrial Park is not anticipated to generate a significant adverse impact related to solid waste disposal considerations.

4. Education

a. Existing Conditions

Lānaʻi High and Elementary School reported the enrollment of 565 students for the 2020-2021 school year (DOE, Official Enrollment County School Year 2020-2021). It is the largest of six (6) kindergarten through grade 12 public schools in the Department of Education (DOE) system. It is the only school that serves educational needs on the island of Lānaʻi.

b. Potential Impacts and Proposed Mitigation Measures

The proposed Miki Basin Industrial Park will allow existing industrial facilities currently scattered in business and residential areas in Lānaʻi City

to relocate to more appropriate locations having the infrastructure and buffers necessary for industrial uses. The project is not a population generator and, as such, adverse impacts on educational facilities are not anticipated.

5. Recreational Resources

a. Existing Conditions

The Maui County Department of Parks and Recreation and Lānaʻi public schools maintain a number of recreational resources on the island of Lānaʻi. County parks and facilities in Lāna'i City include: the Lāna'i Community Center, the Lānaʻi Gym and Tennis Courts, and the Lāna'i Little League Field, Fraser Avenue Park and Kaumālapa'u Highway/Fraser Avenue Park.

Pūlama Lāna'i also owns and maintains a number of recreational facilities that are available for public use including Dole Park, Olopua Woods Park, Waialua Park, Hulopoʻe Beach Park, and the Lāna'i Recreation Center.

Other recreational facilities operated by Pūlama Lānaʻi include the 18-hole championship golf course at Mānele Resort and the 9-hole Cavendish Golf Course.

b. Potential Impacts and Mitigation Measures

The proposed action is not expected to generate a need for additional recreational facilities. There are no anticipated adverse impacts to existing recreational facilities and resources.

D. INFRASTRUCTURE

1. Roadways

a. Existing Conditions

A Traffic Impact Analysis Report (TIAR) was prepared by Austin, Tsutsumi, and Associates, Inc. on June 3, 2021, to evaluate the traffic impacts resulting from the proposed 200-acre Miki Basin Industrial Park. See **Appendix "G"**.

The following are brief descriptions of the existing roadways studied within the vicinity of the project:

- **Kaumālapaʻu Highway** - Kaumālapaʻu Highway is generally an east-west, two-way, two-lane state-owned roadway that runs perpendicular to Miki Road. This roadway begins to the west at the Fuel Depot and terminates to the east at its intersection with Lanai Avenue/Queens Street. The speed limit along Kaumālapaʻu Highway is 45 miles per hour (mph) near Miki Road.

- **Miki Road** - Miki Road is generally a north-south, two-way privately owned roadway that begins to the north at its intersection with Kaumālapaʻu Highway and extends approximately 2.95 miles to the south – primarily through undeveloped land. The roadway is only approximately 13 to 15 feet wide, and therefore requires vehicles to pull off to the unpaved shoulder when encountering approaching vehicles traveling in the opposite direction.

Due to the prolonged disruptions to both residential and visitor traffic in the Hawaiʻi region as a result of the impacts of the COVID-19 pandemic, collecting new traffic count data at this time would be atypical. Previously collected data in conjunction with available traffic volume data from the Hawaiʻi Department of Transportation (HDOT) were instead used to estimate the existing 2020 traffic volumes at the study intersections.

The TIAR included a Level Of Service (LOS) analysis for the various study intersections surrounding the project area. LOS is a qualitative measure used to describe the conditions of traffic flow at intersections, with values ranging from free-flow conditions at LOS A to congested conditions at LOS F. The Kaumālapaʻu Highway/Miki Road intersection currently operates with all movements at Level of Service (LOS) B or better during the AM and PM peak hours of traffic. No significant delays or queuing were previously observed during the 2018 data collection at the intersection during either peak hour of traffic.

b. Potential Impacts and Mitigation Measures

It is assumed that at least two (2) driveway access points to the project site will be provided along Miki Road. Project Driveway 1 provides access to the light and heavy industrial areas west of Miki Road and Project Driveway 2 provides access to the light industrial area east of Miki Road. Refer to **Appendix "G"**.

The project is anticipated to generate 161 trips during the weekday AM peak hour of traffic and 163 trips during the weekday PM peak hour of traffic by 2040.

Upon completion of the project, all intersection movements are forecast to operate at LOS B or better during the AM and PM peak hours of traffic. Miki Road is privately-owned; the levels of service for the proposed uses on such are acceptable and not significant.

The TIAR noted the following improvements are recommended when warranted:

- Widen Miki Road between its intersection with Kaumālapaʻu Highway to the project driveway(s). Miki Road is currently estimated to be 13 feet wide, and should be widened to accommodate the design vehicle (lowboy with crane) and full side-by-side bidirectional travel with intersection geometries capable of accommodating turning movements.

- Provide an exclusive westbound left-turn deceleration lane.

2. Water

a. Existing Conditions

i. Water System

Akinaka & Associates, Ltd. prepared a Water Master Plan for Mānele Bay Water System (Public Water System 238 ("PWS 238")), which provides service to the project area. The study analyzes the existing water distribution system and capacity of PWS 238. In particular for this Draft EA, the study provides a recommendation for the new and incremental forecasted water demand for the Miki Basin Industrial Park as it relates to PWS 238. See **Appendix "H-1"**.

PWS 238 is owned, operated and maintained by the Lānaʻi Water Company. PWS 238 is sourced by Well No. 2 (State Well No. 5-4953-001) and Well No. 4 (State Well No. 5-4952-002). PWS 238 provides water service to Mānele, Hulopoʻe and the Pālāwai Irrigation Grid. Water from the wells is either stored in the existing 0.5 million gallon (MG) Hiʻi Tank, 1.0 MG concrete Hiʻi Reservoir, or fed directly into the distribution system depending on the demand. PWS 238 consists of 10-inch, 12-inch, and 16-inch transmission mains. PWS 238 is interconnected with the Lānaʻi City Water System (Public Water System 237 ("PWS 237")). During emergencies, PWS 237 can be connected to PWS 238 by opening a valve.

The existing average daily water usage of PWS 238 is estimated at 433,000 gallons per day (GPD).

Existing water demand for the Concrete Batch Plant (CBP) is 3,500 GPD, which is currently provided by PWS 238. Existing water demand for the asphalt plant is 1,000 GPD, which is currently provided by PWS 237. The asphalt plant will have a new demand of 1,000 GPD on PWS 238, when it is relocated into the Miki Basin Industrial Park.

ii. Water Availability

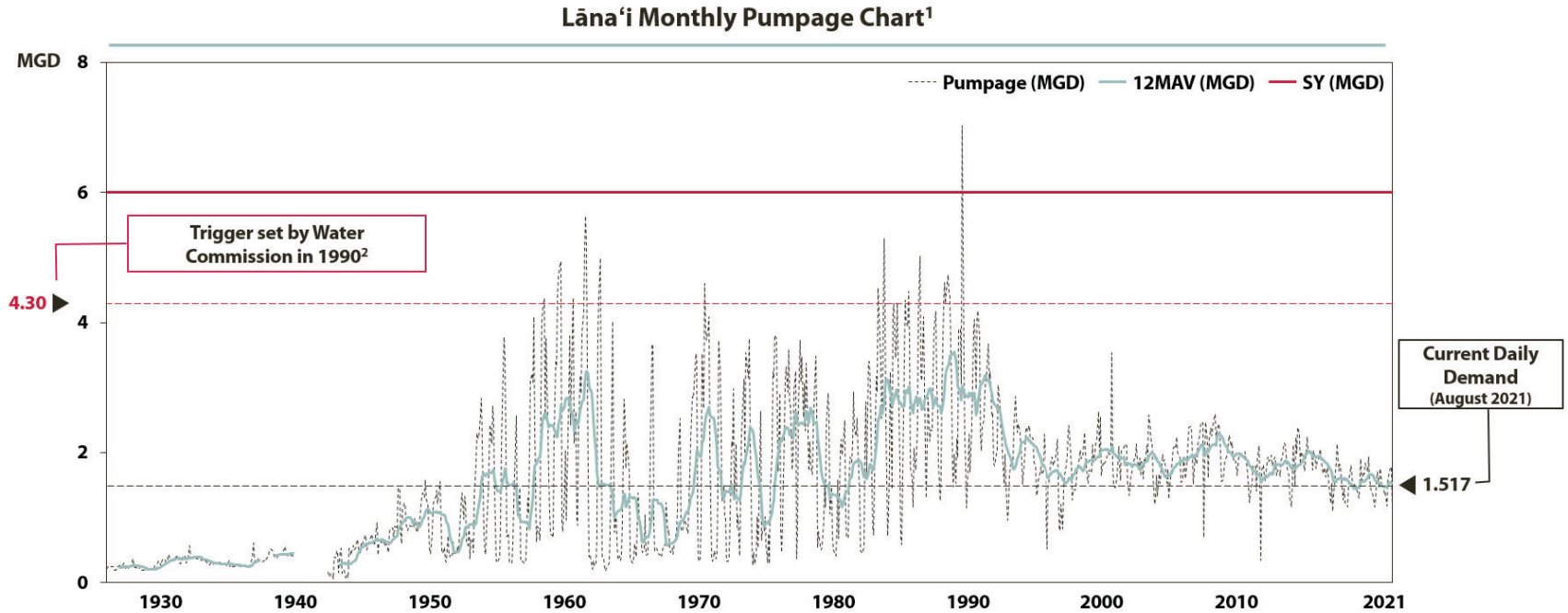
There are two (2) aquifers on Lānaʻi, the Leeward Aquifer system and Windward Aquifer system, each with a sustainable yield of 3.0 million gallons per day (MGD). Together, the total sustainable yield for the island of Lānaʻi is 6.0 MGD.

Lānaʻi Water Company provides Periodic Water Reports (PWR) to the Maui County Department of Water Supply and State of Hawaiʻi Commission on Water Resource Management ("CWRM"). The PWR can be accessed each month from the Lānaʻi Water Company's website.[1] The PWR contains data sets of gallons of water pumped, water use on the island, water well levels, and water temperature and chlorides. CWRM publishes on their website a twelve (12) month moving average ("12MAV") monthly pumpage chart relative to the island's 6.0 MGD sustainable yield.[2] In the context of the island's sustainable yield of 6.0 MGD, the CWRM established a management guideline trigger of 4.3 MGD to initiate proceedings to designate Lānaʻi as a groundwater management area (County of Maui, Department of Water Supply, 2011). Lānaʻi Water Company has a data set containing water readings from 1926 through today. The current daily water demand on Lānaʻi, last updated on August 2021, is 1.517 MGD. The current daily water demand is significantly lower than the 4.3 MGD trigger set by the CWRM in 1990 and the 6.0 MGD sustainable yield for the island of Lānaʻi. **Table 1** below is reproduced from the CWRM website for Lānaʻi.

[1] See hyperlink https://lanaiwatercompany.com/water-reports/
[2] See hyperlink https://files.hawaii.gov/dlnr/cwrm/monitoringdata/pump_lanai.pdf

Table 1. Lana‘i Monthly Pumpage Chart

LĀNA‘I MONTHLY PUMPAGE CHART[1]



1. Downloaded from http://files.hawaii.gov/dlnr/cwrm/monitoringdata/pump_lanai.pdf, Adopted from LPC Workshop Item D1 on 16SEPT21, slide 12 of 15, presented by CWRM.
2. March 29, 1990 CWRM Non-Designation Decisions Condition #5d. See also Ibid slide 3 of 15.

REF-61

b. Potential Impacts and Mitigation Measures

i. Water System

The near-term Miki Basin Industrial Park's anticipated uses include the relocation of the CBP and the asphalt plant. These near-terrm uses are expected to have an incremental demand of 2,625 GPD for the CBP and a new demand of 1,000 GPD for the asphalt plant on PWS 238. In the long term, the new Industrial Uses are expected to have a new demand of 156,000 GPD on PWS 238.

According to the Water Master Plan for PWS 238, the full build out of the Miki Basin Industrial Park's new or incremental estimated water demand on PWS 238 is 159,625 GPD. The estimated water demand on PWS 238 for the full buildout of the Miki Basin Industrial Park is 163,125 GPD, which includes the existing and new or incremental estimated water demand. **Table 2** below (Figure A in **Appendix "H-1"**) provides a summary of the estimated water demand for the Miki Basin Industrial Park.

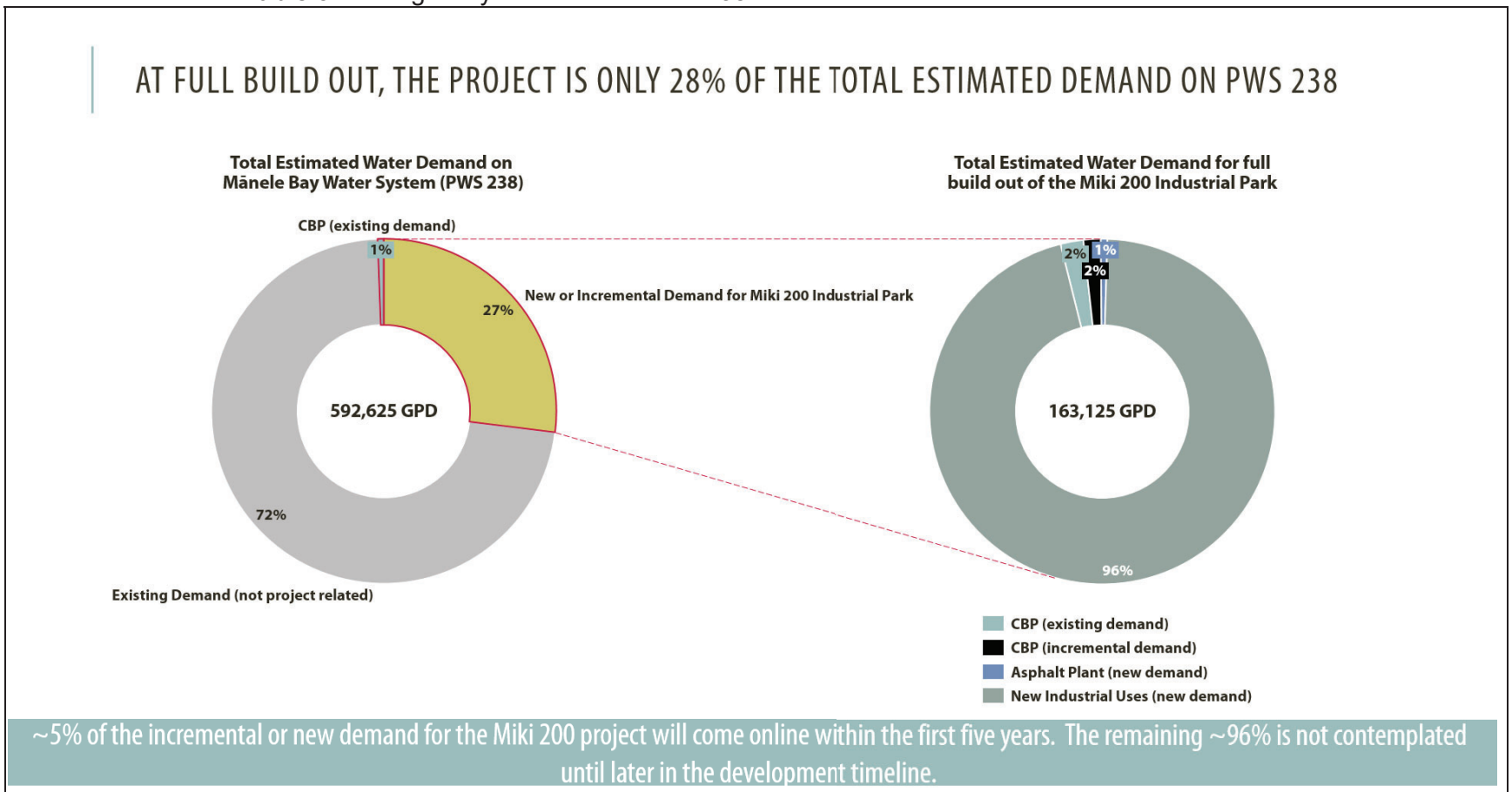
Table 2. Summary of Estimated Water Demand at Miki Basin Industrial Park

Description	Acres	Existing Water Demand on Mānele Bay Water System (PWS 238) (GPD)	New or Incremental Water Demand on Mānele Bay Water System (PWS 238) (GPD)	Full Build Out of Industrial Park Water Demand on Mānele Bay Water System (PWS 238) (GPD)
CBP	14.5	3,500	2,625	6,125
Asphalt Plant	12.5	--	1,000	1,000
Renewable Energy Projects	127.0	--	--	--
New Industrial Uses	26.0	--	156,000	156,000
Infrastructure	20.0	--	--	--
TOTAL	**200.0**	**3,500**	**159,625**	**163,125**

The projected average day demand for PWS 238, including full buildout of the Miki Basin Industrial Park and existing demands (not Miki Basin Industrial Park related), is 592,625 GPD. **Table 3**, pie chart (Figure B in **Appendix "H-1"**), below provides a visual summary of the percentages of existing, new or incremental water demands on PWS 238 for the Miki Basin Industrial Park.

REF-62

Table 3. Average Day Demand for PWS 238 with Full Buildout of Miki Basin Industrial Park



REF-63

The Water Master Plan notes that PWS 238 does not have adequate well-pump capacity (source) for the full buildout of the Miki Basin Industrial Park, however, there is enough storage to support the full buildout with the existing tank and reservoir. Refer to **Appendix "H-1".**

Although the transmission mains do meet Water Systems Standards (WSS) for fire flow protection, the existing water system does not meet the WSS in other aspects. There is an existing pressure reducing valve (PRV) that has an outflow limit that could be lowered. If a booster pump could be added to the system, the PRV can be set lower, and the booster could pump the water so that there can be enough pressure to distribute water uphill.

The Water Master Plan, included in **Appendix "H-1"**, includes a detailed list of improvements that will be required to support full buildout of the industrial park. These improvements include modifying or replacing the existing PRV, drilling a new source or multiple sources to obtain an additional minimum pump capacity of 426 gallons per minute (GPM), and evaluating the condition of sections of the Pālāwai Irrigation Grid to determine the need for pipe repair, replacement or possible abandonment.

In response to the need for new water source, a "New Well Supply Alternatives" report was completed by Tom Nance Water Resource Engineering. The report considered alternatives, including available supply in the Leeward Aquifer System, well installed pumping capacity versus its long-term sustainable supply, and current sources of supply for PWS 238. See **Appendix "H-2"**.

Three (3) alternative well sites were evaluated, with the recommended site located 2,000 feet northwest of existing Well No. 2 at the top of a former pineapple field and accessed by old plantation roads. This proposed well site is far enough away from existing wells so as not to impact their sustainable supplies. A well at this site would encounter high-level, drinking water quality groundwater and could meet or exceed the necessary 426 GPM capacity to ensure adequate supply for the full build out of the Miki Basin Industrial Park. Refer to **Appendix "H-2"**.

Pūlama Lāna'i will conform with the requirements of the Hawaii Safe Drinking Water Branch and County of Maui Water System Standards in developing a safe drinking water system, and any

other associated regulatory entity as it relates to installation, inspection and maintenance of water systems on the site. Additionally, the design and operations of facilities will include measures which will promote the conservation of water resources.

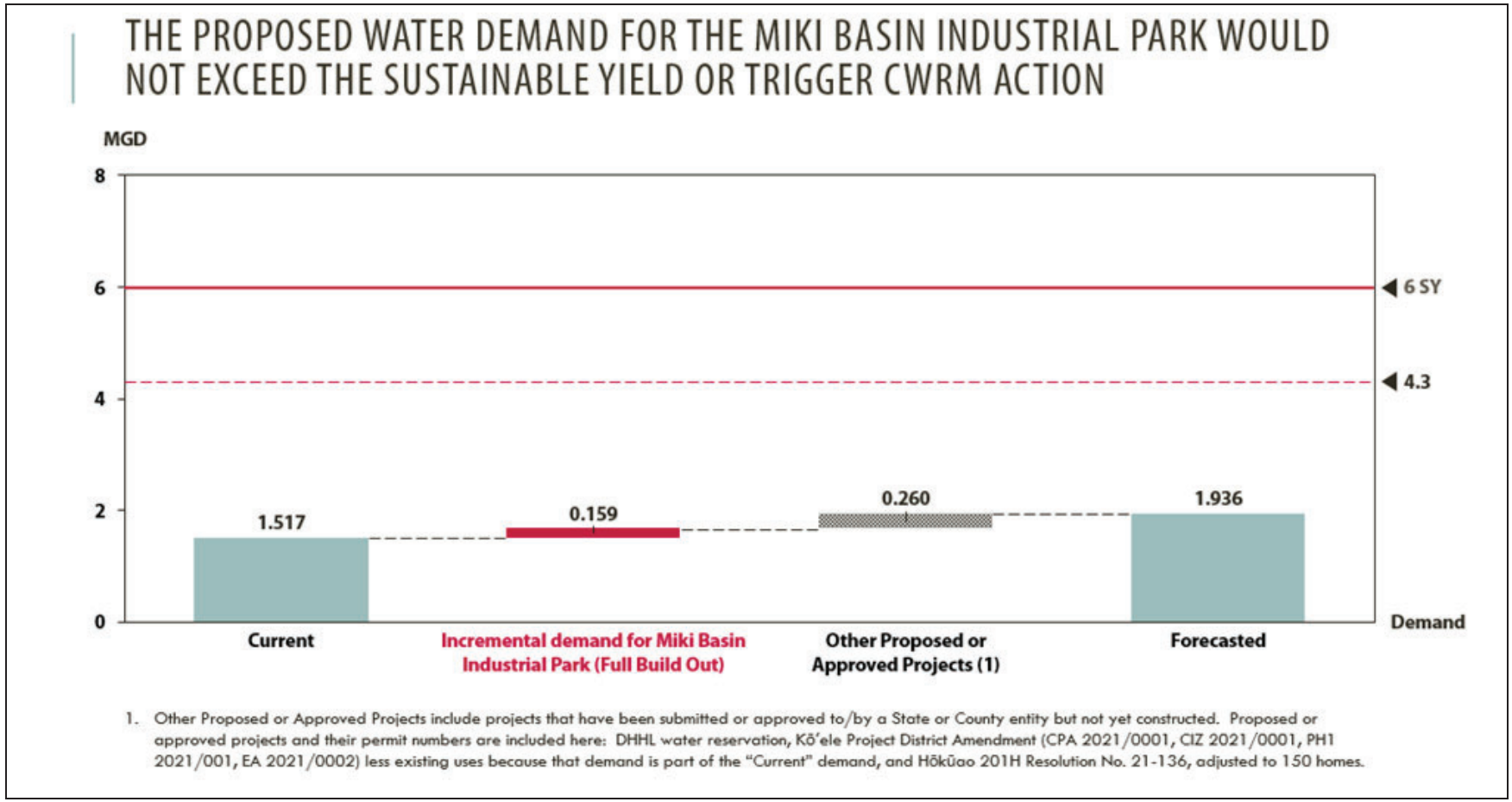
ii. <u>Water Availability</u>

The New Well Supply Alternatives report prepared by Tom Nance Water Resource Engineering concluded that a new well to supply the Miki Basin Industrial Park project can be accommodated within the Leeward Aquifer System's 3.0 MGD sustainable yield. Refer to **Appendix "H-2"**.

The water demand for the proposed project is also analyzed in the context of the 6.0 MGD sustainable yield for the island as a whole. **Table 4** below was created to provide a perspective of the incremental demand for the full build out of the Miki Basin Industrial Park's additional water demand on the island as well as other proposed or approved projects on the island. On the far left, the current water demand on Lānaʻi is represented as a light aqua bar (1.517 MGD), the next additional incremental demand in the red bar is the full build out for the Miki Basin Industrial Park (0.159 MGD), followed by the gray bar for other proposed or approved projects (0.260 MGD). The total forecasted water demand for Lānaʻi (summation of the values) is 1.936 MGD, which is 55 percent less than the 4.3 MGD trigger set by CWRM and 68 percent less than the sustainable yield of 6 MGD for Lānaʻi.

Based on the foregoing, significant adverse impacts to water resources are not anticipated as a result of the proposed project.

Table 4. Forecasted Cumulative Water Demand for Island of Lānaʻi



REF-66

3. Wastewater

a. Existing Conditions

Akinaka & Associates, Ltd. prepared a Wastewater Master Plan to identify and review the condition of the existing systems and analyze the existing systems for projected wastewater estimates for the project. See **Appendix "I"**.

There is currently no existing County or privately owned or operated wastewater treatment system in the vicinity of the proposed 200-acre Miki Basin Industrial Park. Wastewater is currently treated via onsite individual wastewater systems.

b. Potential Impacts and Mitigation Measures

According to the Akinaka & Associates, Ltd. Wastewater Master Plan for the proposed 200-acre Miki Basin Industrial Park, the construction of onsite Individual Wastewater Systems (IWS), decentralized Wastewater Treatment Plants (WWTP) and collection systems will be required to support development activity.

Each development within the industrial park will be required to provide its own wastewater treatment system and associated wastewater collection system. The type of treatment system used will be determined by the size and type of development. Sizing of each system will be determined during the design phase of each development.

Since specific development plans for the industrial park are not yet available, proposed wastewater flows for buildout of the industrial park are based on the proposed land use and an estimated developable area for each parcel. The proposed design average wastewater flow for full buildout of the industrial park is 80,179 GPD, with a design peak flow of 333,688 GPD.

Onsite IWS systems and decentralized WWTPs are regulated by the Department of Health (DOH). IWS systems can be used as a temporary onsite means of wastewater disposal in lieu of a WWTP under certain conditions. Where developments do not meet the requirements for an IWS, decentralized WWTPs are recommended. WWTPs can be sized to accommodate flows from multiple properties located in the same general area. Depending on the development timeline, construction of the WWTP can be phased such that the system can be adapted and expanded to accommodate additional flows at a later date.

It is anticipated that the concrete facility and asphalt plant may be the first sites developed, and will require the installation of an IWS septic system. The wastewater flows generated from these facilities are minimal and could be managed with an IWS even after development of a nearby decentralized WWTP. The light industrial area west of Miki Road would produce the majority of the projected design wastewater flow. A WWTP developed at the lowest point in the project site on the southwestern edge of the light industrial area west of Miki Road could collect the wastewater from this area without the need for pump stations and force mains. Refer to **Appendix "I"**.

The wastewater system for the Miki Basin Industrial Park will be designed in conformance with the requirements of the DOH and the County of Maui to ensure proper handling and treatment of wastewater generated by the project.

4. Drainage

a. Existing Conditions

R.M. Towill Corporation prepared a Drainage Report on July 9, 2021, to determine that the offsite and onsite drainage system requirements for the proposed Miki Basin Industrial Park meet the County of Maui Storm Drainage Standards. See **Appendix "J"**.

Offsite runoff generated from the area north of Miki Road sheet flows and is intercepted by an unlined ditch along Miki Road. Once in the unlined ditch, the runoff flows towards the southeast direction to a low point in Miki Road, near the existing MECO facility.

The existing onsite terrain is covered with vegetation and slopes at about five (5) percent from Miki Road toward the southeast. There is no existing storm drain system within the project area.

Offsite runoff, including runoff generated from the MECO facility, is diverted around the Miki Basin Industrial Condominium site and is discharged into an existing drainageway. Runoff generated within the existing Miki Basin Industrial Condominium site is collected by an onsite drainage system and is discharged offsite.

b. Potential Impacts and Mitigation Measures

The proposed development will increase the amount of impervious area within the project. Offsite runoff will be intercepted before entering the

project site by proposed drainage ditches. The drainage ditches will divert runoff around the perimeter of the project site to an offsite discharge point downstream. Onsite runoff will be collected by a proposed underground storm drain system consisting of pipes and inlets.

Existing drainage patterns will be maintained by discharging intercepted offsite runoff to its original flow path. Offsite runoff will be collected by interceptor ditches located on the perimeter of the site that discharge to existing drainageway and ultimately to Miki Basin.

The proposed concrete rectangular drainage ditches vary in size from 8 feet by 8 feet to 2 feet by 3 feet. The ditches are sized to accommodate the peak runoff flow from the 100-year, 24-hour storm and 10-year, 1-hour storm where necessary and provide a minimum 2-foot freeboard.

The development of the proposed industrial parcels will increase the runoff onsite by 141.36 cfs based on a 100-year, 24-hour storm. The additional flow generated within the proposed parcels can be accommodated by the existing Miki Basin and Pālāwai Basin. The additional runoff volume is negligible compared to the available basin capacity. Stormwater treatment will not be provided for this project since the runoff flows into an existing offsite sump with no outlet to the ocean. Applicable law will be followed to minimize soil movement, erosion and compaction during all project actions.

Development of the project will include the implementation of site-specific BMPs during the construction to provide erosion control and minimize impacts to downstream properties.

Stormwater runoff from stockpiles will be significantly reduced, if needed, by using sheet plastic or other impervious material to prevent the co-mingling of stormwater with sediments in the aggregate. With or without this control, the management of stormwater runoff will also be directed or diverted from discharging into waters of the state by use of detention or retention basins, or other drainage control device(s).

The project will also include post-construction BMPs, which will improve the quality of stormwater runoff from the proposed development. The drainage design criteria will be to minimize any alterations to the natural pattern of the existing onsite surface runoff. The proposed drainage plan will meet the requirements of Chapter 4, *"Rules for the Design of Storm Drainage Facilities in the County of Maui"* and Chapter 111, *"Rules for the Design of Storm Water Treatment Best Management Practices"*.

Based on the foregoing,, the proposed 200-acre industrial development will not have an adverse impact on any existing downstream properties.

5. Electricity, Telephone Systems, and Cable Television Services

a. Existing Conditions

The MECO powerplant is adjacent to the proposed project and provides energy to Lānaʻi Airport operations. The electrical service lines to the Airport are underground, running from Kaumālapaʻu Highway along the Airport access road to the Airport.

b. Potential Impacts and Mitigation Measures

The Miki Basin Industrial Park will include 127 acres for renewable energy projects, including photovoltaic equipment with battery energy storage.

The project is not anticipated to have an adverse impact on existing electrical, telephone, or cable television systems, nor is it expected to extend existing service area limits. Early project coordination will be carried out with the service providers to ensure services can be delivered to the project site in a timely basis.

E. CUMULATIVE AND SECONDARY IMPACTS

Cumulative impacts are defined by Title 11, Chapter 200.1, Hawaiʻi Administrative Rules (HAR), Environmental Impact Statement Rules as:

> *…the impact on the environment which results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.*

A “secondary impact” or “indirect effect” is defined by Title 11, Chapter 200.1, HAR as

> *…effects which are caused by the action and later in time or farther removed in distance, but is still reasonably foreseeable.*

The context for analyzing secondary and cumulative impacts is defined by the time horizon within which “reasonably foreseeable” conditions may occur. From a local planning standpoint, the future context for development is established by the Maui County General Plan (General Plan) and the Lānaʻi Community Plan. The General Plan defines parameters for growth. The document plans for the horizon year 2030 and “reasonably foreseeable” conditions may be considered within this future context.

Whereas the Countywide Policy Plan covers planning goals and objectives at the broadest levels, the regional Community Plans consider specific regional needs and opportunities. The Lānaʻi Community Plan (LCP) identifies fostering a robust and diversified economy as a critical component to establishing a sustainable and resilient future for Lāna`i. The LCP explains:

> *This requires diversifying the tourism industry, supporting agriculture, encouraging new industries, expanding education and support services for small businesses, and providing necessary infrastructure, land, and affordable sea and air transportation options. Lowering energy costs by reducing dependence on fossil fuels and increasing renewable energy is also key to providing stronger economic opportunities and becoming more sustainable.*
>
> *This will be achieved by increasing the generation and use of renewable energy sources, promoting the use of electric vehicles, and exploring options for biofuels, biodiesel, and waste-to-energy technology. Water resources will be used in a sustainable and economic manner by recycling one hundred percent of wastewater for irrigation and exploring options for reuse of household graywater for lawn and garden irrigation. (LCP, p. 2 12)*

The Miki Basin Industrial Park is anticipated to be developed over a period of 20 years, depending on future economic and population growth, and market conditions. It is expected that there will be a need for industrial zoned lands on the island of Lānaʻi, considering there is none available presently. In addition to providing land for renewable energy uses and relocation of existing facilities, the project area will provide light and heavy industrial space as well as warehouse and baseyard space for existing and new businesses on the island. Possible new future industrial uses include a slaughterhouse, warehouse space for cold storage, laboratory/testing facilities, niche product development, automotive services, multi-media facility, animal hospital, and other uses. These businesses will generate sales in the local economy and support employment.

The site is well-suited for industrial development. As previously mentioned, the project area is adjacent to existing industrial uses including the Lānaʻi Airport, the Miki Basin Industrial Condominium, and MECO generating facility.

At 3.2 miles southwest of Lānaʻi City, it is far enough removed from the island's main business center and residential area as to minimize those impacts common to industrial areas, such as noise, odors, and heavy vehicles. Yet, the project area is close enough to be conveniently accessible to businesses, residents, and the workforce.

Development of the 200-acre industrial park will allow existing industrial facilities currently scattered in business and residential areas in Lānaʻi City to relocate to more appropriate locations having the infrastructure and buffers necessary for industrial uses; and provide opportunities for future industrial development on Lānaʻi, which will add to the

diversification of Lānaʻi's economy and thereby contribute to the island's resiliency and sustainability.

The proposed Miki Basin Industrial Park is not anticipated to result in significant impacts that will not be mitigated. It is not part of a larger action and will not result in significant cumulative impacts. The project is not a population generator and will not result in significant adverse secondary impacts.

REF-72

RELATIONSHIP TO GOVERNMENTAL PLANS, POLICIES, AND CONTROLS

III

III. RELATIONSHIP TO GOVERNMENTAL PLANS, POLICIES, AND CONTROLS

A. STATE LAND USE DISTRICTS

Pursuant to Chapter 205, Hawaiʻi Reivsed Statutes (HRS), all lands in the State have been placed into one (1) of four (4) major land use districts by the State Land Use Commission. These land use districts are designated "Urban", "Rural", "Agricultural", and "Conservation". The project site is located within the "Agricultural" district. See **Figure 8**. The Applicant will seek a District Boundary Amendment from the State of Hawaiʻi Land Use Commission (SLUC) to designate the subject property "Urban". Pursuant to Chapter 205, Hawaiʻi Revised Statutes (HRS), the "Urban" districts shall include uses or activities provided by ordinances or regulations of the County in which the "Urban" district is located. Section E below, outlines the County of Maui's zoning regulations that are applicable to the proposed project. The proposed project is consistent with the "Urban" district designation.

Land Use Commission Rules, Chapter 15-15, HAR

Reclassification of the subject property must meet the following standards of the Urban District as set forth in the Land Use Commission Rules, Chapter 15-15-18, HAR:

1. *It shall include lands characterized by "city-like" concentration of people, structure, streets, urban level of services and other related land uses.*

   Response: The subject action involves a reclassification of district boundaries to enable implementation of the master-planned Miki Basin Industrial Park, which is a 200-acre light and heavy industrial development located in an area called for in the Lānaʻi Community Plan. The project site is designated "Light Industrial" and "Heavy Industrial" by the Lānaʻi Community Plan and is located in the vicinity of similar land uses. The Applicant will develop the major common infrastructure, such as roads, electric and water utility lines. The lands and surrounding areas are characterized as having "city-like" structures, streets, urban level of services, and other related land uses.

2. *It shall take into consideration the following specific factors*

   A. *Proximity to centers of trading and employment except where the development would generate new centers of trading and employment.*

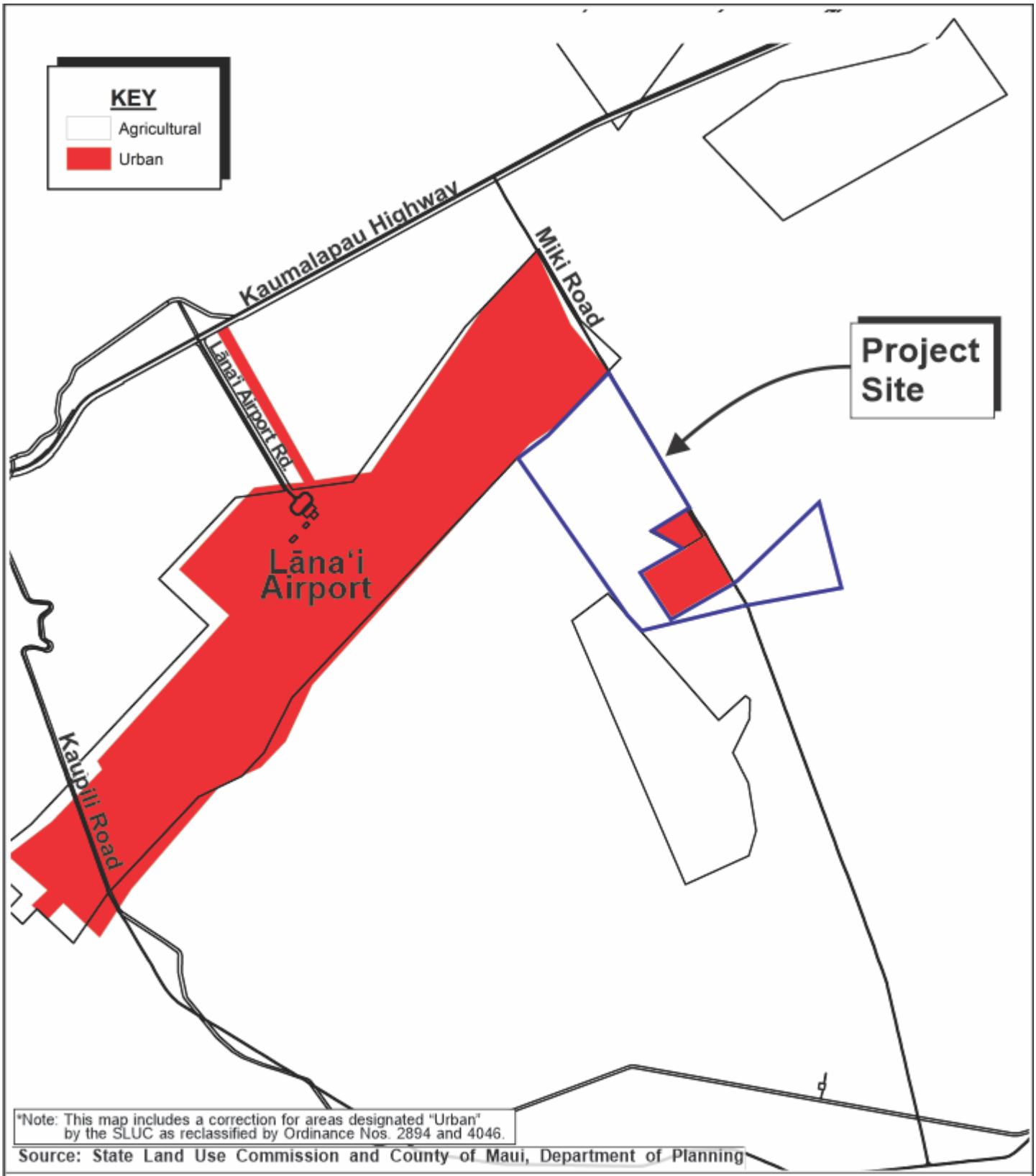


Figure 8

Miki Basin Industrial Park
State Land Use Designation Map

Prepared for: Lanai Resorts LLC, a Hawaii Limited Liability Company doing business as Pūlama Lānaʻi

MUNEKIYO HIRAGA

Pulama Lanai\MikiBasinExp 1769\Applications\Figures\SLUD

REF-75

B. Availability of basic services such as schools, parks, wastewater systems, solid waste disposal, drainage, water, transportation systems, public utilities, and police and fire protection.

C. Sufficient reserve areas for foreseeable urban growth

Response: (A.) The Miki Basin Industrial Park is located on land adjoining the Lānaʻi Airport, the Maui Electric Company (MECO) 5-acre power plant and the existing 20-acre Miki Basin Industrial Condominium. The proposed project will complement the existing industrial uses in the vicinity, as envisioned by the Lānaʻi Community Plan.

(B.) The implementation of the project will include provisions for services, such as wastewater systems, water systems, and drainage improvements. It is within the service area of local police, hospitals, and fire prevention services and would not extend their service boundaries. It is also accessible to private waste disposal services, and adjacent to major transportation routes.

(C.) The Lānaʻi Community Plan identified the Miki Basin area as a logical area for the expansion of industrial uses due to its proximity to similar existing facilities.

3. It shall include lands with satisfactory topography, drainage, and reasonably free from danger of any flood, tsunami, unstable soil condition, and other adverse environmental effects.

Response: The subject property has a significantly high elevation at well over 1,000 feet above sea level. The existing onsite terrain is covered with vegetation and slopes at about five (5) percent from Miki Road toward the southeast. The site is free from danger of any flood, tsunami, unstable soil conditions and other adverse environmental effects. The subject property is located in Flood Zone X (unshaded) on the Flood Insurance Rate Map for the area, and not within the tsunami evacuation area. Additional runoff generated within the proposed industrial parcels can be accommodated by the existing Miki Basin and Pālāwai Basin. Development of the project will include the implementation of site-specific, best management practices (BMPs) during the construction to provide erosion control and minimize impacts to downstream properties.

4. *Land contiguous with existing urban areas shall be given more consideration than non-contiguous land, and particularly when indicated for future urban use on state or county general plans.*

Response: The Miki Basin Industrial Park is located on land adjoining the Lānaʻi Airport, the MECO 5-acre power plant and the existing 20-acre Miki Basin Industrial Condominium, which are all designated "Urban". The project is a 200-acre light and heavy industrial development located in an area called for in the Lānaʻi Community Plan.

5. *It shall include lands in appropriate locations for new urban concentrations and shall give consideration to areas of urban growth as shown on the state and county general plans.*

Response: The project site is located in an area designated for light industrial and heavy industrial uses in the Lānaʻi Community Plan. It also is located on land adjoining the Lānaʻi Airport, MECO power plant, and the 20-acre Miki Basin Industrial Condominium which are designated "Urabn" by the State Land Use Commission.

6. *It may include lands which do not conform to the standards in paragraph (1) to (5):*

   A. *When surrounded by or adjacent to existing urban development; and*

   B. *Only when those lands represent a minor portion of this district*

Response: The Miki Basin Industrial Park includes lands which conform to the standards in paragraphs (1) to (5). The 200-acre project site is adjacent to existing urban development and represents a small portion of the approximately 18,000 acres that were previously used for growing pineapple, and approximately 45,000 acres of State Agricultural Land on Lānaʻi.

7. *It shall not include lands, the urbanization of which will not contribute toward scattered spot urban development, necessitating unreasonable investment in public infrastructure or support services.*

Response: The Miki Basin Industrial Park is comprehensively designed and intended to meet future industrial, commercial, and public/quasi-public land use requirements, integrated with the existing urban services in Lānaʻi. Due to the concentration of industrial type uses in the Miki Basin area, namely the adjacent Lānaʻi Airport, the MECO 5-acre power plant, and the existing 20-acre Miki Basin Industrial Condominium, the urbanization of the project area would

not contribute towards scattered development, but would consolidate a range of land uses for similar purposes.

8. *It may include lands with a general slope of twenty percent or more if the commission finds that those lands are desirable and suitable for urban purposes and that the design and construction controls, as adopted by any federal, state or county agency, are adequate to protect the public health, welfare and safety, and the public's interest in the aesthetic quality of the landscape.*

Response: The project area is relatively flat, with slopes at about five (5) percent from Miki Road toward the southeast.

B. HAWAIʻI STATE PLAN

Chapter 226, HRS, also known as the Hawaiʻi State Plan, is a long-range comprehensive plan which serves as a guide for the future long-term development of the State by identifying goals, objectives, policies, and priorities, as well as implementation mechanisms. The Plan consists of three (3) parts. Part I includes the Overall Theme, Goals, Objectives, and Policies; Part II includes Planning, Coordination, and Implementation; and Part III establishes Priority Guidelines. Part II of the State Plan covers its administrative structure and implementation process.

The overall theme of the Hawaiʻi State Plan is governed by the following general principles.

1. Individual and family self-sufficiency

2. Social and economic mobility

3. Community or social well-being

In consonance with the foregoing principles, the Hawaiʻi State Plan identifies three (3) clarifying goals:

1. A strong, viable economy, characterized by stability, diversity, and growth, that enables the fulfillment of the needs and expectations of Hawaiʻi's present and future generations.

2. A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people.

3. Physical, social, and economic well-being, for individuals and families in Hawaiʻi, that nourishes a sense of community responsibility, of caring, and of participation in community life.

This section of the environmental assessment examines the applicability of the proposed action as it relates to the objectives, policies, and priority guidelines of the Hawai‘i State Plan, as set forth in HRS Sections 226-5 through 226-27.

The table below summarizes the relationship between the proposed action and the goals of the Hawai‘i State Plan. The relationship between the action and the goals are categorized into the following groups. More detailed analysis and discussion, including the methodology used, is presented in **Appendix "K-1"**.

1. **Directly applicable**: the action and its potential effects directly advances or promotes the objective, policy or priority guideline.

2. **Indirectly applicable**: the action and its potential effects indirectly supports or advances the objective, policy or priority guideline.

3. **Not applicable**: the action and its potential effects have no direct or indirect relationship to the objectives and policies of the Hawai‘i State Plan.

In general, a proposed action's applicability to the objectives, policies and priority guidelines of the Hawai`i State Plan is judged on the basis of the action's direct or indirect relationship to the respective objectives, policies and priority directions. It is recognized that the categorization of "applicability" is subject to interpretation and should be appropriately considered in the context of local and regional conditions. The analysis presented in **Table 5** and summarized below focuses on key elements of the proposed action's relationship to the Hawai‘i State Plan. Detailed discussion on the applicability of the proposed action to each goal and related objectives, policies, and implementing actions of the Hawai`i State Plan is provided in **Appendix "K-1"**.

Table 5. Hawai‘i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies (Chapters 226-1 to 226-27)

Hawai‘i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies **Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable**	**DA**	**IA**	**NA**
HRS 226-1: Findings and Purpose			
HRS 226-2: Definitions			
HRS 226-3: Overall Theme			
HRS 226-4: State Goals. In order to guarantee, for the present and future generations, those elements of choice and mobility that insure that individuals and groups may approach their desired levels of self-reliance and self determination, it shall be the goal of the State to achieve: (1) A strong, viable economy, characterized by stability, diversity, and growth, that enables the fulfillment of the needs and expectations of Hawaii's present and future generations. (2) A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people. (3) Physical, social, and economic well-being, for individuals and families in Hawaii, that nourishes a sense of community responsibility, of caring, and of participation in community life.			

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	NA
Chapter 226-5 Objective and Policies for Population			
Objective: It shall be the objective in planning for the State's population to guide population growth to be consistent with the achievement of physical, economic and social objectives contained in this chapter.	✓		
Chapter 226-6 Objectives and policies for the economy – – in general			
Objectives: Planning for the State's economy in general shall be directed toward achievement of the following objectives:			
(1) Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people, while at the same time stimulating the development and expansion of economic activities capitalizing on defense, dual-use, and science and technology assets, particularly on the neighbor islands where employment opportunities may be limited.		✓	
(2) A steadily growing and diversified economic base that is not overly dependent on a few industries, and includes the development and expansion of industries on the neighbor islands.		✓	
Chapter 226-7 Objectives and policies for the economy – – agriculture.			
Objectives: Planning for the State's economy with regard to agriculture shall be directed towards achievement of the following objectives:			
(1) Viability of Hawaii's sugar and pineapple industries.			✓
(2) Growth and development of diversified agriculture throughout the State.			✓
(3) An agriculture industry that continues to constitute a dynamic and essential component of Hawaii's strategic, economic, and social well-being.			✓
Chapter 226-8 Objective and policies for the economy – – visitor industry.			
Objective: Planning for the State's economy with regard to the visitor industry shall be directed towards the achievement of the objective of a visitor industry that constitutes a major component of steady growth for Hawaii's economy.			✓
Chapter 226-9 Objective and policies for the economy – – federal expenditures.			
Objective: Planning for the State's economy with regard to federal expenditures shall be directed towards achievement of the objective of a stable federal investment base as an integral component of Hawaii's economy.			✓
Chapter 226-10 Objective and policies for the economy – – potential growth and innovative activities.			
Objective: Planning for the State's economy with regard to potential growth and innovative activities shall be directed towards achievement of the objective of development and expansion of potential growth and innovative activities that serve to increase and diversify Hawaii's economic base.		✓	

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	NA
Chapter 226-10.5 Objectives and policies for the economy – – information industry.			
Objective: Planning for the State's economy with regard to telecommunications and information technology shall be directed toward recognizing that broadband and wireless communication capability and infrastructure are foundations for an innovative economy and positioning Hawaii as a leader in broadband and wireless communications and applications in the Pacific Region.			✓
Chapter 226-11 Objectives and policies for the physical environment – – land based, shoreline, and marine resources.			
Objectives: Planning for the State's physical environment with regard to land-based, shoreline, and marine resources shall be directed towards achievement of the following objectives:			
(1) Prudent use of Hawaii's land-based, shoreline, and marine resources.		✓	
(2) Effective protection of Hawaii's unique and fragile environmental resources.			✓
Chapter 226-12 Objective and policies for the physical environment – – scenic, natural beauty, and historic resources.			
Objective: Planning for the State's physical environment shall be directed towards achievement of the objective of enhancement of Hawaii's scenic assets, natural beauty, and multi-cultural/historical resources.		✓	
Chapter 226-13 Objectives and policies for the physical environment – – land, air, and water quality.			
Objectives: Planning for the State's physical environment with regard to land, air, and water quality shall be directed towards achievement of the following objectives.			
(1) Maintenance and pursuit of improved quality in Hawaii's land, air, and water resources.	✓		
(2) Greater public awareness and appreciation of Hawaii's environmental resources.		✓	
Chapter 226-14 Objective and policies for facility systems – – in general.			
Objective: Planning for the State's facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal, and energy and telecommunication systems that support statewide social, economic, and physical objectives.		✓	
Chapter 226-15 Objectives and policies for facility systems – – solid and liquid waste.			
Objectives: Planning for the State's facility systems with regard to solid and liquid wastes shall be directed towards the achievement of the following objectives:			
(1) Maintenance of basic public health and sanitation standards relating to treatment and disposal of solid and liquid wastes.		✓	
(2) Provision of adequate sewerage facilities for physical and economic activities that alleviate problems in housing, employment, mobility, and other areas.	✓		

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	NA
Chapter 226-16 Objective and policies for facility systems – – water.			
Objective: Planning for the State's facility systems with regard to water shall be directed towards achievement of the objective of the provision of water to adequately accommodate domestic, agricultural, commercial, industrial, recreational, and other needs within resource capacities.	✓		
Chapter 226-17 Objectives and policies for facility systems – – transportation.			
Objectives: Planning for the State's facility systems with regard to transportation shall be directed towards the achievement of the following objectives:			
(1) An integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods.			✓
(2) A statewide transportation system that is consistent with and will accommodate planned growth objectives throughout the State.			✓
Chapter 226-18 Objectives and policies for facility systems – – energy.			
Objectives: Planning for the State's facility systems with regard to energy shall be directed toward the achievement of the following objectives, giving due consideration to all:			
(1) Dependable, efficient, and economical statewide energy systems capable of supporting the needs of the people;		✓	
(2) Increased energy security and self-sufficiency through the reduction and ultimate elimination of Hawaii's dependence on imported fuels for electrical generation and ground transportation.	✓		
(3) Greater diversification of energy generation in the face of threats to Hawaii's energy supplies and systems;		✓	
(4) Reduction, avoidance, or sequestration of greenhouse gas emissions from energy supply and use; and	✓		
(5) Utility models that make the social and financial interests of Hawaii's utility customers a priority.			✓
Chapter 226-18.5 Objectives and policies for facility systems – – telecommunications.			
Objectives: Planning for the State's telecommunications facility systems shall be directed towards the achievement of dependable, efficient, and economical statewide telecommunications systems capable of supporting the needs of the people.			✓
Chapter 226-19 Objectives and policies for socio-cultural advancement – – housing.			
Objectives: Planning for the State's socio-cultural advancement with regard to housing shall be directed toward the achievement of the following objectives:			✓
(1) Greater opportunities for Hawaii's people to secure reasonably priced, safe, sanitary, and livable homes, located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals, through collaboration and cooperation between government and nonprofit and for-profit developers to ensure that more affordable housing is made available to very low-, low- and moderate-income segments of Hawaii's population.			✓

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	NA
(2) The orderly development of residential areas sensitive to community needs and other land uses.			✓
(3) The development and provision of affordable rental housing by the State to meet the housing needs of Hawaii's people.			✓
Chapter 226-20 Objectives and policies for socio-cultural advancement – – health.			
Objectives: Planning for the State's socio-cultural advancement with regard to health shall be directed towards achievement of the following objectives:			
(1) Fulfillment of basic individual health needs of the general public.			✓
(2) Maintenance of sanitary and environmentally healthful conditions in Hawaii's communities.			✓
(3) Elimination of health disparities by identifying and addressing social determinants of health.			✓
Chapter 226-21 Objectives and policies for Socio-cultural advancement – – education.			
Objective: Planning for the State's socio-cultural advancement with regard to education shall be directed towards achievement of the objective of the provision of a variety of educational opportunities to enable individuals to fulfill their needs, responsibilities, and aspirations.		✓	
Chapter 226-22 Objective and policies for socio-cultural advancement – – social services.			
Objective: Planning for the State's socio-cultural advancement with regard to social services shall be directed towards the achievement of the objective of improved public and private social services and activities that enable individuals, families, and groups to become more self-reliant and confident to improve their well-being.			✓
Chapter 226-23 Objective and policies for socio-cultural advancement – – leisure.			
Objective: Planning for the State's socio-cultural advancement with regard to leisure shall be directed towards the achievement of the objective of the adequate provision of resources to accommodate diverse cultural, artistic, and recreational needs for present and future generations.			✓
Chapter 226-24 Objective and policies for socio-cultural advancement – – individual rights and personal well-being.			
Objective: Planning for the State's socio-cultural advancement with regard to individual rights and personal well-being shall be directed towards achievement of the objective of increased opportunities and protection of individual rights to enable individuals to fulfill their socio-economic needs and aspirations.			✓
Chapter 226-25 Objective and policies for socio-cultural advancement – – culture.			
Objective: Planning for the State's socio-cultural advancement with regard to culture shall be directed toward the achievement of the objective of enhancement of cultural identities, traditions, values, customs, and arts of Hawaii's people.		✓	

Hawai‘i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	NA
Chapter 226-26 Objectives and policies for socio-cultural advancement – – public safety.			
Objective: Planning for the State’s socio-cultural advancement with regard to public safety shall be directed towards the achievement of the following objectives:			
(1) Assurance of public safety and adequate protection of life and property for all people.			✓
(2) Optimum organizational readiness and capability in all phases of emergency management to maintain the strength, resources, and social and economic well-being of the community in the event of civil disruptions, wars, natural disasters, and other major disturbances.			✓
(3) Promotion of a sense of community responsibility for the welfare and safety of Hawaii’s people.			✓
Chapter 226-27 Objectives and policies for socio-cultural advancement – – government.			
Objectives: Planning the State’s socio-cultural advancement with regard to government shall be directed towards the achievement of the following objectives:			
(1) Efficient, effective, and responsive government services at all levels in the State.			✓
(2) Fiscal integrity, responsibility, and efficiency in the state government and county governments.			✓

The proposed Miki Basin Industrial Park is consistent with the State Plan’s goals and objectives. The project strengthens the state’s economy through short-term employment via construction development as well as long-term opportunities in industrial and renewable energy industries. Construction BMPs will be used to manage and minimize land, air and water quality impacts, while the industrial park's planned 127 acres of renewable energy projects will reduce Lāna‘i’s future greenhouse gas emissions.

The Applicant will be responsible for providing code compliant wastewater systems. The Applicant will also ensure the adequacy of water supply and transmission/distribution capacity. Once the project is completed, individual users within the industrial park will be responsible for managing private solid waste collection services and promoting the conservation of water resources.

Priority Guidelines

“Priority guidelines” means those guidelines which shall take precedence when addressing areas of statewide concern. This section addresses applicability criteria to the priority guidelines set forth in HRS 226-103.

Priority guidelines of the Hawai‘i State Plan covers the economy, population growth and land resources, crime and criminal justice, affordable housing, quality education, sustainability, and climate change adaptation.

Table 6 below summarizes the relationship between the proposed action and the priority guidelines of the Hawai‘i State Plan. More detailed discussion is presented in **Appendix "K-1"**.

Table 6. Hawai‘i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies (Chapters 226-101 to 226.109)

Hawai‘i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies **Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable**	DA	**IA**	**N/A**
Chapter 226-101: Purpose. The purpose of this part is to establish overall priority guidelines to address areas of statewide concern.			
Chapter 226-102: Overall direction. The State shall strive to improve the quality of life for Hawaii's present and future population through the pursuit of desirable courses of action in seven major areas of statewide concern which merit priority attention: economic development, population growth and land resource management, affordable housing, crime and criminal justice, quality education, principles of sustainability, and climate change adaptation.			
Chapter 226-103: Economic priority guidelines.			
(a) Priority guidelines to stimulate economic growth and encourage business expansion and development to provide needed jobs for Hawaii's people and achieve a stable and diversified economy:	✓		
(b) Priority guidelines to promote the economic health and quality of the visitor industry:			✓
(c) Priority guidelines to promote the continued viability of the sugar and pineapple industries:			✓
(d) Priority guidelines to promote the growth and development of diversified agriculture and aquaculture:			✓
(e) Priority guidelines for water use and development:		✓	
(f) Priority guidelines for energy use and development:	✓		
(g) Priority guidelines to promote the development of the information industry:			✓
Chapter 226-104: Population growth and land resources priority guidelines.			
(a) Priority guidelines to effect desired statewide growth and distribution:			✓
(b) Priority guidelines for regional growth distribution and land resource utilization:	✓		
Chapter 226-105: Crime and criminal justice.			
Priority guidelines in the area of crime and criminal justice:			✓
Chapter 226-106: Affordable housing.			
Priority guidelines for the provision of affordable housing:			✓
Chapter 226-107: Quality education.			
Priority guidelines to promote quality education:			✓
CHAPTER 226-108: Sustainability			
Priority guidelines and principles to promote sustainability shall include:		✓	
CHAPTER 226-109: Climate change adaptation			
Priority guidelines and principles to promote climate change adaptation shall include:		✓	

The proposed Miki Basin Industrial Park is directly applicable to Hawai‘i's priority guildines to stimulate economic growth and encourage business expansion and development to

provide needed jobs for Hawai‘i’s people and achieve a stable and diversified economy. The project provides short-term employment via construction development, as well as long-term opportunities in industrial and renewable energy industries. The industrial park includes 127 acres of renewable energy projects (e.g., photovoltaic plus battery energy storage).

The proposed project implements the vision for placement of industrial land uses on the island and expands upon the much-needed industrially zoned land area called for in the Lāna‘i Community Plan. While the underlying lands are designated “Agricultural” by the State Land Use Commission and County zoning, the Community Plan’s “Light Industrial” and “Heavy Industrial” land use designations recognize the need to provide for these critical economic development uses which may include relocation of uses from Lanai City. This location, adjacent to Lāna‘i Airport, also assures that sensitive environments such as shoreline areas, open spaces, and scenic resources will be avoided.

C. STATE FUNCTIONAL PLAN

A key element of the Statewide Planning System is the Functional Plans which set forth the policies, statewide guidelines, and priorities within a specific field of activity. There are 13 Functional Plans which have been developed by the State agency primarily responsible for a given functional area. Together with the County General Plans, the State Functional Plans establish more specific strategies for implementation. In particular, State Functional Plans provide for the following:

- Identify major Statewide priority concerns
- Define current strategies for each functional area
- Identify major relationships among functional areas
- Provide direction and strategies for departmental policies, programs, and priorities
- Provide a guide for the allocation of resources
- Coordinate State and County roles and responsibilities in the implementation of the Hawai‘i State Plan

Thirteen (13) Functional Plans have been prepared by State agencies. **Table 7** provides an assessment of the relationship between the proposed action and each of the 13 Functional Plans.

Table 7. Relationship Between the Proposed Miki Basin Industrial Project and the State Functional Plans

	State Functional Plan	State Coordinating Agency	Purpose	Analysis
1	Agriculture Functional Plan (1991)	Department of Agriculture	Continued viability of agriculture throughout the State	Although the development of the proposed project will result in a loss of 200 acres of agricultural lands on Lānaʻi, the lands are characterized by a low productivity rating and have not been cultivated since the pineapple plantation closed in 1992. Furthermore, the 200-acre site amounts to only 1.1 percent of the approximately 18,000 acres of former plantation lands on Lānaʻi that remain available for agricultural use. The lack of significant growth of diversified crops reflects increased competition from resulting from technology and other advances that have improved the delivery of fresh produce (faster, less spoilage, better coordination of supply to demand), along with trade agreements which increased food exports to the U.S. from low-cost producers in Mexico, Central America, South America, and elsewhere. Refer to **Appendix "B"**.
2	Conservation Lands State Functional Plan (1991)	Department of Land and Natural Resources	Addresses issues of population and economic growth and its strain on current natural resources; broadening public use of natural resources while protecting lands and shorelines from overuse; additionally, promotes the aquaculture industry	The proposed project will not utilize any State Conservation lands. Similarly, the project is located inland, and not near the coastline. The proposed action is not anticipated to contravene the objectives and policies of this functional plan.
3	Education State Functional Plan (1989)	Department of Education	Improvements to Hawaiʻi's educational curriculum, quality of educational staff, and access to adequate facilities	The proposed project will not create new demands on public education. The proposed action is not anticipated to contravene the objectives and policies of this functional plan.

Table 7. Relationship Between the Proposed Miki Basin Industrial Project and the State Functional Plans (continued)

	State Functional Plan	State Coordinating Agency	Purpose	Analysis
4	Employment State Functional Plan (1990)	Department of Labor and Industrial Relations	Improve the qualifications, productivity, and effectiveness of the State's workforce through better education and training of workers as well as efficient planning of economic development, employment opportunities, and training activities	The project provides short-term employment via construction development as well as long-term opportunities in industrial and renewable energy industries. This will provide local residents with opportunities to successfully compete in the workforce and potentially start new businesses that create more job opportunities. The proposed action is not anticipated to contravene the objectives and policies of this functional plan.
5	Energy State Functional Plan (1991)	Department of Business, Economic Development and Tourism	Lessen the reliance on petroleum and other fossil fuels in favor of alternative sources of energy so as to keep up with the State's increasing energy demands while also becoming a more sustainable island state; achieving dependable, efficient, and economical statewide energy systems	The proposed action is supportive of the Energy State Functional Plan's objectives and policies. The proposed Miki Basin Industrial Park includes 127 acres of renewable energy projects (e.g., photovoltaic plus battery energy storage), which will reduce Lānaʻi's long-term dependence on fossil fuels and decrease greenhouse gas emissions.
6	Health State Functional Plan (1989)	Department of Health	Improve health care system by providing for those who don't have access to private health care providers; increasing preventative health measures; addressing 'quality of care' elements in private and public sectors to cut increasing costs	The proposed action is not anticipated to contravene the objectives and policies of this functional plan.
7	Higher Education Functional Plan (1984)	University of Hawaiʻi	Prepare Hawaiʻi's citizens for the demands of an increasingly complex world through providing technical and intellectual tools	The proposed action is not anticipated to contravene the objectives and policies of this functional plan.

Table 7. Relationship Between the Proposed Miki Basin Industrial Project and the State Functional Plans
(continued)

	State Functional Plan	State Coordinating Agency	Purpose	Analysis
8	Historic Preservation State Functional Plan (1991)	Department of Land and Natural Resources	Preservation of historic properties, records, artifacts and oral histories; provide public with information/education on the ethnic and cultural heritages and history of Hawai‘i	An Archaeological Inventory Survey (AIS) was prepared for sites within the Miki Basin Industrial Park. A data recovery plan will be implemented prior to proposed construction activities, and research questions will be developed and addressed through data yielded by laboratory testing. Refer to **Appendix "D-1"**. The AIS also included research compliant with guidelines for development of a Cultural Impact Assessment (CIA) study. The proposed project will not have any significant negative impact on traditional and customary practices. Refer to **Appendix "D-3"**. The proposed action is in consonance with this functional plan.
9	Housing State Functional Plan (2017)	Hawai‘i Housing Finance and Development Corporation	Based largely on joint public/private efforts to finance, build, and maintain an adequate supply of affordable housing. It will be a working tool to guide the State, the counties, as well as the private sector in meeting the overall goal that every Hawaii resident will have the opportunity to live in a safe, decent and affordable home.	The proposed action is not anticipated to contravene the objectives and policies of this functional plan.
10	Human Services State Functional Plan (1989)	Department of Human Services	Refining support systems for families and individuals by improving elderly care, increasing preventative measures to combat child/spousal abuse and neglect; providing means for 'self-sufficiency'	The proposed action is not anticipated to contravene the objectives and policies of this functional plan.

Table 7. Relationship Between the Proposed Miki Basin Industrial Project and the State Functional Plans (continued)

	State Functional Plan	State Coordinating Agency	Purpose	Analysis
11	Recreation State Functional Plan (1991)	Department of Land and Natural Resources	Manage the use of recreational resources via addressing issues: (1) ocean and shoreline recreation, (2) mauka, urban, and other recreation opportunities, (3) public access to shoreline and upland recreation areas, (4) resource conservation and management, (5) management of recreation programs/facilities/areas, and (6) wetlands protection and management	The proposed action is not anticipated to contravene the objectives and policies of this functional plan.
12	Tourism State Functional Plan (1991)	Department of Business, Economic Development and Tourism	Balance tourism/economic growth with environmental and community concerns; development that is cognizant of the limited land and water resources of the islands; maintaining friendly relations between tourists and community members; development of a productive workforce and enhancement of career and employment opportunities in the visitor industry	The proposed action is not anticipated to contravene the objectives and policies of this functional plan.
13	Transportation State Functional Plan (1991)	Department of Transportation	Development of a safer, more efficient transportation system that also is consistent with planned physical and economic growth of the state; construction of facility and infrastructure improvements; develop a transportation system balanced with new alternatives; pursue land use initiatives which help reduce travel demand	The proposed project will be implemented in proximity to existing State and County roadway facilities. The project's Traffic Impact Analysis Report (TIAR) identifies recommended traffic improvements to be implemented with the project. Refer to **Appendix "G"**.

REF-90

D. GENERAL PLAN OF THE COUNTY OF MAUI

As indicated by the Maui County Charter, the purpose of the general plan shall be to:

> *... indicate desired population and physical development patterns for each island and region within the county; shall address the unique problems and needs of each island and region; shall explain opportunities and the social, economic, and environmental consequences related to potential developments; and shall set forth the desired sequence, patterns and characteristics of future developments. The general plan shall identify objectives to be achieved, and priorities, policies, and implementing actions to be pursued with respect to population density, land use maps, land use regulations, transportation systems, public and community facility locations, water and sewage systems, visitor destinations, urban design, and other matters related to development.*

Chapter 2.80B of the Maui County Code, relating to the General Plan and Community Plans, implements the foregoing Charter provision through enabling legislation which calls for a Countywide Policy Plan and a Maui Island Plan.

1. Countywide Policy Plan

The Countywide Policy Plan was adopted in March 2010 and is a comprehensive policy document for the islands of Maui County to the year 2030. The plan replaces the General Plan of the County of Maui 1990 Update and provides the policy framework for the development of the Maui Island Plan as well as for updating the nine (9) detailed Community Plans. The Countywide Policy Plan provides broad goals, objectives, policies and implementing actions that portray the desired direction of the County's future. Goals are intended to describe a desirable condition of the County by the year 2030 and are intentionally general. Objectives tend to be more specific and may be regarded as milestones to achieve the larger goals. Policies are not intended as regulations, but instead provide a general guideline for County decision makers, departments, and collaborating organizations toward the attainment of goals and objectives. Implementing actions are specific tasks, procedures, programs, or techniques that carry out policy.

The table below summarizes the relationship between the proposed action and the 11 goals of the Countywide Policy Plan. The relationship between the action and the goals are categorized into the following groups. More detailed analysis and discussion, including the methodology used, is presented in **Appendix "K-2"**.

1. **Directly applicable:** the action and its potential effects directly advances, promotes or affects the relevant goal, objective, or policy.

2. **Indirectly applicable:** the action and its potential effects indirectly supports, advances or affects the objective, policy or priority guideline.

3. **Not applicable:** the action and its potential effects have no direct or indirect relationship to the objectives and policies of the Countywide Policy Plan.

In general, a proposed action's applicability to the goals, objectives, policies and implementing actions of the Countywide Policy Plan is judged on the basis of the action's direct or indirect relationship to the respective objectives, policies and priority directions. It is recognized that the categorization of "applicability" is subject to interpretation and should be appropriately considered in the context of local and regional conditions. The analysis presented in **Table 8** and summarized below focuses on key elements of the proposed action's relationship to the Countywide Policy Plan. Detailed discussion on the applicability of the proposed action to each goal and related objectives, policies, and implementing actions of the Countywide Policy Plan is provided in **Appendix "K-2"**.

Table 8. Countywide Policy Plan

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
A. PROTECT THE NATURAL ENVIRONMENT			
Goal: Maui County's natural environment and distinctive open spaces will be preserved, managed, and cared for in perpetuity.		✓	
B. PRESERVE LOCAL CULTURES AND TRADITIONS			
Goal: Maui County will foster a spirit of pono and protect, perpetuate, and reinvigorate its residents" multi-cultural values and traditions to ensure that current and future generations will enjoy the benefits of their rich island heritage.		✓	
C. IMPROVE EDUCATION			
Goal: Residents will have access to lifelong formal and informal educational options enabling them to realize their ambitions.			✓
D. STRENGTHEN SOCIAL AND HEALTHCARE SERVICES			
Goal: Health and social services in Maui County will fully and comprehensively serve all segments of the population.			✓
E. EXPAND HOUSING OPPORTUNITIES FOR RESIDENTS			
Goal: Quality, island-appropriate housing will be available to all residents.			✓
F. STRENGTHEN THE LOCAL ECONOMY			
Goal: Maui County's economy will be diverse, sustainable, and supportive of community values.	✓		
G. IMPROVE PARKS AND PUBLIC FACILITIES			
Goal: A full range of island-appropriate public facilities and recreational opportunities will be provided to improve the quality of life for residents and visitors.			✓
H. DIVERSIFY TRANSPORTATION OPTIONS			
Goal: Maui County will have an efficient, economical, and environmentally sensitive means of moving people and goods.		✓	

REF-92

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
I. IMPROVE PHYSICAL INFRASTRUCTURE			
Goal: Maui County's physical infrastructure will be maintained in optimum condition and will provide for and effectively serve the needs of the County through clean and sustainable technologies.		✓	
J. PROMOTE SUSTAINABLE LAND USE AND GROWTH MANAGEMENT			
Goal: Community character, lifestyles, economies, and natural assets will be preserved by managing growth and using land in a sustainable manner.		✓	
K. STRIVE FOR GOOD GOVERNANCE			
Goal: Government services will be transparent, effective, efficient, and responsive to the needs of residents.	✓		

The proposed Miki Basin Industrial Park directly or indirectly promotes many of the goals and objectives of the Countywide Policy Plan. This includes the project's investment in the local economy, which will support local businesses that are linked to the construction, industrial, and renewable energy industries. From a long-term perspective, the proposed action supports economic diversification and the overall business environment by providing opportunities for new enterprises to establish places of operations for their respective ventures. The project also implements the vision for placement of industrial land uses on the island and expands upon the much-needed industrially zoned land area called for in the Lānaʻi Community Plan.

The proposed action directly promotes civic engagement and good governance through the Chapter 343, HRS, Environmental Assessment (EA) and land use entitlements processes. Public participation is promoted through the review process for the Draft EA and land use applications, as well as through the Urban Design Review Board and Lānaʻi Planning Commission proceedings. Additionally, the applicant has undertaken a community outreach process designed to inform the larger community of the proposed project. Collectively, the foregoing processes support community-based decision-making.

2. Lānaʻi Community Plan

The project site is located in the Lānaʻi Community Plan region which is one (1) of nine (9) Community Plan regions established in the County of Maui. Planning for each region is guided by the respective Community Plans, which are designed to implement the Maui County General Plan. Each Community Plan contains recommendations and standards which guide the sequencing, patterns, and characteristics of future development in the region.

The Lānaʻi Community Plan was adopted by the County of Maui through Ordinance No. 4343 which took effect on July 26, 2016.

Land use guidelines are set forth by the Lānaʻi Community Plan Land Use Map. See **Figure 9**. The project site is designated as "Light Industrial" and "Heavy Industrial" by the Community Plan. The project is consistent with the following objectives and policies of the Lānaʻi Community Plan:

HAZARD MITIGATION

Goal:

Lanaʻi will be prepared for natural disasters.

Policy:

3. *Encourage economic diversity, environmental health, infrastructure, maintenance, and hazard preparedness to improve the community's resiliency.*

Analysis: The proposed Miki Basin Industrial Park will include 127 acres for renewable energy projects (e.g., photovoltaic plus battery energy storage), which aim to improve the overall resiliency and sustainability of Lānaʻi. The planned increase in renewable energy projects will also reduce the island's reliance on fossil fuel, currently imported from off-island and used to generate electricity by Maui Electric Company.

CULTURAL, HISTORIC, AND SCENIC RESOURCES

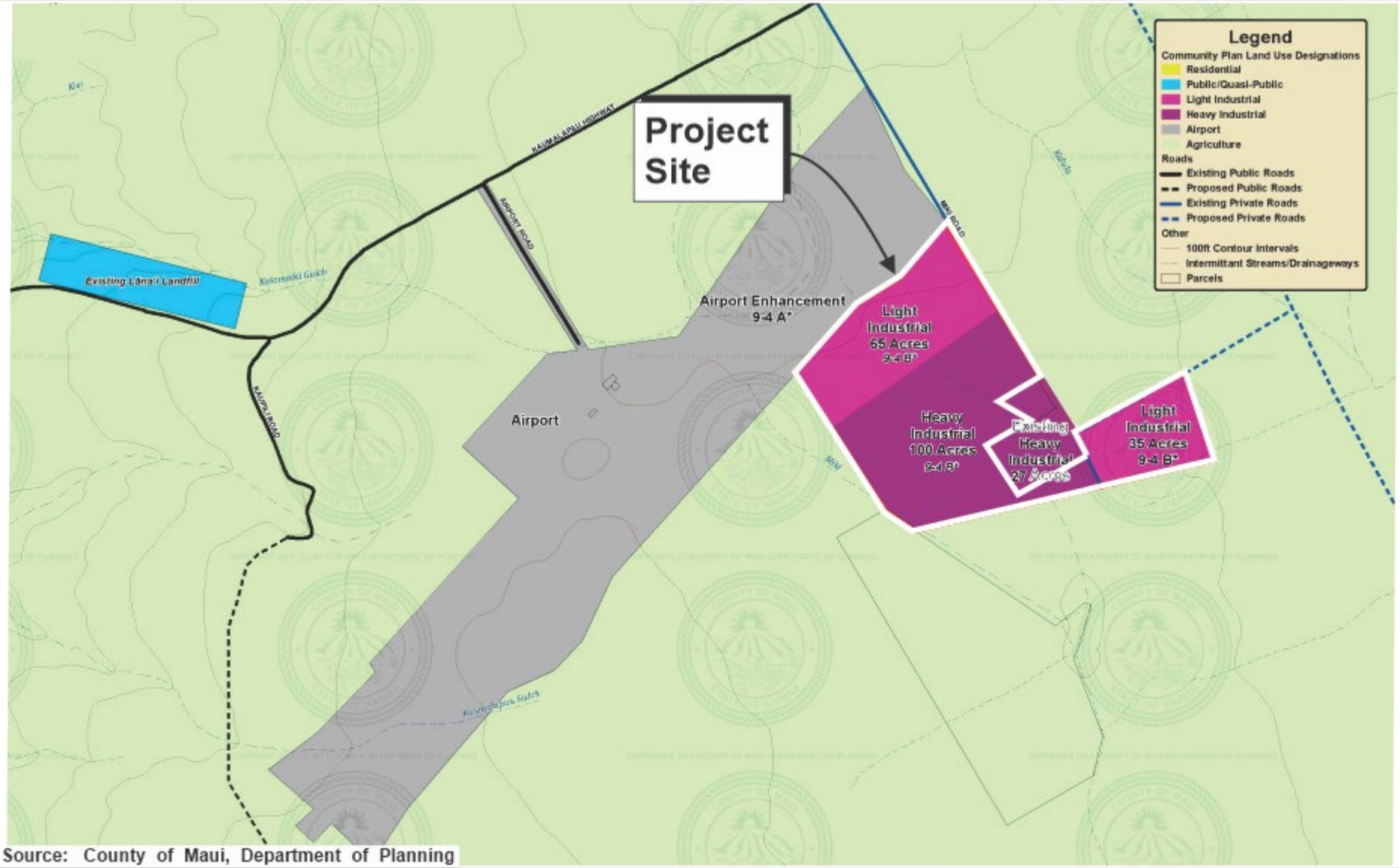
Goal:

Lānaʻi's diverse cultural, archaeological, and historic resources and practices, and scenic resources will be protected for future generations.

Policy:

9. *Require developments to mitigate their impacts on historic, cultural, natural, and scenic resources.*

Analysis: The proposed project has been designed so as to not impede scenic views from upland areas. An AIS has been prepared and accepted by the SHPD. The Applicant will abide by the recommendations and requirements from the SHPD.



Source: County of Maui, Department of Planning

Figure 9

Miki Basin Industrial Park
Lāna'i Community Plan Map

NOT TO SCALE

Prepared for: Lanai Resorts LLC, a Hawaii Limited Liability Company doing business as Pūlama Lāna'i

MUNEKIYO HIRAGA

Pulama Lanai/MikiBasinExp 1769/Applications/Figures/Lanai Comm Plan

REF-95

ECONOMIC DEVELOPMENT

Goal:

A stable, sustainable, and diverse economy that is consistent and compatible with Lana i's rural island lifestyle.

Policy:

1. *Support diversification of Lana'i's economy.*

Analysis: While much of Lāna'i's economy relies on the visitor industry, the proposed Miki Basin Industrial Park will include 127 acres for renewable energy projects (e.g., Photovoltaic plus battery energy storage) and 26 acres for new industrial uses. Possible new future industrial uses include a slaughterhouse, warehouse space for cold storage, laboratory/testing facilities, niche product development, automotive services, multi-media facility and an animal hospital. These new uses will further the diversification of the island's economy.

Policy:

8. *Encourage and support lease and fee simple land ownership options for residential commercial, and industrial properties.*

Analysis: The Applicant may lease land within the Miki Basin Industrial Park for individuals to pursue industrial operations and businesses. The Applicant will develop the major common infrastructure, such as roads and electric and water utility lines, to support the industrial park, while individual users will be responsible for vertical development on their particular properties and for compliance with applicable regulatory requirements associated with their individual developments.

INFRASTRUCTURE AND UTILITIES (ENERGY)

Goal:

Increase the proportion of electricity that is generated from renewable sources to reduce electricity costs and Lana'i's dependence on fossil fuels.

Policy:

1. *Support the increased use of renewable energy sources.*

Analysis: As previously mentioned, the proposed Miki Basin Industrial Park will include 127 acres for renewable energy projects (e.g., photovoltaic plus battery energy storage), which will reduce Lānaʻi's reliance on fossil fuel.

LAND USE

Goal:

Lanaʻi will have an efficient and sustainable land use pattern that protects agricultural lands, open space, natural systems, and rural and urban character.

Policy:

2. *Limit new residential, commercial, or industrial development to existing communities and proposed expansion areas as shown on the Lana'i Community Plan land use maps.*

Analysis: The proposed project implements the vision for placement of industrial land uses on the island and expands upon the much-needed industrially zoned land area called for in the Lānaʻi Community Plan.

Policy:

10. *Ensure all lands are zoned and zoning standards are consistent with community plan policies and land use designations as shown on Maps 9.2 through 9.6.*

Analysis: The project area is designated "Agricultural" by the State Land Use Commission (SLUC) and "Agricultural" and "Interim" by the Maui County Zoning. The proposed action would seek to align the State and County land use designations to districts similar to the "Light Industrial" and "Heavy Industrial" designation by the Lānaʻi Community Plan. The Applicant will seek a District Boundary Amendment (DBA) from SLUC to designate the subject property "Urban", as well as a Change of Zoning (CIZ) request from "Agricultural" and "Interim" to "M-1, Light Industrial" and "M-2, Heavy Industrial" to the Maui County Council. The EA will serve as the primary supporting document for the DBA and CIZ processes.

E. COUNTY ZONING

The land underlying the proposed project site are zoned "Agricultural", with a small portion zoned "Interim" by the Maui County Zoning. See **Figure 10**. The Applicant will seek a Change of Zoning (CIZ) request to the Maui County Council for "M-1, Light Industrial" and "M-2, Heavy Industrial" designation, similar to the designation called for in the Lānaʻi Community Plan. The EA will serve as the primary supporting document for the CIZ process.

Pūlama Lānaʻi will work with Maui County in establishing the allowable uses in the Miki Basin Industrial Park from the overall permitted uses allowed by zoning. The Miki Basin Industrial Park will focus on Light and Heavy Industrial uses, including renewable energy uses, an ashalt plant, a concrete recycling and rock crushing operation, and materials storage and stockpiling of aggregate and construction materials. Possible new future industrial uses in the project area include a slaughterhouse, warehouse space for cold storage, laboratory/testing facilities, niche product development, automotive services, multimedia facility, animal hospital, and other uses. It is noted that certain uses, including asphalt plant and rock crushing operations, are identified as special uses by the zoning ordinance and the applicable County Special Use Permit will be obtained.

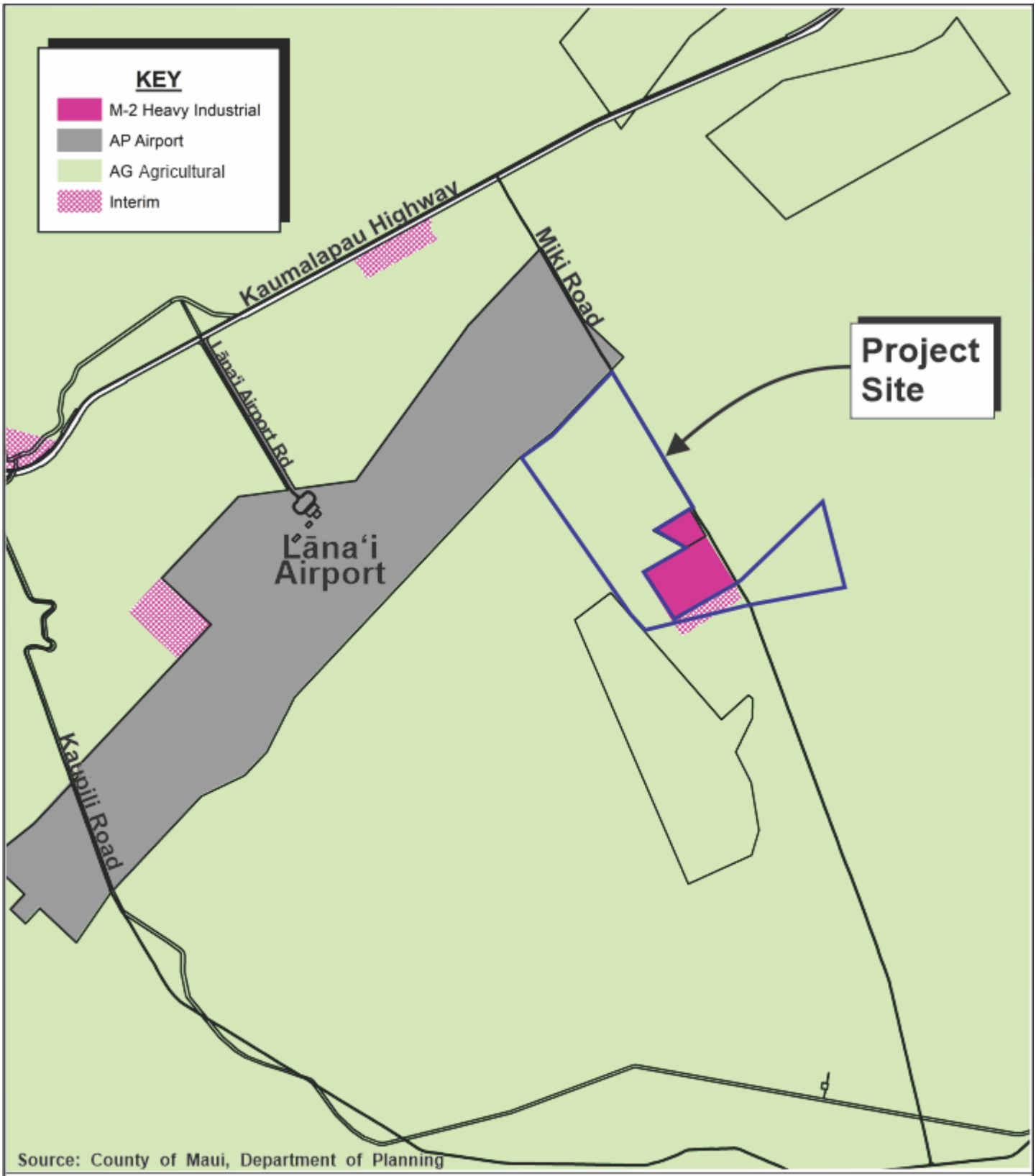
MCC, Section 19.510.040 outlines the criteria which a project must meet in order to be granted a CIZ by the Maui County Council. The proposed project was evaluated with respect to these criteria as discussed below:

1. **The proposed request meets the intent of the general plan and the objectives and policies of the community plans of the county.**

   As previously discussed, the proposed project implements the vision for placement of industrial land uses on the island and expands upon the much-needed industrially zoned land area called for in the Lānaʻi Community Plan. The community plan states: *"The existing industrial uses on Miki Road will be expanded into a proposed industrial area of approximately 200 acres"*.

2. **The proposed request is consistent with the applicable community plan land use map of the county.**

   As previously discussed, the Lānaʻi Community Plan already designates the project area with the appropriate land use of "Light Industrial" and "Heavy Industrial".



Source: County of Maui, Department of Planning

Figure 10 Miki Basin Industrial Park
Maui County Zoning Map

0 500 1000 2000 Feet

Prepared for: Lanai Resorts LLC, a Hawaii Limited Liability Company doing business as Pūlama Lānaʻi

MUNEKIYO HIRAGA

Pulama Lanai\MikiBasinExp 1769\Applications\Figures\MauiCountyZoning

REF-99

3. **<u>The proposed request meets the intent and purpose of the district being requested.</u>**

The proposed Miki Basin Industrial Park conforms to the requested "M-1, Light Industrial" District designation, which includes *"warehousing and distribution types of activity, and permits most compounding, assembly, or treatment of articles or materials,"* according to MCC Chapter 19.24. The project also conforms to the requested "M-2, Heavy Industrial" District designation, which includes the *"manufacture or treatment of goods from raw materials,"* according to MCC Chapter 19.26.

The industrial park includes the concrete recycling and rock crushing operation, and materials storage and stockpiling of aggregate and construction materials. Possible new future industrial uses in the project area include a slaughterhouse, warehouse space for cold storage, laboratory/testing facilities, niche product development, automotive services, multi-media facility, animal hospital, and other uses.

4. **<u>The application, if granted, would not adversely affect or interfere with public or private schools, parks, playgrounds, water systems, sewage and solid waste disposal, drainage, roadway and transportation systems, or other public requirements, conveniences and improvements.</u>**

The application, if granted, will not adversely affect or interfere with public or private schools, parks, playgrounds as the proposed development is not considered a direct population generator, and will not necessitate an expansion of existing services or provision of new social services.

However, with regards to infrastructure, the proposed Miki Basin Industrial Park project will be developed to include all required infrastructural systems needed to support the project. A Traffic Impact Analysis Report, Water Master Plan, a study on new well supply alternatives for the Mānele Bay Water System, Wastewater Master Plan, and Drainage Report were all prepared for the project, which assessed existing infrastructure, projected project demand and needs, and proposed infrastructure systems to support the proposed project to ensure the proposed development's infrastructural needs are appropriately addressed. Refer to **Appendix "G"**, **Appendix "H-1"**, **Appendix "H-2"**, **Appendix "I"**, and **Appendix "J"**.

5. **<u>The application, if granted, would not adversely impact the social, cultural, economic, environmental, and ecological character and quality of the surrounding area.</u>**

As previously discussed, the proposed project is located on land adjoining the Lānaʻi Airport, the Maui Electric Company (MECO) 5-acre power plant, and the existing 20-acre Miki Basin Industrial Condominium. The master-planned project is a 200-acre light and heavy industrial development located in an area called for in the Lānaʻi Community Plan. It would not adversely impact social, cultural, economic, environmental, and ecological character and quality of the area.

6. **<u>If the application change in zoning involves the establishment of an agricultural district with a minimum lot size of two acres, an agricultural feasibility study shall be required and reviewed by the department of agriculture and the United States Soil and Conservation Service.</u>**

The CIZ does not involve the establishment of an agricultural district. The request is for a change in zoning to "M-1, Light Industrial" and "M-2, Heavy Industrial".

During the CIZ process, it is understood that the County Council may establish conditions of zoning which are recorded in a unilateral agreement against the property. Conditions of zoning may require preparation of a compliance report addressing compliance and fulfillment of the conditions.

Additionally, MCC, Section 19.30A.020 outlines criteria applied to agricultural lands for determining whether those lands should be retained in the agricultural district. If two (2) of the following three (3) criteria are met, the lands are given high priority for retention:

A. Agricultural Lands of Importance to the State of Hawai'i (ALISH);

B. Lands not classified by the ALISH system whose agricultural land suitability, based on soil, topographic, and climatic conditions, supports the production of agricultural commodities, including but not limited to coffee, taro, watercress, ginger, orchard and flower crops and nonirrigated pineapple. In addition, these lands shall include lands used for intensive animal husbandry, and lands in agricultural cultivation in five of the ten years immediately preceding the date of approval of this chapter; and

C. Lands which have seventy-five percent or more of their boundaries contiguous to lands within the agricultural district.

Although the lands underlying the proposed project meet both Criteria A and C, there are several reasons supporting the proposed rezoning of the lands from "Agricultural" to "M-1, Light Industrial" and "M-2, Heavy Industrial".

1. **Important Agricultural Lands**

As previously mentioned, the lands underlying the proposed project site are not designated as Important Agricultural Lands (IAL) and there are no IAL lands in the vicinity of the proposed project.

2. **Agriculture Functional Plan**

The Agriculture Functional Plan supports a system of standards, criteria, and procedures "to redesignate parcels of 'important agricultural lands' to 'urban' or 'other use' upon a demonstrated change of economic or social conditions, where the requested resedignation will provide greater benefits to the public than its retention in the IAL district" (State of Hawaiʻi, Department of Agriculture, 1991). Although the project site is not designated IAL, economic and social conditions have evolved over the years, with plantation agriculture declining in Hawaiʻi. Furthermore, the proposed use of the lands for the Miki Basin Industrial Park project would consolidate industrial uses to a location near similar facilities and activities. These uses would provide long-term public benefit. As such, the proposed rezoning of land from "Agricultural" to "M-1, Light Industrial" and "M-2, Heavy Industrial" is anticipated to provide greater benefits to the public than retaining the land in an underutilized agricultural designation.

3. **Lānaʻi Community Plan**

The proposed project implements the vision for placement of industrial land uses on the island and expands upon the much-needed industrially zoned land area called for in the Lānaʻi Community Plan. In this regard, the proposed rezoning is supported by the Lānaʻi Community Plan.

4. **Impacts on Agriculture**

An Impacts on Agriculture report was prepared for the proposed project to analyze potential impacts the project has on agricultural resources. Refer to **Appendix "B"**. The loss of 200 acres of agriculture land on Lānaʻi, plus the loss of agricultural land due to other projects (i.e., the cumulative impact), is too small to affect the growth of diversified agriculture on Lānaʻi or Statewide. The project will also not have any adverse effects on any existing onsite agricultural operations since the land has not been cultivated since the pineapple plantation closed in 1992.

The impacts on agriculture will be offset by the benefits of the project, including:

(1) employment generated by construction activity and onsite commercial and industrial activity;

(2) offsite economic activity generated by the purchases of goods and services by construction companies and the families of construction workers;

(3) tax revenues derived from County property taxes and State taxes (excise, personal income, and corporate income); and

(4) goods and services provided by businesses of the project.

F. HAWAIʻI COASTAL ZONE MANAGEMENT PROGRAM

The Hawaiʻi Coastal Zone Management Program (HCZMP), as formalized in Chapter 205A-2, HRS, establishes objectives and policies for the preservation, protection, and restoration of natural resources of Hawaiʻi's coastal zone. The applicability of coastal zone management considerations applies to all lands in the State of Hawaiʻi and, as such, has been reviewed and assessed as follows.

1. Recreational Resources

Objective:

Provide coastal recreational opportunities accessible to the public.

Policies:

a. Improve coordination and funding of coastal recreational planning and management; and

b. Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:

i. Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;

ii. Requiring restoration of coastal resources that have recreational and ecosystem value including, but not limited to coral reefs, surfing sites, fishponds, sand beaches, and coastal dunes when these resources will be unavoidably damaged by development; or requiring monetary compensation to the State for recreation when restoration is not feasible or desirable;

iii. Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;

iv. Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;

v. Ensuring public recreational uses of county, state, and federally

owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;

vi. Adopting water quality standards and regulating point and nonpoint sources of pollution to protect, and where feasible, restore the recreational value of coastal waters;

vii. Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and

viii. Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, and county authorities; and crediting such dedication against the requirements of section 46-6.

Response: The project is not located in proximity to the shoreline. The proposed project will not impact coastal recreational resources, nor will it affect public shoreline access and activities.

2. Historic Resources

Objective:

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

Policies:

a. Identify and analyze significant archaeological resources;

b. Maximize information retention through preservation of remains and artifacts or salvage operations; and

c. Support state goals for protection, restoration, interpretation, and display of historic resources.

Response: An Archaeological Inventory Survey (AIS) was accepted for sites within the Miki Basin Industrial Park. A data recovery plan will be implemented prior to the proposed construction activities, and research questions will be developed and addressed through data yielded by laboratory testing.

Additionally, the Applicant will comply with all applicable County, State and Federal laws and rules regarding the treatment of archaeological and historic sites. Should evidence of archaeological or cultural resources be encountered during site

preparation work or during drilling, then activities at the site will be suspended and Pūlama Lānaʻi and the DLNR State Historic Preservation Division (SHPD) will be contacted immediately for review, evaluation, and recommendations on how to preserve or avoid damage to the resources.

3. Scenic and Open Space Resources

Objective:

Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.

Policies:

a. Identify valued scenic resources in the coastal zone management area;

b. Ensure that new developments are compatible with their visual environment by designing and locating those developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;

c. Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and

d. Encourage those developments that are not coastal dependent to locate in inland areas.

Response: The proposed project is located inland and not on or near the shoreline. The proposed project is not anticipated to adversely impact coastal scenic and open space resources.

4. Coastal Ecosystems

Objective:

Protect valuable coastal ecosystems, including reefs, beaches, and coastal dunes, from disruption and minimize adverse impacts on all coastal ecosystems.

Policies:

a. Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;

b. Improve the technical basis for natural resource management;

c. Preserve valuable coastal ecosystems of significant biological or

economic importance, including reefs, beaches, and dunes;

d. Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and

e. Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.

Response: The proposed project is located inland, away from coastal ecosystems and is, therefore, not anticipated to have adverse impacts on coastal/shoreline resources, including reefs and marine resources. Appropriate BMPs will be utilized to ensure that construction runoff is appropriately detained, minimizing any impact on coastal waters. In addition, an application for a National Pollutant Discharge Elimination System (NPDES) permit for construction will be submitted to the State Department of Health (DOH) for review and approval prior to the start of construction.

5. Economic Uses

Objective:

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

Policies:

a. Concentrate coastal dependent development in appropriate areas;

b. Ensure that coastal dependent development and coastal related development are located, designed, and constructed to minimize exposure to coastal hazards and adverse social, visual, and environmental impacts in the coastal zone management area; and

c. Direct the location and expansion of coastal development to areas designated and used for that development and permit reasonable long-term growth at those areas, and permit coastal development outside of designated areas when:

i. Use of designated locations is not feasible;

ii. Adverse environmental effects and risks from coastal hazards are minimized; and

iii. The development is important to the State's economy.

Response: The proposed project is not a coastal dependent development. The project site is located inland from the shoreline. The proposed project will support economic diversity through the development of industrial and renewable energy projects. The development will also stimulate the economy through the generation of construction jobs. The proposed project does not contravene the objective and policies for economic use.

6. Coastal Hazards

Objective:

Reduce hazard to life and property from coastal hazards.

Policies:

a. Develop and communicate adequate information about the risk of coastal hazards;

b. Control development, including planning and zoning control, in areas subject to coastal hazards;

c. Ensure that developments comply with requirements of the National Flood Insurance Program; and

d. Prevent coastal flooding from inland projects.

Response: According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map for the area, the project site falls within Zone X (shaded), an area of minimal flooding. In addition, the project site is not located within the projected 3.2-foot sea level rise exposure area or tsunami evacuation zone. Drainage improvements will be designed in accordance with the Drainage Standards of the County of Maui to ensure that the project will not adversely affect downstream properties from the effects of flooding and erosion. Adverse impacts to hazard-sensitive areas are not anticipated.

7. Managing Development

Objective:

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

Policies:

a. Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;

b. Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements; and

c. Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the public to facilitate public participation in the planning and review process.

Response: Opportunities for agency and public review of the proposed action are provided pursuant to Chapter 343, HRS approval process. A summary of the consultation efforts is provided in Chapter VIII.

8. Public Participation

Objective:

Stimulate public awareness, education, and participation in coastal management.

Policies:

a. Promote public involvement in coastal zone management processes;

b. Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities; and

c. Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.

Response: The project has, and will continue to address public awareness, education, and participation objectives. As noted above, the Applicant has undertaken consultation with government and community stakeholders. Refer to Chapter VIII. Opportunities for agency and public review of the proposed action are also provided through the comment processes pursuant to Chapter 343, HRS.

9. Beach Protection

Objective:

A. Protect beaches and coastal dunes for:

(i) Public use and recreation;

(ii) The benefit of coastal ecosystem; and

(iii) Use as natural buffers against coastal hazards; and

B. Coordinate and fund beach management and protection.

Policies:

a. Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion;

b. Prohibit construction of private shoreline hardening structures, including seawalls and reventments, at sites having sand beaches and at sites where shoreline hardening structures interfere with existing recreational and waterline activities;

c. Minimize the construction of public shoreline hardening structures, including seawalls and revetments at sites having sand beaches and at sites where shoreline hardening structures interfere with existing recreational and waterline activities;

d. Minimize grading of and damage to coastal dunes;

e. Prohibit private property owners from creating a public nuisance by inducing or cultivating the private property owner's vegetation in a beach transit corridor; and

f. Prohibit private property owners from creating a public nuisance by allowing the private property owner's unmaintained vegetation to interfere or encroach upon a beach transit corridor.

Response: The project site is located inland, away from the shoreline and is not anticipated to impact shoreline processes.

10. Marine and Coastal Resources

Objective:

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

Policies:

a. Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;

b. Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;

c. Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;

d. Promote research, study, and understanding of ocean and coastal processes, impacts of climate change and sea level rise, marine life, and other ocean resources to acquire and inventory information necessary to understand how coastal development activities relate to and impact ocean and coastal resources; and

e. Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.

Response: The project site is located inland, away from the ocean and is, therefore, not anticipated to have an impact on marine or coastal resources.

UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

IV

IV. UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

In the short term, the proposed project will result in unavoidable construction-related impacts, including air quality impacts during construction and noise impacts generated by construction equipment and activities. Air quality impacts will be mitigated by following Best Management Practices (BMPs) during construction to minimize air quality impacts to surrounding properties such as dust screens around active construction areas and regular sprinkling of water to reduce dust. In addition, there may be temporary noise impacts associated with construction equipment and vehicles. These noise and air quality impacts will be temporary in nature, occurring only during the construction period, and will be mitigated to the extent practicable through implementation of BMPs.

The proposed project commits 200 acres of land for the construction of the proposed Miki Basin Industrial Park. Other resources which will be committed in the implementation of the proposed action include material and fuel resources. The project will result in short-term beneficial impacts related to temporary construction employment and spending.

In the long term, mitigation measures will be implemented to reduce impacts from the relocated asphalt plant, concrete recycling and rock crushing operation, as well as materials storage and stockpiling of aggregate and construction materials. At the relocated concrete recycling and rock crushing operation, dust control would be handled by use of regular wetting of the crushed concrete and rock, and materials storage areas with a sufficient amount of water to saturate the area without causing runoff.

Cement processed at the concrete recycling and rock crushing operation will also be free of paint or other hazardous coatings or products. If there is rebar embedded in the concrete, it will be broken up onsite, and the rebar removed. The rebar will be shipped off-island for appropriate disposal in a landfill. The size of the rocks collected would be three (3) inches in diameter (across any dimension) or less.

The Applicant will work to minimize noise emissions at the relocated facilities, including the use of all combustion powered equipment and vehicles. Any equipment found to be in poor condition will be repaired or replaced, and mufflers shall be used in accordance with federal and state laws and regulations. Considering the project represents the relocation of existing facilities, significant increases in noise generation are not anticipated. It should be noted that the relocation site was selected, in part, due its close proximity to similar industrial uses, as well as its distance from noise-sensitive areas.

Construction of the industrial park will allow existing industrial facilities currently scattered in business and residential areas in Lānaʻi City to relocate to more appropriate locations having the

infrastructure and buffers necessary for industrial uses. The proposed action also provides opportunities for future industrial development on Lānaʻi, which will add to the diversification of Lānaʻi's economy and, thereby, contribute to the island's resiliency and sustainability.

ALTERNATIVES TO THE PROPOSED ACTION

V

V. ALTERNATIVES TO THE PROPOSED ACTION

A. PREFERRED ALTERNATIVE

The Miki Basin Industrial Park described in Chapter I represents the preferred alternative for the 200-acre project. The proposed Miki Basin Industrial Park will include 127 acres for renewable energy projects (e.g., photovoltaic plus battery energy storage), 20 acres for infrastructure purposes (10 percent of the project area which will be used for roads, common areas, and other related uses), 12.5 acres for the relocation of an existing asphalt plant, and 26 acres for new industrial uses. The remaining 14.5 acres will be used for the relocation of an existing concrete recycling and rock crushing operation, and for the materials storage and stockpiling of aggregate and construction materials.

Over 85 percent of the project area has been allocated for specific uses. Possible new future industrial uses include a slaughterhouse, warehouse space for cold storage, laboratory/testing facilities, niche product development, automotive services, multi-media facility, animal hospital, and other uses.

As a master-planned project, Pūlama Lānaʻi will develop the major common infrastructure, such as roads and electric and water utility lines. Individual uses within the Miki Basin Industrial Park will be responsible for vertical development on their particular properties and for compliance with applicable regulatory requirements associated with their individual developments. Improved lots will be offered for lease.

The preferred alternative is consistent with and will implement the Lānaʻi Community Plan.

B. NO ACTION ALTERNATIVE

Under the “no action” alternative, the project site would remain “as is”. The “no action” alternative is not considered to be in the best interest of Lānaʻi residents as the “no action” alternative would not allow existing industrial facilities currently scattered in business and residential areas to relocate to more appropriate locations having the infrastructure and buffers necessary for industrial uses. This alternative would also inhibit the implementation of the Lānaʻi Community Plan. For these reasons, the No Action Alternative is not being considered.

C. DEFERRED ACTION ALTERNATIVE

A deferral of the proposed action means that the development proposal would be pursued at a later point in time. The deferral alternative is not considered viable from a project implementation standpoint. The Applicant’s commitment to planning, design, and construction of the Miki Basin Industrial Park allows for the project to proceed at this time. Delays in project implementation will likely result in higher development costs and greater

uncertainty. The Applicant believes that the project can be viably developed under current market and financing conditions. With this in mind, the “deferred action alternative” is not considered appropriate.

D. SITE PLAN ALTERNATIVES

Various site plan alternatives have been considered for the Miki Basin Industrial Park. As previously noted, a Draft Environmental Assessment (EA) was previously published for the Miki Basin Industrial Park on November 23, 2019. The proposed action contemplated in the November 2019 Draft EA was 100 acres of light industrial uses and 100 acres of heavy industrial uses. Since that time, additional planning has led to the refinement of the uses within the Miki Basin Industrial Park. The Preferred Alternative identifies specific uses that will occupy the Miki Basin Industrial Park, including renewable energy projects and a mix of relocated and new industrial uses.

SIGNIFICANCE CRITERIA ASSESSMENT

VI

REF-117

VI. SIGNIFICANCE CRITERIA ASSESSMENT

The proposed project involves the development of the Miki Basin Industrial Park, a 200-acre master-planned light and heavy industrial development, on land adjoining the Lānaʻi Airport, the Maui Electric Company (MECO) 5-acre power plant, and the existing 20-acre Miki Basin Industrial Condominium.

Pursuant to Chapter 343, Hawaiʻi Revised Statutes (HRS), and Chapter 200.1 (Title 11), Environmental Impact Statement Rules, Hawaiʻi Administrative Rules (HAR), the proposed action, its expected primary and secondary consequences, and the cumulative as well as the short-term and long-term effects of the action have been evaluated in accordance with the Significance Criteria of Section 11-200.1-13 of the Administrative Rules. Discussion of project conformance to the Significance Criteria is as follows:

1. <u>Irrevocably commit a natural, cultural, or historic resource.</u>

There are no known rare, threatened, or endangered species of flora, fauna, avifauna, or important habitats located within the project site. As noted earlier, an Archaeological Inventory Survey (AIS) has been accepted by SHPD on the project area and two (2) historic sites were evaluated as significant. Refer to **Appendix "D-1"**.

In addition, mitigation measures include preparation and implementation of an Archaeological Data Recovery Plan prior to construction activities. These measures will mitigate potentially adverse effects of the industrial development in accordance with the rules of the State Historic Preservation Division (SHPD) to ensure that if human skeletal remains are identified during subsurface work, that the protocol concerning the inadvertent discovery of human remains pursuant to the HAR is followed. Subsequent to mitigation, the project will have a less than significant impact. A Ka Paʻakai Analysis and Determination conducted for the project determined that the availability and accessibility of cultural resources in the region will not be significantly impacted. Refer to **Appendix "D-3"**.

The proposed project is not anticipated to involve an irrevocable commitment to loss or destruction of any natural or cultural resource.

2. <u>Curtail the range of beneficial uses of the environment</u>

The entire project area has lain fallow from agricultural use for over 30 years, with some grazing occurring during a few of these years. The vegetation is a dense growth of grasses and shrubs. The land is characterized as having a low productivity rating of "D" for agriculture by the Land Study Bureau (LSB) soils rating system.

There are no significant adverse impacts to climate, topography, or soils anticipated to result from the proposed project. There are also no known rare, threatened, or endangered species of flora, fauna, or avifauna located within the project site. Refer to **Appendix "C"**.

The proposed project will relocate existing industrial facilities to a more appropriate community-planned location, and the commitment of land resources for the proposed action will not curtail the range of beneficial uses of the environment.

The proposed project will not detract from the island's inventory of agricultural lands and will not present any adverse effects on agricultural production.

3. Conflict with the State's environmental policies or long-term environmental goals established by law.

The proposed project involves the development of the Miki Basin Industrial Park, a 200-acre master-planned light and heavy industrial development. The proposed project does not conflict with the State's Environmental Policy and Guidelines as set forth in Chapter 344, HRS.

4. Have a substantial adverse effect on the economic welfare, social welfare, or cultural practices of the community or State.

The proposed project will have a positive short-term effect on economic and social welfare by providing construction and construction-related employment. From a long-term perspective, the proposed project will allow existing industrial facilities currently scattered in business and residential areas in Lānaʻi City to relocate to more appropriate locations having the infrastructure and buffers necessary for industrial uses. The proposed action also provides opportunities for future industrial development on Lānaʻi, including 127 acres for renewable energy projects, which will add to the diversification of Lānaʻi's economy and contribute to the island's resiliency and sustainability.

As mentioned earlier, a Ka Paʻakai Analysis and Determination conducted for the project determined that the availability and accessibility of cultural resources in the region will not be significantly impacted. No substantial adverse long-term economic or social welfare impacts to the community, County, or State are anticipated.

5. Have a substantial adverse effect on public health.

A temporary increase in noise during construction is anticipated; however, this impact will be a minor, short-term inconvenience and will be minimized by the limitations on the hours of construction activity. A temporary increase in dust and debris also is anticipated to affect the air quality within the immediate vicinity of the project area.

From a long-term perspective, industrial uses at the Miki Basin Industrial Park will be required to comply with government regulations pertaining to air quality, noise, solid and

liquid waste, drainage, and other impacts. As appropriate, mitigation measures and Best Management Practices (BMPs) will be implemented for specific uses within the project. For example, dust control measures will be implemented at the concrete recycling and rock crushing operation and proper equipment maintenance will be utilized to minimize noise impacts.

As noted in various drafts of the Lānaʻi Community Plan, the island's primary industrial areas are located southwest of Lānaʻi City, near the Lānaʻi Airport, and at Kaumālapaʻu Harbor. These are purposefully placed to be removed from residential and other uses that may be negatively impacted by industrial uses.

6. <u>Involve adverse secondary impacts, such as population changes or effects on public facilities.</u>

The proposed project involves the development of the Miki Basin Industrial Park, a 200-acre master-planned light and heavy industrial development. As a master-planned project, Pūlama Lānaʻi will develop the major common infrastructure, such as roads and electric and water utility lines.

The project is not anticipated to involve substantial secondary impacts due to population change. Secondary impacts on public facilities are also not anticipated. The Applicant will provide the necessary onsite and offsite infrastructure to support the proposed project. No substantial changes or effects on public facilities are expected with project implementation.

As such, the project is not anticipated to result in significant adverse secondary impacts. The proposed infrastructure improvements are not anticipated to significantly adversely impact public facilities or services.

7. <u>Involve a substantial degradation of environmental quality.</u>

No substantial degradation of environmental quality resulting from the action is anticipated. BMPs and appropriate erosion control measures will be utilized during the construction period. Drainage system improvements will be constructed in accordance with applicable regulatory design standards to ensure that surface runoff will not have an adverse effect on adjacent or downstream properties. Any potential short-term impacts to air and noise quality during the construction phase of the project will be mitigated through employing BMPs. In the long term, the project will not adversely impact air quality and ambient noise.

From a long-term perspective, activities which may have air or noise quality impacts will be regulated by the State Department of Health (DOH). As previously noted, 127 acres of the Miki Basin Industrial Park will be utilized for renewable energy projects (photovoltaic plus battery storage), which will not generate adverse air quality impacts. Other future

uses include the relocation of existing facilities, which are not anticipated to represent new air or noise quality impacts on Lānaʻi.

8. <u>Be individually limited but cumulatively has substantial adverse effect upon the environment or involves a commitment for larger actions.</u>

The Miki Basin Industrial Park site is well-suited for industrial development. It is adjacent to the most significant industrial uses on Lānaʻi, the Lānaʻi Airport, the Miki Basin Industrial Condominium, and Maui Electric Company's (MECO) generating facility. Development of the 200-acre industrial park will allow existing industrial facilities currently scattered in business and residential areas in Lānaʻi City to relocate to more appropriate locations having the infrastructure and buffers necessary for industrial uses. The project will also provide opportunities for future industrial development on Lānaʻi, which will add to the diversification of Lānaʻi's economy. The project does not represent a commitment to larger actions and no significant adverse cumulative impacts are anticipated.

9. <u>Have a substantial adverse effect on a rare, threatened, or endangered species, or its habitat.</u>

Rare, threatened or endangered species of flora, fauna, avifauna or their habitats are not expected to be adversely affected by the proposed project as none were identified in the biological resources survey conducted for the project. Refer to **Appendix "C"**.

10. <u>Have a substantial adverse effect on air or water quality or ambient noise levels.</u>

Construction activities will result in short-term air quality and noise impacts. BMPs for dust control measures, such as temporary diversion channels and retention basin, regular watering and sprinkling, and erection of dust screens will be implemented to minimize construction-related air quality impacts, as warranted. Equipment mufflers or other noise attenuating equipment, as well as proper equipment and vehicle maintenance and other BMPs are anticipated to mitigate noise from construction activities. Erosion control measures implemented during construction will reduce the amount of silt and stormwater runoff flowing downstream.

As mentioned previously, activities which may have air or noise quality impacts will be regulated by the DOH. At the concrete recycling and rock crushing operation, the Applicant will store and transport loose aggregates and materials in a manner that will minimize particulate emissions into the air. Depending on the prevailing weather conditions and the nature of the materials being stored or stockpiled, the aggregates and rock materials may be covered or periodically sprayed with water to minimize the generation of dust.

The Applicant will work to minimize noise emissions, including the use of all combustion powered equipment and vehicles. Any equipment found to be in poor condition will be repaired or replaced, and mufflers shall be used in accordance with federal and state laws

and regulations. It should be noted that the relocation site was selected, in part, due its close proximity to similar industrial uses, as well as its distance from noise-sensitive areas.

The Miki Basin Industrial Park will also utilize 127 acres for renewable energy projects (photovoltaic plus battery storage), which will not generate adverse air quality impacts. While specific uses for the 26 acres of new industrial space have not been solidified, many of the the potential uses contemplated, such as warehouses and testing facilities, do not represent noxious uses that would be a source of air pollution. It is noted that before any air pollution sources can be built an application must be filed with the DOH with detailed information on such sources.

11. Have a substantial adverse effect on or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, sea level rise exposure area, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.

The project site is situated inland and is not anticipated to have any adverse impact upon coastal waters or resources, beaches, estuaries, or other fresh water bodies.

According to the Federal Emergency Management Agency's Flood Insurance Rate Maps currently in effect, the project site falls within Zone X (unshaded), an area of minimal flooding. The project site is located outside of the tsunami inundation zone. In addition, the project site is located outside of the 3.2-foot projected sea level rise exposure area.

12. Have a substantial adverse effect on scenic vistas and viewplanes, during day or night, identified in county or state plans or studies.

The proposed project is low-profile and is not located within a scenic view corridor. Impacts to visual and aesthetic resources will be mitigated through the project's layout and design. As such, the proposed project is not anticipated to adversely affect scenic view corridors.

13. Require substantial energy consumption or emit substantial greenhouse gases.

Pūlama Lānaʻi will ensure that the industrial park incorporates, to the extent feasible and practicable, measures to promote energy conservation, sustainable design, and environmental stewardship.

The proposed project will include 127 acres for renewable energy projects, including photovoltaic equipment with battery energy storage. These renewable energy projects will offset fossil fuels currently used by MECO.

Based on the aforementioned findings, the State of Hawaiʻi, Land Use Commission has determined that the proposed project will result in an Anticipated Finding of No Significant Impact (AFNSI).

LIST OF PERMITS AND APPROVALS

VII

VII. LIST OF PERMITS AND APPROVALS

The following permits and approvals will be required prior to the implementation of the project:

State of Hawai‘i

1. Chapter 343 Hawai‘i Revised Statutes, Environmental Assessment
2. Land Use District Boundary Amendment Approval (Land Use Commission)
3. National Pollutant Discharge Elimination System (NPDES), as applicable
4. Community Noise Permit, as applicable

County of Maui

1. Maui County Code, Title 19, Change of Zoning (CIZ)
2. County Special Use Permit (asphalt plant and rock crushing operation)
3. Subdivision process, as applicable
4. Construction Permits (Grading, Building, Electrical, and Plumbing)

PARTIES CONSULTED DURING THE PREPARATION OF THE DRAFT ENVIRONMENTAL ASSESSMENT; LETTERS RECEIVED AND RESPONSES TO SUBSTANTIVE COMMENTS

VIII

VIII. PARTIES CONSULTED DURING THE PREPARATION OF THE DRAFT ENVIRONMENTAL ASSESSMENT; LETTERS RECEIVED AND RESPONSES TO SUBSTANTIVE COMMENTS

During the Lānaʻi Community Plan process, the proposed 200-acre Industrial land was publicly discussed at ten (10) Lānaʻi Community Plan Advisory Council meetings, four (4) Lānaʻi Planning Commission meetings, and three (3) Maui County Council meetings as part of an update to the Lānaʻi Community Plan. A public community meeting was also held on Lānaʻi on October 22, 2018. The project was explained, and questions were asked and answered.

As previously noted, a Draft Environmental Assessment (EA) for the Miki Basin Industrial Park was previously published on November 23, 2019. Because additional detail has become available on the proposed action and technical studies have been updated, this new Draft EA is being published. Consultation conducted during the preparation of the November 23, 2019 Draft EA and comments received on that previously published Draft EA informed the preparation of this Draft EA. Copies of letters received and responses to substantive comments are provided herein.

A. PRECONSULTATION COMMENTS RECEIVED PRIOR TO THE PUBLICATION OF THE NOVEMBER 23, 2019 DRAFT EA AND RESPONSES PROVIDED

On November 9, 2018 pre-assessment consultation and scoping letters were emailed and/or mailed to:

Federal

1. U.S. Department of the Interior, Fish & Wildlife Service

State of Hawai‘i

2. Department of Business, Economic Development & Tourism - Office of Planning
3. Department of Health – OEQC
4. Department of Land & Natural Resources
5. State Land Use Commission
6. Department of Transportation
7. Office of Hawaiian Affairs
8. Lāna‘i Public and School LibraryStatewide Regional Libraries

County of Maui

9. Department of Fire and Public Safety
10. Office of Economic Development
11. Department of Environmental Management
12. Department of Planning
13. Department of Public Works
14. Department of Transportation
15. Department of Water Supply
16. Police Department

B. NOVEMBER 23, 2019 DRAFT EA COMMENTS AND RESPONSES

Copies of the November 23, 2019 Draft EA were sent to the following entities

Federal

1. U.S. Department of the Interior, Fish & Wildlife Service

State of Hawai‘i

2. Department of Business, Economic Development & Tourism - Office of Planning
3. Department of Health – Environmental Health Administration
4. Department of Health – OEQC
5. Department of Land & Natural Resources
6. Department of Transportation
7. Office of Hawaiian Affairs
8. Lāna‘i Public and School Library
9. Statewide Regional Libraries

County of Maui

10. Department of Fire and Public Safety
11. Department of Environmental Management
12. Department of Housing and Human Concerns
13. Department of Parks and Recreation
14. Department of Planning
15. Department of Public Works
16. Department of Transportation
17. Department of Water Supply
18. Police Department

Copies of comment letters and responses provided are included herein.

Preconsultation Comments Received Prior to the Publication of the November 23, 2019 Draft EA and Responses Provided

REF-128

DAVID Y. IGE
Governor

DOUGLAS S. CHIN
Lieutenant Governor

LUIS P. SALAVERIA
Director

MARY ALICE EVANS
Deputy Director

LAND USE COMMISSION
Department of Business, Economic Development & Tourism
State of Hawai'i

DANIEL E. ORODENKER
Executive Officer

BERT SARUWATARI
Planner

SCOTT A.K. DERRICKSON AICP
Planner

RASMI AGRAHARI
Planner

RILEY K. HAKODA
Planner/Chief Clerk

FRED A. TALON
Drafting Technician

SSFM International, Inc.
RECEIVED
11.26.2018

November 19, 2018

Jennifer Scheffel, Senior Environmental Planner
SSFM International Inc.
99 Aupuni Street, Suite 202
Hilo, Hawai'i 96720

Subject: Pūlama Lāna'i Miki Basin 200-acre Industrial Area
Island of Lāna'i
Tax Map Key No.: (2) 4-9-002: 061 (portion)
Pre-Assessment Consultation for Draft Environmental Assessment

Dear Ms. Scheffel:

The Commission has received your letter requesting comments on your pre-assessment Draft Environmental Assessment (DEA) on November 13, 2018. We have the following comments:

The proposed action identifies two steps to be taken: a reclassification of 200 acres by the LUC and then rezoning by the Lāna'i Planning Commission and Maui County Council. However, there is also discussion of a 20-acre proposed Heavy Industrial condominium project. Please clarify whether this additional 20 acres would be part of the reclassification request.

SSFM is indicating that an Environmental Assessment (EA) will be done rather than a Environmental Impact Statement (EIS) to satisfy requirements of Hawai'i Revised Statutes (HRS) Chapter 343. Please provide a discussion on what issues are triggers for HRS Chapter 343 compliance and the rationale for making this early decision to conduct an EA rather than an EIS.

SSFM should indicate which government entity would be the accepting authority for HRS Chapter 343 compliance and the rationale for that choice.

A prior docket, A89-649 Mānele Golf Course, required under Condition 1, that Petitioner convey 25 acres of lands to the State of Hawai'i: a proposed 15-acre industrial parcel and a proposed

235 SOUTH BERETANIA STREET ● SUITE 406 ● HONOLULU, HAWAI'I 96813 ● TEL (808) 587-3822 ● FAX (808) 587-3827 ● EMAIL: dbedt.luc.web@hawaii.gov
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

10-acre commercial parcel. The assessment should discuss the location of these lands with respect to the proposed district boundary amendment; including whether these lands have been conveyed to the State and how any proposed projects on those lands will interact with Pūlama Lāna'i's proposed development.

Thank you for the opportunity to comment on the subject application. Should you have any questions, please feel free to contact me or Scott Derrickson, AICP of our office at 587-3921.

Sincerely,

Daniel E. Orodenker
Executive Officer

cc: Leo Asuncion, State Office of Planning
Michelle Choteau McLean, Maui County Planning
Caron Green, Chair Lāna'i Planning Commission

Ho'okuleana LLC
... to take responsibility ...

Peter T. Young
1539 Kanapu'u Drive
Kailua, Hawai'i 96734
(808) 226-3567 (Cell Phone)
PeterYoung@Hookuleana.com
www.Hookuleana.com

Land Use Commission
235 South Beretania Street, Suite 406
Honolulu, HI 96813

April 19, 2019

Sent only via e-mail to scott.a.derrickson@hawaii.gov

Re: Miki Basin Industrial Park, Lāna'i - Draft Environmental Assessment

Gentlemen:

Thank you for your response to our Pre-Assessment Consultation and Scoping request for the above referenced project (SSFM initially sent the pre-assessment request, I will be preparing the EA).

We acknowledge your comments concerning issues to be included in the Environmental Assessment. Under separate correspondence, we provided information on an unrelated issue concerning 25-acres that were part of a prior LUC action; information on this unrelated 25-acres will not be in the Miki Basin EA.

A draft Environmental Assessment is being prepared and we will be sending you a copy for your review.

Thanks,
HO'OKULEANA LLC

Peter T. Young
President

Do well by doing good.

OFFICE OF PLANNING
STATE OF HAWAII

235 South Beretania Street, 6th Floor, Honolulu, Hawai'i 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawai'i 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: http://planning.hawaii.gov/

DAVID Y. IGE
GOVERNOR

LEO R. ASUNCION
DIRECTOR
OFFICE OF PLANNING

DTS201811291657NA

November 30, 2018

Ms. Jennifer M. Scheffel
Senior Environmental Planner
SSFM International, Inc.
99 Aupuni Street, Suite 202
Hilo, Hawaii 96720

SSFM International, Inc.
RECEIVED
12-17-2018

Dear Ms. Scheffel:

Subject: Pre-Assessment Consultation for Draft Environmental Assessment, Pulama Lanai Miki Basin 200-Acre Industrial Area, Island of Lanai TMK: (2) 4-9-002: 061 (por)

Thank you for the opportunity to provide comments on the pre-assessment consultation request for the preparation of a Draft Environmental Assessment (Draft EA) on the proposed reclassification and rezoning of land from Agricultural to Urban/Light and Heavy Industrial, on the Island of Lanai.

It is our understanding that Lanai Resorts, LLC, (dba Pulama Lanai) proposes to designate 200 acres of land around the existing Maui Electric Company facility and adjacent to the Lanai Airport as Light and Heavy Industrial Zoning. The site is undeveloped land currently designated as Agriculture for both the State and the County. Pulama Lanai will be requesting the State Land Use Commission (LUC) to reclassify the 200 acres from Agricultural to Urban. The Draft EA is being prepared to support Pulama Lanai's application for reclassification. Subsequently, Pulama Lanai will request the Lanai Planning Commission and Maui County Council to rezone the land to 100 acres of Light Industrial and 100 acres of Heavy Industrial.

The Office of Planning (OP) has reviewed the transmitted material and has the following comments to offer:

1. LUC District Boundary Amendment Issues of Concern
   Pulama Lanai will be requesting the LUC to reclassify 200 acres of land from the Agricultural District to the Urban District. OP represents the State as a mandatory party in proceedings before the LUC. In developing its position, OP will be evaluating whether the project meets the LUC decision-making criteria in HRS § 205-17, as well as its conformance with Coastal Zone Management objectives and policies in HRS § 205A-2.

   Attached for your consideration is a document entitled "Issues of Concern in District Boundary Amendment Proceedings Based on LUC Decision-Making Criteria." The

DEA should address relevant issues and concerns, particularly the areas of State concern and best practices that could or will be incorporated in the proposed project to address State priority guidelines for sustainability. A short list of resources related to best practices can be found at the OP website at http://hawaii.gov/dbedt/op/land_use.htm.

We also recommend that Pulama Lanai consult with affected State agencies early in the project formulation process; and that they continue to do so in the preparation of the DEA so potential impacts to resources, facilities, and services managed or provided by the State and appropriate mitigation measures are identified in the DEA and subsequent petition.

2. Hawaii State Land Use Approvals
Pulama Lanai states that the subject parcels are adjacent to the Lanai Airport. Also attached for your consideration is OP Technical Assistance Memorandum TAM-2016-1, issued August 1, 2016, which describes various Department of Transportation, Airports Division and Federal Aviation Administration concerns regarding projects near State airports.

3. Hawaii State Planning Act
Hawaii Administrative Rules (HAR) § 11-200-10(4) requires an Environmental Assessment to provide a general description of the action's technical, economic, social, and environmental characteristics.

In this regard, the Draft EA should provide a discussion on the project and its ability to meet State goals and priorities as detailed in HRS Chapter 226. The analysis on the Hawaii State Planning Act should examine the project's consistency with all three parts of HRS Chapter 226 or clarify where the project conflicts with them. If any of these statutes are not applicable to the project, the analysis should affirmatively state such determination, along with discussion paragraphs.

4. Hawaii Coastal Zone Management Program
The Coastal Zone Management (CZM) area is defined as "all lands of the State and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the U.S. territorial sea" (HRS § 205A-1).

The proposed action should conform with all the objectives and supporting policies of the Hawaii CZM program, as listed in HRS § 205A-2. Pursuant to HRS § 205A-4, in implementing the objectives of the CZM program, agencies shall give full consideration to ecological, cultural, historic, esthetic, recreational, scenic, open space values, coastal hazards, and economic development. As this project will require the approval of government agencies, the Draft EA should contain analysis on the project's consistency

with HRS § 205A-2.

5. Drainage / Stormwater Runoff Mitigation / Erosion Control
Pursuant to HAR § 11-200-10(6) – identification and summary of impacts and alternatives considered; in order to ensure that the surface water and marine resources of the Island of Lanai remain protected, the effects of stormwater inundation, resulting from the proposed land use changes and ultimately future development activities should be evaluated in the Draft EA.

Issues that may be examined include, but are not limited to, project site characteristics in relation to flood and erosion prone areas, open spaces, the potential vulnerability of surface water resources, drainage infrastructure currently in place, soil absorption characteristics of the area, and examining the amount of permeable versus impervious surfaces in the project area. These items should be considered when developing mitigation measures for the protection for surface water resources and the coastal ecosystem, pursuant to HAR § 11-200-10(7).

If you have any questions regarding this comment letter, please contact Aaron Setogawa of our Land Use Division at (808) 587-2883 or Joshua Hekekia of our CZM Program at (808) 587-2845.

Sincerely,

Leo R. Asuncion
Director

Enclosure

Issues of Concern in District Boundary Amendment Proceedings Based on LUC Decision-Making Criteria

The following issues are commonly discussed and analyzed for project proposals in petitions and their supporting environmental assessments (EAs) or environmental impact statements (EISs) prepared pursuant to Hawaii Revised Statutes (HRS) Chapter 343. This list reflects the range of issues the State Land Use Commission (LUC) must take into consideration in its decision-making under HRS Chapter 205, and Hawaii Administrative Rules (HAR) Chapter 15-15. This list is not exhaustive or complete.

1. **Water Resources.** Groundwater and surface water resource protection and water quality are critical State issues. A thorough evaluation of these resources includes identifying and discussing: (a) estimated water demand by types of land use; (b) proposed potable and non-potable water sources to be used for the project and measures to reduce water demand and promote water reuse in the project; (c) whether the proposed project is within a designated Water Management Area; (d) the impact of the project on the sustainable yield and water quality of affected aquifers and surface water sources; (e) permits or other approvals required for proposed water source use; and (f) the consistency of the project and impact of the project in terms of proposed water use and system improvements and priorities contained in the county water use and development plan, prepared pursuant to the State Water Code, HRS Chapter 174C.

2. **Agricultural Lands.** Article XI, Section 3, of the Hawaii State Constitution provides that "[t]he State shall conserve and protect agricultural lands, promote diversified agriculture, increase agricultural self-sufficiency, and assure the availability of agriculturally suitable lands." Protecting agriculture is a policy objective in the Hawaii State Plan, HRS Chapter 226, and in the State Administration's New Day Comprehensive Plan, which is available at http://hawaii.gov/gov/about/a-new-day. Agricultural activity in the vicinity of the proposed project should be identified, and the impact of urban use or conversion of project lands on existing and future agricultural use and the viability of agricultural use of adjoining agricultural lands needs to be examined. Please discuss how the proposed project meets policy objectives to promote and protect agriculture, particularly in cases where the lands have high agricultural value.

3. **Affordable Housing.** Increasing the supply of affordable housing is a critical State and county issue. Every county has an affordable housing policy and both the Hawaii State Plan, HRS Chapter 226, and the State Administration's New Day Comprehensive Plan identify affordable housing as a policy priority. If applicable, please discuss specifically how the proposed project will meet State and county affordable housing policy objectives, to include a discussion of how the project's proposed residential product types will be allocated among the market and various affordable housing target populations, and the expected price ranges for the different product types.

4. **Coastal Zone Management (CZM).** The Office of Planning is the lead agency for the Hawaii CZM Program, which is a Federal-State partnership for protecting, restoring, and responsibly developing coastal communities and resources. The coastal zone is defined as all lands of the State and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the United States territorial sea (HRS § 205A-1). EA/EISs should reference this definition of the coastal zone. State agency actions must be consistent with the CZM program objectives and policies under HRS § 205A-2. The EA/EIS needs to discuss the project in terms of its consistency with the following CZM objective areas.

   a. **Coastal and Ocean Resources.** The State has an interest in protecting coastal and marine ecosystems and resources, as well as coastal and marine water quality. The EA/EIS should identify any coastal and marine resources and ecosystems that may be impacted by the proposed project, and the potential for nonpoint sources of pollution from the project to adversely affect coastal and marine water quality. Project impacts on existing site and offsite hydrology and measures to manage stormwater and runoff need to be discussed. The Office of Planning recommends the use of low impact development (LID) techniques and other best

management practices (BMPs) that promote onsite infiltration and minimize runoff from storm events. More information on LID and stormwater BMPs can be found at http://hawaii.gov/dbedt/czm/initiative/lid.php.

   b. **Coastal and Other Hazards.** The EA/EIS should describe any hazard risks that are relevant to the site and describe the measures that are proposed to mitigate any hazard impacts, such as from tsunami, hurricane, wind, storm wave, sea level rise, flood, erosion, volcanic activity, earthquake, landslide, subsidence, and point and nonpoint source pollution. This should include a discussion of any wildfire hazard and any mitigation measures that might be required to address potential threats from wildfires.

   The EA/EIS process also provides an opportunity to address the sustainability of proposed projects in terms of natural hazards and hazard mitigation, and the potential impact of climate change on the proposed project over time. To this end, OP recommends the final EA/EIS include a discussion of the proposed project with respect to the *State Multi-Hazard Mitigation Plan, 2010 Update*, adopted in September 2010, available at http://www.scd.hawaii.gov/documents/HawaiiMultiHazardMitigationPlan2010PUBLIC.pdf, as well as the respective County Hazard Mitigation Plan.

   c. **Coastal-dependent Uses and Beach Protection**. If the project is located on or near the coast, the EA/EIS should discuss why the proposed development needs to be located on the coast, the economic uses that will be of benefit to the State, as well as potential impacts on beach access. The discussion should identify measures to protect beach systems and ensure short- and long-term public access to beaches.

   d. **Coastal Recreational Resources.** If the project is located on the coast, the EA/EIS should include a description of recreational uses and facilities on or near the project site, and discuss how the impact of increasing users on coastal and ocean recreational resources and competing uses will be mitigated and managed during project development and buildout.

   e. **Scenic Resources.** The EA/EIS should discuss the impact of the proposed project on scenic views to and from the coast and along the coast and coastal open space, and how any impacts on these scenic and open space resources will be avoided, minimized, or mitigated.

   f. **Special Management Area (SMA) Permitting.** The SMA is defined by the counties and includes areas in the coastal zone that are particularly sensitive so that it requires special attention. Please identify whether the proposed project is within the SMA and how SMA permitting requirements pursuant to HRS Chapter 205A, will be satisfied.

   For additional resources and information, visit http://hawaii.gov/dbedt/czm.

5. **Cultural, Archaeological, and Historic Resources.** Another CZM objective is to protect, preserve, and where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone that are significant in Hawaiian and American history and culture. If archaeological or historic properties or artifacts, including native Hawaiian burials, are identified in an archaeological inventory survey on the property, the EA/EIS should discuss how the petitioner has consulted with the State Historic Preservation Division (SHPD), what plans will be prepared to monitor or protect identified resources, and how the petitioner intends to comply with HRS Chapter 6E, related to historic preservation, and the CZM objective and policies for historic resources contained in HRS §§ 205A-2(b) and (c). SHPD has information and guidance available at http://hawaii.gov/dlnr/hpd/hpgrtg.htm.

   The EA/EIS document should identify any cultural resources and cultural practices associated with the property, including visual landmarks, if applicable, and discuss the impact of the proposed project on identified cultural resources and practices as well as proposed mitigation measures. The LUC is obligated under Article XII, Section 7 of the Hawaii State Constitution to protect the

reasonable exercise of customarily and traditionally exercised native Hawaiian rights. In order to fulfill its duty to preserve and protect customary and traditional native Hawaiian rights to the extent feasible, pursuant to the Hawai'i Supreme Court's holding in Ka Pa'akai O Ka'Aina v. Land Use Commission, State of Hawaii, specific findings are required as to the following:

a. The identify and scope of "valued cultural, historical, or natural resources in the petition area, including the extent to which traditional and customary native Hawaiian rights are exercised in the petition area;

b. The extent to which those resources – including traditional and customary native Hawaiian rights – wil be affected or impaired by the proposed action; and

c. The feasible action, if any, to be taken by the petitioner to reasonably protect native Hawaian rights if they are found to exist.

The State Office of Environmental Quality Control (OEQC) provides guidance for preparing a cultural assessment at http://oeqc.doh.hawaii.gov, at "Environmental_Assessment_PrepKit." (http://oeqc.doh.hawaii.gov/Shared%20Documents/Preparation_of_Hawaii_Environmental_Policy_Act_Documents/Guidance_on_Cultural_Impact/1997%20Cultural%20Impacts%20Guidance.pdf)

5. **Biota.** The EA/EIS should include an inventory and assessment of flora and fauna, including invertebrates, found on or in proximity to the project site and in any lava tubes and caves on the property that are listed on the federal or State list of endangered or threatened species. Please also discuss species of concern and candidates for listing. The petitioner should consult with the Database Manager at the Hawaii Biodiversity and Mapping Program, Center for Conservation Research and Training, University of Hawaii, (808) 956-8094, as to the potential for the presence of rare species in the project area. The EA/EIS should discuss measures to be taken to protect rare, threatened, or endangered species or ecosystems of concern as required by law. The design of the biological survey should consider both wet and dry season observations to capture the fullest range of flora and fauna.

6. **Wastewater Treatment and Disposal.** The EA/EIS needs to identify the anticipated volume of wastewater to be generated by type of user, as well as the proposed means of wastewater treatment and disposal. A discussion of the availability of county wastewater collection and treatment capacity and its existing service levels, design capacity, and allocated capacity is also needed. The EA/EIS should also identify whether any facility improvements would be required to accommodate additional wastewater generated within the service area, including the proposed project. If a private wastewater treatment system is identified as the preferred option, the EA/EIS should discuss the type of plant to be used, permitting requirements, plans for reuse and/or disposal of treated effluent and waste solids, and how the private system will be operated and maintained.

7. **Energy Use and Impacts**. The State Hawai'i Clean Energy Initiative has adopted a goal of using efficiency and renewable energy resources to meet 70 percent of Hawaii's energy demand by 2030, with 30 percent from efficiency measures and 40 percent from locally-generated renewable sources. The EA/EIS should quantify the projected energy requirements of the project and discuss measures to be taken to reduce energy demand, promote energy efficiency, and to promote use of alternative, renewable energy sources. Please discuss how energy efficiency and energy demand reduction, including reduced transportation energy use will be incorporated in the design of the project and identify the kinds of green building and sustainable design practices that could be used to promote energy and resource conservation in the proposed project. Please also identify any generating or transmission capacity constraints that may arise as a result of the proposed project and other projects planned for the region.

8. **Impact on State Facilities and Resources.** The EA/EIS should quantify the impacts of the proposed project on State-funded facilities, including schools, highways, harbors, and airports, and discuss these impacts in terms of existing and planned capacity of the impacted facilities. The EA/EIS should cite the mitigation measures proposed to be used in the development of the project and describe efforts to address identified State agency concerns. Regarding transportation impacts, consider project design options that limit the need to drive, including mixed land uses, compact site design, walkable neighborhoods, and providing a variety of transportation choices (e.g., biking, public transit, etc.).

9. **Conservation District.** If the proposed project is within the State Conservation District, the EA/EIS should provide an inventory of conservation resources, and discuss how the loss of these resources (habitat, watershed area, etc.) will impact the public.

10. **Conformance with County Plan Designations and Urban Growth or Rural Community Boundaries.** Act 26, Session Laws of Hawaii (SLH) 2008, reaffirmed the Land Use Commission's duty to consider any proposed reclassification with respect to the counties' adopted general, community, or development plans. If the proposed project is not consistent with the county plans or lies outside a county urban growth or rural community boundary, the EA/EIS should provide an analysis and discussion of the following:

    a. **Alternative Sites Considered.** Describe and discuss alternative sites that were considered for the project, and discuss why the project could not be accommodated on lands within the urban growth or rural community boundary, if the county plan delineates such boundaries, or on land already designated by the county for similar uses.

    b. **Impact on Surrounding Lands.** Discuss what the impacts of changing the county plan designation or extending the urban growth or rural community boundary would have on the surrounding lands.

    c. **Significant Public Benefit.** Discuss what, if any, public benefits are provided by the proposed project above that already required under existing approval and permitting requirements.

    d. **Plan Amendment.** Provide a timeframe for application for and approval of any required plan amendment.

11. **Environmental Health Hazards.** The EA/EIS should discuss the potential for the project or project users to generate hazardous materials or release possible contaminants to the air, soil, or water, as well as measures to be taken to ensure that environmental and public health and safety will be protected during construction and after buildout. The EA/EIS should also identify and discuss any potential health and environmental threats that may be present due to site-specific contamination from past or current use. If contaminants of concern are identified for the project site, OP recommends that the petitioner consult with the State Department of Health's Hazard Evaluation and Emergency Response Office as to measures to be taken to address possible or actual contamination at the site.

12. **Solid Waste Management.** The EA/EIS should quantify the volume of solid waste likely to be generated by the project by types of users, and describe the impact the project will have on the county's existing and planned capacity for managing solid waste as represented in the county's solid waste management plan. The EA/EIS should discuss specific mitigation measures to be taken to reduce solid waste generation and ensure that recycling and reuse are incorporated within the project area by residential, commercial, and institutional users.

13. **Sustainability Analysis.** OP is implementing the sustainability elements of the State Administration's New Day Comprehensive Plan and Act 181, SLH 2011 (the new sustainability priority guideline of the Hawai'i State Planning Act) by requesting petitioners to prepare

sustainability plans for their projects in district boundary amendment proceedings before the LUC. LUC Dockets A06-771, DR Horton-Schuler Homes (Hoopili) and A11-793, Castle & Cooke Homes (Koa Ridge Makai/Castle & Cooke Waiawa) provide a good point of reference for sustainability plans. The Koa Ridge Sustainability Plan and Hoopili Sustainability Plan can be found on the LUC's web site under each respective docket's exhibits.

To address the principles and priority guidelines for sustainability, OP recommends that a sustainability plan or relevant elements thereof be incorporated as part of program and plan development. The sustainability plan should be included as part of the applicant's submission for development review and approval, including environmental assessments or in petitions for district boundary amendment to the State Land Use Commission submitted pursuant to HRS Chapter 205. See Technical Assistance Memorandum 2013-1 in Planner's Toolbox available online at http://planning.hawaii.gov.
The sustainability plan should address the following areas:

a. **Sustainable Development** - the development's contribution to creating a high quality of life and mutual supportive role among environmental, economic, and social equity concerns, as enumerated in HRS §226-108.

b. **Smart Growth and Livability Principles** - the principles that promote safety and options with transportation choices, the promotion of energy-efficient, equitable and affordable housing choices, the enhancement of economic competitiveness and support to the existing communities.

c. **Resource Conservation** – incorporation of energy and water efficiencies, including the implementation of solid or liquid waste management through methods of recycle and reuse, low impact development with respect to site design considerations and structural best management practices to increase on-site infiltration and reduce off-site flows and pollution from stormwater runoff, and climate change and hazard mitigation and adaptation strategies.

d. **Green Building Standards** - the planned use of green building and sustainable design practices.

14. **Development Timetable.** The LUC requires that projects seeking reclassification be substantially completed within ten years or seek incremental approvals, pursuant to HAR § 15-15-50. The EA/EIS and/or petitioner should provide a schedule of development for each phase of the total project and a map showing the location and timing of each phase or increment of development. Regarding infrastructure (e.g., highway improvements), the petitioner should discuss how improvements will be completed to ensure that mitigation coincides with the impact created by the proposed project.

STATE OF HAWAI'I OFFICE OF PLANNING
TECHNICAL ASSISTANCE MEMORANDUM

TAM – 2016 – 1 ISSUED: 08-01-2016

AUTHORITIES: State Planning, Hawaii Revised Statutes (HRS) Chapter 225M; Hawaii State Planning Act, HRS Chapter 226; Hawaii Land Use Law, HRS Chapter 205; Aeronautics, HRS Chapter 261; Airport Zoning Act, HRS Chapter 262

SUBJECT: Federal Aviation Administration (FAA) Order 5190.6B

The Office of Planning provides technical assistance to state and county agencies in administering the statewide planning system.[1] This technical advisory discusses an FAA Order which may impact the use of land adjacent to or in the immediate vicinity of Hawaii's airports.

Background

Pursuant to FAA Order 5190.6B[2]:

"20.1. Background. Land use planning is an important tool in ensuring that land adjacent to, or in the immediate vicinity of, the airport is consistent with activities and purposes compatible with normal airport operations, including aircraft landing and takeoff. Ensuring compatible land use near federally obligated airports is an important responsibility and an issue of federal interest. In effect since 1964, Grant Assurance 21, Compatible Land Use, implementing Title 49 United States Code (U.S.C.) § 47107(a)(10), requires, in part, that the sponsor:"

"...take appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. In addition, if the project is for noise compatibility program implementation, it will not cause or permit any change in land use, within its jurisdiction, that will reduce its compatibility, with respect to the airport, of the noise compatibility program measures upon which federal funds have been expended."

There are a number of sources that can assist an airport sponsor in dealing with noise, obstructions, and other incompatible land uses. These include, but are not limited to:

[1] HRS §§ 225M-2(b), 226-53(10).

[2] https://www.faa.gov/airports/resources/publications/orders/compliance_5190_6/media/5190_6b_chap20.pdf

a. Hazardous Wildlife Attractants on or Near Airports, AC 150/5200-33B, August 28, 2007.[3]
b. Construction or Establishment of Landfills near Public Airports, AC 150/5200-34A, January 26, 2006.
c. Federal and State Coordination of Environmental Reviews for Airport Improvement Projects. (RTF format) – Joint Review by Federal Aviation Administration and National Association of State Aviation Officials (NASAO), issued March 2002.[4]
d. Land Use Compatibility and Airports, a Guide for Effective Land Use Planning (PDF format), issued by the FAA Office of Environment and Energy.[5]
e. Compatible Land Use Planning Initiative (PDF format), 63 Fed. Reg. 27876, May 21, 1998.[6]
f. A Model Zoning Ordinance to Limit Height of Objects Around Airports, Advisory Circular (AC) 150/5190-4A.
g. Glint/Glare Hazards, Airport Airspace Analysis (iOE/AAA), Combined Federal Regulation CFR Part 77 (e-CFR format) – Current as of December 15, 2015 (same as obstruction process below).
h. Obstruction Evaluation/Airport Airspace Analysis (iOE/AAA), Combined Federal Regulation CFR Part 77 (e-CFR format) – Current as of December 15, 2015.
i. Avigation and Noise Easements – Permitting agencies shall ensure that all permits issued to projects near airports are compatible with avigation easement agreements between the State of Hawaii Department of Transportation, Airports Division (DOT-A) and property owners. These easements grant the DOT-A the right of flight of aircrafts, the safe operations of airports, and acceptance of certain noise levels and other phenomena associated with the airport. The right to flight includes the prevention of wildlife hazard through appropriate mitigation and monitoring. In all land-use zone changes, this easement is required and must satisfy DOT-A requirements.

[3] http://www.faa.gov/documentLibrary/media/advisory_circular/150-5200-33B/150_5200_33b.pdf
[4] https://www.faa.gov/airports/resources/publications/reports/environmental/media/eis-faa-nasao-report.pdf
[5] http://www.faa.gov/about/office_org/headquarters_offices/apl/noise_emissions/planning_toolkit/media/III.B.pdf
[6] https://www.gpo.gov/fdsys/pkg/FR-1998-05-21/pdf/98-13577.pdf

Pertinent Information from FAA's Land-Use Practices on or near Airports That Potentially Attract Hazardous Wildlife, Glint/Glare Hazards and Obstruction Hazards:

2-1. General. The wildlife attracted to the airport environment vary considerably, depending on several factors, including land-use practices on or near the airport. Other hazards that attract wildlife include glint/glare hazards, certain street and property lighting designs, and aerial obstruction hazards, all of which threaten aviation safety. In addition to the specific considerations outlined below, airport operators should refer to Wildlife Hazard Management at Airports, Glint/Glare, and Obstruction guidance materials prepared by the FAA.

Pertinent Information from FAA Order 5190.6B Compatible Land Use and Airspace Protection:

4-3. Other Land-Use Practice Changes. As a matter of policy, the FAA encourages operators of public-use airports who become aware of proposed land use practice changes that may attract hazardous wildlife within 5 statute miles of their airports, to include glint/glare hazards and aerial obstructions to promptly notify the FAA. The FAA also encourages proponents of such land use changes to notify the FAA as early in the planning process as possible. Advanced notice affords the FAA an opportunity (1) to evaluate the effect of a particular land-use change on aviation safety and (2) to support efforts by the airport sponsor to restrict the use of land next to or near the airport to uses that are compatible with the airport.

Land use practices that may attract hazardous wildlife, and may also be a glint/glare hazard or an aerial obstruction hazard to existing flight paths include, but are not limited to:

- Underwater waste discharges
- Aquaculture activities conducted outside of fully enclosed buildings
- Water features on properties such as fountains or ponds, areas of permanent or temporary standing water, and furrow irrigation and drainage systems
- Landfills and material recycling/processing facilities
- Photovoltaic/Solar panels
- Utility poles and lines
- Wind turbines
- Antenna towers
- High rise building structures
- Cranes
- Tethered Air Balloon Devices
- Street and exterior property lights
- Certain landscape, trees, and ground cover

4-3.a. Airports that have received Federal grant-in-aid assistance are required by their grant assurances to take appropriate actions to restrict the use of land next to or near the airport to uses that are compatible with normal airport operations. The FAA recommends that airport operators to the extent practicable oppose off-airport land-use changes or practices within the separations identified in Sections 1-2 through 1-4 that may attract hazardous wildlife, and/or be glint/glare, and/or obstruction hazards. Failure to do so may lead to noncompliance with applicable grant assurances. The FAA will not approve the placement of airport development projects pertaining to aircraft movement in the vicinity of hazardous wildlife attractants, or where glint/glare and/or obstruction hazards exist without appropriate mitigating measures. Increasing the intensity of wildlife control efforts is not a substitute for eliminating or reducing a proposed wildlife hazard, nor is the placement adjustments to mitigate glint/glare and obstruction hazards. Airport operators should identify hazardous wildlife, glint/glare, and obstruction hazards during any planning process for new airport development projects.

Pertinent Information from FAA 14 Code of Federal Regulation Part 77 Safe, Efficient Use and Preservation of the Navigable Airspace:

7460-1 Notice of Proposed Construction or Alteration – Requirement to file §77.9 Construction or alteration requiring notice.

If requested by the FAA, or if you propose any of the following types of construction or alteration, you must file notice with the FAA of:

(a) Any construction or alteration that is more than 200 ft. above ground level (AGL) at its site.
(b) Any construction or alteration that exceeds an imaginary surface extending outward and upward at any of the following slopes:
  (1) 100 to 1 for a horizontal distance of 20,000 ft. from the nearest point of the nearest runway of each airport described in paragraph (d) of this section with its longest runway more than 3,200 ft. in actual length, excluding heliports.
  (2) 50 to 1 for a horizontal distance of 10,000 ft. from the nearest point of the nearest runway of each airport described in paragraph (d) of this section with its longest runway no more than 3,200 ft. in actual length, excluding heliports.
  (3) 25 to 1 for a horizontal distance of 5,000 ft. from the nearest point of the nearest landing and takeoff area of each heliport described in paragraph (d) of this section.
(c) Any highway, railroad, or other traverse way for mobile objects, of a height which, if adjusted upward 17 feet for an Interstate Highway that is part of the National System of Military and Interstate Highways where overcrossings are designed for a minimum of 17 feet vertical distance, 15 feet for any other public roadway, 10 feet or the height of the highest mobile object that would normally traverse the road, whichever is greater, for a private road, 23 feet for a railroad, and for a waterway or any other traverse way not previously mentioned, an amount equal to the height of

the highest mobile object that would normally traverse it, would exceed a standard of paragraph (a) or (b) of this section.

NOTE

(a) You must submit this form at least 45 days before the start date of the proposed construction or alteration or the date an application for a construction permit is filed, whichever is earliest.
(b) If you propose construction or alteration that is also subject to the licensing requirements of the Federal Communications Commission (FCC), you must submit notice to the FAA on or before the date that the application is filed with the FCC.
(c) If you propose construction or alteration to an existing structure that exceeds 2,000 ft. in height above ground level (AGL), the FAA presumes it to be a hazard to air navigation that results in an inefficient use of airspace. You must include details explaining both why the proposal would not constitute a hazard to air navigation and why it would not cause an inefficient use of airspace.
(d) The 45-day advance notice requirement is waived if immediate construction or alteration is required because of an emergency involving essential public services, public health, or public safety. You may provide notice to the FAA by any available, expeditious means. You must file a completed FAA Form 7460–1 within 5 days of the initial notice to the FAA. Outside normal business hours, the nearest flight service station will accept emergency notices.
(e) There is a Notice Criteria Tool on https://oeaaa.faa.gov/oeaaa/external/gisTools/gisAction.jsp?action=showNoNoticeRequiredToolForm on the left margin of the webpage. It is free and will help to determine if proposed structures need to filed for aeronautical review.

Photovoltaic and Solar Farms concerns about hazards to safe air navigation from:

1. Potential glare and glint caused by parabolic troughs and heliostats that might cause temporary loss of vision to pilots on arrival or departure, or to Air Traffic Control personnel in the control tower.
2. Electromagnetic interference with on-and off-airport radar systems that may pick up a false signal from the metal components of the mirrors with impacts that can vary based on solar tracking activity.
3. Physical penetrations of navigable airspace from power towers that extend into Part 77 imaginary surfaces, terminal instrument procedures (TERPS) surfaces, or the path of radio emitting navigational aids.
4. Thermal plumes emitted by the power tower that produce unexpected upward moving air columns into navigable air space.
5. Use your discretion to evaluate the proposed footprint to be developed. If the footprint is approaching 1 acre, have the proponent submit a 7460-1. If its within 3 nautical miles of an airport, have them submit a 7460-1.

Wind Farms concerns about hazards to safe air navigation from:

1. Create false targets and impacts FAA long radar capabilities.
2. Height of structures and propellers.
3. Any wind farm proposal needs to have the proponent submit a 7460-1.

Application

The State of Hawai'i Department of Transportation, Airports Division (DOT-A) discourages such land uses that may attract hazardous wildlife within five (5) statute miles of airport boundaries, pursuant to FAA Advisory Circular 150/5200-33B, (August 28, 2007). Attached are maps depicting the five (5) statute miles from airports in the State of Hawai'i, including glint/glare hazards pursuant to Federal Aviation Administration Notice of Interim Policy dated October 23, 2013 and aerial obstruction to existing flight paths pursuant to Combined Federal Regulation CFR Part 77 (e-CFR format) – Current as of December 15,2015.

State, county, and federal agencies who have jurisdiction over areas within five (5) statute miles of airport boundaries and have permit authority over future land uses that may attract hazardous wildlife shall consider FAA Advisory Circular 150/5200-33B, including glint/glare hazards and aerial obstruction(s) to existing flight paths in accordance with the FAA Obstruction Evaluation/Airport Airspace Analysis (iOE/AAA), Combined Federal Regulation CFR Part 77 in their decision making on plans and permits,

Consultation with the DOT-A (Airport Operations) shall be performed at the earliest time where a future land use that may attract hazardous wildlife, glint/glare hazard or aerial obstruction(s) is proposed. Agencies should inform applicants of permits or approvals of such proposed land uses to consult with the DOT-A (Airport Operations) as soon as possible, pursuant to the Airport Zoning Act HRS Chapter 262.

Where applicable, when a land-owner petitions the State of Hawaii Land Use Commission (LUC) with a request for a land use district boundary amendment, the State will propose an LUC condition requiring an avigation and noise easement be granted to DOT-A and the terms of the easement must meet the requirements of the DOT-A, including mitigation to minimize potential wildlife hazards to aircrafts and airport operations.

In cases where the respective counties are the authority for land use district boundary amendments (petitions under fifteen (15) acres), the respective counties should contact DOT-A for any requirements of an avigation and noise easement.

When a landowner in the vicinity of the airport pursues redevelopment of a property, the landowner must grant an avigation and noise easement to the DOT-A to ensure compatible land use in the vicinity of the airport. The terms of the easement must satisfy DOT-A requirements.

Grant of avigation and noise easements to DOT-A is necessary for the safety of air transportation which is a public benefit. State, County, and Federal regulatory and service agencies that work with any aspect of the conditions identified in an avigation and noise easement must take appropriate actions and incorporate the DOT-A avigation easement requirements in their decisions.

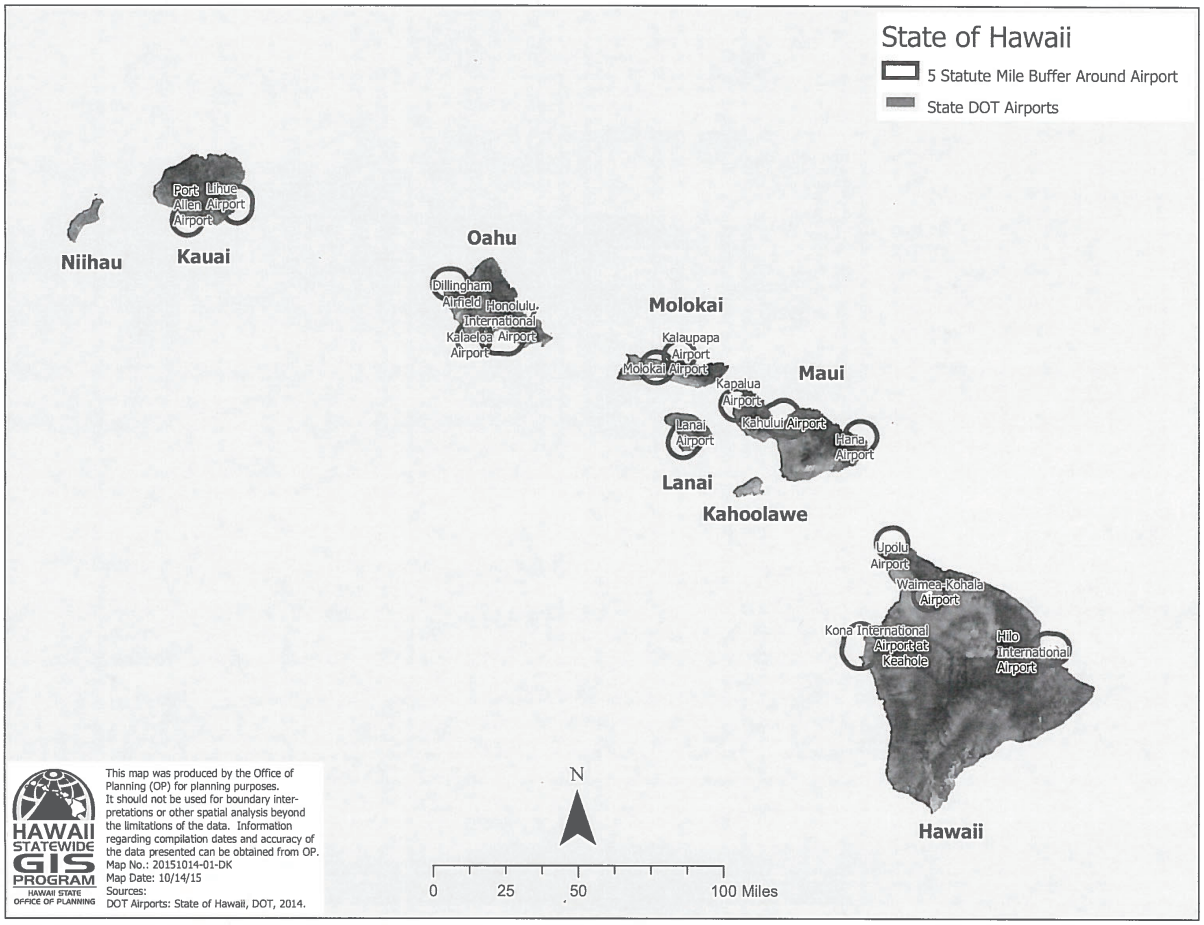
Office of Planning
State of Hawai'i
P.O. Box 2359
Honolulu, HI 96804

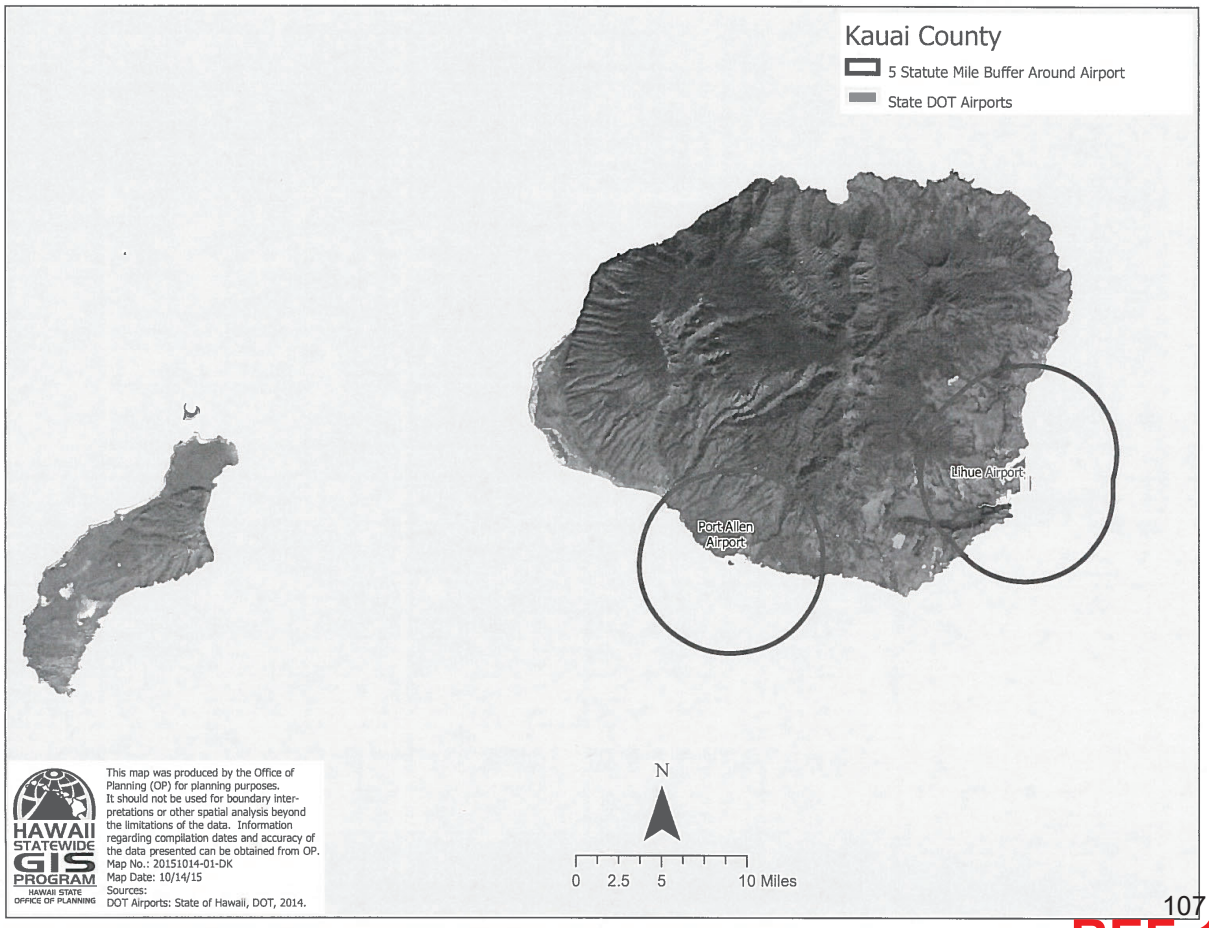
Phone: (808) 587-2846
Web: planning.hawaii.gov

Department of Transportation
Airports Division
State of Hawai'i
400 Rodgers Boulevard, Suite 700
Honolulu, HI 96819-1880

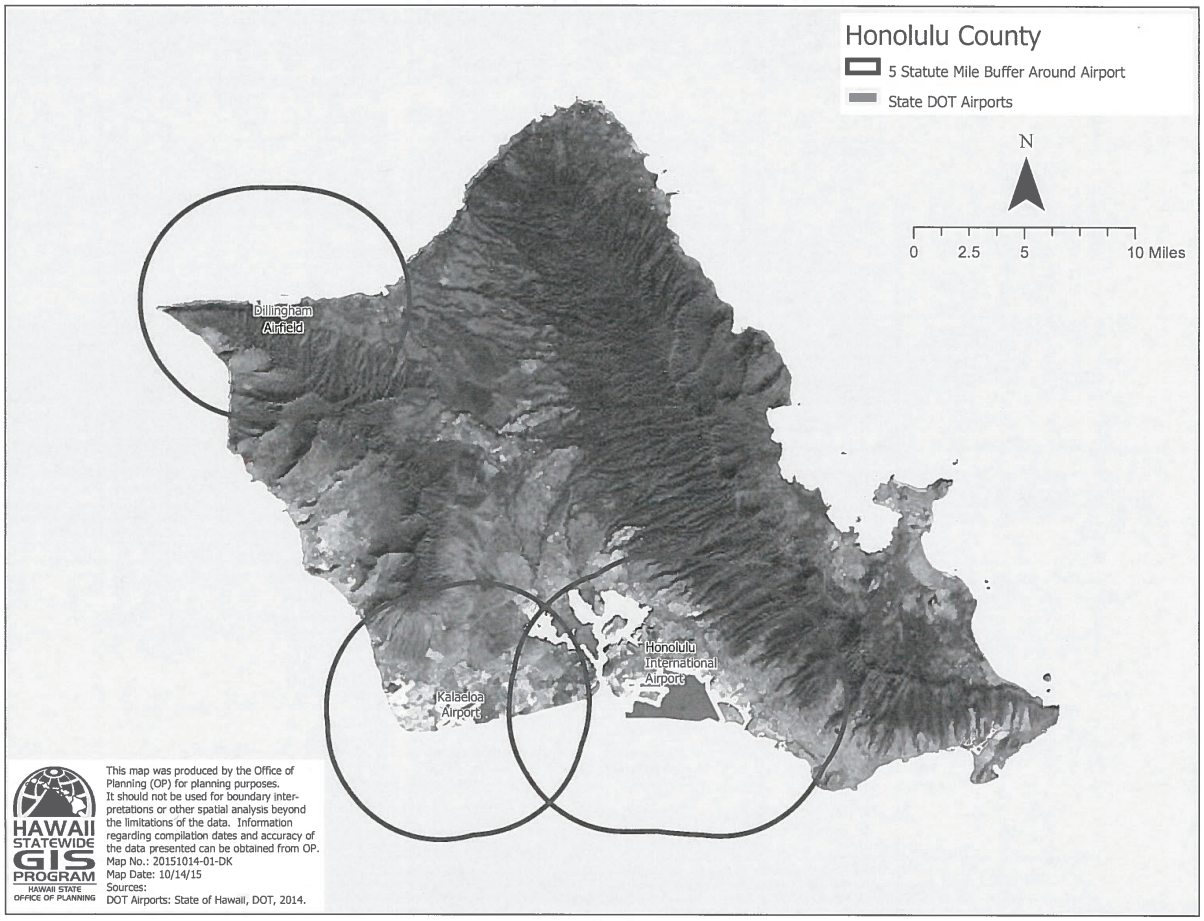
Phone: (808) 838-8810

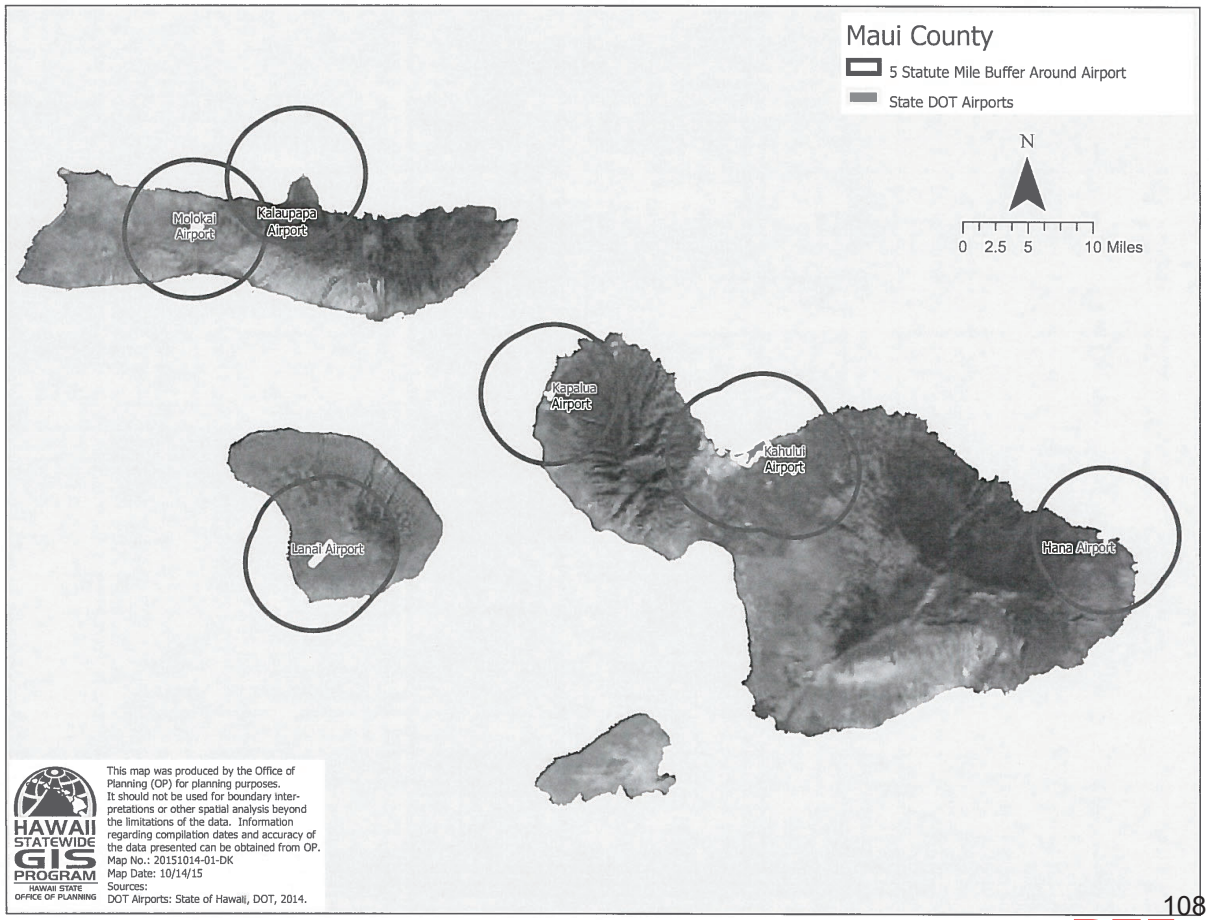
Note: A Technical Assistance Memorandum (TAM) is an informational statement of the law, regulations, or policies. It is accurate on the date issued. Subsequent changes in the law or regulations, judicial decisions, or changes in policies could affect the validity of the information presented in a TAM.


State of Hawaii
5 Statute Mile Buffer Around Airport
State DOT Airports
Niihau
Port Allen Airport
Lihue Airport
Kauai
Oahu
Dillingham Airfield
Honolulu International Airport
Kalaeloa Airport
Molokai
Kalaupapa Airport
Molokai Airport
Maui
Kapalua Airport
Kahului Airport
Hana Airport
Lanai Airport
Lanai
Kahoolawe
Upolu Airport
Waimea-Kohala Airport
Kona International Airport at Keahole
Hilo International Airport
Hawaii
N
0 25 50 100 Miles
HAWAII STATEWIDE GIS PROGRAM
HAWAII STATE OFFICE OF PLANNING
This map was produced by the Office of Planning (OP) for planning purposes.
It should not be used for boundary interpretations or other spatial analysis beyond the limitations of the data. Information regarding compilation dates and accuracy of the data presented can be obtained from OP.
Map No.: 20151014-01-DK
Map Date: 10/14/15
Sources:
DOT Airports: State of Hawaii, DOT, 2014.

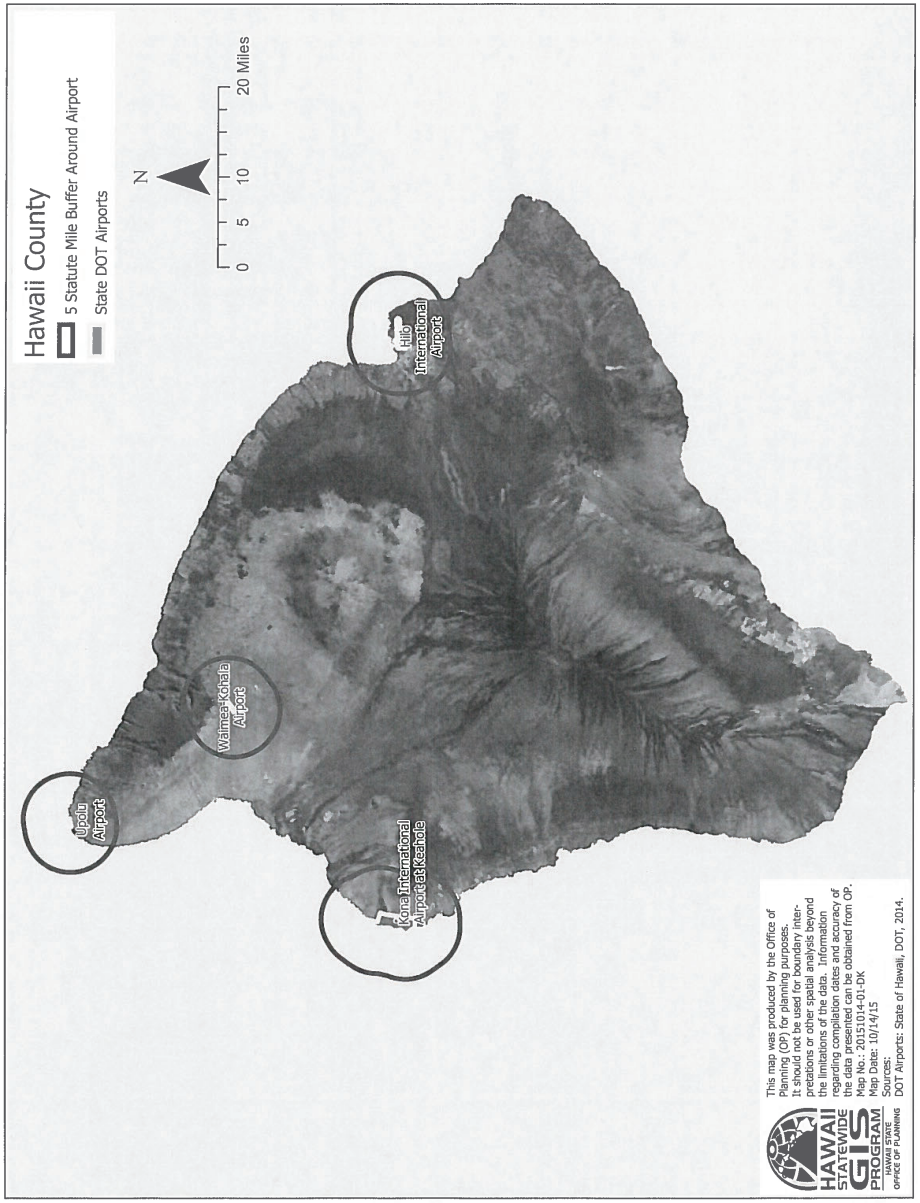

Kauai County
5 Statute Mile Buffer Around Airport
State DOT Airports
Lihue Airport
Port Allen Airport
N
0 2.5 5 10 Miles
HAWAII STATEWIDE GIS PROGRAM
HAWAII STATE OFFICE OF PLANNING
This map was produced by the Office of Planning (OP) for planning purposes.
It should not be used for boundary interpretations or other spatial analysis beyond the limitations of the data. Information regarding compilation dates and accuracy of the data presented can be obtained from OP.
Map No.: 20151014-01-DK
Map Date: 10/14/15
Sources:
DOT Airports: State of Hawaii, DOT, 2014.

REF-138


Honolulu County
5 Statute Mile Buffer Around Airport
State DOT Airports
N
0 2.5 5 10 Miles
Dillingham Airfield
Kalaeloa Airport
Honolulu International Airport
HAWAII STATEWIDE GIS PROGRAM
HAWAII STATE OFFICE OF PLANNING
This map was produced by the Office of Planning (OP) for planning purposes.
It should not be used for boundary interpretations or other spatial analysis beyond the limitations of the data. Information regarding compilation dates and accuracy of the data presented can be obtained from OP.
Map No.: 20151014-01-DK
Map Date: 10/14/15
Sources:
DOT Airports: State of Hawaii, DOT, 2014.


Maui County
5 Statute Mile Buffer Around Airport
State DOT Airports
N
0 2.5 5 10 Miles
Molokai Airport
Kalaupapa Airport
Kapalua Airport
Kahului Airport
Lanai Airport
Hana Airport
HAWAII STATEWIDE GIS PROGRAM
HAWAII STATE OFFICE OF PLANNING
This map was produced by the Office of Planning (OP) for planning purposes.
It should not be used for boundary interpretations or other spatial analysis beyond the limitations of the data. Information regarding compilation dates and accuracy of the data presented can be obtained from OP.
Map No.: 20151014-01-DK
Map Date: 10/14/15
Sources:
DOT Airports: State of Hawaii, DOT, 2014.

REF-139



Ho'okuleana LLC

... to take responsibility ...

Peter T. Young
1539 Kanapu'u Drive
Kailua, Hawai'i 96734
(808) 226-3567 (Cell Phone)
PeterYoung@Hookuleana.com
www.Hookuleana.com

Office of Planning, State of Hawaii
235 South Beretania Street, 6th Floor
Honolulu, HI 96813

April 19, 2019

Sent only via e-mail to Johua.K.Hekekia@dbedt.hawaii.gov

Re: Miki Basin Industrial Park, Lāna'i - Draft Environmental Assessment

Gentlemen:

Thank you for your response to our Pre-Assessment Consultation and Scoping request for the above referenced project (SSFM initially sent the pre-assessment request, I will be preparing the EA).

We acknowledge your comments concerning Land Use District Boundary Amendments, Land Use Approvals, Environmental Assessment requirement, CZM and Drainage related to the project. These will be incorporated into the EA.

A draft Environmental Assessment is being prepared and we will be sending you a copy for your review.

Thanks,
HO'OKULEANA LLC

Peter T. Young

Peter T Young
President

Do well by doing good.

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

December 7, 2018

SSFM International, Inc.
Attn: Ms. Jennifer M. Scheffel
Sr. Environmental Planner
99 Aupuni Street, Suite 202
Hilo, Hawaii 96720

via email: jscheffel@ssfm.com

Dear Ms. Scheffel:

SUBJECT: Pre-Assessment Consultation for Draft Environmental Assessment for the Proposed **Pulama Lanai Miki Basin 200-Acre Industrial Area** located on the Island of Lanai; (2) 4-9-002:por. 061

Thank you for the opportunity to review and comment on the subject matter. The Land Division of the Department of Land and Natural Resources (DLNR) distributed or made available a copy of your request pertaining to the subject matter to DLNR's Divisions for their review and comments.

At this time, enclosed are comments from the (a) Division of Forestry & Wildlife, and (b) Commission on Water Resource Management on the subject matter. Should you have any questions, please feel free to call Darlene Nakamura at (808) 587-0417. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosures
cc: Central Files

19304

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
FIRST DEPUTY

JEFFREY T. PEARSON, P.E.
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
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

DEC - 5 2018

MEMORANDUM

TO: RUSSELL Y. TSUJI, Administrator
Land Division

FROM: DAVID G. SMITH, Administrator DGS

SUBJECT: **Division of Forestry and Wildlife Comments on the Pre-Assessment Consultation for the Proposed Pulama Lānaʻi Miki Basin 200-acre Industrial Area Draft Environmental Assessment**

The Department of Land and Natural Resources Division of Forestry and Wildlife (DOFAW) has received your inquiry regarding the preparation of a draft Environmental Assessment to support the proposed reclassification of 200 acres of land adjacent to Lānaʻi Airport from Agriculture to Urban in the Miki Basin, Lānaʻi, TMK: (2) 4-9-002:061 por., to align with the zoning in the Lānaʻi Community Plan. The applicant, Pulama Lānaʻi, states the subject parcel consists of undeveloped agricultural land. We provide the following comments for potential development of the property that may occur as a result of the reclassification.

The State and Federal listed Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) has the potential to occur in the vicinity of the project area and may roost in trees. To avoid the potential for impacts to this tree-roosting species, site clearing should be timed to avoid disturbance during the bat birthing and pup rearing season (June 1 through September 15). If this cannot be avoided woody plants greater than 15 feet (4.6 meters) tall should not be disturbed, removed, or trimmed without consulting DOFAW. Barbed wire should be avoided for any construction because bat mortalities have been documented as a result of becoming ensnared by barbed wire during flight.

We note that artificial lighting can adversely impact seabirds that may pass through the area at night causing disorientation that could result in collision with manmade artifacts or grounding of birds. For nighttime lighting that might be required, DOFAW recommends that any lights be fully shielded to minimize impacts. Nighttime work that requires outdoor lighting should be avoided during the seabird fledging season from September 15 through December 15. This is the period when young seabirds take their maiden voyage to the open sea.

The State and Federal listed Blackburn's Sphinx Moth (BSM; *Manduca blackburni*) has a historic range that encompasses the project area. Larvae of BSM feed on many nonnative hostplants that include tree tobacco (*Nicotiana glauca*) which grows in disturbed soil. We recommend contacting our Maui DOFAW office at (808) 984-8100 for further information about where BSM may be present and whether a vegetation survey should be conducted to determine the presence of plants preferred by BSM.

DOFAW recommends surveying for rare and endangered plants that historically occur in the area. If any of these species are found, please notify our Maui DOFAW office at (808) 984-8100.

We recommend using native plant species for landscaping that are appropriate for the area (i.e. climate conditions are suitable for the plants to thrive, historically occurred there, etc.). Please do not plant invasive species. DOFAW recommends consulting the Hawai'i-Pacific Weed Risk Assessment website to determine the potential invasiveness of plants proposed for use in the project (https://sites.google.com/site/weedriskassessment/home).

You should avoid moving soil or other plant material within and between the islands due to the potential presence of pathogens. We recommend consulting the Hawai'i Interagency Biosecurity Plan at http://dlnr.hawaii.gov/hisc/plans/hibp/ in planning, design, and construction of the project.

Finally, DOFAW is concerned about attracting vulnerable birds to areas that may host non-native predators such as cats, rodents, and mongoose. We recommend taking action to minimize predator presence; remove cats, place bait stations for rodents and mongoose, and provide covered trash receptacles.

We appreciate your efforts to work with our office for the conservation of our native species. Should the scope of the project change significantly, or should it become apparent that threatened or endangered species may be impacted, please contact our staff as soon as possible. If you have any questions, please contact Jim Cogswell, Wildlife Program Manager at (808) 587-4187 or James.M.Cogswell@hawaii.gov.

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED
COMMISSION ON WATER
RESOURCE MANAGEMENT
2018 NOV 21 AM 11:45

November 21, 2018

MEMORANDUM

TO:

DLNR Agencies:
__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 – Maui District
X Historic Preservation

FR:

TO:

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Assessment Consultation for Draft Environmental Assessment for the Proposed **Pulama Lanai Miki Basin 200-Acre Industrial Area**
LOCATION: Island of Lanai; TMK: (2) 4-9-002:por. 061
APPLICANT: SSFM International on behalf of Lanai Resorts, LLC dba Pulama Lanai

Transmitted for your review and comment is information on the above-referenced subject matter. We would appreciate your comments by **December 6, 2018.**

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 Darlene Nakamura at 587-0417. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(x) Comments are attached.

Signed: /s/ Jeffrey T. Pearson, P.E.

Print Name: Deputy Director

Date: December 3, 2018

cc: Central Files

FILE ID: RFD.4984.5
DOC ID: 20631

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON

BRUCE S. ANDERSON, PH.D.
WILLIAM D. BALFOUR, JR.
KAMANA BEAMER, PH.D.
MICHAEL G. BUCK
NEIL J. HANNAHS
PAUL J. MEYER

JEFFREY T. PEARSON, P.E.
DEPUTY DIRECTOR

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

December 3, 2018

REF: RFD.4984.5

TO: Mr. Russell Tsuji, Administrator
Land Division

FROM: Jeffrey T. Pearson, P.E., Deputy Director
Commission on Water Resource Management

SUBJECT: Pre-Assessment Consultation for Draft Environmental Assessment for the Proposed Pulama Lanai Miki Basin 200-Acre Industrial Area

FILE NO.: RFD.4984.5
TMK NO.: (2) 4-9-002:por. 061

Thank you for the opportunity to review the subject document. The Commission on Water Resource Management (CWRM) is the agency responsible for administering the State Water Code (Code). Under the Code, all waters of the State are held in trust for the benefit of the citizens of the State, therefore all water use is subject to legally protected water rights. CWRM strongly promotes the efficient use of Hawaii's water resources through conservation measures and appropriate resource management. For more information, please refer to the State Water Code, Chapter 174C, Hawaii Revised Statutes, and Hawaii Administrative Rules, Chapters 13-167 to 13-171. These documents are available via the Internet at http://dlnr.hawaii.gov/cwrm.

Our comments related to water resources are checked off below.

☐ 1. We recommend coordination with the county to incorporate this project into the county's Water Use and Development Plan. Please contact the respective Planning Department and/or Department of Water Supply for further information.

☐ 2. We recommend coordination with the Engineering Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.

☐ 3. We recommend coordination with the Hawaii Department of Agriculture (HDOA) to incorporate the reclassification of agricultural zoned land and the redistribution of agricultural resources into the State's Agricultural Water Use and Development Plan (AWUDP). Please contact the HDOA for more information.

☐ 4. We recommend that water efficient fixtures be installed and water efficient practices implemented throughout the development to reduce the increased demand on the area's freshwater resources. Reducing the water usage of a home or building may earn credit towards Leadership in Energy and Environmental Design (LEED) certification. More information on LEED certification is available at http://www.usgbc.org/leed. A listing of fixtures certified by the EAP as having high water efficiency can be found at http://www.epa.gov/watersense.

☐ 5. We recommend the use of best management practices (BMP) for stormwater management to minimize the impact of the project to the existing area's hydrology while maintaining on-site infiltration and preventing polluted runoff from storm events. Stormwater management BMPs may earn credit toward LEED certification. More information on stormwater BMPs can be found at http://planning.hawaii.gov/czm/initiatives/low-impact-development/

☐ 6. We recommend the use of alternative water sources, wherever practicable.

☐ 7. We recommend participating in the Hawaii Green Business Program, that assists and recognizes businesses that strive to operate in an environmentally and socially responsible manner. The program description can be found online at http://energy.hawaii.gov/green-business-program.

☐ 8. We recommend adopting landscape irrigation conservation best management practices endorsed by the Landscape Industry Council of Hawaii. These practices can be found online at

http://www.hawaiiscape.com/wp-content/uploads/2013/04/LICH_Irrigation_Conservation_BMPs.pdf.

☐ 9. There may be the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.

☐ 10. The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit is required prior to use of water. The Water Use Permit may be conditioned on the requirement to use dual line water supply systems for new industrial and commercial developments.

☐ 11. A Well Construction Permit(s) is (are) are required before the commencement of any well construction work.

☐ 12. A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.

☐ 13. There is (are) well(s) located on or adjacent to this project. If wells are not planned to be used and will be affected by any new construction, they must be properly abandoned and sealed. A permit for well abandonment must be obtained.

☐ 14. Ground-water withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.

☐ 15. A Stream Channel Alteration Permit(s) is (are) required before any alteration can be made to the bed and/or banks of a steam channel.

☐ 16. A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is constructed or altered.

☐ 17. A Petition to Amend the Interim Instream Flow Standard is required for any new or expanded diversion(s) of surface water.

☐ 18. The planned source of water for this project has not been identified in this report. Therefore, we cannot determine what permits or petitions are required from our office, or whether there are potential impacts to water resources.

☒ OTHER: The Draft Environmental Assessment should discuss the projected water demands for the project, both potable and non-potable, and provide the calculations used to estimate demands. The Draft Environmental Assessment should identify the proposed water source(s) to support the project, and include a discussion of the potential impacts on water resources and other public trust uses of water, and describe any proposed mitigation measures. Water conservation and efficiency measures to be implemented should be discussed. The consistency of this project with the Lanai Water Use and Development Plan (2011) should also be discussed.

If you have any questions, please contact Lenore Ohye of the Commission staff at 587-0216.

Ho'okuleana LLC
… to take responsibility …

Peter T. Young
1539 Kanapu'u Drive
Kailua, Hawai'i 96734
(808) 226-3567 (Cell Phone)
PeterYoung@Hookuleana.com
www.Hookuleana.com

Department of Land and Natural Resources
Division of Forestry and Wildlife
1151 Punchbowl Street, Room 325
Honolulu, Hawaii 96813

April 19, 2019

Sent only via e-mail to James.M.Cogswell@hawaii.gov

Re: Miki Basin Industrial Park, Lāna'i - Draft Environmental Assessment

Gentlemen:

Thank you for your response to our Pre-Assessment Consultation and Scoping request for the above referenced project (SSFM initially sent the pre-assessment request, I will be preparing the EA).

We acknowledge your comments that the Hawaiian Hoary Bat has the potential to occur in the vicinity of the project area and may roost in trees, your concern for artificial lighting, Blackburn's Sphinx Moth range and your recommendation to survey for rare and endangered plants that historically occur in the area.

A draft Environmental Assessment is being prepared and we will be sending you a copy for your review.

Thanks,
HO'OKULEANA LLC

Peter T Young
President

Ho'okuleana LLC
… to take responsibility …

Peter T. Young
1539 Kanapu'u Drive
Kailua, Hawai'i 96734
(808) 226-3567 (Cell Phone)
PeterYoung@Hookuleana.com
www.Hookuleana.com

Hawaii Department of Land and Natural Resources
Commission on Water Resource Management
P. O. BOX 621
Honolulu, HI 96809

April 19, 2019

Sent only via e-mail to Lenore.N.Ohye@hawaii.gov

Re: Miki Basin Industrial Park, Lāna'i - Draft Environmental Assessment

Gentlemen:

Thank you for your response to our Pre-Assessment Consultation and Scoping request for the above referenced project.

We acknowledge your comments concerning the projected water demands for the project. These will be incorporated into the EA.

A draft Environmental Assessment is being prepared and we will be sending you a copy for your review.

Thanks,
HO'OKULEANA LLC

Peter T Young
President

Do well by doing good.

DAVID Y. IGE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

JADE T. BUTAY
DIRECTOR

Deputy Directors
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:
DIR 1297
STP 8.2566

December 13, 2018

Ms. Jennifer M. Scheffel
Senior Environmental Planner
SSFM International, Inc.
99 Aupuni Street, Suite 202
Hilo, Hawaii 96720

Dear Ms. Scheffel:

Subject: Pulama Lanai Miki Basin
Pre-Assessment Consultation for Draft Environmental Assessment (DEA)
Lanai, Maui, Hawaii
TMK: (2) 4-9-002:061 (por.)

The Department of Transportation (DOT) understands the applicant is proposing to reclassify 200 acres of land from agriculture into urban. They will then rezone the land to 100 acres of Light Industrial and 100 acres of heavy industrial. The site is adjacent to the Lanai Airport and the Palawai Basin near the State-owned Kaumalapau Highway and Manele Road (Route 440).

DOT comments on the subject project are as follows:

Airports Division

1. The proposed Pulama Lanai project is approximately 300 feet from the centerline of the future Runway 21 extension at Lanai Airport (LNY). Developers of all projects within five miles from a Hawaii State airport are advised to read the Technical Assistance Memorandum (TAM) for guidance with development and activities that may require further review and permits. The TAM can be viewed at this link: http://files.hawaii.gov/dbedt/op/docs/TAM-FAA-DOT-Airports_08-01-2016.pdf.

2. Federal Aviation Administration (FAA) regulation requires the submittal of FAA Form 7460-1 Notice of Proposed Construction or alteration pursuant to the Code of Federal Regulations, Title 14, Part 77.9, if the construction or alteration is within 20,000 feet of a public use or military airport which exceeds a 100:1 surface from any point on the runway of each airport with its longest runway more than 3,200 feet. The form and criteria for submittal can be found at the following website: https://oeaaa.faa.gov/oeaaa/external/portal.jsp.

3. Large-scale photovoltaic (PV) panel installations have the potential to create glint and glare hazard condition for aircraft pilots. If the proposed project includes PV installation, it is recommended that the project proponent conduct a glint and glare analysis to ensure that the solar energy installation will not create hazardous conditions to Lanai Airport flight operations. Please see the following website for more information: www.sandia.gov/glare. Large-scale solar energy installations also have the potential to emit radio frequency interference (RFI).

   Glint, glare, radio frequency interference (RFI), photovoltaic (PV) panels and tall equipment (such as cranes that may be used during construction) can create hazardous conditions to pilots. Any such PV system, construction equipment, and/or other structure that creates such a hazardous condition for pilots, must be immediately mitigated by the owner upon notification by Hawaii Department of Transportation, Airports Division (HDOTA) and/or by FAA.

4. Wildlife attractants near airports create the potential for bird-strike hazards to aircraft operation. All activities that can potentially attract wildlife within five (5) miles of HDOTA airports are discouraged. HDOTA recommends that Pulama Lanai ensures that landscaping and project features will not create a wildlife attractant. FAA Advisory Circular 150/5200-33B Hazardous Wildlife Attractants on or Near Airports, provides guidance for developments and wildlife management around airports.

5. Due to the development proximity to Lanai Airport, there is a potential for fumes, smoke, vibrations, odors, etc., from aircraft flight operations over the proposed development. The project may also be subject to single event noise from aircraft operations.

   HDOTA requests that Pulama Lanai grant an avigation easement to HDOTA for assurances of flight safety over the proposed site.

6. Lanai Resorts has committed to future relocation of Miki Road and utilities outside of airport property in the attached letter from Mr. Kurt Matsumoto, dated March 18, 2013. Currently, we request further discussion between HDOTA and Pulama Lanai on the possibility to include the Miki Road relocation with development of the proposed project.

Highways Division

A traffic study should be prepared by a traffic engineer licensed in the State of Hawaii and should be included in the DEA.

   a. The traffic study should evaluate any local impacts to the State Highway (Route 440) and nearby State facilities attributed by the project.

b. An evaluation should be included for regional traffic impacts by the proposed project and any potential fair share contribution to traffic improvements.

c. Include any phasing plan and the transportation improvements of each phase.

If there are any questions, please contact Mr. Blayne Nikaido of the DOT Statewide Transportation Planning Office at (808) 831-7979 or by email at blayne.h.nikaido@hawaii.gov.

Sincerely,

JADE T. BUTAY
Director of Transportation

Attachment

Lānaʻi RESORTS, LLC
733 Bishop Street, Suite 2000
Honolulu, HI 96813

March 18, 2013

Honorable Glenn M. Okimoto, Ph.D.
Director of Transportation
State of Hawaii, Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Dr. Okimoto:

Subject: Miki Basin Heavy Industrial Area
District Boundary Amendment (DBA) and Change In Zoning (CIZ)

Per the recent video conference with Garrett Smith and Elton Teshima, DOT-STP Office; Mike Auerbach and Lynn Becones, DOT-Airports; Gary Ashikawa and Russell Iwasa, DOT-HWY Oahu; Fred Cajigal, DOT-HWY Maui; Ralph Masuda, Lanai Resorts, LLC; Keith Niiya and Adrienne Wong, Austin Tsutsumi and Associates, Inc.; and Michael Munekiyo, Munekiyo & Hiraga, Inc.; held on February 26, 2013, the subject of the encroachment of Miki Road (a private road) onto DOT airports property was discussed. A past commitment by Castle & Cooke Resorts, LLC, to relocate Miki Road and utilities at the time that Lanai Airport expansion plans are made known, then CCR at that time would be willing to meet and discuss the specifics of relocating Miki Road. This commitment still stands for the new owner, Lanai Resorts, LLC.

Lanai Resorts, LLC is prepared to discuss the scope of Miki Basin Road relocation, a new Kaumalapau Highway intersection improvement, and a new traffic assessment with DOT Highways and Airports personnel when the need arises, at your convenience, so that we can accommodate your needs. In fact we are amenable to your requesting that a condition of approval be placed on the DBA and CIZ request to the Maui County Council that the Miki Road relocation shall be done upon request by DOT after meeting with Lanai Resorts, LLC on the proposed Lanai Airport expansion plan.

Thank you for your cooperation and consideration on this matter.

Sincerely,

Kurt Matsumoto
Chief Operating Officer

cc: Garrett Smith and Elton Teshima, Department of Transportation (DOT) STP Office
Mike Auerbach and Lynn Becones, DOT-Airports
Gary Ashikawa and Russell Iwasa, DOT-HWY Oahu
Fred Cajigal, DOT-HWY Maui
Leith Niiya and Adrienne Wong, Austin Tsutsumi & Associates
Michael Munekiyo, Munekiyo and Hiraga, Inc.
Ralph Masuda, Lanai Resorts, Maui Office

Pūlama Lānaʻi

April 18, 2019

Mr. Jade T. Butay
Director of Transportation
Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813-5097

Re: Pulama Lanai Miki Basin
Pre-Assessment Consultation for Draft Environmental Assessment (DEA)
Lanai, Maui, Hawaii
TMK: (2) 4-9-002:061 (por.)

Dear Mr. Butay:

This letter is in response to your December 13, 2018 letter regarding the above DEA. Your letter is also attached. Our responses follow in the same order as your letter:

Airports Division

1. Thank you for the information on reviewing the TAM for guidance with development and activities that may require further review and permit. There are none.
2. Thank you for the information on the FAA requirement within 20K feet of a public airport. We shall provide this information when there are prospective users of the 200 acres.
3. Thank you for the information on large-scale photovoltaic panel installations. We are aware of this having completed this for our Tesla installation at the Hydroponic facility.
4. Thank you for the information on discouraging the attraction of bird hazards near the airport within 5 miles of the airport. We have placed the restriction on drainage for all projects within the 5 mile radius, which basically covers all of the populated areas of Lanai.
5. Thank you for the notice of possible issue of aircraft noise for the area. We have just completed a DRAFT NEPA EA for a 500 foot runway extension for Lanai Airport and the noise study showed that the noise would not leave the runway exterior, much less the airport land.
   We would certainly work with HDOTA on an aviation easement for flight safety assurances over the proposed site. Please let me know how we would proceed with this.
6. Yes, there is such a letter, but it is based on the Lanai Airport Master Plan which has a 2000 foot runway extension. A 2000 foot runway extension results in a need for additional land to be transferred to DOT-Airports, and Miki Basin road being moved further mauka. The 500 foot runway extension at Lanai Airport did not change the existing boundaries of the current airport property. At this time there is no need to change the Miki Basin road alignment.

HONOLULU OFFICE 733 Bishop Street, Suite 2000 Honolulu, Hawai'i 96813 Tel 808 237 2001 Fax 808 566 6927 pulamalanai.com
LANA'I OFFICE 1311 Fraser Ave PO Box 630310 Lāna'i City, Hawai'i 96763 Tel 808 565 3000 Fax 808 565 3881

Highways Division

a. A traffic study has been prepared for the EA, and does evaluate any local impacts to the State Highway (Route 440) and nearby State facilities attributed to the project.
b. An evaluation of regional traffic impacts are in the traffic study, and there is no potential fair share contribution from HDOTH for traffic improvements.
c. There are no phasing plans for the improvements.

We are moving forward on completing the DEA. Should you have any further questions, please do not hesitate to contact me. Mahalo!

Me ke aloha pumehana
With warm aloha,

Lyon P. McCrory
Senior Vice President of Government Affairs

C: Blayne Nikaido, DOT Statewide Transportation Planning Office, by e-mail
blayne.h.nakaido@hawaii.gov

Enclosure (1)

NOVEMBER 23, 2019
DRAFT EA COMMENTS
AND RESPONSES

REF-148

MICHAEL P. VICTORINO
Mayor

LORI TSUHAKO
Director

LINDA R. MUNSELL
Deputy Director

DEPARTMENT OF HOUSING
& HUMAN CONCERNS
COUNTY OF MAUI
2200 MAIN STREET, SUITE 546
WAILUKU, MAUI, HAWAII 96793
PHONE: (808) 270-7805

November 26, 2019

Mr. Peter T. Young
President
Ho'okuleana LLC
1539 Kanapu'u Drive
Kailua, Hawaii 96734

Dear Mr. Young:

Subject: Miki Basin Industrial Park – Adjoining Lanai Airport, Lanai
Draft Environmental Assessment (DEA)
TMK: (2) 4-9-002:061

The Department has reviewed the Draft Environmental Assessment for the above subject project. Based on our review, we have determined that the subject project is not subject to Chapter 2.96, Maui County Code. The owner will not be required to comply.

Please call Mr. Buddy Almeida of our Housing Division at 270-7355 if you have any questions.

Sincerely,

C. BUDDY ALMEIDA
Housing Administrator

cc: Director of Housing and Human Concerns

Ho'okuleana LLC
... to take responsibility ...

Peter T. Young
1539 Kanapu'u Drive
Kailua, Hawai'i 96734
(808) 226-3567 (Cell Phone)
PeterYoung@Hookuleana.com
www.Hookuleana.com

Buddy Alameida, Housing Administrator
County of Maui
Department of Housing and Human Concerns
2200 Main Street, Suite 546
Wailuku , HI 96793

Re: Miki Basin Industrial Park – Comments on Draft Environmental Assessment

Dear Mr. Alameida:

Thank you for your comments on the Draft Environmental Assessment on the Miki Basin Industrial Park.

You note that the Department has made a determination that the project is not subject to Chapter 2.96, Maui County Code.

Thank you for your comments.

Sincerely,
HO'OKULANA LLC

Peter T. Young
President

Do well by doing good.

REF-149

MICHAEL P. VICTORINO
Mayor
MICHELE CHOUTEAU MCLEAN, AICP
Director
JORDAN E. HART
Deputy Director

DEPARTMENT OF PLANNING
COUNTY OF MAUI
ONE MAIN PLAZA
2200 MAIN STREET, SUITE 315
WAILUKU, MAUI, HAWAII 96793

December 16, 2019

Mr. Peter T. Young
Hookuleana LLC
1539 Kanapuu Drive
Kailua, Hawaii 96734

Dear Mr. Young:

SUBJECT: COMMENTS ON DRAFT ENVIRONMENTAL ASSESSMENT (DEA) FOR THE MIKI BASIN INDUSTRIAL PARK, ON 200 ACRES OF LAND ADJACENT TO THE LANAI AIRPORT, LANAI, HAWAII; TMK: (2) 4-9-002:061 (POR.) (EAC 2019/0011)

The Department of Planning (Department) is in receipt of the Draft Environmental Assessment (DEA) for the Miki Basin Industrial Park (Park) located on approximately 200 acres adjacent to the Lanai Airport on the Island of Lanai at TMK: (2) 4-9-002:061 (POR.). The applicant is Pulama Lanai.

On September 25, 2019, the State of Hawaii Land Use Commission (LUC) made a determination that the proposed project on Lanai triggered HRS Chapter 343 review and that the LUC would be the accepting authority for the environmental assessment. Also, the LUC made a determination that the applicant's DEA at that time warranted an anticipated Finding of No Significant Impact (FONSI). The Department concurred with the LUC decision at its September meeting.

The Park will provide 100 acres for light industrial uses and 100 acres for heavy industrial uses as defined in the Maui County Code (MCC) and as to be further defined through the Change in Zoning review by the Lanai Planning Commission and Maui County Council (Council). Full buildout of the proposed 200-acre Park will be done incrementally over a period of about 30 years. Having industrial entitled land ready for development should assist in providing diversified employment opportunities on Lanai through the growth of small businesses that could quickly ramp up if such land were available. Additionally, relocating some "industrial" uses currently operating in Lanai City to the Miki Basin Industrial Park likely will enhance safety by moving certain "industrial" uses further away from the residential core of Lanai City. Although 200 acres may seem like a lot of land to be moved into the industrial zone,the Department recognizes that this is a 30 year build-out plan and that it is consistent with the goals of the Lanai Community Plan in providing sufficient space for placement of industrial operations.

This project implements the vision for logical placement of industrial land uses on Lanai and expands the industrial zoned land area called for in the 2016 Lanai Community Plan. Consequently, a District Boundary Amendment (DBA) from Agricultural to Urban and a Change in Zoning from Agricultural to M-1 Light Industrial, M-2 Heavy Industrial, and M-3 Restricted Industrial will provide for consistent land designations with the Lanai Community Plan.

The Department is pleased to see in the DEA the comment that, *"Pulama Lanai will work with Maui County in establishing the allowable uses in the Miki Basin Industrial Park from the overall permitted uses allowed by zoning. Of note, while apartments and many other business-related use are permitted under zoning, no form of residential use will be permitted in the Miki Basin Industrial Park. The Park will focus on Light and Heavy Industrial uses, as well as relocation of their cement/asphalt facility to this site." Page 19, DEA.* The Department notes that many industrial uses are regulated by layers of state and federal laws which regulate and monitor potential environmental impacts.

The Department is aware that Pulama Lanai in its hearings before the Lanai Planning Commission and Maui County Council wlll further define which particular industrial uses are likely to be located in the Park at least in the near term and that the Lanai Planning Commission and the Council will review conditional zoning in detail. The Department welcomes additional detail on which uses currently operating on Lanai may be relocated to the Park and what effect this relocation may have on service provisions to the community.

Thank you for the opportunity to comment on this project. Should you have any questions about the comments in this letter, please contact the Department by email at planning@mauicounty.gov or by phone at (808) 270-8205.

Sincerely,

MICHELE MCLEAN, AICP
Planning Director

xc: Clayton I. Yoshida, AICP, Planning Program Administrator (PDF)
John S. Rapacz, Planning Program Administrator (PDF)
Pam Eaton, Planning Program Administrator (PDF)
Kathleen Aoki, Administrative Planning Officer (PDF)
Peter Young, Hookuleana LLC (PDF)
Lynn McCrory, Pulama Lanai (PDF)
State Land Use Commission (PDF)
State Office of Planning
Project File

MCM:CIY:KFW:lak
K:\WP_DOCS\Planning\EAC\2019\0011_MikiBasinIndustrialPark\FOR AX\AgencyResponse.doc

Ho'okuleana LLC
... to take responsibility ...

Peter T. Young
1539 Kanapu'u Drive
Kailua, Hawai'i 96734
(808) 226-3567 (Cell Phone)
PeterYoung@Hookuleana.com
www.Hookuleana.com

Michele McLean, Planning Director
County of Maui
Department of Planning
2200 Main Street, Suite 315
Wailuku , HI 96793

Re: Miki Basin Industrial Park – Comments on Draft Environmental Assessment

Dear Ms. McLean:

Thank you for your comments on the Draft Environmental Assessment on the Miki Basin Industrial Park.

You note that the proposed project on Lanai triggered HRS Chapter 343 review and that the SLUC would be the accepting authority for the environmental assessment. Also, the SLUC made a determination that the applicant's DEA, at that time, warranted an anticipated finding of no significant impact (AFONSI). The Department concurred with this decision of the SLUC at its September meeting.

You also noted that having industrial entitled land ready for development should assist in providing diversified employment opportunities on Lanai through the growth of small businesses that could quickly ramp up if such land were available. Additionally, relocating some "industrial" uses currently operating in Lanai City to the Miki Basin Industrial Park likely will enhance safety by moving certain "industrial" uses further away from the residential core of Lanai City. Although 200 acres may seem like a lot of land to be moved into the industrial zone, the Department recognizes that this is a 30 year building out plan and that it matches the goals of the Lanai Community Plan in providing sufficient space for placement of industrial operations.

You also noted that this project implements the vision for logical placement of industrial land uses on Lanai and expands the industrially-zoned land area called for in the recently adopted Lanai Community Plan. Consequently, a District Boundary Amendment (DBA) from Agricultural to Urban and a Change in Zoning from Agricultural to M-1 Light Industrial, M-2 Heavy Industrial, and M-3 Restricted Industrial will provide for consistent land designations with the Lanai Community Plan.

Thank you for your comments.

Sincerely,
HO'OKULANA LLC

Peter T. Young
President

Do well by doing good.

POLICE DEPARTMENT
COUNTY OF MAUI

MICHAEL P. VICTORINO
MAYOR

OUR REFERENCE

YOUR REFERENCE

55 MAHALANI STREET
WAILUKU, HAWAII 96793
(808) 244-6400
FAX (808) 244-6411

TIVOLI S. FAAUMU
CHIEF OF POLICE

DEAN M. RICKARD
DEPUTY CHIEF OF POLICE

December 9, 2019

Mr. Peter T. Young, President
Ho'okuleana LLC
1539 Kanapuu Drive
Kailua, Hawaii 96734

Re: Draft Environmental Assessment on Miki Basin Industrial Park

Dear Mr. Young:

This is in response to your letter dated November 23, 2019 requesting comments on the Draft Environmental Assessment on Miki Basin Industrial Park.

In review of the submitted documents, we have no comments or recommendations at this time.

Thank you for giving us the opportunity to comment on this project.

Sincerely,

Assistant Chief John Jakubczak
for: TIVOLI S. FAAUMU
Chief of Police

Ho'okuleana LLC
... to take responsibility ...

Peter T. Young
1539 Kanapu'u Drive
Kailua, Hawai'i 96734
(808) 226-3567 (Cell Phone)
PeterYoung@Hookuleana.com
www.Hookuleana.com

Tivoli Faaumu, Chief of Police
County of Maui
Police Department
55 Mahalani Street
Wailuku , HI 96793

Re: Miki Basin Industrial Park – Comments on Draft Environmental Assessment

Dear Chief Faaumu:

Thank you for your comments on the Draft Environmental Assessment on the Miki Basin Industrial Park.

You note the Police Department has no comments or recommendations at this time.

Thank you for your comments.

Sincerely,
HO'OKULANA LLC

Peter T. Young
President

Do well by doing good.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawaii 96850

In Reply Refer To:
01EPIF00-2020-TA-0092

December 9, 2019

Mr. Peter T Young
Ho'okuleana LLC
1539 Kanapuu Drive
Kailua, Hawaii 96734

Subject: Technical Assistance for the Development of the Miki Basin Industrial Park, Lanai

Aloha Mr. Young,

The U.S. Fish and Wildlife Service (Service) received your correspondence on November 23, 2019 regarding the presence of federally endangered or threatened species and designated critical habitat near the proposed development of the Miki Basin Industrial Park on the island of Lanai (TMK 2-4-9-002:061). This project, which is slated to be developed incrementally over a 30-year timespan, would provide 100 acres of light industrial and 100 acres of heavy industrial development. The initial phase will be the development of the needed infrastructure, including roads and power lines, in order to facilitate additional site-specific development within the complex.

Based on information you provided and pertinent information in our files, including data compiled by the Hawaii Biodiversity and Mapping Project, there is one listed species in the vicinity of the project area or that may pass through the project area: endangered Hawaiian petrel (*Pterodroma sandwichensis*). There is no proposed or designated critical habitat within the vicinity of the project area. We offer the following recommendations to avoid and minimize project impacts to listed species pursuant to the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq*.).

Hawaiian Petrel:
Lanaihale, the mountain just above Lanai City, is home to one of the largest and densest Hawaiian petrel colonies known to exist. The Hawaiian petrel may traverse the project area at night during the breeding, nesting and fledging seasons (March 1 to December 15). Outdoor lighting could result in seabird disorientation, fallout, and injury or mortality. Seabirds are attracted to lights and after circling the lights they may become exhausted and collide with nearby wires, buildings, or other structures or they may land on the ground. Downed seabirds are subject to increased mortality due to collision with automobiles, starvation, and predation by dogs, cats, and other predators. Young birds (fledglings) traversing the project area between

September 15 and December 15, in their first flights from their mountain nests to the sea, are particularly vulnerable.

The Service acknowledges the following avoidance and minimization measures included in the Environmental Assessment and recommends full implementation in the development of the final project:

- The proposed project will use appropriate lighting so as not to unnecessarily attract seabirds.
- The project will not have nighttime construction occuring during the fledging season (September 15 through December 15).
- Use of lower-power (180 Watt) monochromatic and low-pressure sodium lighting (as opposed to the more common full-spectrum and high-pressure sodium lighting), which provides high contrast with sharply reduced brightness and glare, yet the yellow light does not attract insects and is not believed to be used for avian navigation.
- Use of light fixtures with "top-visor" shielding to minimize the potential for stray light up-scatter and side-scatter, so that the bulb is not visible at lamp height from the side.
- Installation of automatic motion sensor switches and controls on all outdoor lights or turn off lights when human activity is not occurring in the lighted area.
- Limiting light levels and hours of use to the minimum levels allowable under Occupational Safety and Health Administration (OSHA) worker safety and security.

Even with the incorporation of these avoidance and minimization measures, it is possible that the project may not be able to fully avoid adverse effects to Hawaiian petrels. If this potential project should receive federal funding, federal permits, or any federal authorization, it will require a Section 7 consultation with the Service. The Service only conducts Section 7 consultations with the federal action agency or their designated representative.

Thank you for your efforts to conserve listed species and native habitats. Please contact Fish and Wildlife Biologist John Vetter (808-792-9406, email: john_vetter@fws.gov) if you have any questions or for further guidance. When referring to this project, please include this reference number: ***01EPIF00-2020-TA-0092.***

Sincerely,

Michelle Bogardus
Island Team Leader
Maui Nui and Hawaii Island

Ho'okuleana LLC
… to take responsibility …

Peter T. Young
1539 Kanapu'u Drive
Kailua, Hawai'i 96734
(808) 226-3567 (Cell Phone)
PeterYoung@Hookuleana.com
www.Hookuleana.com

Michelle Bogardus, Island Team Leader, Maui Nui and Hawaii Island
United States Department of the Interior
Fish And Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawaii 96850

Re: Miki Basin Industrial Park – Comments on Draft Environmental Assessment
01EPIF00-2020-TA-0092

Dear Ms. Bogardus:

Thank you for your comments on the Draft Environmental Assessment on the Miki Basin Industrial Park and Technical Assistance for the Development of the Miki Basin Industrial Park.

You noted that based on information in the DEA and pertinent information in your files, including data compiled by the Hawaii Biodiversity and Mapping Project, there is one listed species in the vicinity of the project area or that may pass through the project area: endangered Hawaiian petrel (Pterodroma sandwichensis). There is no proposed or designated critical habitat within the vicinity of the project area.

You noted that the Service acknowledges that several avoidance and minimization measures were included in the Environmental Assessment and you recommended full implementation in the development of the final project. We intend to do so, and understand, as you note, that even with the incorporation of these avoidance and minimization measures, it is possible that the project may not be able to fully avoid adverse effects to Hawaiian petrels.

At this time, there is no intent to receive federal funding, federal permits or any federal authorization for the project.

Thank you for your comments.

Sincerely,
HO'OKULANA LLC

Peter T. Young
President

Do well by doing good.

REF-153

Peter T Young

From: Debra Greene <debra@DebraGreene.com>
Sent: Monday, December 23, 2019 5:34 PM
To: daniel.e.orodenker@hawaii.gov
Cc: lmccrory@pulamalanai.com; PeterYoung@Hookuleana.com
Subject: Re: Opposing proposed Lana'i land use change

Aloha Director Orodenker,

I just wanted to clarify that my comments below are on the draft environmental assessment (the 469 page document) and I understand will receive a response. Thank you.

Sincerely,

Debra

Debra Greene, PhD
Founder
KeepYourPower.org

PHONE: 808-874-6441
WEBSITE: www.KeepYourPower.org

Sent from my faster, safer, more secure HARDWIRED computer

On Dec 23, 2019, at 1:59 PM, Debra Greene <debra@debragreene.com> wrote:

Aloha Executive Director Daniel Orodenker,

I am writing on behalf of Keep Your Power, a coalition of concerned citizens, residents of Hawaii, who oppose the application submitted by Pulama Lana'i to change the land use designation for the area by Lana'i airport from agricultural to urban.

In June of this year the Research Corporation of the University of Hawaii (RCUH), on behalf of Alphabet (Google), tech giant SoftBank and defense contractor AeroVironment, submitted an application to the Lana'i Planning Commission to approve use of agricultural land to build a second airport and turn Lana'i into a giant drone manufacturing plant and launchpad.

In fact, RCUH went ahead and built an airstrip and a 16,500 square foot drone hangar on agricultural land without permits or approvals. Clearly they were not acting in good faith.

The "after-the-fact" RCUH application was resoundingly opposed by Hawaii residents, to the extent that the application was quickly modified due to opposition and eventually withdrawn. Their application was also opposed by Hawaiian cultural practitioners in a lawsuit. Despite this opposition, the current proposed upzoning from agricultural to urban would accomplish what RCUH was trying to do. That is not right.

We oppose this zoning change. Lana'i does not need a second airport, nor the loss of agricultural land. Food production is more important than industrial development. And the rest of the state, and our

ocean inhabitants, should not have to suffer the onslaught of highly experimental football field sized drones beaming down toxic radiation in our airspace, because of the desire of a few.

Sincerely,

Debra

Debra Greene, PhD
Founder
KeepYourPower.org

PHONE: 808-874-6441
WEBSITE: www.KeepYourPower.org

Sent from my faster, safer, more secure HARDWIRED computer

REF-154

Ho'okuleana LLC
… to take responsibility …

Peter T. Young
1539 Kanapu'u Drive
Kailua, Hawai'i 96734
(808) 226-3567 (Cell Phone)
PeterYoung@Hookuleana.com
www.Hookuleana.com

Debra Greene, PhD
Founder
KeepYourPower.org
PHONE: 808-874-6441 debra@DebraGreene.com
WEBSITE: www.KeepYourPower.org

Re: Miki Basin Industrial Park – Comments on Draft Environmental Assessment

Dear Ms. Greene:

Thank you for your comments on the Draft Environmental Assessment on the Miki Basin Industrial Park.

You note several issues related to a suggested second airport on Lanai, a drone manufacturing plant and launchpad. The link in your email notes:

- Flying football field sized drones beaming toxic wireless radiation into the ocean and parts of Maui county
- new airborne overhead 5G communication, which would provide strong wireless service over a large area, including deep valleys, remote lands, and over the ocean
- land on Lāna'i for high tech drone experiment blanketing the Earth with wireless radiation

You are apparently suggesting something different from the proposed use, as called for in the draft EA. I will call your attention to the mapping and explanations in the Lāna'i Community Plan.

The Pūlama Lāna'i proposal mirrors the mapping and land use types for light and heavy industrial uses. That plan notes that "The island's primary industrial areas are located southwest of Lāna'i City, near the Lāna'i Airport, and at Kaumālapa'u Harbor." The proposed uses are consistent with the intent to consolidate industrial uses and the Community Plan notes that "Light industrial uses in Lāna'i City will also be moved and consolidated in this area. The area will also serve as a staging area for shipments from the harbor to be distributed closer to town."

Related to "loss of agricultural land", I call you attention to the analysis related to agricultural lands that notes,

> The development of the Project will result in a loss of 200 acres of fallow agricultural lands on Lāna'i. However, there are approximately 18,000 acres of former plantation lands on Lāna'i which remain available for agricultural use, and over 200,000 acres statewide.
>
> The lack of significant growth of diversified crops reflects increased competition from overseas resulting from technology and other advances that have improved the delivery of fresh produce (faster, less spoilage, better coordination of supply to demand), along with trade agreements which increased food exports to the U.S. from low-cost producers in Mexico, Central America, South America, and elsewhere.

> The loss of 200 acres of agriculture land on Lāna'i, plus the loss of agricultural land due to other projects (i.e., the cumulative impact), is too small to affect the growth of diversified agriculture on Lāna'i or Statewide.

With respect to your comment that "Lana'i does not need a second airport", please note that the proposed action in the draft EA does not suggest a second airport for the Island. The only association to airports is that the project is adjacent to the Lanai Airport, as well as other industrial types of uses. As noted in the draft EA, "The site is well-suited for industrial development. It is adjacent to the most significant industrial uses on Lāna'i, the Lāna'i Airport, the Miki Basin Industrial Condominium, and Maui Electric Company's (MECO) generating facility."

Thank you for your comments.

Sincerely,
HO'OKULANA LLC

Peter T. Young
President

December 22, 2019

Daniel Orodenker, Executive Director
State of Hawai'i Land Use Commission
235 S. Beretania Street, Room 406
Honolulu, Hawai'i 96813 daniel.e.orodenker@hawaii.gov

Lynn McCrory, Senior Vice President of Government Affairs
733 Bishop Street, Suite 2000
Honolulu, Hawai'i 96813 lmccrory@pulamalanai.com

Peter T Young, President Ho'okuleana LLC
1539 Kanapu'u Drive
Kailua, Hawai'i 96734 PeterYoung@Hookuleana.com

RE:
Docket No. A19-809 Pulama Lana'i
Draft Environmental Assessment (DEA) and AFONSI
Proposed Miki Basin Industrial Park
Lana'i Airport, Lana'i, State of Hawai'i
Tax Map Key No. (2) 4-9-002:061 (por.)

Dear Mr. Orodenker:

Pūlama Lānaʻi has requested the LUC act as the accepting authority for a petition requesting a Land Use District Boundary Amendment, Change in Zoning, and building and subdivision permits for a proposed 200-acre Miki Industrial Park, and submitted an Environmental Assessment in support of a FONSI designation. (EA-2).

I. THE PROPOSED MIKI INDUSTRIAL PARK MUST BE ASSESSED FOR ITS CUMULATIVE IMPACTS AND EFFECT ON THE ISLAND'S WATER RESOURCES.

On September 25, 2019, in response to LUC Commissioner Okuda's question, Pūlama Lānaʻi's attorney insisted that the proposed Miki Basin Industrial Park was a "stand-alone" proposition.[1]

This contention should be heavily scrutinized.

[1] http://files.hawaii.gov/luc/minutesofmtgs/2019/09252019kahului.pdf

Pūlama Lānaʻi estimates an additional 1,099,500 GPD will be required to support the Industrial Park at full build-out, which it estimates could take 30 years. There is not a single mention of incremental usage over that period, nor commitment to provide usage figures as it develops. Instead, the EA offers simply that "*there is time to monitor [water] as the incremental development moves forward.*" EA at 67.

The 2016 Lāna'i Community Plan starkly laid out the limitations on Lāna'i's existing water system:

"The capacity of existing water resources may be insufficient to support new growth. Projects that already have entitlements could consume most of the remaining capacity of Lana'i's single aquifer. It may be necessary to increase the capacity of water resources for new development." CP at 2-4.

As a result, Pūlama Lānaʻi proposed developing a desalination plant in the Community Plan:

Pūlama Lānaʻi told the community that it was "*exploring the option of developing desalination plants that would create potable water out of saltwater. Producing potable water through desalination would greatly decrease the potential of over pumping the aquifer"* and these desal plants would "*increase available daily fresh water from the current 4 MGD to 10 MGD."* CP at 2-7 and 6-2.

Although the Lāna'i Community Plan Advisory Committee clearly relied on Pūlama's desal promises in stating it had: "*predicated their decisions on the availability of significant additional water sources for future development proposals,*" CP at 7-3, Pūlama Lānaʻi has since abandoned any plans for desal; all exploratory wells have been capped; and the EA makes no mention of desalination.

Now, along with proposing additional long-term industrial build-out at Miki Basin, Pūlama Lānaʻi simply kicks the can down a 30-year road with respect to how it might meet the additional water demands the Miki Industrial Park would require;[2] this is especially troubling in light of the fact that a mere 20-acre industrial condominium development at Miki has yet to be completed - after 20 years - its water use as a result is unknown, and there are a multitude of additional development plans on the books, only two of which were mentioned in the EA: a 201H housing development that will require

[2] Section 4.6.1 of the EA states that sometime in 2019 some unidentified entity at CWRM "*allowed for the possibility that there are seven additional aquifers that could provide water to Lānaʻi with up to a SY of 36M GPD.*" EA at 49. Notably this assertion is made with no citation or attribution and is thoroughly useless as predictive of the island's sustainable yield, which remains 6M GPD.

REF-156

121,700 GPD (EA-68) and a Koele Project District amendment that projects use of 246,392 GPD (EA-70).

Not mentioned or discussed are many additional development plans detailed in the Community Plan (which largely relied on the abandoned desal proposal), among which are:

- A 73-acre County affordable housing project (this is in addition to and separate from Pulama's housing plans);
- A 50-acre Tennis Academy Park, including housing;
- A 524-acre University and Research Institute;
- A Gateway Park of 16 acres;
- Rural Residential 50-acre area; and
- 105-acre Mixed Use Residential development, Manele-Mauka.

The following chart details proposed additional developments from the Community Plan:

9 | LAND USE

Table 9.2 Lāna'i Community Plan
Acreage by Growth Area and Land Use Designations

Growth Area	Land Use Designations								Total Acres
	Mixed-Use Residential	Hotel	Airport	Light Industrial	Heavy Industrial	Public/ Quasi-public	Park	Rural	
Lāna'i City									1,488
Lāna'i City Expansion*	546								
University Campus						524			
Tennis Academy							50		
Linear Park/Drainage							280		
Gateway Park							16		
Rural Residential								50	
Film Studios				22					
Airport									246
Enhancement of present airport facilities			46						
Miki Basin Industrial				100	100				
Mānele									181
Mānele Mauka	105								
Rural Residential								76	
Kaumālapa'u									60
Ocean Resources Heavy Industrial					10				
Kaumālapa'u Mixed-Use Residential	50								
TOTAL ACRES	701		46	122	110	524	346	126	1,975

*Note: Includes proposal to incorporate County Affordable Housing Project into new land use designation.

II. PŪLAMA LĀNA'I HAS FAILED TO SUPPORT SMALL SUSTAINABLE BUSINESS GROWTH IN THE PAST.

Pūlama Lāna'i states in the EA that the Miki Industrial Park expansion is consistent with the Lāna'i Community Plan and furthers Pūlama's desire to "*foster the growth of small businesses by providing support in key areas such as marketing and human resources and by expanding the amount of commercial and industrial space available for lease and for sale.*" CP at 6-2.

Unfortunately, Pūlama's practices have not always supported this philosophy, to the detriment of Lāna'i residents trying to contribute to Lāna'i's economy.

For several years, a native Hawaiian-owned business — The Lāna'i Ohana Poke Shop — operated out of a small space controlled by Pūlama Lāna'i in Lāna'i City. This very successful family-operated shop served poke to residents, construction workers, and tourists alike. Its poke bowls were statewide favorites. And then Larry Ellison's Richard's Market began selling poke bowls, with larger portions and lower prices. When Pūlama Lāna'i's then-Vice President for Community Relations was asked why they would do that, her response was "we believe that competition is good." Really? Competition between the deep pockets of Larry Ellison and a small, Lāna'i native Hawaiian family?

A similar result of the proposed "sustainability" proclaimed by Pūlama Lāna'i in this EA happened to a small fishing charter operation. Pūlama Lāna'i simply brought in their own boats, hired their own operators, and put the local fishing charter business out of work.

Lāna'i had a small car rental operation. Pūlama Lāna'i put them out of business and now runs its own Lāna'i Car Rental.

Pūlama states that it provides green waste recycling and makes compost available to residents. EA at 72. Although residents continue to supply green waste to Pūlama, compost has not been available to residents for close to six months.

Pūlama Lāna'i says its 200-acre master-planned light and heavy industrial development will abut "the existing 20-acre Miki Basin Industrial Condominium," EA-11, but this 20-acre project has languished uncompleted for close to 20 years; there was no discussion before the LUC in September, nor is there any in the EA, on the status of a mandate to sell 50% of it fee simple.

Not only has the Miki Basin 20-acre condominium project not materialized, Pūlama now apparently wants to reserve the right to maintain total control over the additional 200-acre industrial development. EA at 2.

So it's with a hearty dose of salt that the LUC should digest Pūlama Lāna'i's "commitment" to making Lāna'i's economy diversified and sustainable.

REF-157

Conclusions:

1) No further approvals for additional industrial development should be granted until the conditions of Ordinance No. 2895 (Bill No. 79 of 2000) have been complied with. Specifically, PL is required to offer 50% of the 20 acres in fee and has not done so.
2) A FONSI is an inappropriate conclusion to reach, given the fragile water resource available to Lāna'i and the many published development plans already on the books for Lāna'i, without further exploration and firm and timely commitments from Pūlama Lānaʻi regarding funding of additional water resource; there is a reason why most of Lāna'i's high-level wells have been drilled in the Leeward aquifer: the windward side is steep, mountainous, and inaccessible. To simply say that it's "available" for future wells is an empty promise.
3) No amendments, zoning changes or approvals should be granted until significant conditions and strenuous reporting requirements are put in place by the LUC.
4) Pūlama should be held to its representations regarding supporting sustainable growth for small businesses and required to explain and justify to the LUC any decision to withhold any portion of the 200-acre industrial park from sale.

Sincerely,

Robin Kaye
511 Ilima Ave.
Lāna'i city, HI 96763
808-559-6124 rkayelny@gmail.com

Ho'okuleana LLC
… to take responsibility …

Peter T. Young
1539 Kanapu'u Drive
Kailua, Hawai'i 96734
(808) 226-3567 (Cell Phone)
PeterYoung@Hookuleana.com
www.Hookuleana.com

Robin Kaye
511 Ilima Ave.
Lāna'i City, HI 96763 rkayelny@gmail.com

Re: Miki Basin Industrial Park – Comments on Draft Environmental Assessment

Dear Mr. Kaye:

Thank you for your comments on the Draft Environmental Assessment on the Miki Basin Industrial Park.

You note several issues related to water availability for the project, desalination and noted several other projects are noted in the Lāna'i Community Plan that are not noted in the draft EA.. You conclude with matters not directly related to the land use matter, but focus on claims against Pūlama Lāna'i.

Based on your comments, additional information was added to the final EA. Of note, discussion on other projects that are noted in the Lāna'i Community Plan was added to the final EA, including the Lāna'i City Expansion, Tennis Academy, Gateway Park, University, Rural Residential and Mānele Mauka. Summary information is provided for each.

You suggested that a FONSI is inappropriate, especially in the context of water resource availability. The final EA includes further discussion on the recommendations and conclusions from the Lāna'i Water Use and Development – especially as it relates to water sourcing for future developments.

Related to this, information from the final review and discussion on the 2011 WUDP by the Commission on Water Resource Management was added that notes the resource development strategy for additional development on Lāna'i includes new ground water source development, water reuse expansion, and desalination, in addition to both supply-side and demand-side conservation.

The Lāna'i Water Use and Development Plan includes a list of potential supply options sufficient to meet the forecast land uses. These sources include recommissioning old wells, drilling new wells, desalination and other source options. With this was a long list of new potential wells.

In discussing new wells, the WUDP notes that new wells "could be developed to provide additional water supply for Lāna'i. Aside from additional supply, benefits provided by additional wells would include improved geographical distribution of well pumping, increased production redundancy for system reliability, and potentially increased flexibility of operations."

With respect to Leeward versus Windward well development strategies, the Lāna'i WUDP (2011) notes the need to "Plan and ultimately develop operable groundwater sources in the Windward aquifer to distribute groundwater pumping and provide resources, as necessary, to provide for system growth beyond the capacity of the Leeward aquifer." (Lāna'i WUDP; 31)

As noted in the draft EA, it has been anticipated that initially the water system growth would be to expand upon the Leeward system, but then look at new well development on the Windward system. This is consistent with the recommendations and findings in the Lāna'i WUDP.

Do well by doing good.

REF-158

The Lānaʻi Water Use and Development Plan notes that "Desalination of seawater offers essentially unlimited ultimate source capacity but is more expensive than other available options." (Lānaʻi WUDP; 5-38) In 2013, Pūlama Lānaʻi submitted an application for "a reverse osmosis desalination water treatment facility located on property described as Tax Map Key (TMK) (2) 4-9-002:001 (por.)" The request was for a "proposed Reverse Osmosis ("RO") Well No. 3 (source well), water transmission lines, and access roads."

In 2015, the Lānaʻi Planning Commission found that "The proposed project could prove to be a dependable alternative water supply that reduces the island's reliance on the High Level Aquifer, and could positively contribute to the availability of potable and non-potable water on the island and meeting the anticipated long-term water demand." The Maui Planning Department recommended approval of the Project District Application and recommended approval of the Special Use Permit Application that included the desalination project.

However, after Pūlama Lānaʻi's request/explanations and the Planning Department's recommendation for approval as submitted, the Lānaʻi Planning Commission granted a permit for only a 15-year term (rather than the 30-years applied for, which was based on the significant financial cost and the anticipated useful life of the desalination plant) and also added a condition that "Once the desalination plant is operational no High Level Aquifer water will be pumped to or used in the Mānele Project District except in the event of an emergency as determined by the Lānaʻi Water Company and the Lānaʻi Water Advisory Committee, and then only for human consumption."

As such, construction of the desalination plant was halted on September 12, 2014. Pūlama Lānaʻi has indicated it has not given up on development of a desalination plant. I will also repeat that the Lānaʻi WUDP notes a number of new wells in the Leeward and Windward systems, suggesting that groundwater wells are reasonable and reliable sources for water to Mānele and elsewhere on the Island.

You also note some situations that you suggest call into question Pūlama Lānaʻi's commitment to support economic growth, economic diversity/sustainability and support for small business growth on the Island. I have passed those on to representatives at Pūlama Lānaʻi and they reaffirm their commitment to the people and businesses on the Islands.

As the proposed project relates to the proposed designation of the site for light and heavy industrial uses, I will call your attention to the mapping and explanations in the Lānaʻi Community Plan. The Pūlama Lānaʻi proposal mirrors the mapping and land use types for light and heavy industrial uses. That plan notes that "The island's primary industrial areas are located southwest of Lānaʻi City, near the Lānaʻi Airport, and at Kaumālapaʻu Harbor." The proposed uses are consistent with the intent to consolidate industrial uses and the Community Plan notes that "Light industrial uses in Lānaʻi City will also be moved and consolidated in this area. The area will also serve as a staging area for shipments from the harbor to be distributed closer to town."

Thank you for your comments.

Sincerely,
HOʻOKULANA LLC

Peter T. Young
President

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

December 23, 2019

Ho'okuleana LLC
Attention: Mr. Peter Young
1539 Kanapu'u Drive
Kailua, Hawaii 96734

via email: PeterYoung@Hookuleana.com

Dear Mr. Young:

SUBJECT: Draft Environmental Assessment for **Miki Basin Industrial Park** located at Lanai City, Island of Lanai; TMK: (2) 4-9-002:061 (por.) on behalf of Pulama Lanai

Thank you for the opportunity to review and comment on the subject matter. In addition to our previous comments dated December 19, 2019, enclosed are comments from the Commission on Water Resource Management on the subject matter. Should you have any questions, please feel free to contact Darlene Nakamura at (808) 587-0417 or email: darlene.k.nakamura@hawaii.gov. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosures
cc: Central Files

REF-159

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RECEIVED
LAND DIVISION
2019 DEC 18 AM 10:45

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

November 27, 2019

RECEIVED
COMMISSION ON WATER RESOURCE MANAGEMENT
2019 NOV 29 PM 3:11

MEMORANDUM

TO: **DLNR Agencies:**
___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 – Maui District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Draft Environmental Assessment for **Miki Basin Industrial Park**
LOCATION: Lanai City, Island of Lanai; TMK: (2) 4-9-002:061 (por.)
APPLICANT: Ho'okuleana LLC on behalf of Pulama Lanai

Transmitted for your review and comment is information on the above-referenced subject matter. Please submit any comments by **December 18, 2019.**

The DEA can be found on-line at: http://health.hawaii.gov/oegc/ (Click on The Environmental Notice in the middle of the page.)

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 Darlene Nakamura at 587-0417or by email at darlene.k.nakamura@hawaii.gov. Thank you.

( ) We have no objections.
( ) We have no comments.
(x) Comments are attached.

Signed: /s/ M. Kaleo Manuel

Print Name: Deputy Director

Date: December 16, 2019

Attachments
cc: Central Files

FILE ID: RFD.4984.5
DOC ID: 22035

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON

BRUCE S. ANDERSON, PH.D.
KAMANA BEAMER, PH.D.
MICHAEL G. BUCK
NEIL J. HANNAHS
WAYNE K. KATAYAMA
PAUL J. MEYER

M. KALEO MANUEL
DEPUTY DIRECTOR

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

December 16, 2019

REF: RFD.4984.5

TO: Mr. Russell Tsuji, Administrator
Land Division

FROM: M. Kaleo Manuel, Deputy Director
Commission on Water Resource Management

SUBJECT: Draft Environmental Assessment for Miki Basin Industrial Park

FILE NO.: RFD.4984.5
TMK NO.: (2) 4-9-002:061 (por.)

Thank you for the opportunity to review the subject document. The Commission on Water Resource Management (CWRM) is the agency responsible for administering the State Water Code (Code). Under the Code, all waters of the State are held in trust for the benefit of the citizens of the State, therefore all water use is subject to legally protected water rights. CWRM strongly promotes the efficient use of Hawaii's water resources through conservation measures and appropriate resource management. For more information, please refer to the State Water Code, Chapter 174C, Hawaii Revised Statutes, and Hawaii Administrative Rules, Chapters 13-167 to 13-171. These documents are available via the Internet at http://dlnr.hawaii.gov/cwrm.

Our comments related to water resources are checked off below.

[X] 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.

[X] 4. We recommend that water efficient fixtures be installed and water efficient practices implemented throughout the development to reduce the increased demand on the area's freshwater resources. Reducing the water usage of a home or building may earn credit towards Leadership in Energy and Environmental Design (LEED) certification. More information on LEED certification is available at http://www.usgbc.org/leed. A listing of fixtures certified by the EAP as having high water efficiency can be found at http://www.epa.gov/watersense.

[X] 5. We recommend the use of best management practices (BMP) for stormwater management to minimize the impact of the project to the existing area's hydrology while maintaining on-site infiltration and preventing polluted runoff from storm events. Stormwater management BMPs may earn credit toward LEED certification. More information on stormwater BMPs can be found at http://planning.hawaii.gov/czm/initiatives/low-impact-development/

[X] 6. We recommend the use of alternative water sources, wherever practicable.

[X] 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.

[X] 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.

- [X] 9. There may be the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.
- [ ] 10. The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit is required prior to use of water. The Water Use Permit may be conditioned on the requirement to use dual line water supply systems for new industrial and commercial developments.
- [X] 11. A Well Construction Permit(s) is (are) are required before the commencement of any well construction work.
- [ ] 12. A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.
- [ ] 13. There is (are) well(s) located on or adjacent to this project. If wells are not planned to be used and will be affected by any new construction, they must be properly abandoned and sealed. A permit for well abandonment must be obtained.
- [ ] 14. Ground-water withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.
- [ ] 15. A Stream Channel Alteration Permit(s) is (are) required before any alteration can be made to the bed and/or banks of a steam channel.
- [ ] 16. A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is constructed or altered.
- [ ] 17. A Petition to Amend the Interim Instream Flow Standard is required for any new or expanded diversion(s) of surface water.
- [ ] 18. The planned source of water for this project has not been identified in this report. Therefore, we cannot determine what permits or petitions are required from our office, or whether there are potential impacts to water resources.

[X] OTHER: The DEA should provide a simple summary table in Section 4.6.2, showing the existing withdrawal amounts from the Leeward and Windward Aquifer System Areas, respectively, as well as the projected future demands for each aquifer system area associated with this project.

We also recommend a discussion of the consistency of this current proposal for the Miki Basin Industrial Park with the projected buildout described in the 2011 Lanai Water Use and Development Plan.

If you have any questions, please contact Lenore Ohye of the Commission staff at 587-0216.

Hoʻokuleana LLC

… to take responsibility …

Peter T. Young
1539 Kanapuʻu Drive
Kailua, Hawaiʻi 96734
(808) 226-3567 (Cell Phone)
PeterYoung@Hookuleana.com
www.Hookuleana.com

Kaleo Manuel, Deputy Director
Commission on Water Resource Management
Department of Land and Natural Resources
Post Office Box 621
Honolulu Hawaii 96809

Re: Miki Basin Industrial Park – Comments on Draft Environmental Assessment

Dear Mr. Manuel:

Thank you for your comments on the Draft Environmental Assessment on the Miki Basin Industrial Park.

You recommend and Pūlama Lānaʻi intends to implement coordination with the county; that efficient fixtures be installed and water efficient practices implemented throughout the development to reduce the increased demand on the area's freshwater resources; 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; use of alternative water sources, wherever practicable; adopting landscape irrigation conservation best management practices endorsed by the Landscape Industry Council of Hawaii.

The two versions of the EA (draft and final) include summaries of the existing water systems on Lānaʻi, including the withdrawal amounts from the Leeward and Windward Aquifer System Areas. As noted in the draft and final EAs, the intent is to use available water capacity to handle the initial needs. As needs increase over time and the development of industrial park expands, then new wells will be drilled in the Leeward and Windward aquifers. It is not clear specifically when and where those new wells will be added; Pūlama Lānaʻi and Lānaʻi Water Company will be in regular communication with the Water Commission on any future well development.

This is a 30-year project and the water needed will depend on what types of industries come to the island. As we do not know what industries will want to start operations on Lānaʻi, we don't have any way to be specific as to what will be needed, produced from where, and in what order. We do know that if we do not rezone the land, expanding the opportunities beyond tourism will not occur for the Lānaʻi community. Limiting the island to tourism is not moving toward sustainability. Sustainability for Lānaʻi will require multiple options and this is one of them.

Information from the final review and discussion on the 2011 WUDP by the Commission on Water Resource Management was added that notes the resource development strategy for additional development on Lānaʻi includes new ground water source development, water reuse expansion, and desalination, in addition to both supply-side and demand-side conservation.

The Lānaʻi Water Use and Development Plan includes a list of potential supply options sufficient to meet the forecast land uses. These sources include recommissioning old wells, drilling new wells, desalination and other source options. With this was a long list of new potential wells.

Do well by doing good.

In discussing new wells, the WUDP notes that new wells "could be developed to provide additional water supply for Lānaʻi. Aside from additional supply, benefits provided by additional wells would include improved geographical distribution of well pumping, increased production redundancy for system reliability, and potentially increased flexibility of operations."

With respect to Leeward versus Windward well development strategies, the Lānaʻi WUDP (2011) notes the need to "Plan and ultimately develop operable groundwater sources in the Windward aquifer to distribute groundwater pumping and provide resources, as necessary, to provide for system growth beyond the capacity of the Leeward aquifer." (Lānaʻi WUDP; 31)

As noted in the EA (draft and final), it has been anticipated that initially the water system growth would be to expand upon the Leeward system, but then look at new well development on the Windward system. This is consistent with the recommendations and findings in the Lānaʻi WUDP.

With respect to the demand estimates and overall water consumption estimates into the future that are reflected in the Water Use and Development Plan, please note that Pūlama Lānaʻi has made significant progress in reduction of leaks, conservation efforts and changes to existing projects resulting in reduced water demands and usage.

In addition to the reduced scale, densities and number of units called for in the proposed Kōʻele Project District and Mānele Project District amendments, during the recent refresh at Mānele, there was also a reduced number of hotel units at Mānele Hotel. Likewise, at Mānele, Pūlama Lānaʻi reduced the irrigation and pool water usage for the pool area changes. They changed types of plantings and left large areas to be in a natural state, rather than grass; so there is no irrigation needed. The pool area uses artificial turf rather than grass. And, Mānele went with two pools, rather than the prior three.

Lānaʻi Water Company has completed a 100% replacement program for all water meters on Lānaʻi with the installation of Smart Meters. These meters allow 15 minute increment readings for all meters, and have an App that consumers can use to see their usage. The system also provides notifications to LWC and the consumer if there appears to be a leak.

Because of this, we believe that the WUDP overestimates the water demand into the future.

Thank you for your comments.

Sincerely,
HOʻOKULANA LLC

Peter T. Young
President

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

December 19, 2019

Ho'okuleana LLC
Attention: Mr. Peter Young
1539 Kanapu'u Drive
Kailua, Hawaii 96734

via email: PeterYoung@Hookuleana.com

Dear Mr. Young:

SUBJECT: Draft Environmental Assessment for **Miki Basin Industrial Park** located at Lanai City, Island of Lanai; TMK: (2) 4-9-002:061 (por.) on behalf of Pulama Lanai

Thank you for the opportunity to review and comment on the subject matter. The Land Division of the Department of Land and Natural Resources (DLNR) distributed or made available a copy of your request pertaining to the subject matter to DLNR's Divisions for their review and comments.

At this time, enclosed are comments from the (a) Engineering Division and (b) Land Division – Maui District on the subject matter. Should you have any questions, please feel free to contact Darlene Nakamura at (808) 587-0417 or email: darlene.k.nakamura@hawaii.gov. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosures
cc: Central Files

REF-162

DAVID Y. IGE
GOVERNOR OF HAWAII

RECEIVED
LAND DIVISION
'19 DEC -5 AM 11:27
DEPT. OF LAND
NATURAL RESOURCES
STATE OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

'19 DEC 02 AM 06:55 ENGINEERING

November 27, 2019

MEMORANDUM

FROM

TO:

DLNR Agencies:
__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 – Maui District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Draft Environmental Assessment for **Miki Basin Industrial Park**
LOCATION: Lanai City, Island of Lanai; TMK: (2) 4-9-002:061 (por.)
APPLICANT: Ho'okuleana LLC on behalf of Pulama Lanai

Transmitted for your review and comment is information on the above-referenced subject matter. Please submit any comments by **December 18, 2019.**

The DEA can be found on-line at: http://health.hawaii.gov/oegc/ (Click on The Environmental Notice in the middle of the page.)

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 Darlene Nakamura at 587-0417or by email at darlene.k.nakamura@hawaii.gov. Thank you.

( ) We have no objections.
( ) We have no comments.
(✓) Comments are attached.

Signed: _____

Print Name: Carty S. Chang, Chief Engineer

Date: 12/4/19

Attachments
cc: Central Files

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Russell Y. Tsuji
Ref: Draft Environmental Assessment for Miki Basin Industrial Park
Location: Lanai City, Island of Lanai
TMK(s): (2) 4-9-002:061 (por.)
Applicant: Ho'okuleana LLC on behalf of Pulama Lanai

COMMENTS

The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a Special Flood Hazard Area (high risk areas). State projects are required to comply with 44CFR regulations as stipulated in Section 60.12. Be advised that 44CFR reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may stipulate higher standards that can be more restrictive and would take precedence over the minimum NFIP standards.

The owner of the project property and/or their representative is responsible to research the Flood Hazard Zone designation for the project. Flood Hazard Zones are designated on FEMA's Flood Insurance Rate Maps (FIRM), which can be viewed on our Flood Hazard Assessment Tool (FHAT) (http://gis.hawaiinfip.org/FHAT).

If there are questions regarding the local flood ordinances, please contact the applicable County NFIP coordinating agency below:

- Oahu: City and County of Honolulu, Department of Planning and Permitting (808) 768-8098.
- Hawaii Island: County of Hawaii, Department of Public Works (808) 961-8327.
- Maui/Molokai/Lanai County of Maui, Department of Planning (808) 270-7253.
- Kauai: County of Kauai, Department of Public Works (808) 241-4896.

Signed: _____
CARTY S. CHANG, CHIEF ENGINEER

Date: 12/4/19

REF-163

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RECEIVED
LAND DIVISION
2019 DEC 16 AM 11:37

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

November 27, 2019

MEMORANDUM

RECEIVED
MAUI DISTRICT
LAND DIVISION
2019 DEC -2 PM 2:55

TO: **DLNR Agencies:**
___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 – Maui District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Draft Environmental Assessment for **Miki Basin Industrial Park**
LOCATION: Lanai City, Island of Lanai; TMK: (2) 4-9-002:061 (por.)
APPLICANT: Ho'okuleana LLC on behalf of Pulama Lanai

Transmitted for your review and comment is information on the above-referenced subject matter. Please submit any comments by **December 18, 2019.**

The DEA can be found on-line at: http://health.hawaii.gov/oeqc/ (Click on The Environmental Notice in the middle of the page.)

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 Darlene Nakamura at 587-0417or by email at darlene.k.nakamura@hawaii.gov. Thank you.

( ) We have no objections.
(X) We have no comments.
( ) Comments are attached.

Signed: _____

Print Name: Daniel Ornellas

Date: 12/6/19

Attachments
cc: Central Files

Ho'okuleana LLC
... to take responsibility ...

Peter T. Young
1539 Kanapu'u Drive
Kailua, Hawai'i 96734
(808) 226-3567 (Cell Phone)
PeterYoung@Hookuleana.com
www.Hookuleana.com

Russell Tsuji, Land Administrator
Department of Land and Natural Resources
Post Office Box 621
Honolulu Hawaii 96809

Re: Miki Basin Industrial Park – Comments on Draft Environmental Assessment

Dear Mr. Tsuji:

Thank you for your comments on the Draft Environmental Assessment on the Miki Basin Industrial Park.

We note that the Engineering Division noted rules related to the National Flood Insurance Program and acknowledge that the property owner is responsible to research the Flood Hazard Zone designation for the project. We also note that the draft EA indicates that the subject property is within the X flood zone.

We note the Maui Land Division has no comments.

Thank you for your comments.

Sincerely,
HO'OKULANA LLC

Peter T. Young
President

Do well by doing good.

REF-164

Standard Comments for Land Use Reviews
Clean Air Branch
Hawaii State Department of Health

If your proposed project:

Requires an Air Pollution Control Permit

You must obtain an air pollution control permit from the Clean Air Branch and comply with all applicable conditions and requirements. If you do not know if you need an air pollution control permit, please contact the Permitting Section of the Clean Air Branch.

s

Includes construction or demolition activities that involve asbestos

You must contact the Asbestos Abatement Office in the Indoor and Radiological Health Branch.

Has the potential to generate fugitive dust

You must control the generation of all airborne, visible fugitive dust. Note that construction activities that occur near to existing residences, business, public areas and major thoroughfares exacerbate potential dust concerns. It is recommended that a dust control management plan be developed which identifies and mitigates all activities that may generate airborne, visible fugitive dust. The plan, which does *not* require Department of Health approval, should help you recognize and minimize potential airborne, visible fugitive dust problems.

Construction activities must comply with the provisions of Hawaii Administrative Rules, §11-60.1-33 on Fugitive Dust. In addition, for cases involving mixed land use, we strongly recommend that buffer zones be established, wherever possible, in order to alleviate potential nuisance complaints.

You should provide reasonable measures to control airborne, visible fugitive dust from the road areas and during the various phases of construction. These measures include, but are not limited to, the following:

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

If you have questions about fugitive dust, please contact the Enforcement Section of the Clean Air Branch

Clean Air Branch (808) 586-4200 cab@doh.hawaii.gov	Indoor Radiological Health Branch (808) 586-4700

April 1, 2019

Ho'okuleana LLC
… to take responsibility …

Peter T. Young
1539 Kanapu'u Drive
Kailua, Hawai'i 96734
(808) 226-3567 (Cell Phone)
PeterYoung@Hookuleana.com
www.Hookuleana.com

Barry Ching
Department of Health
Clean Air Branch
Hale Ola Building
2827 Waimano Home Road, Room 225
Pearl City, HI 96782-1487 Cab.General@doh.hawaii.gov

Re: Miki Basin Industrial Park – Comments on Draft Environmental Assessment

Dear Mr. Ching:

Thank you for your comments on the Draft Environmental Assessment on the Miki Basin Industrial Park.

We acknowledge that you provided April 1, 2019 Standard Comments for Land Use Reviews from the Clean Air Branch. These relate to required permitting, procedures and points of contact in addressing clean air concerns.

Thank you for your comments.

Sincerely,
HO'OKULANA LLC

Peter T. Young
President

Do well by doing good.

OFFICE OF PLANNING
STATE OF HAWAII

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

DAVID Y. IGE
GOVERNOR

MARY ALICE EVANS
DIRECTOR
OFFICE OF PLANNING

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: http://planning.hawaii.gov/

DTS201912121110HE

December 31, 2019

TO: Daniel Orodenker, Executive Officer
Land Use Commission

FROM: Mary Alice Evans, Director
Office of Planning

SUBJECT: Docket No. A19-807/Lanai Resorts, LLC dba Pulama Lanai
Miki Basin Industrial Park
Draft Environmental Assessment – Anticipated Finding of No Significant Impact
Lanai Airport, Lanai, Hawaii
TMK: (2) 4-9-002: por. 061

Pulama Lanai is seeking a State Land Use District Boundary Amendment (Land Use Commission Docket No. A19-807) to reclassify 200 acres from the State Agricultural District to the Urban District to develop the Miki Basin Industrial Park. The subject Draft Environmental Assessment – Anticipated Finding of No Significant Impact (DEA-AFONSI) is in support of the reclassification action.

Pulama Lanai proposes a master-planned light and heavy industrial development located 3.2 miles southwest of Lanai City and connected to Kaumalapau Highway (State Route 440) via Miki Road. The 200-acre project site is designated for industrial use on the Lanai Community Plan Land Use Map and adjoins the Lanai Airport, the 5-acre Maui Electric Company power plant, and the existing 20-acre Miki Basin Industrial Condominium. All three neighboring facilities are in the State Urban District. The site is on fallow agricultural land, rated "D" by the Land Study Bureau, that has not been used since 1992 when pineapple production ceased.

As a master-planned project, Pulama Lanai will develop the major common infrastructure, such as roads and electric and water utility lines. Industrial park users will be responsible for connection to their individual lots. Pulama Lanai does not intend to build the project all at once and anticipates that full buildout will occur over a 30-year time period.

The Office of Planning (OP) has reviewed the DEA-AFONSI and offers the following comments:

1. Development Timetable
   Pulama Lanai states that full buildout of the project is expected to take 30 years. Please be aware that projects seeking State Land Use reclassification are required to be *substantially completed within ten years* or seek incremental approvals (Hawaii Administrative Rules § 15-15-50 (c) (20)). The Final Environmental Assessment (FEA) should provide a schedule of development for each phase of the total development and a map showing the location and timing of each phase or increment. Regarding infrastructure, e.g. highway improvements, new water source, storage and distribution system, the FEA should discuss how improvements will be completed to ensure that mitigation coincides with the impact created by the proposed project.

2. Low Impact Development
   OP acknowledges that Sections 4.5 (pgs. 42-48) of the DEA-AFONSI contains an extensive evaluation on geology, soils, slope stability and proposed drainage infrastructure that will be incorporated into the industrial park. Page 45 states that offsite runoff will be intercepted before entering the project site by proposed drainage ditches. The drainage ditches will divert runoff around the perimeter of the project site to an offsite discharge point downstream. Onsite runoff will be collected by a proposed underground storm drain system consisting of pipes and inlets. Page 48 goes on to state that storm water treatment will not be provided for this project since the runoff flows into an existing offsite sump with no outlet to the ocean.

   Industrial activity in the Miki Basin may alter the absorption rate with the introduction of impervious surfaces, lead to increased sheet flow, and overwhelm drainage infrastructure intended to divert rainwater to detention zones. Low impact development (LID) designs include enhanced landscaping, bio-swales, permeable pavement, rain catchment systems, and bio-detention basins. LID design elements are effective at keeping stormwater in place, and treat toxins, sediment, and loose soil onsite.

   Pulama Lanai should consult with the County of Maui on the feasibility and effectiveness of onsite stormwater treatment systems.

3. Water Resources
   OP notes that the DEA-AFONSI contains an extensive discussion of the project's impact on water resources, including Lanai Water Company's conformance with the State Commission on Water Resource Management requirements, identification of new sources of water, water infrastructure improvements needed to support full buildout of the

project, and the cumulative impact of other development projects on water resources (pgs. 49-72). In addition, a Water Master Plan is also included (Exhibit H).

4. Cultural Resources
OP notes that the DEA-AFONSI partially discusses the project's potential impact on traditional and customary native Hawaiian rights on Pages 37-38. A fuller discussion and a specific finding consistent with the Hawaii Supreme Court's Ka Paakai holding is contained in the DEA-AFONSI, Exhibit A, September 24, 2019 letter to Kurt Matsumoto from Kepa Maly.

5. Previous Comments
Our previous response letter to an Early Consultation Request, dated November 30, 2018, requested that the DEA:
- Examine the project's relevancy with the provisions of Hawaii Revised Statutes (HRS) Chapter 226, the Hawaii State Planning Act; and
- Assess the project's adherence with HRS § 205A-2, the objectives and supporting policies of the Hawaii Coastal Zone Management (CZM) program.

OP acknowledges that our prior comments have been addressed in the DEA-AFONSI.

If you have any questions, please contact Aaron Setogawa of our Land Use Division at (808) 587-2883 or Joshua Hekekia of our CZM program at (808) 587-2845.

Sincerely,

Mary Alice Evans
Director

c: Lynn McCrory, Senior Vice President of Government Affairs, Pulama Lanai
Peter T. Young, President, Hookuleana LLC
Michele McLean, AICP, Director, Department of Planning, County of Maui

Ho'okuleana LLC
... to take responsibility ...

Peter T. Young
1539 Kanapu'u Drive
Kailua, Hawai'i 96734
(808) 226-3567 (Cell Phone)
PeterYoung@Hookuleana.com
www.Hookuleana.com

Mary Alice Evans, Director
Office of Planning
Post Office Box 2359
Honolulu Hawaii 96804

Re: Miki Basin Industrial Park – Comments on Draft Environmental Assessment

Dear Mary Alice:

Thank you for your comments on the Draft Environmental Assessment on the Miki Basin Industrial Park.

We note the development timetable, drainage, water resources (you note that there is extensive discussion on water resources) and cultural resources. You note the cultural analysis included in the Exhibits section of the report is consistent with requirements and also acknowledge that your previous comments have been addressed in the EA.

We are aware of State Land Use reclassification timing you reference and understand that the project needs to be substantially completed within ten years or Pūlama Lāna'i should seek incremental approvals. As noted in the EA, the development timeframe is dependent on market conditions; the present estimate is that the project will be developed incrementally over a period of 30-years, depending on the market conditions. With respect to drainage, as you suggest, Pūlama Lāna'i will consult with the County of Maui on the feasibility and effectiveness of onsite stormwater treatment systems.

Thank you for your comments.

Sincerely,
HO'OKULANA LLC

Peter T. Young
President

Do well by doing good.

REF-167

REFERENCES IX

IX. REFERENCES

County of Maui, 2010, 2030 General Plan, Countywide Policy Plan, Wailuku, Hawaiʻi.

County of Maui, Department of Fire and Public Safety, 2014-2015 Annual Report.

County of Maui, Department of Planning, 2012, Land Use Forecast, Island of Lānaʻi, Maui County General Plan 2030, Wailuku, Hawaiʻi.

County of Maui, Department of Planning, Lānaʻi Community Plan, 2016.

County of Maui, Department of Water Supply, Lānaʻi Island Water Use and Development Plan, 2011.

County of Maui, Office of Economic Development, 2019 Maui County Data Book.

Intergovernmental Panel on Climate Change (IPCC) (2007). Summary for Policymakers. In: Climate Change 2007: The Physical Science Basis. EXIT Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

State of Hawaiʻi, Department of Agriculture, Agriculture Functional Plan, 1991.

State of Hawaiʻi, Department of Education, Official Enrollment County School Year 2020-2021, https://www.hawaiipublicschools.org.

State of Hawaiʻi, Department of Health, Clean Air Branch, Hawaii Greenhouse Gas Emissions Report for 2015, Final Report, January 2019.

State of Hawaiʻi, Department of Labor and Industrial Relations (DLIR), 2020, Current Employment Statistics, http://www.hiwi.org.

State of Hawaiʻi, Department of Labor and Industrial Relations (DLIR), 2021, Current Employment Statistics, http://www.hiwi.org.

U.S. Department of Agriculture (USDA), Soil Conservation Service, Soil Survey of Islands of Kauai, Oahu, Maui, Molokaʻi and Lanai, State of Hawaiʻi, August 1972.

U.S. Census Bureau, American Community Survey, Five-Year Population Estimates, 2019.

U.S. Environmental Protection Agency (EPA), 2019, GHG Reporting Program Data, https://ghgdata.epa.gov/ghgp/main.do, accessed June 2021.

MARKET ASSESSMENT

APPENDIX A

REF-170

Miki Basin Industrial Park:
Market Assessment

Miki Basin Industrial Park:
Market Assessment

PREPARED FOR:

Pūlama Lānaʻi

PREPARED BY:

Plasch Econ Pacific LLC

September 2021

REF-171

Contents

Executive Summary ..... ES- 1

Part I: Introduction and Proposed Project ..... I- 1

1. **Introduction** ..... I- 1
   - a. Content and Purpose ..... I- 1
   - b. Methodology ..... I- 1
   - c. Organization of the Report ..... I- 2
   - d. Economic Consultant ..... I- 2
2. **Project Overview** ..... I- 2
   - a. Project Location ..... I- 2
   - b. Project Description ..... I- 2
   - c. Development Period ..... I- 3
   - d. Land Classifications and Required Approvals ..... I- 3

Part II: Lāna‘i’s Economy and Socio-Economic Conditions ..... II- 1

1. **Economic Overview** ..... II- 1
2. **Socio-Economic Conditions** ..... II- 1
   - a. Population ..... II- 1
   - b. Households ..... II- 2
   - c. Housing ..... II- 2
   - d. Income and Education ..... II- 3
3. **Economic Role of Shipping** ..... II- 3
4. **Implications to the Demand for Industrial Land** ..... II- 3

Part III: Market for Industrial Land ..... III- 1

1. **Supply of Industrial Land** ..... III- 1
2. **Market Conditions** ..... III- 2
   - a. Annual Absorption of Industrial Land ..... III- 2
   - b. Vacancy Rates ..... III- 2
   - c. Industrial Land Sales and Values ..... III- 2
   - d. Industrial Rents ..... III- 3

3. **Demand for Industrial Land** ..... III- 3
   - a. Current Industrial Uses ..... III- 3
   - b. Committed Industrial Uses, Miki 200 ..... III- 3
   - c. Typical Industrial Activities ..... III- 4
   - d. Land Required for Typical Industrial Activities ..... III- 5
   - e. Industrial Activities After 2030 ..... III- 7
   - f. Summary ..... III- 7
4. **Conclusions** ..... III- 7

References ..... R- 1

Figures

- I-1. Project Location, Lāna‘i ..... I- 4
- I-2. Project Location, Miki Basin ..... I- 5
- I-3. Site Plan ..... I- 6

Part II Tables: Socio-Economic Conditions

- II-1. Demographic Characteristics, County of Maui and Island of Lāna‘i: 2010 and 2013–2017 Estimates
- II-2. Income and Education, County of Maui and Island of Lāna‘i: 2010–2014 and 2015–2019 Estimates

REF-172

Executive Summary

1. Project Description

The Miki Basin Industrial Park (the **Project** or **Miki 200**) is a proposed master-planned development on a 200-acre centrally located site in the Miki Basin area on the island of Lānaʻi, Hawaiʻi. Consistent with the Lānaʻi Community Plan, Miki 200 will include 100 acres designated Light Industrial and 100 acres designated Heavy Industrial. It will be Lānaʻi's first large-scale industrial park. Lot sizes may range from less than a half-acre to 20 acres or more. Also, rental space may be available in industrial buildings if built. Infrastructure may include internal roads, water, power, sewers, drainage, etc.

Miki 200 will provide space for the relocation and/or expansion of existing industrial activities on Lānaʻi, land and warehouses for storing goods and equipment, and land and buildings to accommodate industrial activities new to Lānaʻi.

2. Projected Supply and Use of Industrial Land

The future supply and use of industrial land on Lānaʻi is projected to be as follows:

	Acres
— **Miki 200** (proposed)	
• Committed	
+ Infrastructure	20.0
+ Renewable energy	127.0
+ Concrete/rock-crushing facility	14.5
+ Asphalt plant	12.5
• Typical industrial activities	7.6
• Vacant (projected development after 2030)	18.4
• **Total Miki 200**	**200.0**
— **Existing Industrial Projects** (acreage includes infrastructure): Pūlama Lānaʻi Central Services, Miki 20, HECO, and Kaumalapau Harbor	
• Currently used (excludes 1.6 acres in temporary use)	21.9
• Available in the future, pending a Land Court Subdivision Approval	11.6
• **Total Existing Industrial Land**	**33.5**
— **Total Industrial Land, Proposed and Existing**	**233.5**

3. Market for Miki 200

Miki 200 will provide much needed industrial land on Lānaʻi, and a much needed industrial park. Currently, vacant industrial land is not available on the island.

Regarding market feasibility, commitments are in place for 174 acres (87%) of the Project area. An additional 7.6 acres for "typical industrial activities" will increase the projected demand to 181.6 acres (91%) by 2030. About 18.4 acres at Miki 200 will accommodate the demand for industrial land beyond 2030. More importantly, this acreage will provide industrial land approved for development and may have major infrastructure in order to take immediate advantage of any new economic opportunities which may arise, thereby diversifying Lānaʻi's economy.

REF-173

Miki Basin Industrial Park: Market Assessment

Part I: Introduction and Proposed Project

1. Introduction

a. Content and Purpose

Miki Basin Industrial Park (the **Project** or **Miki 200**) is a proposed master-planned development on a 200-acre site located in the Miki Basin area on the island of Lānaʻi, Hawaiʻi. This report addresses the anticipated market for the Project. Its purpose is to provide the community, State of Hawaiʻi (**State**) officials and County of Maui (**County**) officials with relevant information about the market on Lānaʻi for an industrial park.

b. Methodology

The market assessment covers:

— The existing supply of industrial land on Lānaʻi based on an inventory of industrial land on Lānaʻi.

— Market conditions for industrial land on Lānaʻi.

— The anticipated demand for industrial land based on committed and anticipated uses. Committed uses were provided by Pūlama Lānaʻi. Anticipated uses are based on per-capita space requirements.

Socio-economic conditions on Lānaʻi are also provided in order to provide insight into possible adjustments to the demand for industrial land. Information is provided on Lānaʻi's population, housing, incomes, education, economic activities, employment and labor force. Data were obtained from the 2010 census by the U.S. Census Bureau, and from the American Community Survey ("**ACS**"). The ACS is an ongoing survey that provides up-to-date information about the nation's population. The ACS includes questions that were not included in the 2010 decennial census but were included in the 2000 census. The most up-to-date available data from the ACS are five-year estimates from 2015-2019.

Dollar amounts are expressed in terms of 2019 purchasing power and market conditions, thereby reflecting conditions prior to COVID-19. Dollar amounts after 2019 are <u>not</u> increased to account for inflation, appreciation in property values, or changes in market conditions.

c. Organization of the Report

The report is divided into three Parts:

— Part I: Introduction and Proposed Project

— Part II: Lānaʻi's Economy and Socio-Economic Conditions

— Part III: Market for Industrial Land

All Figures in this report are embedded in the text, while all tables are at the end.

d. Economic Consultant

The analysis was conducted by Plasch Econ Pacific LLC, a Hawai'i-based economic-consulting firm specializing in economic development, land and housing economics, feasibility studies, valuations, market analysis, public policy analysis, and the economic and fiscal impacts of projects.

2. Project Overview

a. Project Location

The Miki 200 will be centrally located on a 200-acre site in Miki Basin on the island of Lānaʻi, about 1 mile east of the Lānaʻi Airport terminal, 2.7 miles southwest of Lānaʻi City, and 3.7 miles east of Kaumalapau Harbor (see Figures I-1 and I-2). The Tax Map Key (TMK) for the Project area is (2)4-9-002:061(por.).

As shown in Figure I-3, the Project will abut (1) the Hawaiian Electric Company/Maui Electric Co. (**HECO**) power plant, and (2) the "Existing Industrial Condominium" (referred to as **Miki 20** since it is a 20-acre project in the Miki Basin).

b. Project Description

Consistent with the Lānaʻi Community Plan, Miki 200 will include 100 acres designated Light Industrial and 100 acres designated Heavy Industrial. It will be Lānaʻi's first large-scale industrial park. Lot sizes may range from less than a half-acre to 20 acres or more. Also, rental space may be available in industrial buildings if built. Infrastructure may include internal roads, water, power, sewers, drainage, etc.

Miki 200 will provide space for the relocation and/or expansion of existing industrial activities on Lānaʻi, land and warehouses for storing goods and equipment, and land and buildings to accommodate industrial activities new to Lānaʻi. Regarding the last point, it is important to have industrial land readily available and approved for development in order to take immediate advantage of any new economic opportunities which may arise.

REF-174

c. Development Period

Following approval, most Project development is expected to occur over a period of about 10 years, but development could require more or less time, depending on the pace of future economic and population growth, market conditions and lot leases. About 9% of the land is expected to be developed after 2030 (see Subsection III.3.e).

d. Land Classifications and Required Approvals

Current land classifications of the Project Area and proposed changes are as follows:

— State Districts
- Current: Agricultural
- Proposed: Urban

— County Designations
- Lānaʻi Community Plan
  + Current: Light and Heavy Industrial
  + Proposed: No change
- Maui County Zoning
  + Current: Agricultural
  + Proposed: Light and Heavy Industrial

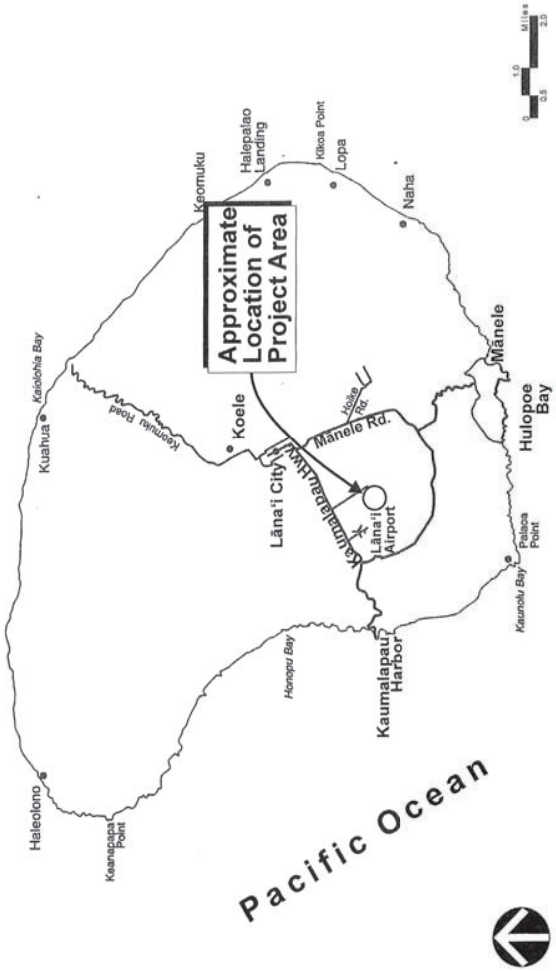


Figure I-1. Project Location, Lānaʻi

REF-175

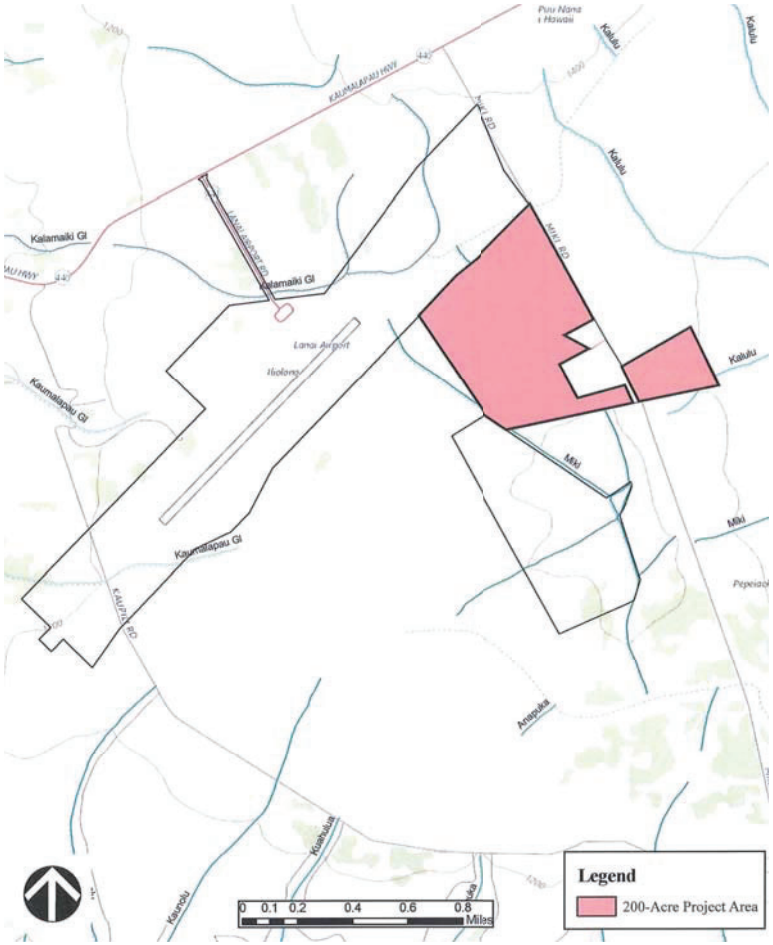


Figure I-2. Project Location, Miki Basin

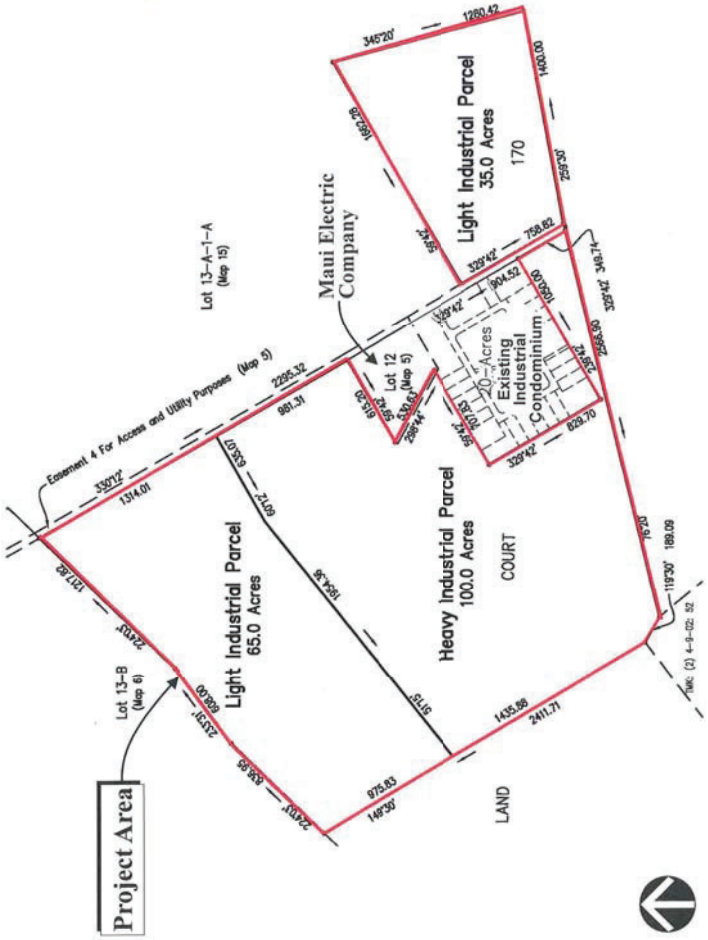


Figure I-3. Site Plan

REF-176

PART II: LANAI'S ECONOMY AND SOCIO-ECONOMIC CONDITIONS

1. ECONOMIC OVERVIEW

From the 1920s to 1992, the primary economic activity on Lānaʻi was growing pineapple for the mainland canned-pineapple market.

Since the 1990s, the two resorts on Lānaʻi (Manele and Kōʻele) have been the primary driving forces for the economy. Manele and Kōʻele feature 213 and 96 luxury rooms and suites, respectively. In addition, both resorts include single-family homes and multi-family homes for retirees, part-time residents, visitors and managers. The purchase of goods and services by visitors, retirees, part-time residents, the hotel, and hotel employees generate most of the jobs on Lānaʻi.

Other economic driving forces on Lānaʻi's include:

- Sensei Farms, a new hydroponic farm which exports fresh vegetables to markets throughout the Hawaiian Islands, and which employs about 50 workers.
- Government operations (schools, the airport, the harbors, police, fire, post office, etc.)
- Social security and retirement income paid to residents.
- Government income-support payments.
- Occasional construction activity for the building or renovation of hotels, homes, commercial and industrial buildings, government facilities, etc.

Except for the hotel an Manele, most commercial activities on the island are located in Lānaʻi City, including grocery stores, drug stores, restaurants, service stations, beauty salons, building suppliers, etc.

2. SOCIO-ECONOMIC CONDITIONS

Tables II-1 and II-2 summarize socio-economic conditions for County of Maui and Lānaʻi. The County consists of the islands of Maui, Lānaʻi, Molokaʻi, Kahoʻolawe, and Molokini. Except where stated otherwise, the estimates below were reported by the American Community Survey.

a. Population

Between 2015 and 2019, Lānaʻi had a resident population of approximately 2,730, or 1.64% of the County population of 165,979 residents. Residents include those who live full-

time or permanently in the County, and exclude visitors and part-time residents (i.e., those who live most of the time in a primary home located elsewhere).

Throughout most of the decade, the U.S. Census Bureau's five-year population estimate for Lānaʻi ranged from approximately 3,100 to 3,500 residents. However, in 2018 and 2019, the five-year estimate dipped below 3,000 residents. As noted above, the 2015-2019 five-year estimate was 2,730 people, which represents a 12.9% decrease from the 2010 population of 3,135 residents. Meanwhile, the population for the County as a whole has increased by 7.2% since 2010 (see Table II-1).

The Lānaʻi Community Plan, which was updated and approved by the Maui County Council in 2016, originally projected that an additional 885 residents will live on the island by the year 2030, for a total population of 4,020 (based on the County's Land Use Forecast produced in December 2012). The Lānaʻi Community Plan did note that increased economic activity and development plans on the island may result in the population growing beyond the original forecast of up to 6,000 residents.

Between 2015 and 2019, Asian residents comprised a higher proportion of the Lānaʻi population compared to the County as a whole: 53.4% of residents were estimated to be Asians compared to 29.3% for the County (Table II-1).

The resident profile of Lānaʻi is older than that of the County as a whole. The median age on Lānaʻi was about 49.0 years old between 2015 and 2019 compared to 41.2 years for the County.

b. Households

The average household size on Lānaʻi is estimated to be 2.31 people per household between 2015 and 2019—a decrease from 2.71 people per household in 2010 (Table II-1). On average, households on Lānaʻi are smaller than households for the County —3.00 people per household.

Approximately 59.8% of the households were estimated to be homeowners. Also, an estimated 63.1% of the households were family households.

c. Housing

Between 2015 and 2019, Lānaʻi had an estimated 1,549 housing units (Table II-1). This figure includes resort/residential units that were used as second homes, or were available for visitors, or were vacant. Approximately 23.8% of housing units were vacant, compared to 25.5% for the County.

Most residents live in Lānaʻi City in single family homes of less than 1,500 square feet on lots of about 6,000 square feet or less (Google Maps). According to the County tax records, many of the homes on Lānaʻi were built before 1940.

d. Income and Education

The mean household income on Lānaʻi between 2015 and 2019 was estimated at $73,484, 39.8% lower than the County as a whole (Table II-2). Correspondingly, Lānaʻi had a lower per-capita income.

A slightly lower proportion of residents on Lānaʻi completed some secondary education compared to the County as a whole. An estimated 50.7% of Lānaʻi residents attended some college or received a higher education degree, compared to 60.8% of the residents for the County. About 67.2% of the households spoke only English at home, while 31.5% spoke Asian and Pacific Island languages.

3. Economic Role of Shipping

Inasmuch as Lānaʻi is a small island with a small population and a small economy, few consumer and business goods are produced on the island. Instead, most goods must be imported by barge or airfreight from Honolulu. Barge service is weekly, but the service is canceled occasionally due to kona storms. Airfreight is available daily, but the capacity is low and the shipping rates are higher than the barge rates.

4. Implications to the Demand for Industrial Land

Economic development is needed on Lānaʻi in order to provide jobs and increase incomes for the residents. As mentioned above, the average household income on Lānaʻi is 39.8% lower than the County-wide average.

For both residents and businesses, Lānaʻi needs more storage space than other communities of similar size because most goods must be imported, and shipping is infrequent and occasionally unreliable. And for most residents, home storage is limited by the relatively small lots and homes.

Part III: Market for Industrial Land

1. Supply of Industrial Land

Currently, Lānaʻi has about 36.2 acres of industrial land of which about 2.7 acres are used for offices and other non-industrial activities, 23.5 acres are used for industrial activities. The supply of industrial land is as follows:

— Pūlama Lānaʻi Central Services: about 7.7 acres, 0 acres available

This project is located in Lānaʻi City at 13110 Fraser Avenue. About 2.7 acres are used for Pūlama Lānaʻi offices and other non-industrial activities, and about 5 acres are used for industrial activities, including a laundry for the hotels, food storage, and a maintenance warehouse. None of the land is available for additional industrial uses.

— Miki 20: about 20 acres, 10 acres available in the future

Maki 20 is an industrial condominium that abuts both the proposed Project and the HECO power plant (see Figure I-3).

This project is anticipated to be subdivided into 31 lots in accordance with County requirements, but the Land Court has yet to approve the subdivision. A petition to the Land Court for approval was submitted in 2018, but which was later amended to include the Hawaiʻi Department of Transportation due to a public road over an easement which runs in part through a portion of the Lānaʻi Airport property. The petition is under review by a Deputy Attorney General.

Currently, about 10 acres are being used for Pūlama Lānaʻi warehouses, Hawaiʻi Gas, Maui Disposal, equipment rentals by Sunbelt, and a concrete/rock crushing plant. The crushing plant involves a temporary use of 1.6 acres that will be relocated to Miki 200.

None of the land is currently available for additional industrial uses. However, about 10 acres will be available in the future, following subdivision approval by the Land Court. Lots encompassing half of Miki 20 will be offered for sale for various industrial activities. This translates to future land sales of about 9 acres , excluding roads and other common areas.

After the subdivision is approved by the Land Court, Miki 20 may evolve to become a small-scale industrial park hosting a variety of industrial tenants.

— HECO Power Plant: about 5 acres, 0 acres available

HECO's generating facilities are located on about 5 acres abutting the proposed Project and Miki 20 (see Figure I-3). None of this land is currently

available for industrial activities other than that used for HECO's generating facilities.

— Kaumalapau Harbor: about 3.5 acres, 0 acres available

About 3.5 acres of industrial land are located at Kaumalapau Harbor. None of this land is currently available for industrial activities other than harbor-related activities.

None of Lānaʻi's industrial land is currently available for additional industrial activities, but 10 additional acres will be available in the future pending subdivision of Miki 20 by the Land Court. Also, no land or building space is available as part of an industrial-park.

Miki 200 will increase the supply of industrial land by 200 acres, resulting in a total island-wide supply of about 233.5 acres of industrial land. This accounting excludes the 2.7 acres used for non-industrial activities at Pūlama Lānaʻi Central Services.

2. MARKET CONDITIONS

a. Annual Absorption of Industrial land

Except for Miki 20, there have been no significant changes in the supply of industrial land on Lānaʻi in decades. Even though subdivision of Miki 20 has yet to be approved by the Land Court, 10 acres of industrial uses were added in the previous decade as indicated above. Since there are no other industrial parks on Lānaʻi, there is no additional history of industrial-park land or building space absorption.

b. Vacancy Rates

All available industrial land on Lānaʻi is being used. Similarly, all available space within existing industrial buildings is used. Thus, the vacancy rates for industrial land and building space is essentially zero.

c. Industrial Land Sales and Values

There have been no recent sales of industrial lots on Lānaʻi, so price data are not available. However, the County assesses land values at market rates. For 2021, Pūlama Lānaʻi Central Services land was assessed at $206,210 per acre. Given its location in Lānaʻi City, this value is higher than that what is expected for Miki 200.

The Miki 20 land is assessed as agricultural land as part of a 16,124-acre parcel. Thus, this project provides no meaningful information on industrial-land values.

For tax purposes, the HECO property is assessed as Agricultural land (not Industrial land) at $94,080 per acre. This high value indicates that the assessment is based on the actual use of the land, and not on a possible agricultural use.

The industrial land at Kaumalapau Harbor is assessed at $863,203 per acre. Since this is harbor-front land, it is not comparable to Miki 200.

For Miki 200, once developed and serviced with utilities, the land is expected to be valued between $100,000 to $200,000 per acre.

d. Industrial Rents

No data are publicly available on market rents for the existing industrial land or space on Lānaʻi.

On Oʻahu, some of the most affordable industrial space can be found at Kenai Industrial Park near the Kalaeloa Barbers Point Harbor. In late 2019, asking rents were about $1.10 per square foot per month. Land values at Kenai Industrial Park are much higher than on Lānaʻi, but building costs on Oʻahu are much lower than on Lānaʻi. Based on Kenai Industrial Park, rents for industrial space at Miki 200 are expected to be less than $1 per square foot per month, assuming that industrial buildings are built and areas within buildings are rented to tenants.

3. DEMAND FOR INDUSTRIAL LAND

a. Current Industrial Uses

As indicated in Section III.2, about 23.5 acres of industrial land are currently being used on Lānaʻi: about 5 acres at Pūlama Lānaʻi Central Services, 10 acres at Miki 20, 5 acres at the HECO site, and 3.5 acres at the harbor.

b. Committed Industrial Uses, Miki 200

For Miki 200, about 174 acres are committed for infrastructure and industrial activities, including:

— Infrastructure: about 20 acres

Internal roads, drainage areas and common areas are expected to require about 20 acres (10%) of the Project area.

— Renewable Energy: about 127 acres

HECO has requested proposals for a 17.5 megawatt (**MW**) photo voltaic system on Lānaʻi plus a 70 MW-hour (**MWh**) battery energy storage system (**PV+BESS**). To help meet the need for renewable energy on Lānaʻi, Pūlama Lānaʻi plans to allocate 127 acres at Miki 200 for renewable energy. The acreage is based on the energy facility being developed at the Pacific Missile Range Facility (**PMRF**) on Kauaʻi (14 MW/70MWh PV+BESS).

— Concrete/Rock Crushing Facility: about 14.5 acres

Pūlama Lānaʻi's concrete recycling and rock- crushing facility uses equipment to crush concrete and rocks into various sizes and types of aggregate to construct roadways, sidewalks, etc., and for backfill throughout the island for construction projects.

The facility and equipment are mobile, and are temporarily located on 1.6 acres at Miki 20. Miki 200 will provide a permanent base for the operation, water for washing equipment and controlling dust, and a central location for serving the island. Most of the acreage for the relocated operation will be used for stockpiling (1) various types of material to be crushed and (2) various grades of aggregate. These stockpiles will provide an ample and ready supply of aggregate when needed.

After the relocation of operations to Miki 200, the 1.6 acres now used at Miki 20 will come available for other industrial activities.

— Asphalt Plant: about 12.5 acres

Pūlama Lānaʻi's asphalt plant is a hot-mix batch plant that services both the community and Pūlama Lānaʻi. The asphaltic concrete produced from this plant supplies material required to pave new roads, and to repair and repave existing ones.

This mobile facility will be relocated from its current temporary site near Kaumalapau Harbor to Miki 200 in order to provide a permanent base of operations in a central location for serving the island. The current location near the harbor will be used for stockpiling supplies.

c. Typical Industrial Activities

"Typical industrial activities" are defined to include those industrial activities typically found in Hawaiʻi (such as manufacturing, warehouses, base yards, etc.), but excluding those activities listed in the previous section (i.e., PV+BESS, concrete/rock-crushing facilities, and asphalt plants).

A pent-up demand for industrial land and industrial space to accommodate "typical industrial activities" is readily apparent on Lānaʻi. Many businesses in Lānaʻi City are operated from homes, partly because there are no industrial parks on Lānaʻi that serve small-scale tenants. Yards and rooms are used for operations and to store equipment and supplies. In some cases, inadequate space may be limiting local companies ability to expand. For some of these businesses, an industrial park may be a more suitable location because of more space, visual impacts, noise, odors, dusts, etc. Many of these home businesses provide a second source of income for workers employed elsewhere on Lānaʻi. If industrial space were available, some business owners might opt to expand their companies into into full-time

operations. In other cases, businesses are operated from vans, and some might benefit from a permeant location in an industrial park. In addition, some industrial activities may fail to develop on Lānaʻi due to a lack of a suitable location.

A partial list of industrial activities that could or are likely to develop at Miki 200 include the following:

— Vehicle rentals (cars, 4-wheel drive vehicles, trucks, etc.)

— Vehicle maintenance and repair (engines, transmissions, tires, body, etc.)

— Car wash

— All-terrain vehicle sales, maintenance, repair, etc.

— Small-boat supplies, maintenance and repair (including fishing gear)

— Commercial laundry services for residents

— Base yards and storage for construction trucks, equipment and supplies (lumber, bricks, cement, pipes, roofing, sheetrock, etc.)

— A base of operations for home maintenance, repairs and services (roofing, electrical, plumbing, appliances, cleaning services, pools, etc.)

— A base of operations for maintaining and repairing office equipment (computers, printers, wifi networks, etc.)

— Self-storage space for household goods, records, business supplies, etc.

— Shops and crafts (metal, woodcrafts, taxidermy, lei hulu, etc.)

— Fruit and vegetable processing, possibly with a shared commercial kitchen

— Veterinarian services and pet supplies at a fixed location

— A gym featuring exercise and therapy equipment

— A fixed location for a slaughtering facility and cold storage for hunted animals (i.e., axis deer and mouflon sheep)

— Laboratories (medical, environmental, etc.)

— Shared office facilities for business at Miki 200

d. Land Required for Typical Industrial Activities

Although the Maui Island economy is much larger than that of Lānaʻi, Maui's supply of industrial land provides information for estimating the potential demand for industrial land on Lānaʻi. The economies of both Maui and Lānaʻi are driven primarily by tourism.

In early 2020, about 1,538 acres on Maui were zoned Light or Heavy Industrial. About 80 acres of industrial land were used for two concrete/rock crushing facilities and two asphalt

plants. No industrial land on Maui was used for utility scale PV+BESS. Thus, 1,458 acres were used for "typical industrial activities" (1,538 acres less 80 acres).

In 2019, the *de facto* population for Maui Island was about 216,990 people. This is based on an estimated *de facto* population of 227,213 for the County of Maui as reported in the *Hawai'i Data Book*, less 9,649 residents living on Lāna'i and Moloka'i, less an estimated 575 visitors on Lāna'i and Moloka'i (479 visitor units × 60% occupancy rate × 2 people per occupied room). The number of visitor units is from the 2020 Visitor Plant Inventory.

Thus, the per-capita land requirement on Maui for "typical industrial activities" was about 6.7 acres per 1,000 people in 2019 (1,458 acres ÷ 216,990 people).

By 2030, the *de facto* population of Lāna'i is expected to reach about 4,510 residents and visitors: about 4,020 residents, 380 visitors staying in hotels, and 110 part-time residents and visitors staying in second homes and vacation homes. As indicated in Section II.2.a, the County's Land Use Forecast for Lāna'i projects 4,020 residents by 2030, while the Lāna'i Community Plan noted that increased economic activity and development plans for the island may result in as many as 6,000 residents. The estimate of 380 visitors staying in hotels is based on 320 rooms at Manele, Kō'ele and Hotel Lāna'i; 60% occupancy; and 2 people per occupied room. The estimate of 110 part-time residents and visitors staying in second homes and vacation homes is based on 137 single-family homes and 121 multi-family homes at Manele and Kō'ele; 75% of the homes used for second homes or vacation homes; 25% occupancy; and 2.5 people per home for single-family homes and 2 people for multi-family homes.

Based on the above, **about 30.3 acres would be required on Lāna'i by 2030 for "typical industrial activities"** (6.7 acres/1,000 people × 4,510 residents and visitors). As mentioned in Section III.4.a, 23.5 acres of industrial land are currently being used on Lāna'i, including about 21.9 acres for "typical industrial activities" and 1.6 acres of temporary concrete/rock crushing operations at Miki 20. Thus, by 2030, there is a **potential demand for an additional 8.4 acres for "typical industrial activities"** (30.3 acres less 21.9 acres), **or about 7.6 acres excluding roads and other common areas** (90% of 8.4 acres). Demand for industrial land could be higher due to increased storage requirements to compensate for infrequent and unreliable shipping.

Regarding self-storage, the SpareFoot Storage Beat reports that commercial storage use amounts to about 5.9 square feet per person in the U.S. For Lāna'i, this translates to about 23,700 square feet of storage by 2030 (5.9 sf/person × 4,020 residents). Assuming a one-story building with a floor area ratio (**FAR**) of 35%, about 1.5 acres would be required for a self-storage facility (23,700 sf × 1 acres/43,560 sf × 1/35% FAR). This acreage would be included in the estimated 7.6 acres for "typical industrial activities."

e. Industrial Activities After 2030

About 18.4 acres at Miki 200 will accommodate the demand for industrial land beyond 2030. More importantly, this acreage will provide industrial land approved for development and may have major infrastructure in order to take immediate advantage of any new economic opportunities which may arise, thereby diversifying Lāna'i's economy. This acreage will also be available to accommodate "typical industrial activities" before 2030 in the event that the pent-up demand is greater than the estimate given in the previous section.

About 10.6 acres at Miki 20 will also be available to accommodate future demand for industrial land (10 acres vacant plus 1.6 acres of temporary use less 1 acre for infrastructure).

f. Summary

The future supply and use of industrial land on Lāna'i is projected to be as follows:

	Acres
— **Miki 200** (proposed)	
• Committed	
+ Infrastructure	20.0
+ Renewable energy	127.0
+ Concrete/rock-crushing facility	14.5
+ Asphalt plant	12.5
• Typical industrial activities	7.6
• Vacant (to be developed after 2030)	18.4
• **Total Miki 200**	**200.0**
— **Existing Industrial Projects**: Pūlama Lāna'i Central Services, Miki 20, HECO, and Kaumalapau Harbor	
• Currently used (includes land for infrastructure, but excludes 1.6 acres in temporary use at Miki 20)	21.9
• Available in the future, pending the Land Court Subdivision Approval of Miki 20	
+ Infrastructure	1.0
+ Lots	10.6
• **Total Existing Industrial Land**	**33.5**
— **Total Industrial Land, Proposed and Existing**	**233.5**

4. CONCLUSIONS

Miki 200 is consistent with the Lāna'i Community Plan, and will provide much needed industrial lots on Lāna'i, and a much needed industrial park. Furthermore, the Project will be

centrally located for serving the island. Lots may range in size from about a half-acre to 20 acres or more, and rental space may be provided in new industrial buildings if built. Rents will be at market rates.

Currently, vacant industrial land is not available on the island. However, about 10.6 gross acres will come available at Miki 20 assuming a favorable subdivision approval by the Land Court and relocation of the temporary concrete/rock crushing facility to Miki 200.

Regarding market feasibility of Miki 200, commitments are in place for 174 acres (87%) of the Project area. An additional 7.6 acres for "typical industrial activities" will increase the projected demand to 181.6 acres (91%) by 2030. The remaining 18.4 acres will provide land to take advantage of unforeseen new economic opportunities which may arise, and to accommodate the demand for industrial land beyond 2030.

REFERENCES

Colliers International. "O'ahu, Hawai'i, Research & Forecast Report, Industrial Market." Fourth Quarter 2019.

County of Maui, Office of Economic Development. Maui County Data Book. 2018.

County of Maui, Real Property Assessment Division. 2021.

Hawai'i Department of Business, Economic Development & Tourism, State of Hawai'i. *The State of Hawai'i Data Book.* Annual.

Hawai'i Energy Projects Directory. 2021.

Hawai'i Public Utilities Commission. Docket No. 2015-0389, Order 37796. May 21, 2021.

Hawai'i Tourism Authority. "2020 Visitor Plant Inventory."

Plasch Econ Pacific LLC. 2021.

Pūlama Lāna'i. 2021.

SpareFoot Storage Beat. "U.S. Self-Storage Industry Statistics.: January 27, 2021.

U.S. Census Bureau. American Community Survey 5 Year Estimate, 2010-2014.

U.S. Census Bureau. American Community Survey 5 Year Estimate, 2015-2019.

Part II Tables:
Socio-Economic Conditions

Table II-1. Demographic Characteristics, County of Maui and Island of Lana'i: 2010 and 2015–2019 Estimates

Item	County of Maui			Lana 'i		
	2010	2015-2019	Change	2010	2015-2019	Change
Population (residents)	154,834	165,979	7.2%	3,135	2,730	-12.9%
Male	77,587	82,633	6.5%	1,600	1,396	-12.8%
Female	77,247	83,346	7.9%	1,535	1,334	-13.1%
Distribution						
Male	50.1%	49.8%		51.0%	51.1%	
Female	49.9%	50.2%		49.0%	48.9%	
Population by Age						
Pre-school Age, 4 and Under	10,020	9,907	-1.1%	235	124	-47.2%
School Age, 5 to 19	29,117	29,706	2.0%	621	366	-41.1%
Working Age, 20 to 64	95,894	97,271	1.4%	1,805	1,546	-14.3%
Retirement Age, 65 and Over	19,803	29,095	46.9%	474	694	46.4%
Distribution						
Pre-school Age, 4 and Under	6.5%	6.0%		7.5%	4.5%	
School Age, 5 to 17	18.8%	17.9%		19.8%	13.4%	
Working Age, 18 to 64	61.9%	58.6%		57.6%	56.6%	
Retirement Age, 65 and Over	12.8%	17.5%		15.1%	25.4%	
Median Age	39.6	41.20	4.0%	38.6	49.00	26.9%
Ethnicity						
White alone	53,336	58,891	10.4%	460	488	6.1%
Black or African American alone	870	845	-2.9%	5	0	-100.0%
American Indian and Alaska Native alone	603	424	-29.7%	2	0	-100.0%
Asian alone	44,595	48,579	8.9%	1,745	1,459	-16.4%
Native Hawaiian and Other Pacific Islander alone	16,051	18,093	12.7%	205	186	-9.3%
Some Other Race alone	3,051	2,865	-6.1%	5	52	940.0%
Two or More Races	36,328	36,282	-0.1%	713	545	-23.6%
Distribution						
White alone	34.4%	35.5%		14.7%	17.9%	
Black or African American alone	0.6%	0.5%		0.2%	0.0%	
American Indian and Alaska Native alone	0.4%	0.3%		0.1%	0.0%	
Asian alone	28.8%	29.3%		55.7%	53.4%	
Native Hawaiian and Other Pacific Islander alone	10.4%	10.9%		6.5%	6.8%	
Some Other Race alone	2.0%	1.7%		0.2%	1.9%	
Two or More Races	23.5%	21.9%		22.7%	20.0%	

Table II-1. Demographic Characteristics, County of Maui and Island of Lanaʻi: 2010 and 2015–2019 Estimates

(continued)

Item	County of Maui			Lana 'i		
	2010	2015-2019	Change	2010	2015-2019	Change
Households	53,886	54,479	1.1%	1,158	1,181	2.0%
Average Size	2.82	3.00	6.4%	2.71	2.31	-14.8%
Tenure						
Homeowners	30,055	33,232	10.6%	591	706	19.5%
Renters	23,831	21,247	-10.8%	567	475	-16.2%
Distribution						
Homeowners	55.8%	61.0%		51.0%	59.8%	
Renters	44.2%	39.0%		49.0%	40.2%	
Household Type						
Family Household	35,498	38,249	7.7%	788	745	-5.5%
Non-family Household	18,388	16,230	-11.7%	370	436	17.8%
Distribution						
Family Household	65.9%	70.2%		68.0%	63.1%	
Non-family Household	34.1%	29.8%		32.0%	36.9%	
Housing Units	70,379	73,169	4.0%	1,545	1,549	0.3%
Occupied	53,886	54,479	1.1%	1,158	1,181	2.0%
Vacant	16,493	18,690	13.3%	387	368	-4.9%
For seasonal, recreational, or occasional use	9,956	n/a		108	n/a	
Distribution						
Occupied	76.6%	74.5%		75.0%	76.2%	
Vacant	23.4%	25.5%		25.0%	23.8%	
For seasonal, recreational, or occasional use	14.1%	n/a		7.0%	n/a	

Sources:

U.S. Censusu Bureau. Decennial Census. 2010.

U.S. Census Bureau. American Community Survey 5 Year Estimate, 2015-2019.

Table II-2. Income and Education, County of Maui and Island of Lanaʻi: 2010–2014 and 2015–2019 Estimates

Item	County of Maui			Lana 'i		
	2010-2014	2015-2019	Change	2010-2014	2015-2019	Change
Income						
Mean Household Income	$84,035	$102,759	22.3%	$67,475	$73,484	8.9%
Per Capita Income	$29,499	$35,241	19.5%	$23,262	$33,052	42.1%
Educational Attainment, 25 Years and Older						
Less than 9th Grade	4,393	4,416	0.5%	146	219	50.0%
Grades 9 to 12, No Diploma	6,007	5,057	-15.8%	158	128	-19.0%
High School Graduate, No College	34,941	36,912	5.6%	896	723	-19.3%
Some College, No Degree	27,200	27,584	1.4%	505	408	-19.2%
Associate Degree	9,854	12,029	22.1%	170	229	34.7%
College, Bachelor's Degree	19,374	21,366	10.3%	367	334	-9.0%
Graduate or Professional Degree	9,000	10,753	19.5%	170	136	-20.0%
Total Population, Age 25 and Older	110,769	118,117	6.6%	2,412	2,177	-9.7%
Distrbution						
Less than 9th Grade	4.0%	3.7%		6.1%	10.1%	
Grades 9 to 12, No Diploma	5.4%	4.3%		6.6%	5.9%	
High School Graduate, No College	31.5%	31.3%		37.1%	33.2%	
Some College, No Degree	24.6%	23.4%		20.9%	18.7%	
Associate Degree	8.9%	10.2%		7.0%	10.5%	
College, Bachelor's Degree	17.5%	18.1%		15.2%	15.3%	
Graduate or Professional Degree	8.1%	9.1%		7.0%	6.2%	
Language Spoken at Home (Household)						
English Only	117,369	120,418	2.6%	2,299	1,751	-23.8%
Spanish	2,768	5,896	113.0%	-	33	0.0%
Other Indo-European	2,483	1,647	-33.7%	1	1	0.0%
Asian and Pacific Island languages	25,882	27,466	6.1%	967	821	-15.1%
Others	234	645	175.6%	-	-	0.0%
Distribution						
English Only	78.9%	77.2%		70.4%	67.2%	
Spanish	1.9%	3.8%		0.0%	1.3%	
Other Indo-European	1.7%	1.1%		0.0%	0.0%	
Asian and Pacific Island languages	17.4%	17.6%		29.6%	31.5%	
Others	0.2%	0.4%		0.0%	0.0%	

Sources:

U.S. Census Bureau. American Community Survey 5 Year Estimate, 2010-2014.

IMPACTS ON AGRICULTURE REPORT

APPENDIX B

REF-185

Proposed Miki Basin Industrial Park: Impacts on Agriculture

Proposed Miki Basin Industrial Park: Impacts on Agriculture

PREPARED FOR:

Pūlama Lānaʻi

PREPARED BY:

Plasch Econ Pacific Inc.
and Munekiyo Hiraga

February 2019

REF-186

CONTENTS

EXECUTIVE SUMMARY **1**
1. INTRODUCTION **1**
2. PROJECT INFORMATION **1**
a. Project Location and TMK 1
b. Project Description 1
c. Land Classifications and Required Approvals 1
3. AGRICULTURAL CONDITIONS **2**
a. Soil Types 2
b. Soil Characteristics 3
c. Soil Ratings 4
d. Slopes 5
e. Climatic Conditions 5
f. Irrigation Water 6
g. Local Advantages and Disadvantages 6
h. Summary of Agricultural Conditions 7
4. PAST AGRICULTURAL USES **7**
5. EXISTING AND FUTURE COMMERCIAL FARMING ON LāNA‘I **8**
a. Existing Farms 8
b. Agricultural Park 8
c. Hydroponic Farm 8
6. IMPACT ON AGRICULTURAL OPERATIONS IN THE PROJECT AREA **9**
7. IMPACT ON THE GROWTH OF AGRICULTURE **9**
8. OFFSETTING BENEFITS **9**
9. CONSISTENCY WITH STATE AND COUNTY POLICIES **10**
a. Availability of Lands for Agriculture 10
b. Conservation of Agricultural Lands 10
c. State and County of Maui Land Use Plans 11
10. REFERENCES **11**

REFERENCES

TABLES

1. Miki Basin Industrial Park: Soil Types and NRCS Ratings 3

FIGURES

1. Regional Location Map
2. Project Location Map
3. Site Plan
4. State Land Use District Classification Map for Island of Lāna‘i
5. State Land Use District Classification Map for Project Area
6. Lāna‘i Community Plan Map
7. Soil Classification Map
8. ALISH Map
9. Land Study Bureau Map
10. Lāna‘i Water System
11. Acreage in Crop, Hawaii: 1960 to 2017

APPENDIX

State and County Goals, Objectives, Policies, and Guidelines Related to Agricultural Lands

REF-187

EXECUTIVE SUMMARY

1. PROPOSED DEVELOPMENT

Pūlama Lāna'i proposes to develop the Miki Basin Industrial Park (the Project) on an approximately 200-acre site (the Project Area) in the Miki Basin area on the island of Lānaʻi, Hawaiʻi. The Project will include 100 acres of light industrial and 100 acres of heavy industrial zoned lands.

2. AGRICULTURAL CONDITIONS

The Project Area has agronomic conditions that are unsuitable for field farming to supply crops to Lānaʻi markets, or for export to Oʻahu or the mainland. The problem is a lack of irrigation water.

Except for water, the Project Area has favorable agronomic conditions: soils are good; solar radiation is moderate; and the trucking distances to Lānaʻi City and Mānele Resort are short. However, Lānaʻi farmers are at a competitive disadvantage in supplying the Oʻahu and mainland markets because of shipping costs.

3. PAST AGRICULTURAL USES

The Project Area and surrounding fields were used for a pineapple plantation from the 1920s to 1992. Since then, the Project Area and the surrounding fields have been fallow.

4. EXISTING AND FUTURE COMMERCIAL FARMING ON LĀNAʻI

Only one commercial farmer operates on Lānaʻi.

There is a plan for a 100-acre agricultural park on the island of Lānaʻi. In 1992, the Land Use Commission required Castle & Cooke's Lānaʻi Resort to set aside 100 acres for the development and operation of an agricultural park by the State Department of Agriculture and County of Maui for the residents of Lānaʻi. This was a condition for approving the Manele Golf Course. However, there has not been any progress on developing the park due to a lack of interest.

Sensei Farms Lānaʻi is developing a hydroponic farm to supply fresh produce to local markets, and possibly to off-island markets. Ten (10) greenhouses are planned, which will be powered by an off-grid photovoltaic system. One of the major advantages of hydroponic farming is that it requires relatively little water compared to field farming.

5. IMPACT ON AGRICULTURAL OPERATIONS WITHIN THE PROJECT AREA

The Project will not have any adverse effects on any existing onsite agricultural operations since the land has not been cultivated since the pineapple plantation closed in 1992.

6. IMPACT ON THE GROWTH OF AGRICULTURE

The development of the Project will result in a loss of 200 acres of fallow agricultural lands on Lānaʻi. However, there are approximately 18,000 acres of former plantation lands on Lanai which remain available for agricultural use, and over 200,000 acres statewide. The loss of 200 acres of agriculture land on Lānaʻi, plus the loss of agricultural land due to other projects (i.e., the cumulative impact), is too small to affect the growth of diversified agriculture on Lānaʻi or Statewide.

7. OFFSETTING BENEFITS

The loss of 200 acres of agricultural land will be offset by the benefits of the Project, including: (1) employment generated by construction activity and onsite commercial and industrial activity; (2) offsite economic activity generated by the purchases of goods and services by construction companies and the families of construction workers; (3) tax revenues derived from County property taxes and State taxes (excise, personal income, and corporate income); and (4) goods and services provided by businesses of the Project.

8. CONSISTENCY WITH STATE AND CITY POLICIES

a. Availability of Lands for Agriculture

The Hawaiʻi State Constitution, the Hawaiʻi State Plan, the State Agriculture Functional Plan, the County of Maui 2030 General Plan, and the County's Lānaʻi Community Plan call directly or implicitly for preserving the economic viability of plantation agriculture and promoting the growth of diversified agriculture. To accomplish this, an adequate supply of agriculturally suitable lands and water must be assured.

With regard to plantation agriculture, the Project Area is no longer part of a pineapple plantation. The last pineapple harvest was in 1992.

With regard to diversified agriculture, the Project will not result in the loss of any existing agricultural operation since the Project Area is not currently being cultivated and has not been cultivated since 1992.

Although the Project will reduce the availability of agricultural land by about 200 acres, the Project will not limit the growth of diversified agriculture statewide or on Lānaʻi since ample agricultural land is available due to the loss of nearly all plantations in Hawaiʻi.

REF-188

b. Conservation of Agricultural Lands

In addition to the above, State and County policies call for conserving and protecting prime agricultural lands, including protecting farmland from urban development.

It should be noted that many of the State agricultural policies were written before the major contraction of plantation agriculture (from 1981 to 2016), and assume implicitly that profitable agricultural activities eventually will be available to utilize all available agricultural lands. This has proven to be a questionable assumption in view of the enormity of the contraction of plantation agriculture, the abundant supply of farmland that came available for diversified agriculture, and the slow growth in the amount of land being utilized for diversified agriculture.

Furthermore, discussions in the State Agriculture Functional Plan recognize that redesignation of lands from Agricultural to Urban and/or Rural should be allowed *"... upon a demonstrated change in economic or social conditions, and where the requested redesignation will provide greater benefits to the general public than its retention in ...agriculture;"* that is, when an *"overriding public interest exists."* The enormous contraction of plantation agriculture, which resulted in the supply of agricultural land far exceeding demand, constitutes a major change in economic conditions. Moreover, the Project will provide community benefits (jobs, tax revenues, etc.) that far exceed the benefits of leaving the land in agriculture. In practice, the Project is expected to have no significant impact on agricultural activity since ample land is available statewide to accommodate the anticipated growth of diversified agriculture.

c. State and County of Maui Land Use Plans

The Lānaʻi Community Plan currently designates the Project Area for Light/Heavy Industrial use. However, the entire Project Area is designated "Agricultural" under the State Land Use District and the Maui County Zoning. Because the Project Area is intended for transition to industrial type uses as evidenced by the Lānaʻi Community Plan, Pūlama Lānaʻi will request an amendment to the State Land Use District and the County zoning for the Project Area to be consistent with the Community Plan.

MIKI BASIN INDUSTRIAL PARK:
IMPACTS ON AGRICULTURE

1. INTRODUCTION

Pūlama Lānaʻi proposes to develop the Miki Basin Industrial Park (the Project) on an approximately 200-acre site (the Project Area), located east of the Lānaʻi Airport in the Miki Basin area, Lānaʻi, Hawaiʻi.

This report addresses the impacts of the Project on agriculture. The material below gives information about the Project, the agricultural conditions of the Project Area, past agricultural uses of the land, the impact of the Project on existing agricultural operations in and near the Project Area, the impact of the Project on the growth of diversified-crop farming, benefits of the Project that would offset adverse agricultural impacts, and consistency of the Project with State and County agricultural policies. The Appendix provides a summary of State and County goals, objectives, policies, and guidelines related to agricultural lands.

2. PROJECT INFORMATION

a. Project Location and TMK

As shown in Figure 1 (all Figures follow the body of the report), the Project Area is situated approximately 3.2 miles southwest of Lānaʻi City. The Project Area is bordered on the west by the Lānaʻi Airport and on the north, east, and south by open lands which were historically utilized for pineapple plantation (see Figure 2). The Tax Map Key (TMK) for the Project Area is (2)4-9-002:061(por.).

b. Project Description

Pūlama Lānaʻi proposes the Miki Basin Industrial Park which will include 100 acres of light industrial and 100 acres of heavy industrial zoned lands (see Figure 3).

c. Land Classifications and Required Approvals

Current land classifications of the Project Area and proposed changes are as follows:

<u>State Districts</u>

- Current: Agricultural (See Figures 4 and 5)
- Proposed: Urban

REF-189

County Designations

- Lānaʻi Community Plan
  - Current: Heavy Industrial and Light Industrial Area) (see Figure6)
- Maui County Zoning
  - Current: Agricultural
  - Proposed: M-1, Light Industrial (100 acres)
    M-2, Heavy Industrial (100 acres)

3. AGRICULTURAL CONDITIONS

a. Soil Types

As shown in Figure 7, the Project Area contains six (6) soil types. Their acreages are shown in Table 1 by their quality as rated by the Natural Resources Conservation Service (NRCS), formerly known as the Soil Conservation Service.

For each of the six (6) soil types, the complete name, the range of slopes, and soil descriptions are:

- **MuA: Molokaʻi silty clay loam, 0 to 3 percent slopes.**

  The Molokaʻi series consists of well drained soils on uplands on the islands of Maui, Lānaʻi, Molokaʻi, and Oʻahu. The MuA soils are on smooth slopes and the surface layer is dark reddish-brown silty clay loam about 15 inches think. The subsoil, about 57 inches thick, is dark reddish brown silty clay loam that has prismatic structure. The material at depths between 35 and 64 inches is moderately compact in place. The soils that are used for pineapple are commonly very strongly acid in the surface layer. Runoff is slow and the erosion hazard is slight.

- **MuB: Molokaʻi silty clay loam, 3 to 7 percent slopes.**

  The MuB soils are characterized by 3 to 7 percent slopes. Included in mapping were a few small areas that are eroded to soft, weathered rock. Runoff is slow to medium and the erosion hazard is slight to moderate. This soil is used for sugar cane, pineapple, pasture, wildlife habitat, and homesites.

- **MuC: Molokai silty clay loam, 7 to 15 percent slopes.**

  The MuC soils are characterized by 7 to 15 percent slopes. The soils occur on knolls and sharp slope breaks. Runoff is medium and the erosion hazard is moderate. This soil is used for sugar cane, pineapple, pasture, wildlife habitat, and homesites.

- **UwB: Uwala silty clay loam, 2 to 7 percent slopes.**

  The Uwala Series consists of well drained soils on uplands on the island of Lānaʻi. The UwB soils have smooth slopes and included in mapping were small, severely eroded areas. Runoff is slow to medium, and the erosion hazard is slight to moderate. The soils are strongly acid in the surface layer and medium acid in the subsoil.

- **UwC: Uwala silty clay loam, 7 to 15 percent slopes.**

  The UwC soils are characterized by 7 to 15 percent slopes. Runoff is medium and the erosion hazard is moderate. Workability is slightly difficult because of the slope. This soil is used primarily for pineapple and small areas are used for wildlife habitat.

- **WrA: Waikapu silty clay loam, 0 to 3 percent slopes.**

  The Waikapu series consist of well drained soils in uplands on the islands of Lānaʻi and Molokaʻi. The WrA soils are characterized by 0 to 3 percent slopes and found on uplands in depressions on old alluvial fans. The soil is typically slightly acid to neutral but is strongly acid to very strongly acid in the surface layer in areas where pineapple is grown. There are a few stones on the surface and a few shallow gullies. Runoff is slow and the erosion hazard is slight.

Table 1. Miki Basin Industrial Park: Soil Types and NRCS Ratings

Soil Types	Acres		NRCS Rating
MuA	44.9	22.5%	I
MuB	88.4	44.2%	IIe
MuC	1.5	0.7%	IIIe
UwB	27.0	13.5%	IIe
UwC	19.5	9.7%	IIIe
WrA	18.7	9.4%	I
Total	**200.0**	**100%**	

b. Soil Characteristics

Land in the Project Area exhibits a number of favorable characteristics for farming, including gentle sloping (and well drained soils. However, due to lack of available irrigation water, the Project Area is not suitable for intensive field farming. The Project Area and the surrounding areas were historically used for pineapple production, which only requires relatively little water. Also, soils in the Project Area are acidic on the surface layer.

REF-190

c. Soil Ratings

Three (3) classification systems are commonly used to rate Hawai‘i soils: (1) Land Capability Grouping, (2) Agricultural Lands of Importance to the State of Hawai‘i, and (3) Overall Productivity Rating.

Land Capability Grouping (NRCS Rating)

The 1972 Land Capability Grouping by the U.S. Department of Agriculture, NRCS rates soils according to eight (8) levels, ranging from the highest classification level “I” to the lowest “VIII”.

Assuming irrigation, approximately 63.7 acres (31.8%) of the Project Area have soils that are rated in Class I, which have few limitations that restrict their use (see Table 1). Approximately 115.4 acres (57.7%) of the Project Area have soils that are rated in Class IIe. Class II soils have moderate limitations that reduce the choice of plants or require moderate conservation practices. The subclassification “e” indicates that the limitations are due to erosion. The reminder of the Project Area, approximately 21.0 acres (10.5%), is characterized as having soils that are rated Class IIIe. Class III soils have severe limitations that reduce the choice of plants, require special conservation practices, or both.

These ratings ignore the lack of irrigation water for the Project Area.

Agricultural Lands of Importance to the State of Hawai‘i (ALISH)

ALISH ratings were developed in 1977 by the NRCS, UH College of Tropical Agriculture and Human Resources, and the State of Hawai‘i, Department of Agriculture. This system classifies land into three (3) broad categories: (a) “Prime” agricultural land which is land that is best suited for the production of crops because of its availability to sustain high yields with relatively little input and with the least damage to the environment; (b) “Unique” agricultural land which is non-Prime agricultural land used for the production of specific high-value crops; and (c) “Other” agricultural land which is non-Prime and non-Unique agricultural land that is important to the production of crops.

The entire Project Area has soils that are rated “Unique” (see Figure 8). This rating reflects the past use of the land for growing pineapple.

Overall Productivity Rating (LSB Rating)

In 1967, the UH Land Study Bureau (LSB) developed the Overall Productivity Rating, which classifies soils according to five (5) levels, with “A” representing the class of highest productivity and “E” the lowest.

The majority of the Project Area has soils rated D, with a small area rated E (see Figure 9). The low rating reflects the lack of irrigation water for the Project Area.

Summary Evaluation of Soil Quality

The Project Area has lands that are considered good farmland based on the soil quality. The land is characterized as “Unique” farmland by ALISH and 89.5 percent of the Project Area is rated I or II by NRCS, indicating that it has few or moderate limitations for farming. The Project Area is relatively flat with well drained soils that are able to sustain high yields, as is evidenced by decades of pineapple cultivation.

However, this evaluation ignores the lack of irrigation water.

d. Slopes

Most of the Project Area has slopes of less than 4%.

e. Climatic Conditions

Like other areas in Hawai‘i, the island of Lāna‘i has a mild semitropical climate that is due primarily to three factors: (1) Hawai‘i’s mid-Pacific location near the Tropic of Cancer, (2) the surrounding warm ocean waters that vary little in temperature between the winter and summer seasons, and (3) the prevailing northeasterly tradewinds that bring air having temperatures which are close to those of the surrounding waters.

Solar Radiation

The Project Area receives a moderate level of sunshine, with average daily insolation of about 420 calories per square centimeter per day.

Rainfall

Average annual rainfall at the Project Area is approximately 20 inches. Most of this rainfall occurs during the winter rainy season (October through April), while the summer months (May through September) are hot and dry.

Temperatures

Average temperatures range from the mid-60s in the winter to the low 70s in the summer.

Winds

The prevailing surface winds are tradewinds that blow between the islands of Maui and Moloka‘i. This wind increases evaporation and soil erosion on the north and east sides of Lāna‘i. Occasional strong winds can cause crop damage if unprotected by windbreaks.

REF-191

f. Irrigation Water

Lana‘i has five (5) water systems, including two (2) drinking water systems, one (1) brackish water system used for irrigation, and two (2) reclaimed water systems, also used for irrigation. Historically, fields on the island of Lāna‘i were irrigated with a combination of surface water from Maunalei Valley and groundwater from wells once used for pineapple cultivation. Figure 10 presents the existing water system on Lāna‘i. All waterlines near the Project Area convey chlorinated water, or they have been abandoned.

Due to a limited amount of potable water on Lāna‘i, brackish groundwater and treated wastewater are used to irrigate the golf courses and resort landscaping. Water is not available to support extensive diversified crop farming on the Lāna‘i fields.

g. Local Advantages and Disadvantages

Lāna‘i Island Market

The Project Area is well-located for supplying the Lāna‘i Island market because of the relatively short distance from the Project Area to Lāna‘i City (the island’s commercial and population center) and to Manele Resort.

The Lāna‘i Island market is relatively small: according to the U.S. Census American Community Survey (ACS) 5-Year Estimate, the resident population of Lāna‘i between 2013 and 2017 was estimated to be 3,203.

Maui Island Market

Lāna‘i farmers are at a disadvantage when competing against Maui farmers because of inter-island shipping costs, delays, and extra handling. There is no regular barge service between Lāna‘i and Maui Island.

The Maui County market is significant, with about 166,260 residents in 2017.

O‘ahu Market

All neighbor island farmers are at a disadvantage when competing against O‘ahu farmers in supplying the Honolulu market due to inter-island shipping costs, delays, and extra handling. In comparing barge and air-cargo services, shipping by barge is less expensive and larger loads can be shipped, but the shipments are slow and infrequent. Air service is faster and frequent, but it is far more expensive, and capacities are limited.

In 2017, O‘ahu’s population was estimated to be about 988,650 residents.

Mainland Market

Compared to Hawai‘i, the mainland market is enormous: in 2017, the U.S. population waas estimated to be 325.7 million. In supplying this market with products that can be

carried by container ship—i.e., products having long shelf-lives such as coffee, nuts, and canned fruit—most neighbor-island farmers are competitive with farmers on O‘ahu. Even though freight from must first be barged to Honolulu then transferred onto a container ship, Matson’s overseas shipping service includes inter-island barge service at no additional fee: except for some minor port charges, Matson charges a common fare for all islands. However, Matson does not service Lāna‘i, so additional shipping fees are required when exporting to the mainland.

In the case of fresh products that must be shipped by air to the mainland—i.e., products having short shelf-lives such as fresh vegetables, fruits, and flowers—farmers on Lāna‘i are at a disadvantage compared to O‘ahu farmers because most mainland air cargo is shipped via Honolulu International Airport. Compared to farmers on O‘ahu, Lāna‘i farmers encounter additional costs, delays, and handling to cover inter-island air-cargo service and transferring the fresh produce from small inter-island aircraft to large overseas aircraft.

In the U.S. mainland market, Hawai‘i farmers must also compete against farmers on the mainland and in Mexico, Central and South America, Southeast Asia, etc. Most of the competing farm areas have lower production and delivery costs than Hawai‘i does. Competing against Mexico is particularly difficult given existing trade agreements and Mexico’s proximity to major U.S. markets.

Summary of Locational Advantages

In terms of location, farmers on the island are relatively well-situated to supply the small Lāna‘i Island market..

However, compared to farmers on O‘ahu and the other islands, they are at a disadvantage in supplying the Honolulu and mainland markets.

h. Summary of Agricultural Conditions

The Project Area has agronomic conditions that are unsuitable for field farming to supply crops to Lāna‘i markets, or for export to O‘ahu or the mainland. The problem is a lack of irrigation water.

Except for water, the Project Area has favorable agronomic conditions: soils are good; solar radiation is moderate; and the trucking distances to Lāna‘i City and Mānele Resort are short. However, Lāna‘i farmers are at a competitive disadvantage in supplying the O‘ahu and mainland markets because of shipping costs.

4. PAST AGRICULTURAL USES

In 1922, James Dole purchased nearly the entire island of Lāna‘i and began developing a plantation for his Hawaiian Pineapple Company, Ltd. (HAPCo). Pineapple was suitable for

REF-192

Lānaʻi's agricultural conditions because Lānaʻi has fertile soils and pineapple requires relatively little water. For almost 70 years, the island of Lānaʻi was the world's largest pineapple plantation with more than 18,000 acres of cultivated lands.

In 1931, Castle & Cooke purchased 21% of the shares of HAPCo, and by 1961 owned the entire company which by then had been renamed Dole Food Company.

In 1980s and 1990s, stiff competition from plantations in Latin America and the Philippines brought declining profitability to the Hawaiʻi pineapple industry.

In 1985, David H. Murdock purchased Castle & Cooke, which owned approximately 98% of the island of Lānaʻi. Pineapple cultivation was slowly phased out, with the final harvest in 1992. By then, the island's economy was shifting from agriculture to tourism.

Since the end of pineapple cultivation on Lānaʻi, the Project Area and the surrounding former pineapple plantation lands have been fallow.

5. EXISTING AND FUTURE COMMERCIAL FARMING ON LĀNAʻI

a. Existing Farms

Only one commercial farmer operates on Lānaʻi, and he sells fresh produce to local grocery stores and the hotels. In addition, some part-time farmers grow crops for personal consumption, and some sell to the grocery stores.

b. Agricultural Park

There is a plan for a 100-acre agricultural park on the island of Lānaʻi. In 1992, the Land Use Commission required Castle & Cooke's Lānaʻi Resort to set aside 100 acres for the development and operation of an agricultural park by the State Department of Agriculture and County of Maui for the residents of Lānaʻi. This was a condition for approving the Manele Golf Course. However, there has not been any progress on developing the park due to a lack of interest.

c. Hydroponic Farm

Sensei Farms Lānaʻi is developing a hydroponic farm to supply fresh produce to local markets, and possibly to off-island markets. Ten (10) greenhouses are being planned, each of which will cover nearly a half acre (160 feet by 124 feet). One of the major advantages of hydroponic farming is that it requires relatively little water compared to field farming. The greenhouses will be powered by an off-grid photovoltaic system.

A Head House building is also planned, which will include a lab, conference rooms, a dining room for employees, offices, a locker room, multi-function space, and a kitchen. The kitchen will be used for cooking demonstrations and meal preparation using produce from the hydroponic farm.

6. IMPACT ON AGRICULTURAL OPERATIONS IN THE PROJECT AREA

There are no existing agricultural operations at the Project Area. As such, there will be no adverse impacts to existing agricultural operations.

7. IMPACT ON THE GROWTH OF AGRICULTURE

The development of the Project will result in a loss of 200 acres of fallow agricultural lands on Lānaʻi. However, there are approximately 18,000 acres of former plantation lands on Lanai which remain available for agricultural use.

Statewide, the remaining supply of available farmland released by plantation agriculture exceeds 200,000 acres. This is about 3.7 times the amount of land in crop—about 54,000 acres. About 15,000 acres of the 54,000 acres are used for food crops grown primarily for the Hawaiʻi market, while about 39,000 acres are used primarily for export crops (pineapple, macadamia nuts, coffee, seeds, flowers, etc.).

The supply of available farmland is vast because of the statewide contraction and closure of many sugarcane and pineapple plantations during the past four decades, combined with the subsequent slow growth of diversified-crop farming (i.e., all crops other than sugarcane and pineapple)—see Figure 11.

Figure 11 also shows the growth of diversified-crop acreage. Even though Hawaiʻi has a long history of strong support for its agriculture industry, little growth in diversified-crop acreage has occurred since 1983, with the single exception being seed crops. However, seed acreage has declined in recent years, and the seed-crop industry faces public opposition over their development of genetically modified organisms (GMO) crops.

The lack of significant growth of diversified crops reflects increased competition from overseas resulting from technology and other advances that have improved the delivery of fresh produce (faster, less spoilage, better coordination of supply to demand), along with trade agreements which increased food exports to the U.S. from low-cost producers in Mexico, Central America, South America, and elsewhere.

Following the plantation closures on Oʻahu, vegetable and melon acreage expanded on the capital island, but this was followed by declines on the Neighbor Islands for the farmers who exported to Oʻahu.

In summary, the loss of 200 acres of agriculture land on Lānaʻi, plus the loss of agricultural land due to other projects (i.e., the cumulative impact), is too small to affect the growth of diversified agriculture on Lānaʻi or Statewide.

8. OFFSETTING BENEFITS

The loss of 200 acres of agricultural land will be offset by the following benefits of the Project:

<u>Construction Activity</u>

- Construction jobs and income associated with Project development.

- Indirect jobs and income generated by purchases of goods and services by construction companies and families of construction workers.
- State tax revenues (excise taxes, personal income taxes, corporate income taxes, etc.) paid by construction companies and workers, and by companies and families that are supported by construction activity.

Operations, Full Development

- Goods and services provided by businesses of the Projects.
- Employment and income generated by onsite industrial activity.
- Tax revenues derived from County property taxes and State taxes (excise, personal income, and cooperate income).

9. CONSISTENCY WITH STATE AND COUNTY POLICIES

a. Availability of Lands for Agriculture

The Hawai‘i State Constitution, the Hawai‘i State Plan, the State Agriculture Functional Plan, the County of Maui 2030 General Plan, and the County’s Lāna‘i Community Plan call directly or implicitly for preserving the economic viability of plantation agriculture and promoting the growth of diversified agriculture. To accomplish this, an adequate supply of agriculturally suitable lands and water must be assured.

With regard to plantation agriculture, the Project Area is no longer part of a pineapple plantation. The last pineapple harvest was in 1992.

With regard to diversified agriculture, the Project will not result in the loss of any existing agricultural operation since the Project Area is not currently being cultivated and has not been cultivated since 1992.

Although the Project will reduce the availability of agricultural land by about 200 acres, the Project will not limit the growth of diversified agriculture statewide or on Lāna‘i since ample agricultural land is available due to the loss of nearly all plantations in Hawai‘i.

b. Conservation of Agricultural Lands

In addition to the above, State and County policies call for conserving and protecting prime agricultural lands, including protecting farmland from urban development.

It should be noted that many of the State agricultural policies were written before the major contraction of plantation agriculture (from 1981 to 2016), and assume implicitly that profitable agricultural activities eventually will be available to utilize all available agricultural lands. This has proven to be a questionable assumption in view of the enormity of the contraction of plantation agriculture, the abundant supply of farmland that came available for diversified agriculture, and the slow growth in the amount of land being utilized for diversified agriculture.

Furthermore, discussions in the State Agriculture Functional Plan recognize that redesignation of lands from Agricultural to Urban and/or Rural should be allowed *“... upon a demonstrated change in economic or social conditions, and where the requested redesignation will provide greater benefits to the general public than its retention in ...agriculture;”* that is, when an *“overriding public interest exists.”* The enormous contraction of plantation agriculture, which resulted in the supply of agricultural land far exceeding demand, constitutes a major change in economic conditions. Moreover, the Project will provide community benefits (jobs, tax revenues, etc.) that far exceed the benefits of leaving the land in agriculture. In practice, the Project is expected to have no significant impact on agricultural activity since ample land is available statewide to accommodate the anticipated growth of diversified agriculture.

c. State and County of Maui Land Use Plans

The Lāna‘i Community Plan currently designates the Project Area for Light/Heavy Industrial use. However, the entire Project Area is designated “Agricultural” under the State Land Use District and the Maui County Zoning. Because the Project Area is intended for transition to industrial type uses as evidenced by the Lāna‘i Community Plan, Pūlama Lāna‘i will request an amendment to the State Land Use District and the County zoning for the Project Area to be consistent with the Community Plan.

10. REFERENCES

Act 25, S.B. No. 1158, April 15, 1993.

County of Maui, Department of Water Supply. *Lanai Water Use & Development Plan, 2011*.

County of Maui, Planning Department. *County of Maui 2030 General Plan Countywide Policy Plan*. 2010.

County of Maui, Planning Department. *Lanai Community Plan*. 2002.

Giambelluca, T.W., Q. Chen, A.G. Frazier, J.P. Price, Y.-L. Chen, P.-S. Chu, J.K. Eischeid, and D.M. Delparte, 2013: *Online Rainfall Atlas of Hawai‘i*. Bull. Amer. Meteor. Soc. 94, 313-316, doi: 10.1175/BAMS-D-11-00228.1.

Giambelluca, T.W., X. Shuai, M.L. Barnes, R.J. Alliss, R.J. Longman, T. Miura, Q. Chen, A.G. Frazier, R.G. Mudd, L. Cuo, and A.D. Businger. 2014. *Evapotranspiration of Hawai‘i. Final report submitted to the U.S. Army Corps of Engineers—Honolulu District, and the Commission on Water Resource Management, State of Hawai‘i.*

Lanai Culture & Heritage Center. *Pineapple of Lāna‘i.* https://www.lanaichc.org/pineapple-history.htm (accessed on November 6, 2018).

Lanai Water Company. *History.* http://lanaiwatercompany.com/about-us/history/ (accessed on November 13, 2018)

Pacific Business News. *100-acre agriculture park on billionaire Larry Ellison's Lanai gaining traction* (April 3, 2017). https://www.bizjournals.com/pacific/news/2017/04/03/100-acre-agriculture-park-on-billionaire-larry.html?ana=RSS%26s%3Darticle_search&utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+bizj_pacific+%28Pacific+Business+News+of+Honolulu%29 (Accessed on November 14, 2018)

R.M. Towill Corporation. *Heavy/Light Industrial Parcels Affecting Lot 13-A-1-A (Map 15) of Land Court Consolidation 170*. 2018.

State Land Use Commission. *State Land Use District Maps*. Effective dated December 20, 1974.

State of Hawai'i, Department of Agriculture. *Agricultural Lands of Importance to the State of Hawai'i*. 1977.

State of Hawai'i, Department of Agriculture. *State Agriculture Functional Plan*. 1991.

State of Hawai'i. *Hawaii State Planning Act, Chapter 226*, Hawai'i Revised Statutes.

The Maui News. *Ellison's hydroponic farm on Lanai is set to open by late '18* (April 1, 2018). http://www.mauinews.com/news/local-news/2018/04/ellisons-hydroponic-farm-on-lanai-is-set-to-open-by-late-18/ (Accessed on November 14, 2018).

U.S. Census Bureau. American Community Survey 5 Year Estimate, 2013-2017.

FIGURES

REF-195

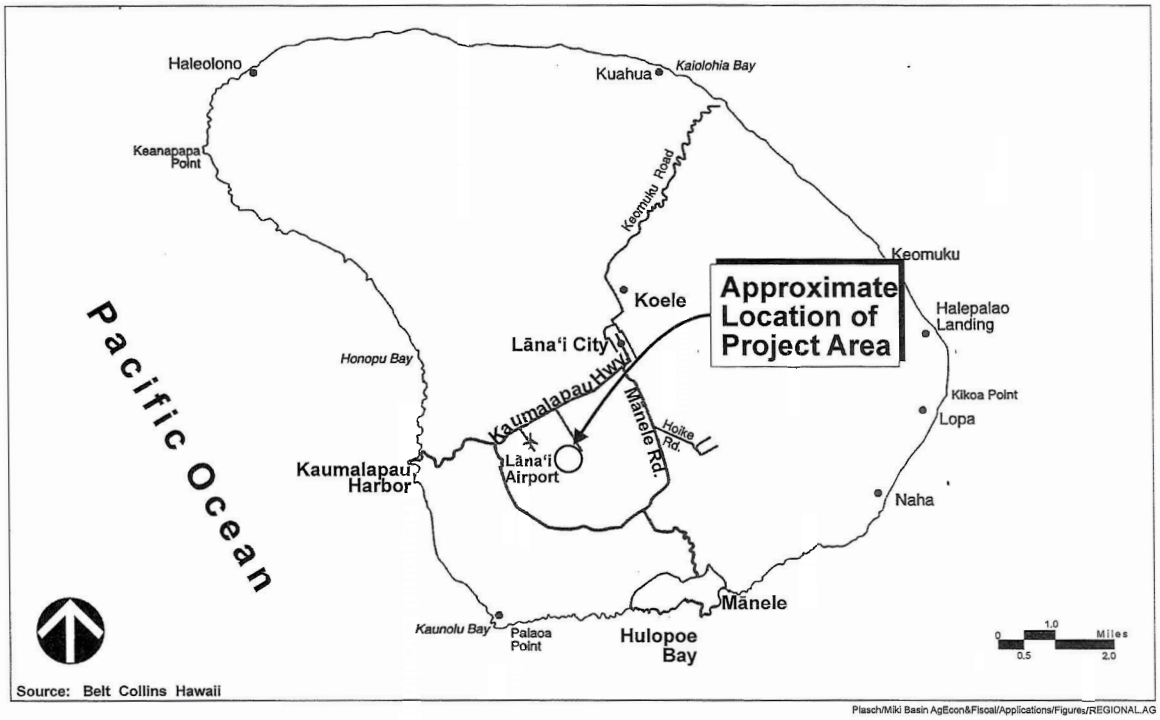


Figure 1. Regional Location Map

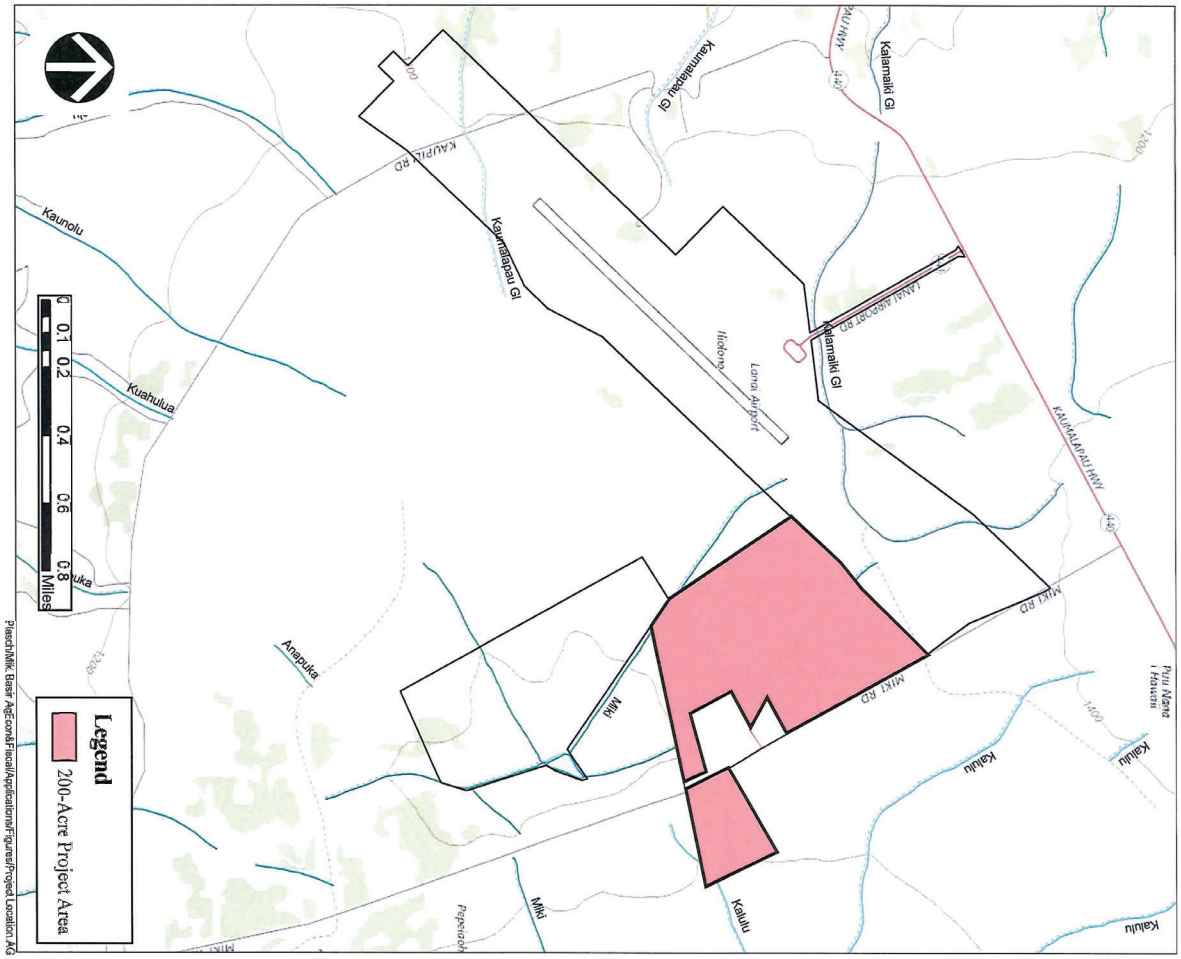


Figure 2. Project Location Map

REF-196

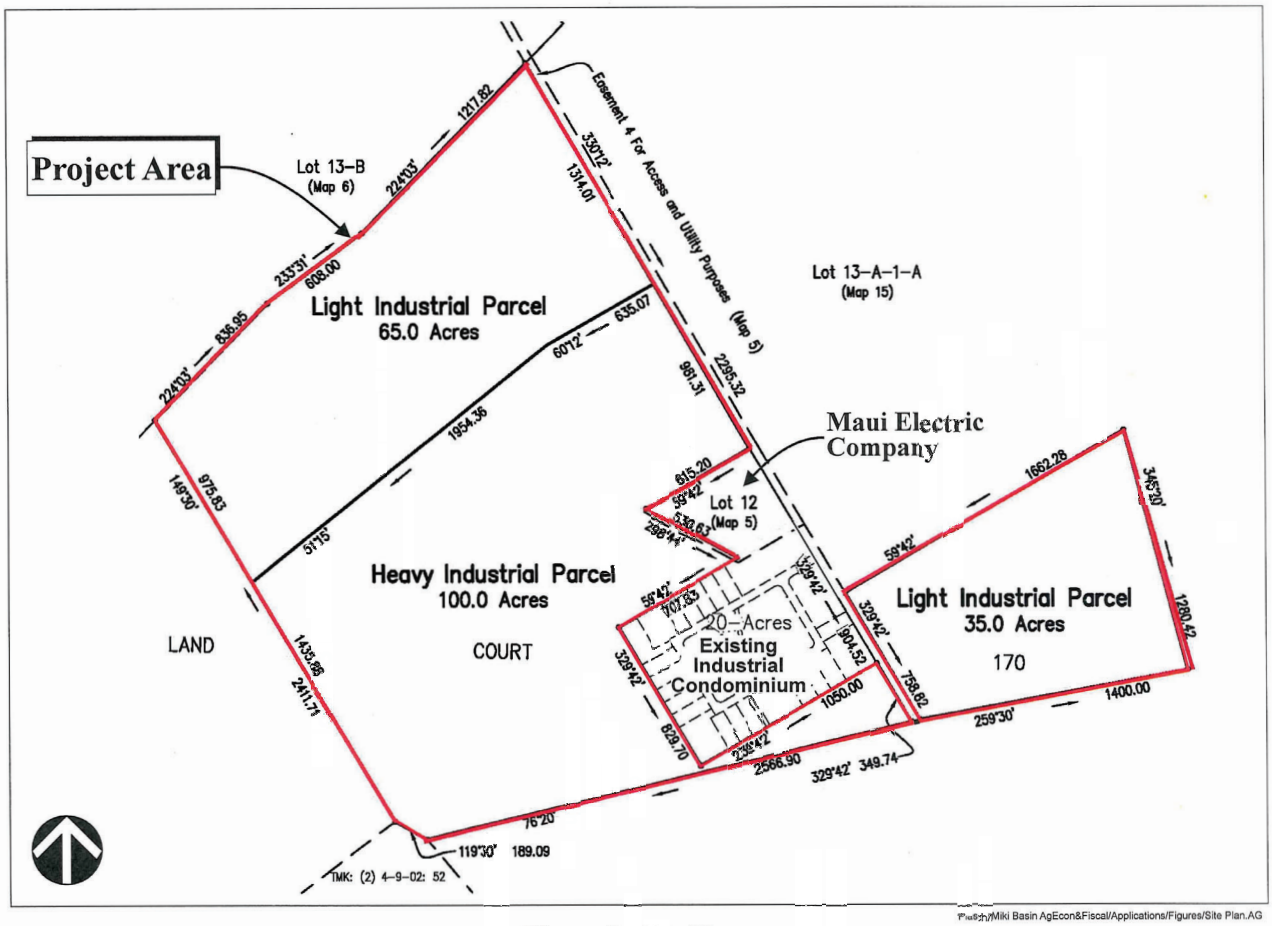
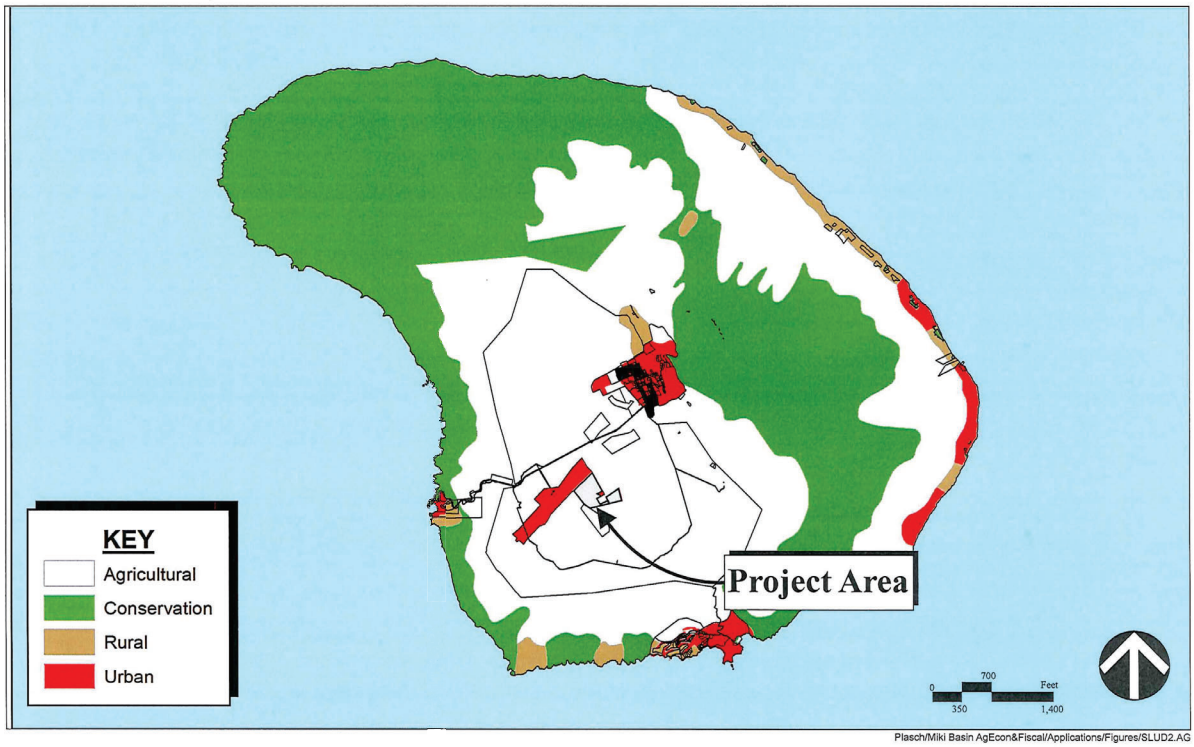


Figure 3. Site Plan



Plasch/Miki Basin AgEcon&Fiscal/Applications/Figures/SLUD2.AG

Figure 4. State Land Use District Classification Map for Island of Lānaʻi

REF-197

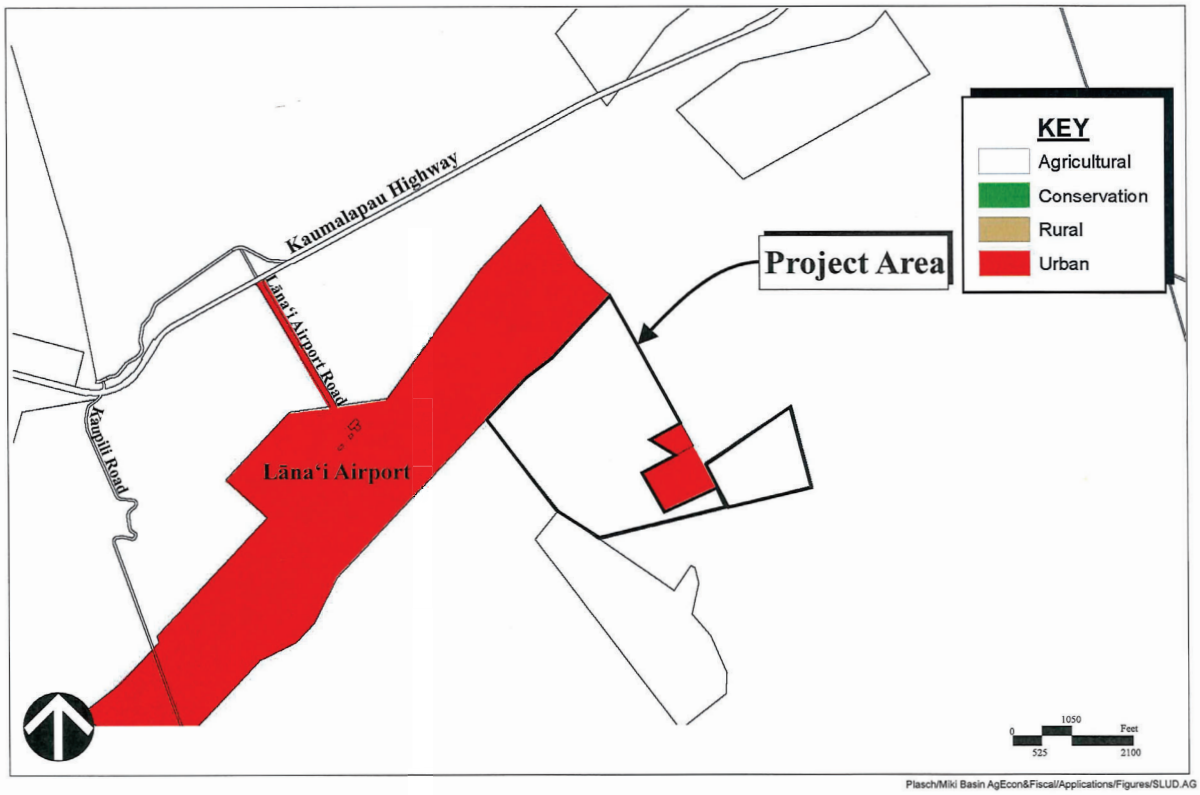


Figure 5. State Land Use District Classification Map for Project Area

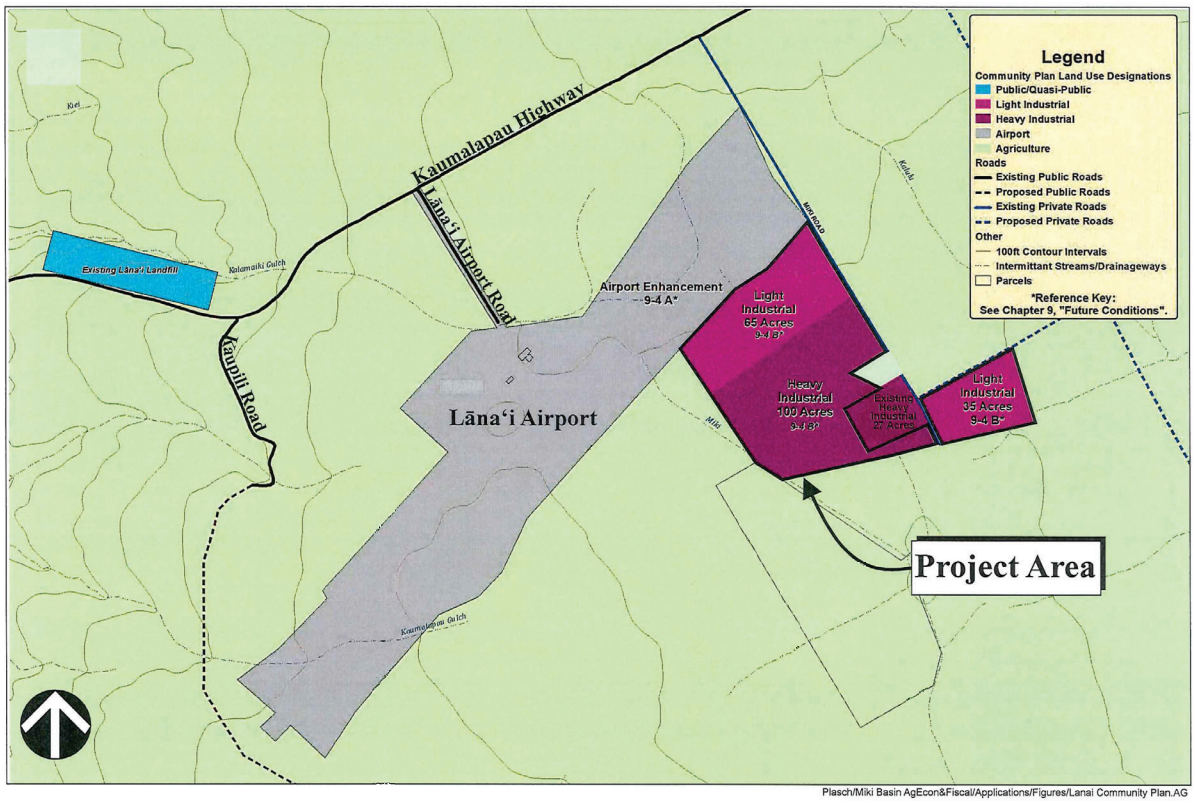


Figure 6. Lāna'i Community Plan Map

REF-198

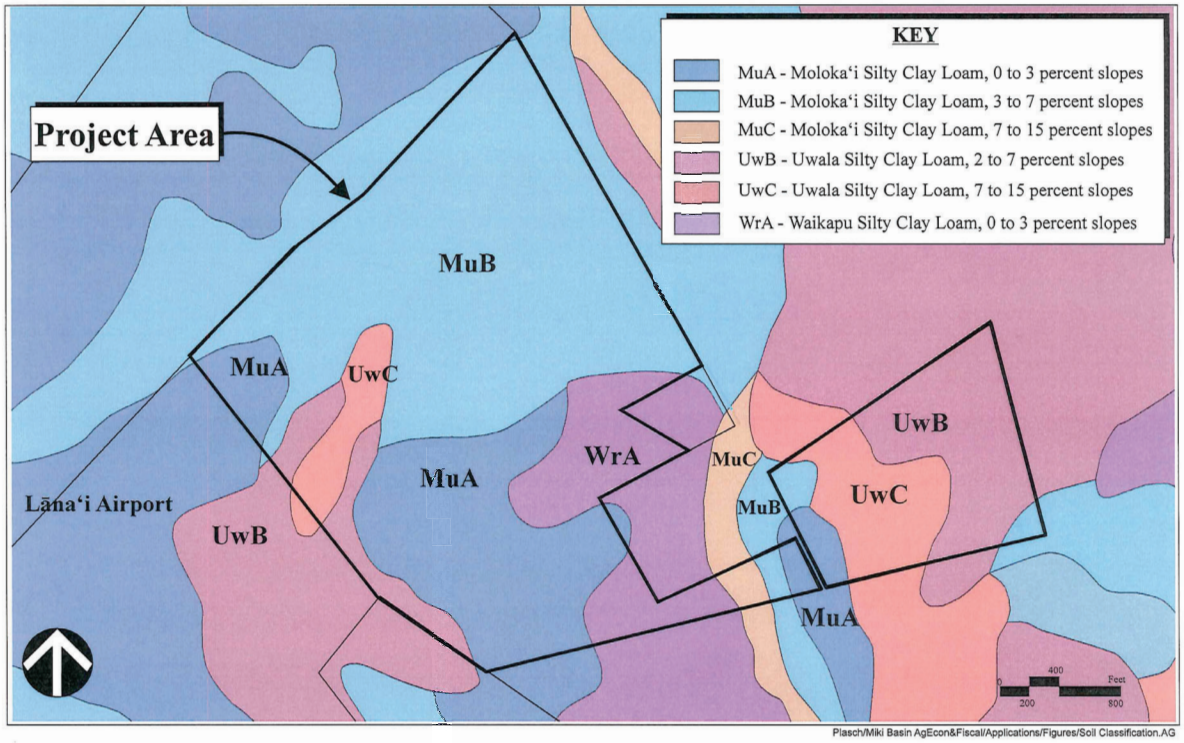


Figure 7. Soil Classification Map

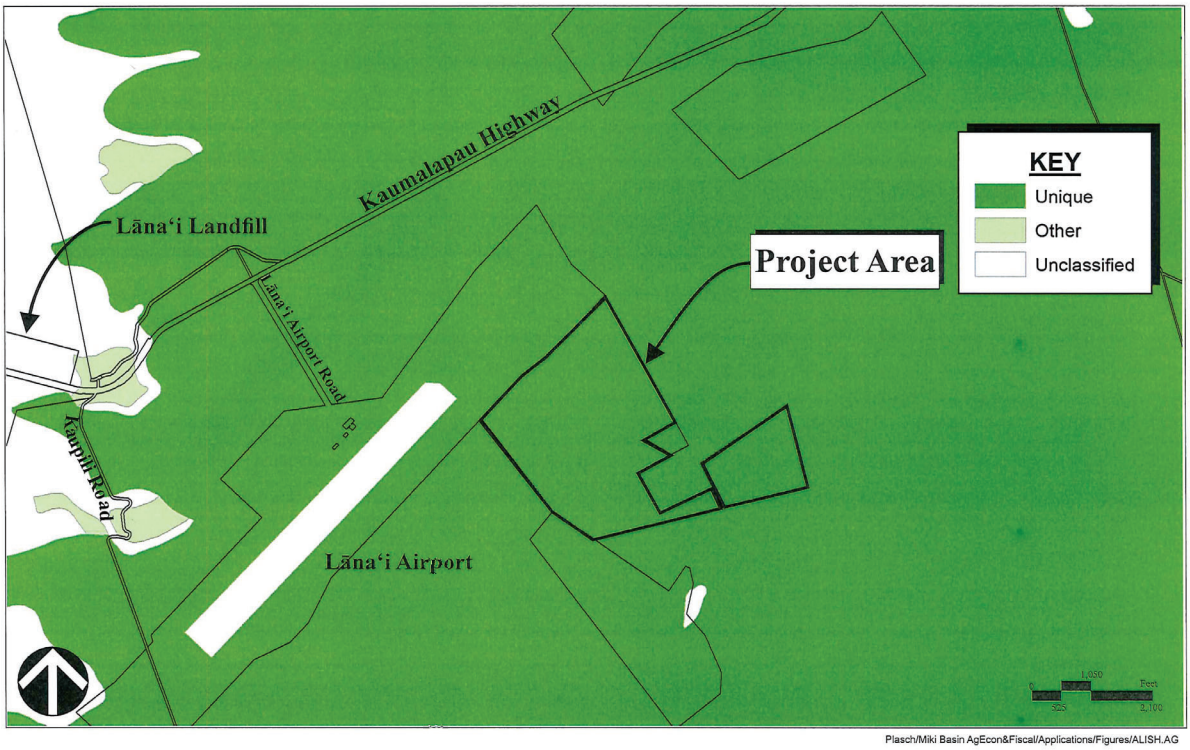


Figure 8. ALISH Map

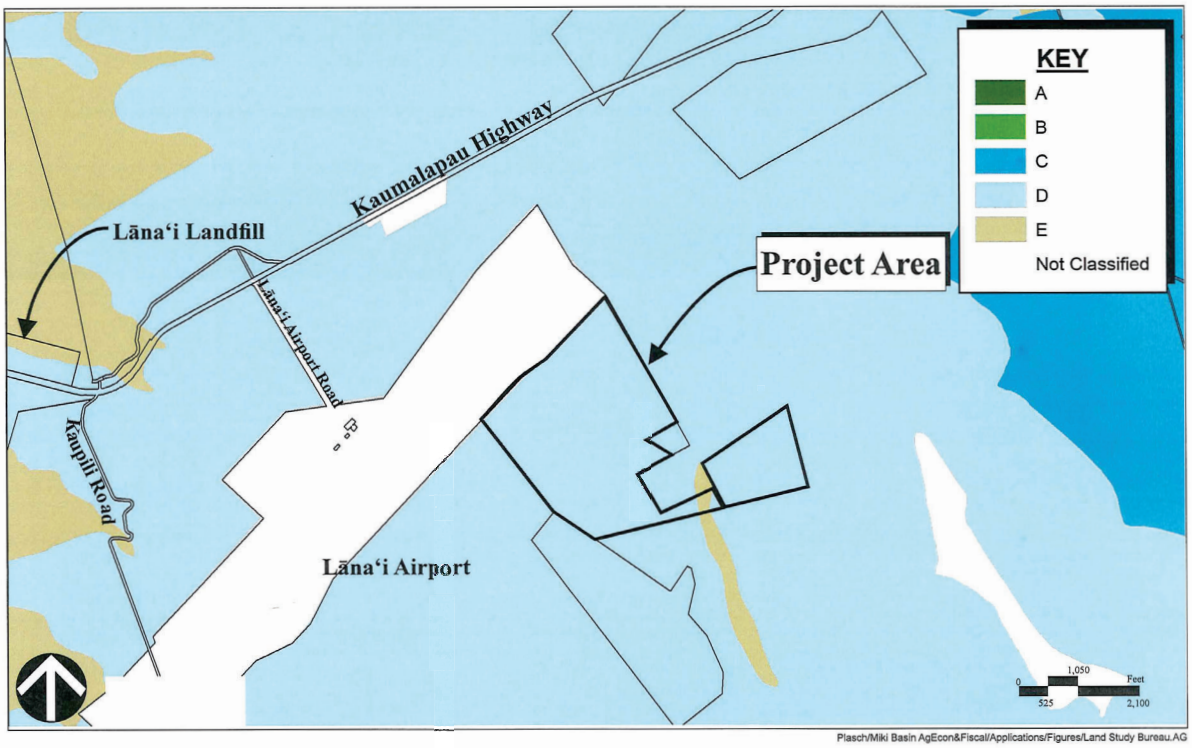


Figure 9. Land Study Bureau Map

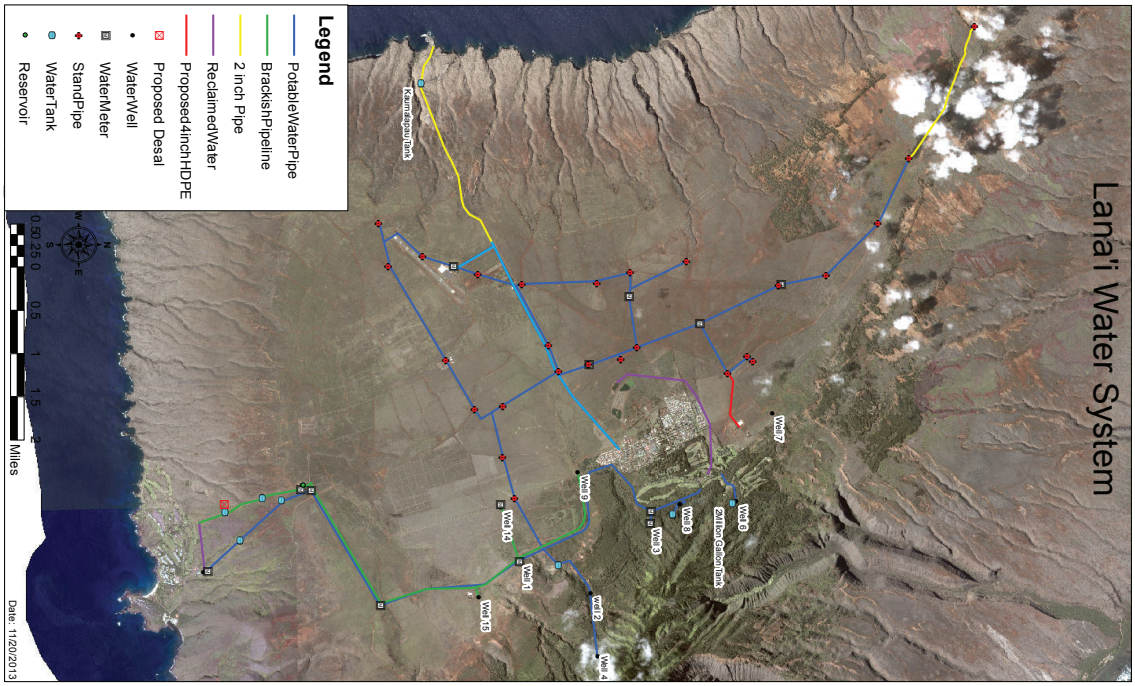


Figure 10. Lānaʻi Water System

REF-200

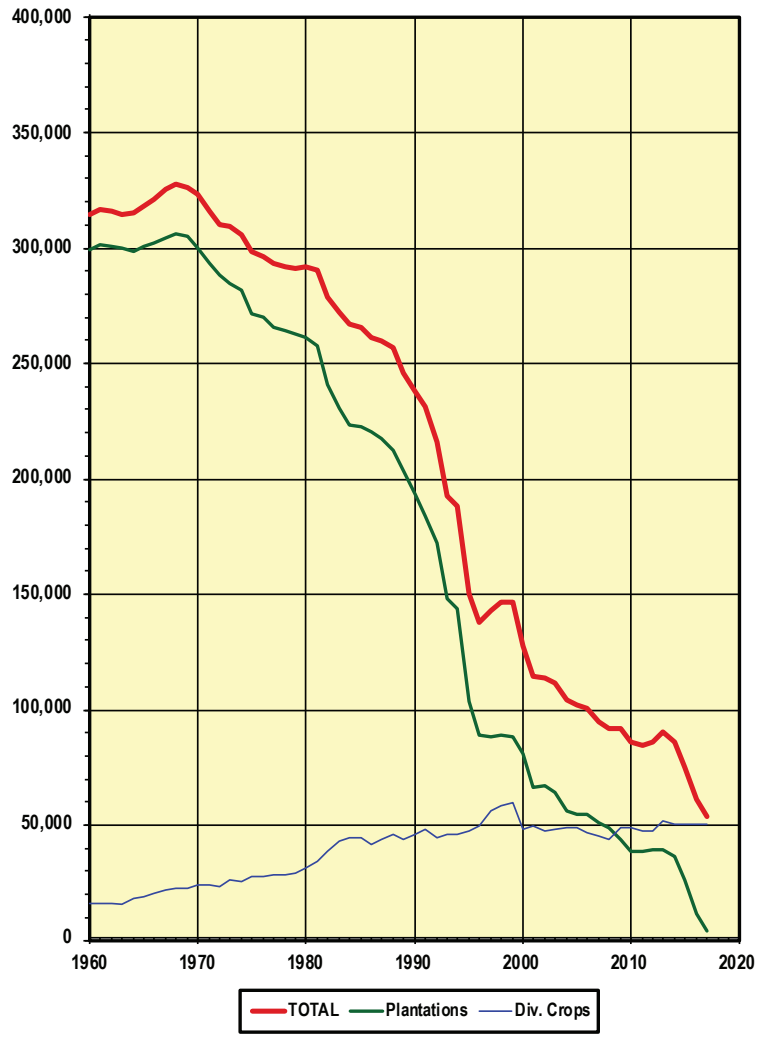


Figure 11. Acreage in Crop, Hawaii: 1960 to 2017

APPENDIX

REF-201

APPENDIX

STATE AND COUNTY GOALS, OBJECTIVES, POLICIES AND GUIDELINES RELATED TO AGRICULTURAL LANDS

1. **HAWAI'I STATE CONSTITUTION** (Article XI, Section 3):

   ...to conserve and protect agricultural lands, promote diversified agriculture, increase agricultural self-sufficiency and assure the availability of agriculturally suitable lands...

2. **HAWAI'I STATE PLAN** (Chapter 226, Hawaii Revised Statutes, as amended):

Section 226-7 Objectives and policies for the economy--agriculture.

(a) Planning for the State's economy with regard to agriculture shall be directed towards achievement of the following objectives:

(1) Viability in Hawaii's sugar and pineapple industries.

(2) Growth and development of diversified agriculture throughout the State.

(3) An agriculture industry that continues to constitute a dynamic and essential component of Hawaii's strategic, economic, and social well-being.

(b) To achieve the agricultural objectives, it shall be the policy of the State to:

(2) Encourage agriculture by making best use of natural resources.

(10) Assure the availability of agriculturally suitable lands with adequate water to accommodate present and future needs.

(16) Facilitate the transition of agricultural lands in economically nonfeasible agricultural production to economically viable agricultural uses.

Section 226-103 Economic priority guidelines.

(c) Priority guidelines to promote the continued viability of the sugar and pineapple industries:

(1) Provide adequate agricultural lands to support the economic viability of the sugar and pineapple industries.

(d) Priority guidelines to promote the growth and development of diversified agriculture and aquaculture:

(1) Identify, conserve, and protect agricultural and aquacultural lands of importance and initiate affirmative and comprehensive programs to promote economically productive agricultural and aquacultural uses of such lands.

(10) Support the continuation of land currently in use for diversified agriculture.

Section 226-104 Population growth and land resources priority guidelines.

(b) Priority guidelines for regional growth distribution and land resource utilization:

(2) Make available marginal or non-essential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the agricultural district.

3. **AGRICULTURAL STATE FUNCTIONAL PLAN** (1991)

(Functional plans are guidelines for implementing the State Plan. They are approved by the Governor, but not adopted by the State Legislature.)

Objective H: Achievement of Productive Agricultural Use of Lands Most Suitable and Needed for Agriculture.

Policy H(2): Conserve and protect important agricultural lands in accordance with the Hawaii State Constitution.

Action H(2)(a): Propose enactment of standards and criteria to identify, conserve, and protect important agricultural lands and lands in agricultural use.

Action H(2)(c): Administer land use district boundary amendments, permitted land uses, infrastructure standards, and other planning and regulatory functions on important agricultural lands and lands in agricultural use, so as to ensure the availability of agriculturally suitable lands and promote diversified agriculture.

4. **COUNTY OF MAUI 2030 GENERAL PLAN, COUNTYWIDE POLICY PLAN (2010)**

Countywide goals, objectives, policies and actions

F. Strengthen the Local Economy

Objective

2. Diversify and expand sustainable forms of agriculture and aquaculture.

Policies

b. Prioritize the use of agricultural land to feed the local population, and promote the use of agriculture lands for sustainable and diversified agricultural activities.

e. Support ordinances, programs, and policies that keep agricultural land and water available and affordable to farmers.

Implementing Actions

c. Create agricultural parks in areas distant from genetically modified crops.

J. Promote Sustainable Land Use and Growth Management

Objective

2. Improve planning for and management of agricultural lands and rural areas.

Policies

a. Protect prime, productive, and potentially productive agricultural lands to maintain the islands' agricultural and rural identities and economies.

REF-202

c. Discourage developing or subdividing agriculturally designated lands when non-agricultural activities would be primary uses.

Implementing Actions

a. Inventory and protect prime, productive, and potentially productive agricultural lands from competing non-agricultural land uses.

5. COUNTY OF MAUI, LĀNA'I COMMUNITY PLAN (2016)

C. ENVIRONMENT AND NATURAL RESOURCES

3. **Goals, Policies, Actions**

Policies

4. Recognize and support agricultural forestry and game BMPs as key elements to maintain preserve and protect Lana island water and marine resources

6. REFERENCES

Act 25, S.B. No. 1158, April 15, 1993.

County of Maui. *County of Maui 2030 General Plan, Countywide Policy Plan.* Adopted by Ordinance No. 3732, effective on March 24, 2010.

Hawaii Department of Agriculture. *The Hawaii State Plan: Agriculture, State Functional Plan*. 1991.

Maui County Council. *Lāna'i Community Plan (2016).*

State of Hawaii, Office of State Planning, Office of the Governor. *The Hawaii State Plan, 1991.* 1991.

REF-203

APPENDIX

C

FLORA AND FAUNA STUDY

REF-204

FLORA AND FAUNA STUDY

MIKI BASIN 200 ACRE INDUSTRIAL DEVELOPMENT

KALULU AND KAUNOLŪ, LĀNAʻI

by:

Robert Hobdy
Environmental Consultant
Kokomo, Maui
April 2018

Prepared for:
Pūlama Lānaʻi

FLORA AND FAUNA STUDY
MIKI BASIN 200 ACRE INDUSTRIAL DEVELOPMENT
KALULU AND KAUNOLŪ, LĀNAʻI

INTRODUCTION

The Miki Basin 200 acre Industrial Development project is located on the inner slopes of Miki Basin and a small portion of Pālawai Basin in southwestern Lānaʻi to the east of Lānaʻi Airport. Miki Road runs through the project area and the project area also surrounds the Maui Electric Company Power Plant within the Basin. All of the lands within and around the project area are owned and managed by Pūlama Lānaʻi.

SITE DESCRIPTION

The project area is situated on gently to moderately sloping lands that were part of a large pineapple plantation. These lands have lain fallow for 25 years since the plantation closed in 1992 and are now overgrown with a dense grassland and shrubs. Soils consist of three series characterized as Waikapū silty clay loam, 0 – 3% slopes, Molokaʻi silty clay loam, 3 – 7% slopes and Uala silty clay loam, 7 – 15% slopes which are all variants of deep, well-drained soils of the upland plateau of Lānaʻi, (Foote et al, 1972). Rainfall averages about 20 inches per year with winter maximums (Armstrong, 1983). Elevations range between 1,150 feet and 1,310 feet above sea level.

SURVEY OBJECTIVES

This report summarizes the findings of a flora and fauna study of the proposed Miki Basin 200 Acre Industrial Development Project that was conducted in April 2018. The objectives of the survey were to:

1. Document what plant and animal species occur on the property or may likely occur in the existing habitat.

2. Document the status and abundance of each species.

3. Determine the presence or likely occurrence of any native flora and fauna, particularly any that are federally listed as Threatened or Endangered. If such occur, identify what features of the habitat may be essential for these species.

4. Determine if the project area contains any special habitats which if lost or altered might result in a significant negative impact on the native flora and fauna in this part of the island.

REF-205

BOTANICAL SURVEY REPORT

SURVEY METHODS

A walk-through botanical survey method was used to cover this 200 acre project area. All parts of this habitat were examined.

A complete inventory of all plant species was made with special attention focused on native plant species and whether any of these were federally protected Threatened or Endangered species that might require special attention or actions.

DESCRIPTION OF THE VEGETATION

The entire project area has lain fallow from agricultural use for 25 years, with some grazing occurring during a few of these years. The vegetation was a dense growth of grasses and shrubs. Thirty-nine plant species were recorded during the survey.

Two species were abundant throughout the project area, Guinea grass (*Megathyrsus maximus*) and lantana (*Lantana camara*). Another two species were common, sourgrass (*Digitaria insularis*) and Madagascar fireweed (*Senecio madagascariensis*). The remaining thirty-five species were either of uncommon or rare occurrence.

Just three common native plant species were found, ʻilima (*Sida fallax*), ʻuhaloa (*Waltheria indica*) and ʻaʻaliʻi (*Dodonaea viscosa*), all of which are widespread and common throughout Hawaii. These have persisted here in small numbers due to their hardy nature.

DISCUSSION AND RECOMMENDATIONS

The vegetation in this project area is dominated by hardy, invasive non-native species. Just three common native plant species, ʻilima, ʻuhaloa and ʻaʻaliʻi, were found here. None of these are of any conservation concern. No special habitats for native plants were found. Because of the above information, it is determined that there is nothing of special botanical concern with regard to this project. No recommendations with reference to plants are deemed necessary.

PLANT SPECIES LIST

Following is a checklist of all those vascular plant species inventoried during the field studies. Plant families are arranged alphabetically. Taxonomy and nomenclature of the flowering plants (Monocots and Dicots) are in accordance with Wagner et al. (1999).

For each species, the following information is provided:

1. Scientific name with author citation.
2. Common English or Hawaiian name.
3. Bio-geographical status. The following symbols are used:

   endemic = native only to the Hawaiian Islands; not naturally occurring anywhere else in the world.

   indigenous = native to the Hawaiian Islands and also to one or more other geographic area(s).

   non-native = all those plants brought to the islands intentionally or accidentally after western contact.

   Polynesian = brought by the Hawaiians during Polynesian migrations.
4. Abundance of each species within the project area:

   abundant = forming a major part of the vegetation within the project area.

   common = widely scattered throughout the area or locally abundant within a portion of it.

   uncommon = scattered sparsely throughout the area or occurring in a few small patches.

   rare = only a few isolated individuals within the project area.

REF-206

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
MONOCOTS			
POACEAE (Grass Family)			
Andropogon virginicus L.	broom sedge	non-native	uncommon
Bothriochloa pertusa (L.) A. Camus	pitted beardgrass	non-native	uncommon
Cynodon dactylon (L.) Pers.	Bermuda grass	non-native	rare
Digitaria insularis (L.) Mez ex Ekman	sourgrass	non-native	common
Eragrostis pectinacea (Michx.) Nees	Carolina lovegrass	non-native	rare
Megathyrsus maximus (Jacq.) Simon & Jacobs	Guinea grass	non-native	abundant
Melinis repens (Willd.) Zizka	Natal redtop	non-native	rare
DICOTS			
AMARANTHACEAE (Amaranth Family)			
Amaranthus spinosus L.	spiny amaranth	non-native	rare
Dysphania ambrosioides (L.) Mosyakin & Clemants	Mexican wormseed	non-native	rare
Dysphania carinata (R.Br.) Mosyakin & Clemants	keeled wormseed	non-native	uncommon
APOCYNACEAE (Dogbane Family)			
Asclepias physocarpa (E. Mey.) Schlecter	baloon plant	non-native	uncommon
ASTERACEAE (Sunflower Family)			
Ageratum conyzoides L.	maile hohono	non-native	rare
Conyza bonariensis (L.) Cronq.	hairy horseweed	non-native	uncommon
Emilia fosbergii Nicolson	red pualele	non-native	rare
Heterotheca grandiflora Nutt.	telegraph weed	non-native	uncommon
Senecio madagascariensis Poir.	Madagascar fireweed	non-native	common
Verbesina encelioides (Cav.) Benth. & Hook.	golden crown-beard	non-native	uncommon
BRASSICACEAE (Mustard Family)			
Lepidium virginicum L.	Virginia pepperwort	non-native	rare
CARYOPHYLLACEAE (Pink Family)			
Polycarpon tetraphyllum (L.) L.	four-leaved allseed	non-native	rare
CONVOLVULACEAE (Morning Glory Family)			
Ipomoea cairica (L.) Sweet	koali 'ai	non-native	rare
Ipomoea obscura (L.) Ker-Gawl.)	----------	non-native	rare
Ipomoea triloba L.	little bell	non-native	rare
EUPHORBIACEAE (Spurge Family)			
Euphorbia hirta L.	hairy spurge	non-native	rare
FABACEAE (Pea Family)			
Chamaecrista nictitans (L.) Moench	partridge pea	non-native	uncommon
Desmanthus pernambucanus(L.) Thellung	slender mimosa	non-native	rare

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
Indigofera suffruticosa Mill.	'inikō	non-native	uncommon
MALVACEAE (Mallow Family)			
Malvastrum coromandelianum (L.) Garcke	false mallow	non-native	rare
Sida ciliaris L.	bracted fanpetals	non-native	rare
Sida cordifolia L.	flannel sida	non-native	rare
Sida fallax Walpers	'ilima	indigenous	uncommon
Sida rhombifolia L.	arrowleaf sida	non-native	rare
Sidastrum micranthum (St. Hil.) Fryx.	sand mallow	non-native	uncommon
Waltheria indica L.	'uhaloa	indigenous	uncommon
OXALIDACEAE (Wood Sorrel Family)			
Oxalis corniculata L.	'ihi 'ai	Polynesian	rare
POLYGALACEAE (Milkwort Family)			
Polygala paniculata L.	root beer plant	non-native	rare
SAPINDACEAE (Soapberry Family)			
Dodonaea viscosa Jacq.	'a'ali'i	indigenous	rare
SOLANACEAE (Nightshade Family)			
Solanum linnaeanum Hepper & P. Jaeger	apple of Sodom	non-native	uncommon
VERBENACEAE (Verbena Family)			
Lantana camara L.	lantana	non-native	abundant
Verbena littoralis Kunth	ha'u ōwī	non-native	rare

REF-207

FAUNA SURVEY REPORT

SURVEY METHODS

A fauna survey was conducted in conjunction with the flora survey. All parts of the project area were covered. Observations were made with the assistance of binoculars. Notes were made of species, numbers and status as well as on tracks, scat and signs of feeding. An inventory was made of all of the animal species encountered.

In addition, an evening survey was conducted to observe crepuscular activities and calls, and to determine any occurrence of the Endangered Hawaiian hoary bat (*Lasirius cinereus semotus*) in the project area.

RESULTS

MAMMALS

Just one mammal species was observed in the project area. A herd of about 20 axis deer were seen and trails, tracks and feeding damage were everywhere. Nomenclature and taxonomy follow (Tomich, 1986).

A special effort was made to look for evidence indicating the presence of ōpeʻapeʻa or Hawaiian hoary bat by conducting an evening survey at two locations within the project area. A bat detecting device (Batbox III D) was employed, set to frequency of 27,000 Hertz that these bats are known to use when echolocating for flying insects. No bats were detected with the use of this device.

Other non-native mammals likely to frequent this area include rats (*Rattus* spp.), mice (*Mus domesticus*), feral cats (*Felis catus*) and occasionally domestic dogs (*Canis familiaris*).

BIRDS

Birdlife was of moderate occurrence in the project area. Twelve species were observed during three site visits, but none were particularly common. Taxonomy and nomenclature follow the American Ornithologists' Union (2018). Eight bird species were of modest occurrence, cattle egret (*Bubulcus ibis*), zebra dove (*Geopelia striata*), nutmeg mannikin (*Lonchura punctulata*), gray francolin (*Francolinus pondicerianus*), northern mockingbird (*mimus polyglottos*), common myna (*Acridotheres tristis*), Eurasian sky lark (*Alauda arvensis*) and Pacific golden-plover (*Pluvialis fulva*). The other four species were of rare occurrence.

Two native bird species were recorded, the indigenous and migratory kōlea or Pacific golden-plover and the endemic pueo or Hawaiian owl (*Asio flammeus sandwichensis*).

A few other non-native bird species may occasionally occur in this area, but this habitat is unsuitable for Hawaii's native forest birds or seabirds.

INSECTS

Insect life was rather sparse in this habitat during three site visits. Twelve non-native species were recorded, representing five insect Orders. Just one species was common throughout the project area, the monarch butterfly (*Danaus plexippus*). Two other species were uncommon, the cabbage butterfly (*Pieris rapae*) and the short-horned grasshopper (*Oedaleus abruptus*). Taxonomy and nomenclature follow Nishida et al (1992).

No native insect species were seen.

DISCUSSION AND RECOMMENDATIONS

The fauna recorded in this project area is largely non-native in character. Axis deer are abundant throughout the area and have significantly modified the habitat by reducing plant species to a few hardy dominants. This in turn has a somewhat limiting effect on resource availability for other mammals, birds and insects.

No Endangered Hawaiian bats were detected in the project area during the survey. They are rare on Lānaʻi but could occur in this area occasionally. The U.S. Fish and Wildlife Service has guidelines that ensure that these bats are not harmed should they show up.

Just two bird species were native to Hawaii, the kōlea and the pueo. The kōlea breed and raise their young in the arctic and then migrate to tropical places like Hawaiʻi to overwinter. Many thousands of kōlea come to Hawaii every winter. Kōlea are quite common and have no endangered or threatened status.

The pueo is a race of the short-eared owl species that is endemic to Hawaii. It occurs on all the islands but is rare on Oʻahu. It is wide ranging in grasslands and shrublands on Lānaʻi. It carries no federal endangered or threatened status.

Two indigenous seabirds the Endangered ʻuaʻu and the Threatened ʻaʻo, while not nesting in the project area, do fly over it during dusk to access their burrows high in the mountains and again at dawn to head out to sea. Young birds taking their first fledging flights are inexperienced fliers. They often are disoriented by bright lights and crash into light structures where they become vulnerable to injury and predators. It is recommended that any significant outdoor lighting associated with the proposed project be hooded to direct the light downward to mitigate this threat.

No other recommendations with reference to fauna are deemed necessary.

ANIMAL SPECIES LIST

Following is a checklist of the animal species inventoried during the field work. Animal species are arranged in descending abundance within three groups: Mammals, Birds and Insects. For each species the following information is provided:

1. Common name
2. Scientific name
3. Bio-geographical status. The following symbols are used:

   endemic = native only to Hawaii; not naturally occurring anywhere else in the world.

   indigenous = native to the Hawaiian Islands and also to one or more other geographic area(s).

   migratory = bird species that spend the fall and winter months in Hawaii and the spring and summer months breeding in the arctic.

   non-native = all those animals brought to Hawaii intentionally or accidentally after western contact.

4. Abundance of each species within the project area:

   abundant = many flocks or individuals seen throughout the area at all times of day.

   common = a few flocks or well scattered individuals throughout the area.

   uncommon = only one flock or several individuals seen within the project area.

   rare = only one or two seen within the project area.

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
MAMMALS			
CERVIDAE (Deer Family)			
Axis axis Erxleben	axis deer	non-native	abundant
BIRDS			
ALAUDIDAE (Sky Lark Family)			
Alauda arvensis L.	Eurasian sky lark	non-native	uncommon
ARDEIDAE (Heron Family)			
Bubulcus ibis L.	cattle egret	non-native	uncommon
CARDINALIDAE (Cardinal Family)			
Cardinalis cardinalis L.	northern cardinal	non-native	rare
CHARADRIIDAE (Plover Family)			
Pluvialis fulva Gmelin	kōlea, Pacific golden-plover	indigenous	uncommon
COLUMBIDAE (Dove Family)			
Geopelia striata L.	zebra dove	non-native	uncommon
ESTRILDIDAE (Estrildid Finch Family)			
Lonchura punctulata L.	nutmeg mannikin	non-native	uncommon
MIMIDAE (Mockingbird Family)			
Mimus polyglottos L.	northern mockingbird	non-native	rare
PHASIANIDAE (Pheasant Family)			
Francolinus pondicerianus Gmelin	gray francolin	non-native	uncommon
Meleagris gallopavo L.	Rio Grande turkey	non-native	rare
Phasianus colchicus L.	ring-necked pheasant	non-native	rare
STRIGIDAE (Owl Family)			
Asio flammeus sandwichensis Bloxam	Pueo, Hawaiian owl	endemic	rare
STURNIDAE (Starling Family)			
Acridotheres tristis L.	common myna	non-native	uncommon

REF-209

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
INSECTS			
ARANAE - spiders			
ARANEIDAE (Orb Weaver Spider Family)			
Araneus diadematus Clerck	European garden spider	non-native	rare
DIPTERA - flies			
CALLIPHORIDAE (Calliphorid Fly Family)			
Calliphora vomitoria L.	bluebottle fly	non-native	rare
Eucalliphora latifrons Hough	blow fly	non-native	rare
SYRPHIDAE (Hoverfly Family)			
Symosyrphus grandicornis Macquart	Australian hoverfly	non-native	rare
HYMENOPTERA - bees, wasps, ants			
APIDAE (Honeybee Family)			
Apis mellifera L.	honeybee	non-native	uncommon
FORMICIDAE (Ant Family)			
Pheidole megacephala Fabricius	big-headed ant	non-native	rare
LEPIDOTERA - butterflies, moths			
CRAMBIDAE (Webworm Moth Family)			
Spoladea recurvalis Fabricius	beet webworm moth	non-native	rare
HESPERIIDAE (Skipper Butterfly Family)			
Hylephila phyleus Drury	fiery skipper	non-native	rare
LYCAENIDAE (Gossamer-winged Butterfly Family)			
Lampides boeticus L.	long-tailed blue butterfly	non-native	rare
NYMPHALIDAE (Brush-footed Butterfly Family)			
Danaus plexippus L.	monarch butterfly	non-native	common
PIERIDAE (White and Sulphur Butterfly Family)			
Pieris rapae L.	cabbage butterfly	non-native	uncommon
ORTHOPTERA - grasshoppers, crickets			
ACRIDIDAE (Grasshopper Family)			
Oedaleus abruptus Thunberg	short-horned grasshopper	non-native	uncommon

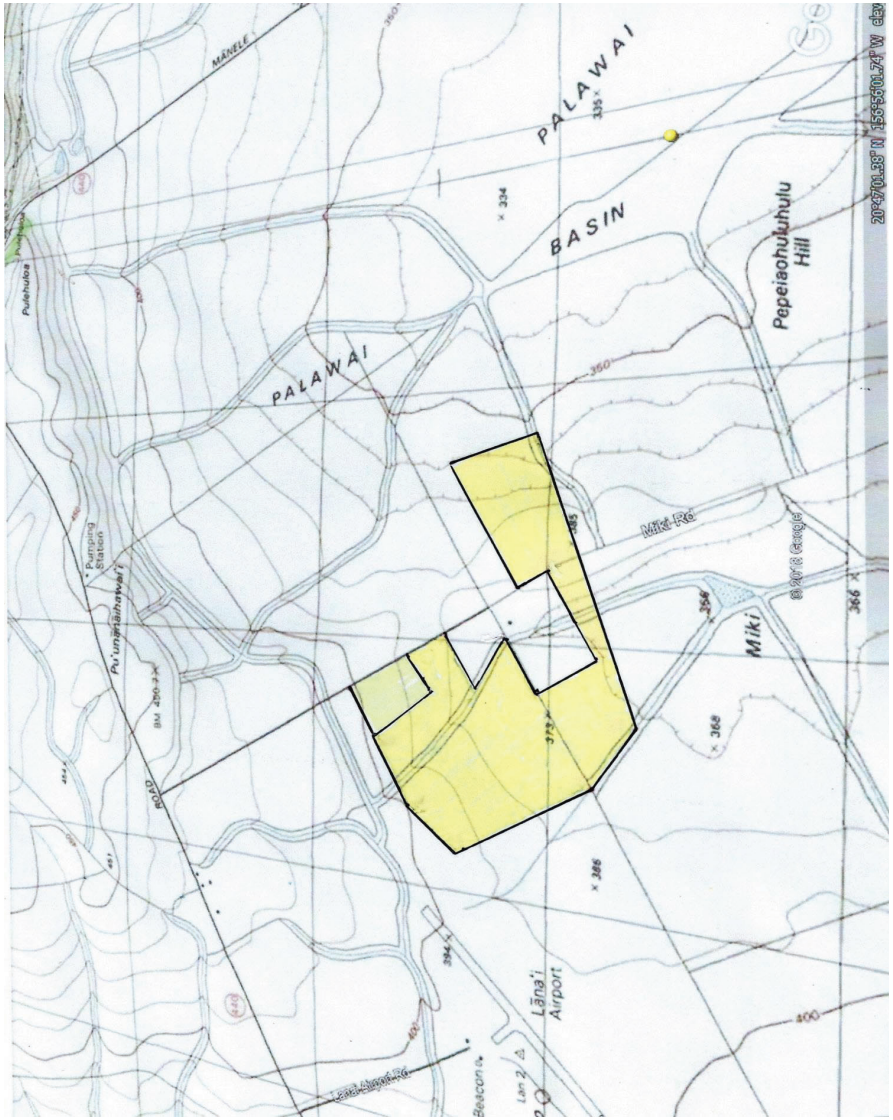


Figure 1. Miki Basin 200 acre Industrial Development Project Area in southwestern Lāna'i

REF-210

Figure 2. View west showing the Guinea grass and lantana shrubland characteristic of western portion of the project area in Miki Basin

Figure 3. View northeast across the Pālāwai Basin portion of the project area showing a guinea grass and lantana shrubland

REF-211

Literature Cited

American Ornithologists' Union 2018. Check-list of North American Birds. 7th edition. American Ornithologists' Union. Washington D.C.

Armstrong, R. W. (ed.) 1983. Atlas of Hawaii. (2nd. ed.) University of Hawaii Press.

Foote, D.E., S. Nakamura, E.L. Hill, F. Stephens. Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai and Lanai. State of Hawaii, U.S.A. Soil Conservation Service, Washington, D.C.

Nishida, G.M., G.A. Samuelson, J.S. Strazanac, K.S. Kami. 1992. Hawaiian Terrestrial Arthropod Checklist, Hawaii Biological Survey.

Tomich, P.Q. 1986. Mammals in Hawaii. Bishop Museum Press, Honolulu.

U.S. Fish and Wildlife Service. 2018. Endangered and threatened wildlife and Plants. Listing and Occurrences for Hawaii. www.USFWS-gov/endangered.

Wagner, W. L., D.R. Herbst, and S. H. Sohmer, 1999. Manual of the flowering plants of Hawai′i. University of Hawai′i Press and Bishop Museum Press. Honolulu.

ARCHAEOLOGICAL INVENTORY SURVEY

APPENDIX

D-1

REF-213

T. S. Dye & Colleagues, Archaeologists, Inc.
735 Bishop St., Suite 315, Honolulu, Hawai'i 96813

Archaeological Inventory Survey for the Miki Basin 200 Acre Industrial Development

Lands of Kalulu and Kaunolū, Lāhaina District, Lāna'i Island
TMK: (2) 4-9-002:061*

Nathan J. DiVito Kepā Maly Thomas S. Dye, PhD

May 9, 2018

Abstract

At the request of Pulama Lāna'i, T. S. Dye & Colleagues, Archaeologists has conducted an archaeological inventory survey with subsurface testing for the Miki Basin 200 Acre Industrial Development located in the lands of Kalulu and Kaunolū, Lāhaina District, Lāna'i Island. The survey evaluated the parcel for the presence or absence of historic properties and cultural materials in support of a zoning change to the project area.

Pedestrian survey resulted in the identification and documentation of a secondarily deposited historic artifact scatter, a secondarily deposited lithic scatter, and an historic property, designated Site 50-40-98-1980. Test excavations included a total of 31 backhoe trenches, one of which yielded a fire-pit feature, recorded as Site 50-40-98-1981.

Both historic properties are likely to date to the traditional Hawaiian period and have been evaluated as significant for the important information on Hawaiian history and prehistory that they have yielded or are likely to yield. The Miki Basin 200 Acre Industrial Development will have an adverse effect on both of these historic properties and data recovery excavations are recommended for Sites 50-40-98-1980 and 50-40-98-1981.

Contents

1 Introduction 3

2 Background 4
2.1 Some Traditions from Lāna'i of Kaululā'au 5
2.2 Historical Events: Transitions in Land Use and Population on Lāna'i 31

*Prepared for Pulama Lāna'i, 1311 Fraser Avenue, P.O. Box 630310, Lāna'i City, HI 96763.

2.3 Land Tenure 37
2.3.1 Māhele 'Āina Statistics on Lāna'i 37
2.3.2 Place Names Referenced in Claims by Applicants 38
2.3.3 Disposition of Ahupua'a and Konohiki Claims on Lāna'i 38
2.3.4 Buke Māhele (Land Division Book), 1848 38
2.3.5 Ali'i and Native Tenant Claims 40
2.3.6 Palapala Sila Nui, 1855–1867: Royal Patent Grant Lands on Lāna'i . . . 45
2.3.7 Boundary Commission Surveys and Testimonies 47
2.4 Ranching Operations on Lāna'i, 1854–1951 65
2.5 Hawaiian Pineapple Company 68
2.6 Archaeological Background 70
2.6.1 Emory Survey 70
2.6.2 Late Twentieth-Century Investigations 72
2.6.3 Cultural Resources Management Studies 72

3 Methods 75

4 Field Results 76

5 Summary and Conclusions 96

A Stratigraphic Contexts 97

B Field Catalog 98

C Artifact List 98

Glossary 101

Hawaiian Terms 102

Abbreviations 106

Bibliography 106

Figures

1 Project location and nearby archaeological investigations 4
2 *Ahupua'a* of Lāna'i 6
3 Native Register, page 1 41
4 Native Register, page 2 42
5 Registered Map 2227 46
6 Sketch map of Lāna'i by W. M. Gibson 56
7 Sketch map depicting disposition of lands of Lāna'i by W. M. Gibson 59
8 Sketch map of Miki Camp 71
9 Location of finds within the project area 77

REF-214

10 Artifacts collected from the Context 19 lithic scatter 78
11 Photograph of the Context 19 lithic scatter 78
12 Ceramics collected from the Context 20 artifact scatter 79
13 Artifacts collected from the Context 18 lithic scatter 80
14 Sketch map and cross section of Site 50-40-98-1980 *fire-pit* 81
15 Project area showing location of excavated backhoe trenches 82
16 Stratigraphic profiles for Backhoe Trenches 1-8 83
17 Stratigraphic profiles for Backhoe Trenches 9-16 86
18 Stratigraphic profile of the Context 12 fire-pit 90
19 Stratigraphic profiles for Backhoe Trenches 17-24 93
20 Stratigraphic profiles for Backhoe Trenches 25-31 96

Tables

1 No. of Scholars 36
2 Place names recorded during the *Māhele* 38
3 Forbidden fish of the *konohiki* and the prohibited woods 39
4 Disposition of *ahupua'a* 40
5 Native tenants of Kaunolū and Kalulu Ahupua'a 44
6 Royal Patent Grants on Lāna'i 45
7 Sediment descriptions for Backhoe Trenches 1-8 83
8 Sediment descriptions for Backhoe Trenches 9-16 87
9 Sediment descriptions for Backhoe Trenches 17-24 90
10 Sediment descriptions for Backhoe Trenches 25-31 93

1 Introduction

At the request of Pulama Lāna'i, T. S. Dye & Colleagues, Archaeologists has completed an archaeological inventory survey with subsurface testing for the Miki Basin 200 Acre Industrial Development. The Miki Basin 200 Acre Industrial Development is located in the lands of Kalulu and Kaunolū, Lāhaina District, Lāna'i Island (fig. 1). The purpose of the survey was to evaluate the *project* parcel for the presence or absence of historic properties and cultural materials in support of a proposed zoning change and construction activities. The parcel is located along Miki Road in the area surrounding the existing Maui Electric Company power plant and associated facilities. The fence line of the Lāna'i Airport marks the northern boundary of the parcel. The Miki Basin 200 Acre Industrial Development is located within TMK: (2) 4-9-002:061 and is situated on lands owned by Pulama Lāna'i.

The Miki Basin 200 Acre Industrial Development is located at an elevation of approximately 415 m above mean sea level in an area called Miki Basin, named after a nearly filled pit crater [26:338]. Vegetation in the area consists of *guava*, *Christmas berry*, and various low-lying shrubs and grasses. The soils underlying the project area comprise Molokai silty *clay* loam, Uwala silty clay loam, and Waikapu silty clay loam, all dark reddish brown soils

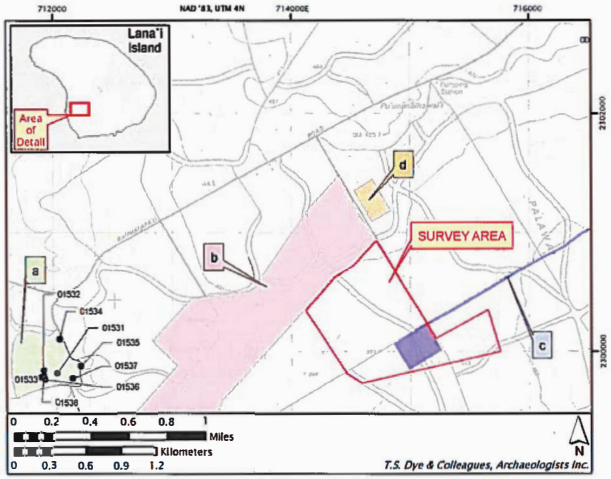


Figure 1: Location of the Miki Basin 200 Acre Industrial Development, nearby archaeological sites, and previous archaeological investigations on a 1992 USGS quadrangle map. Previous archaeological investigations include: *a*, Ahlo [1], Kam [22], Walker and Haun [31]; *b*, Sinoto [28], Borthwick et al. [3], Dagan et al. [5], Lee-Greig and Hammatt [24], Lee-Greig and Hammatt [25]; *c*, DiVito and Dye [6]; *d*, DiVito and Dye [7]. Site numbers are prefaced by 50-40-98- (e.g., 50-40-98-01532).

used primarily for *sugarcane* and pineapple production [12]. The project area is relatively dry and receives approximately 16 in. of rainfall annually.

2 Background

This section presents historical and archaeological background information that was used to predict the kinds and distributions of historic properties that may be present within the project area. The information also provides context for understanding and evaluating the *significance* of historic properties.

The general historic background for the island of Lāna'i was compiled by Kepā Maly. It is based on first-hand observation of cultural practices in the 1970s, interviews with

REF-215

older *kamaʻāina* at that time, and an exhaustive review of pertinent documentary sources, including records held by Kumu Pono Associates and the Lānaʻi Culture & Heritage Center.

The historical narratives cited on the following pages provide readers with access to some of the most detailed and earliest accounts recorded from Lānaʻi. The narratives offer a glimpse into the history recorded from the experience and memory of native residents and eyewitness accounts of those who participated in the events which now make Lānaʻi's history. Some of these historical narratives have been translated from Hawaiian-language accounts for the first time, and other accounts rarely seen since their original date of composition. They are compiled here to provide a more detailed history of the land than has been previously available.

2.1 He Wahi Moʻolelo no Lānaʻi a Kaululāʻau: Some Traditions from Lānaʻi of Kaululāʻau

Lānaʻi is sixth in size of the major Hawaiian Islands (fig. 2), and like all islands in the group, it was formed through volcanic eruptions and is constantly being reshaped by erosional activity. The primary caldera was in the area now known as the Pālāwai Basin, and it is estimated that Lānaʻi first rose above sea level approximately 1.5 million years ago. It is approximately 13.25 mi. long by 13 mi. wide, and at its highest point, Lānaʻi Hale, stands 3,370 ft. above sea level. The island of Molokaʻi lies to the north of Lānaʻi, across the Ka-lohi Channel, and Maui lies to the east, across the ʻAuʻau and Naeheehe Channels; the channel of Ke-ala-i-Kahiki and the island of Kahoʻolawe lie to the southeast. The southern and western sides of Lānaʻi face the open ocean and are fringed by imposing cliff sides, while the windward side slopes gently to the sea. Thus, Lānaʻi sits in the lee of its sister islands. Its history, like that of Molokaʻi and Kahoʻolawe, has almost always been overshadowed by its larger neighbor, Maui.

The name of the island may be literally translated as "day of conquest"—*Lā* meaning "day" and *Naʻi* meaning "conquest." Through the tradition of the chief Kaululāʻau, Lānaʻi was named on the day that the young chief vanquished the evil ghosts from the island. An early missionary dictionary translates the island's name as "hump," but this translation does not fit in with traditional knowledge of the meaning or pronunciation of the name [cf. 27].

In addition to political and social contexts, Lānaʻi's relationship to Maui and Molokaʻi includes a significant environmental one as well, sitting as it does in the rain shadow of the larger and higher islands. Lānaʻi's ecosystem evolved in the absence of man and most other mammals, giving rise to cloud forest zones, which gave life to the land, and made the island hospitable to people when they settled Lānaʻi perhaps as long as 1,000 years ago. There were two primary forest-watershed zones, the major watershed of Lānaʻi Hale at the highest peak of Pālāwai and Keālia Aupuni Ahupuaʻa; and what has historically been called the Kānepuʻu forest zone of Kaʻā Ahupuaʻa. Untouched for countless centuries, the forest systems of Lānaʻi evolved the unique ability to capture droplets of water, which in turn percolated through the ground to create water sources that were spread from mountain to shore across the island. While these precious forest regions have been radically altered by man's activities and feral animals, evidence of the region's water-producing capabilities are still visible on the landscape and in traditional accounts and historic literature.

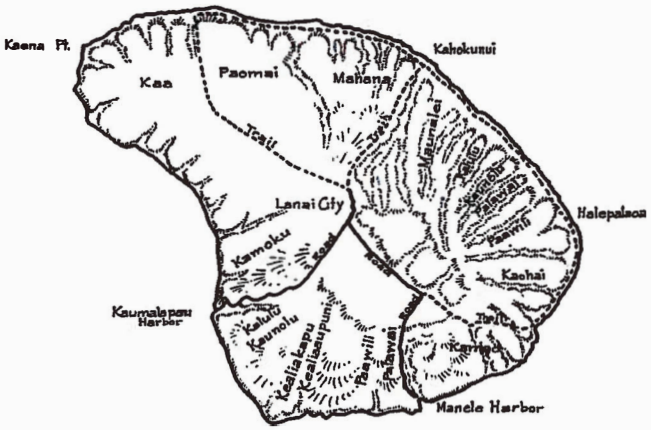


Figure 2: Map of the Island of Lānaʻi naming 13 *ahupuaʻa* which form the major lands of the island, as well as historic trails and roads (Hawaii Territorial Survey Division, 1929).

The earliest traditional lore of Lānaʻi describes the arrival of the gods Kāne, Kanaloa, and their younger god-siblings and companions to the southern shores of the island. Later accounts describe the visit of the goddess Pele and members of her family to the windward region of Lānaʻi. Subsequent narratives describe the settlement of Lānaʻi by evil spirits, and the difficulties that the early human settlers encountered in attempts to safely colonize the island. Another tradition relates that in the early 1400s, a young Maui chief by the name of Kaululāʻau traveled around Lānaʻi vanquishing the evil ghosts/spirits of the island, making it safe for people to live on Lānaʻi, and is the source of the island's name (Lānaʻi a Kaululāʻau).

By the early 1600s, all the islands of the Hawaiian group were settled sufficiently to develop an organized way to manage scarce resources. Each island was divided into political and subsistence subdivisions called *ahupuaʻa*, which generally ran from the ocean fishery fronting the land area to the mountains. Under the rule of Piʻilani, Lānaʻi was divided into 13 *ahupuaʻa*. Native tradition describes *ahupuaʻa* divisions as being marked by *stone* cairns (*ahu*) with a carved pig (*puaʻa*) image placed upon them, and these ancient divisions remain the primary land unit in the Hawaiian system of land management on Lānaʻi today.

REF-216

The culture, beliefs, and practices of the Hawaiians mirrored the natural environment around them. They learned to live within the wealth and limitations of their surroundings. There is significant archaeological evidence on the island indicating that in the period before western *Contact*, more people lived on the land sustainably—growing and catching all they needed—than currently live upon the island. Several important traditions pertaining to the settlement of Lānaʻi and the beliefs and practices of the ancient residents are commemorated at such places as Kaululāʻau, Kalaehī, Ke-ahi-a-Kawelo, Hālulu, Puʻupehe, Pōhaku ō, Kānepuʻu, Kaʻena iki, Nānāhoa, Haʻalelepaʻakai, and Puhi-o-Kaʻala.

Ancient Hawaiian villages, ceremonial features, dryland agricultural fields, fishponds, and a wide range of cultural sites dot the shoreline of Lānaʻi at places like Keone, Kaumālapaʻu, Kaunolū, Māmaki, Kapalaoa, Huawai, Kapihaʻā, Hulopoʻe, Mānele, Kamaiki, Naha, Kahemanō, Lōpā, Kahalepalaoa, Kaheʻa, Keōmoku, Kaʻa, Hauola, Maunalei (including a wet land taro field system in the valley), Kahōkūnui, Kaiolohia, Kahāʻulehale, Kahue, Lapaiki, Awalua, Polihua, and Kaʻena.

In the uplands, localities at Hoʻopulupuluamoa and Malulani, Kōʻele and Kihamāniania, Kalulu uka, Kaunolū uka, Keālia Kapu, Keālia Aupuni, and Pālāwai were also locations of significant traditional settlements and agricultural endeavors. We also know that over the generations, families with permanent residences in the Lāhaina District of Maui frequented Lānaʻi to take advantage of its rich fisheries.

In the period leading up to 1800, there was a decline in the native population, and in the capacity of Lānaʻi to produce agricultural resources. This was, in part, due to disputes between the rulers of Maui and Hawaiʻi which overflowed onto Lānaʻi in the mid to late eighteenth century. In the late eighteenth century and early nineteenth century, foreign diseases and influences spread across the islands, leading to a further decline in the population. By the 1840s, there were approximately 600 inhabitants residing on Lānaʻi. By the 1870s, the population hovered around 300 residents, and by the early 1890s, there were just 175 native residents.

Native Lore and Historical Accounts: The Gods Walked the Land—Early Settlement of Lānaʻi Several traditions pertaining to the gods and people of ancient Lānaʻi were found in a review of Hawaiian-language newspapers. These accounts describe the island condition and the life and practices of Lānaʻi's ancient people. The narratives establish the bond between Lānaʻi and neighboring islands of the Hawaiian group and more distant Kahiki—the ancestral homeland of the gods—as Kāne, Kanaloa, Pele, and others of the god-family shaped the natural environment and lives of the people of the land. Coming into the historic period, readers find significant changes on the land and in the lives of the people of Lānaʻi. Selected accounts are related here that transition readers through the history of Lānaʻi and a native landscape to one of change under western settlement.

A Famine on Lānaʻi—an Ancient Prayer Offered by Pakeaulani to the God Kānepaʻina This tradition tells of two ancient residents of Lānaʻi, a period of famine across the islands, and the death of the population. We learn the name of a god of one of the *heiau* on Lānaʻi,

Kānepaʻina. The word *anela* (Hawaiianized angel) is used by the writer in place of the traditional words *ʻaumakua* or *akua*. Also cited within this account is a *pule* uttered by ancient residents of Lānaʻi.

No na Akua o ka Wa Kahiko ...

Eia mai he wahi moolelo no ka malama ana o kekahi anela paha, a mau anela paha, oia hoi he mau Kane paha. Penei ua wahi moolelo la. Aia ma Lanai ka noho ana o Kaimumahanahana, a me kana keiki o Pakeaulani, a he nui loa no na kanaka ma Lanai ia manawa; a hiki mai ke kau wi, pau aku la na kanaka i ka make a ka ai, a koe elua o Kaimumahanahana, a me Pakeaulani, kokoke make nae ka makuakane. O ka Pakeaulani hana; oia keia. Hele wale aku la no keia e eli wale aku no i kulina uala, a loaa ka uala liilii, (he au ia uala) kalua a moa, lawe aku la keia a he wahi heiau a ianei i hanaʻi, kaumaha aku la, alaila, pule aku la, penei kahi hapa o ka pule.

Kini o ke akua
E ka lehu o ke akua
E ka pukui akua
E ka lalani akua
E kahuli, e kahele
E ka wahine e moe ana ke alo iluna
Eia ka ai au a Pakeaulani keiki a Kaimumahanahana.

Pau ka pule, hoi keia a imi hou i ai no ke ahiahi, a moa ia ai lawe aku, i lawe aku ka hana, ua pau kela ai, kau keia ai, pule no hoi e like me mamua. I kekahi imu liilii ana a ianei, honi mai la kona makuakane i ke ala o ka uala! I mai la kela, "Auhea hoi kau uala e kuu keiki e aala mai nei?" Pane mai la kela, "He ai ia na kuu akua." Pane hou mai kona

About the Gods of Ancient Times

Here is a little tradition pertaining to observances for a certain angel (guardian), angels, or perhaps men. The story is this. There was residing on Lānaʻi, Kaimumahanahana and his son, Pakeaulani, and there were many people living on Lānaʻi at that time. There came a time of famine, and all the people died, leaving only Kaimumahanahana and Pakeaulani, though the father was close to death. Here is what Pakeaulani did. He went and dug up some sweet potato runners and got a few small sweet potatoes (little potatoes growing on a vine), and baked them. He took these things to a heiau and did the following, he worshipped, made the offerings, and prayed. This is a portion of his prayer:

Forty thousand gods
Four hundred thousand gods
Assembly of gods
Alignment of gods
Those that change, those that move about
O women that lie face up
Here is your food, prepared by Pakeaulani, son of Kaimumahanahana.

When he finished praying, he went again and sought out food for the evening. He cooked the food and took it, doing the same with all the food until it was done, and set there (at the temple), and he prayed as he had before. He prepared the food in a small imu, and his father smelled the scent of the sweet potatoes! He said, "Where are

REF-217

makuakane, "Aohe o'u akua, a he akua ka hoi kou?" A hala ae la na la elima o kana hana ana pela, alaila, i ka po kamailio mai la kekahi anela o Kanepaina. I mai la, "Ea, a keia po e panipani aku oe i na pukapuka liilii o ko olua hale, a e noho malie mai kamailio pu me kou makuakane a pau ae la ka laua kamailio pu ana, a hele aku la ia anela. Ninau mai la kona makuakane ia ia, 'Owai kou hoa i kamailio mai la.' I aku la oia, 'O kuu akua hoi ia a'u e malama nei.' Aole liuliu ma ia hope iho, haule mai ana ka ua he nui, ka ua no ia a ao ka po a po ua la nei, a ao ua po nei, malie iho la ka ua. I puka aku ka hana iwaho ua palaku ka Maia, ua moe ke Ko a ala mai, hele ke anakiu o ka uala a keke, ua hele ka Ape a hilala ka ha; o ke kalo hoi ua makaole kekahi kihapai, a o kekahi pumaia ka ha o ke kalo. Ke kalua iho la no ia o ka ai a moa, kaumaha e aku la keia i ke Akua oia nei, a pau hoi mai la laua nei ai ka uala, ke kalo, a ai no hoi ka mai a maona; o ka laha hou no ia o kanaka o Hawaii nei, ma Lanai wale no. Oia iho la kahi moolelo o ka malama ana o kekahi o na Kane ia mau kanaka ..."

your sweet potatoes, that I smell, my son?" He answered him, saying, "It is the food of my god." The father then answered, "I don't have a god, but you do?" Five days passed in his (Pakeaulani) doing this same thing, then on the fifth night, an angel, Kānepa'ina, spoke. He said, "Heed me, this night go and close the very littlest of the holes in the house of you two, and stay calm, do not speak with your father." When they two were finished speaking, the angel departed. His father asked him "Who was the companion with whom you were speaking?" He answered, "My god whom I have been worshipping." Not long afterwards, a great rain fell. It rained night and day, and through several nights and days until there was calm, then the rains fell lightly. Looking outside to see what had transpired, there was seen ripe Mai'a (bananas), Kō (sugar cane) lying upon the ground, 'uala (sweet potatoes) spread all about, Ape (mountain taro) with long stalks leaning to the side; Kalo (taros) which filled the gardens, banana stalks were used as the channels (to irrigate) for the taro. He then cooked the food, and made an offering to his God. When finished, they two ate the sweet potatoes, taro, and bananas until filled. This is how Hawaiians came to once again be spread across Hawaii, only from Lāna'i. So this is one tradition of how one of the Kāne (gods), was worshipped by these men ...

Owau no me ka mahalo. John Puniwai.[1]

I am with appreciation. John Puniwai.[2]

1 *Nupepa Kuokoa*, November 8, 1862.

2 Trans. K. Maly.

He Mo'olelo no Kaululā'au: A Tradition of Kaululā'au One of the best known traditional accounts of Lāna'i dates from the early fifteenth century and associates the island with the ruling chiefs of Maui. In these narratives, a young chief, Kaululā'au, was born to Kaka'alaneo and Kanikaniā'ula. Kaka'alaneo's elder brother was Kāka'e, and Fornander reported that these royal brothers jointly ruled Maui and Lāna'i [14:II-82, 83]. During

Kāka'e and Kaka'alaneo's rule, and for many generations preceding it, anyone who attempted to live on Lāna'i experienced great difficulties, as the island was inhabited by evil ghosts/spirits ruled by their king, Pahulu.

While there are numerous narratives that describe how Kaululā'au came to free Lāna'i from the rule of Pahulu, thus making it safe for people to inhabit the island [2; 10], there are two major versions of this tradition with variations on the events. The best known is the version published by King David Kalākaua in 1888, but the most detailed version was published in the Hawaiian language in 1863 in association with another tradition from Maui, "Ka Moolelo o Eleio" (p. 14).

King Kalākaua's version provides a significant description of Lāna'i and the ability of its people to sustain themselves by working the land and fishing the sea around the island. Through the encouragement of his friend and advisor Walter Murray Gibson,[1] the king compiled the traditions found within *The Legends and Myths of Hawaii* [21] and described Lāna'i as being richly supplied with food crops, natural resources, and fisheries that, but for the presence of the evil beings, made it a desirable place to live.

Excerpts of Kalākaua's version follow, entitled "The Sacred Spear-Point" and "Kelea, the Surf Rider of Maui." These excerpts are followed on page 14 by an excerpt of the Hawaiian-language version of Kaululā'au's legend entitled "Ka Moolelo o Eleio."

"The Sacred Spear-Point" and "Kelea, the Surf Rider of Maui"

> Kaululaau was one of the sons of Kakaalaneo, brother of, and joint ruler with, Kakae in the government of Maui ... The court of the brothers was at Lele (now Lahaina), and was one of the most distinguished in the [island] group.
>
> The mother of Kaululaau was Kanikaniaula, of the family of Kamauaua, king of Molokai, through his son Haili, who was the brother or half-brother of Keoloewa and Kaupeepee ...
>
> Kaululaau was probably born somewhere between the years 1390 and 1400. He had a half-sister, whose name was Wao, and a half-brother, Kaihiwalua ...
>
> [Kaululaau] had a congenial following of companions and retainers, who assisted him in his schemes of mischief ... He would send canoes adrift, open the gates of fish-ponds, remove the supports of houses, and paint swine black to deceive the sacrificial priests. He devised an instrument to imitate the death-warning notes of the *alae*, and frightened people by sounding it near their doors; and to others he caused information to be conveyed that they were being prayed to death.
>
> Notwithstanding these misdemeanors, Kaululaau was popular with the people, since the chiefs or members of the royal household were usually

[1] Walter Murray Gibson settled on Lāna'i by early 1862, and came to control most of the land on the island through fee-simple and leasehold title. A friend of many chiefs, some of whom who had been on Lāna'i with Kamehameha I, Gibson recorded a number of traditions from the island, and is generally attributed with the Lāna'i narratives cited by King Kalākaua.

REF-218

the victims of his mischievous freaks. He was encouraged in his disposition to qualify himself for the priesthood, under the instruction of the eminent high-priest and prophet, Waolani, and had made substantial advances in the calling when he was banished to the island of Lanai by his royal father for an offence which could neither be overlooked nor forgiven.

At that time Lanai was infested with a number of gnomes, monsters and evil spirits, among them the gigantic *moo*, Mooaleo. They ravaged fields, uprooted cocoanut-trees, destroyed the walls of fish-ponds, and otherwise frightened and discomfited the inhabitants of the island. That his residence there might be made endurable, Kaululaau was instructed by the *kaulas* and sorcerers of the court in many charms, spells, prayers and incantations with which to resist the powers of the supernatural monsters. When informed of these exorcising agencies by Kaululaau, his friend, the venerable Waolani, told him that they would avail him nothing against the more powerful and malignant of the demons of Lanai.

Disheartened at the declaration, Kaululaau was about to leave the *heiau* to embark for Lanai, when Waolani, after some hesitation, stayed his departure, and, entering the inner temple, soon returned with a small roll of *kapa* in his hand. Slowly uncording and removing many folds of cloth, an ivory spear-point a span in length was finally brought to view. Holding it before the prince, he said:

> Take this. It will serve you in any way you may require. Its powers are greater than those of any god inhabiting the earth. It has been dipped in the waters of *Po*, and many generations ago was left by Lono upon one of his altars for the protection of a temple menaced by a mighty fish-god who found a retreat beneath it in a great cavern connected with the sea. Draw a line with it and nothing can pass the mark. Affix it to a spear and throw it, and it will reach the object, no matter how far distant. Much more it will do, but let what I have said suffice.

The prince eagerly reached to possess the treasure, but the priest withdrew it and continued:

> I give it to you on condition that it pass from you to no other hands than mine, and that if I am no longer living when you return to Maui—as you some day will—you will secretly deposit it with my bones. Swear to this in the name of Lono.

Kaululaau solemnly pronounced the required oath. The priest then handed him the talisman, wrapped in the *kapa* from which it had been taken, and he left the temple, and immediately embarked with a number of his attendants for Lanai.

Reaching Lanai, he established his household on the south side of the island. Learning his name and rank, the people treated him with great respect—for Lanai was then a dependency of Maui—assisted in the construction of the houses necessary for his accommodation, and provided him with fish, *poi*, fruits and potatoes in great abundance. In return for this devotion he set about ridding the island of the supernatural pests with which it had been for years afflicted.

In the legend of "Kelea, the Surf-rider of Maui," will be found some references to the battles of Kaululaau with the evil spirits and monsters of Lanai. His most stubborn conflict was with the gnome god Mooaleo. He imprisoned the demon within the earth by drawing a line around him with the sacred spear-point, and subsequently released and drove him into the sea.

More than a year was spent by Kaululaau in quieting and expelling from the island the malicious monsters that troubled it, but he succeeded in the end in completely relieving the people from their vexatious visitations. This added immeasurably to his popularity, and the choicest of the products of land and sea were laid at his feet.

His triumph over the demons of Lanai was soon known on the other islands of the group, and when it reached the ears of Kakaalaneo he dispatched a messenger to his son, offering his forgiveness and recalling him from exile. The service he had rendered was important, and his royal father was anxious to recognize it by restoring him to favor.

But Kaululaau showed no haste in availing himself of his father's magnanimity. Far from the restraints of the court, he had become attached to the independent life he had found in exile, and could think of no comforts or enjoyments unattainable on Lanai. The women there were as handsome as elsewhere, the bananas were as sweet, the cocoanuts were as large, the *awa* was as stimulating, and the fisheries were as varied and abundant in product. He had congenial companionship, and bands of musicians and dancers at his call. The best of the earth and the love of the people were his, and the *apapani* ['apapane] sang in the grove that shaded his door. What more could he ask, what more expect should he return to Maui? His exile had ceased to be a punishment, and his father's message of recall was scarcely deemed a favor.

However, Kaululaau returned a respectful answer by his father's messenger, thanking Kakaalaneo for his clemency, and announcing that he would return to Maui sometime in the near future, after having visited some of the other islands of the group; and three months later he began to prepare for a trip to Hawaii. He procured a large double canoe, which he painted a royal yellow, and had fabricated a number of cloaks and capes of the feathers of the *oo* and *mamo*. At the prow of his canoe he mounted a carved image of Lono, and at the top of one of the masts a place was reserved for the proud *tabu* standard of an *aha alii*. This done, with a proper retinue he set sail for Hawaii. [21:209-213]

REF-219

The tradition continues by describing events in which Kaululā'au participated in battles with various demons similar to those on Lāna'i. His journey took him to the islands of Hawai'i, Moloka'i, and O'ahu prior to his return to Maui.

Upon returning to Maui, Kaululā'au was welcomed home by his father, and learned that Waolani, his priestly instructor and friend, had died. Recalling the promise made to Waolani, Kaululā'au secretly hid the sacred spear-point of Lono with the bones of Waolani. Kaululā'au married Laiea-a-Ewa, a high chiefess of O'ahu, and together they lived out their lives, residing at Kaua'ula in Lāhaina and parented six children [21:225].

In the tradition of "Kelea, the Surf-Rider of Maui" [21:229–246], mention is made again of Kaululā'au and his adventures on Lāna'i. The account is centered on Kelea, the daughter of Kahekili I, elder cousin of Kaululā'au. It is reported that when Kahekili I ascended to the throne (ca. 1415), he "became king of Maui and Lanai; for during that period the latter island was under the protection of the *mois* of Maui, while Molokai still maintained its independence" [21:229].

King Kalākaua described the introduction of *'ulu* to Lele, now known as Lāhaina, and Kaululā'au's banishment to Lāna'i:

> It was Kakaalaneo who introduced the bread-fruit there from Hawaii . . . For some disrespect shown to his royal brother [Kakae], whose mental weakness doubtless subjected him to unkind remarks, he banished his son Kaululaau to Lanai, which island, traditions avers, was at that time infested by powerful and malignant spirits. They killed pigs and fowls, uprooted cocoanut-trees and blighted *taro* patches, and a gigantic and mischievous gnome amused himself by gliding like a huge mole under the huts of his victims and almost upsetting them.
>
> The priests tried in vain to quiet these malicious spirits. No sooner were they exorcised away from one locality that they appeared in another, and if they gave the *taro* patches a rest it was only to tear the unripe bananas from their stems, or rend the walls and embankments of artificial ponds, that their stores of fishes might escape to the sea. Aware of these grievances, Kaululaau took with him to Lanai a talisman of rare powers. It was the gift of his friend, the high-priest of his father, and consisted of a spear-point that had been dipped in the waters of *Po*, the land of death, and many generations before left by *Lono* on one of his altars.
>
> Crowning a long spear with this sacred point, Kaululaau attacked the disturbing spirits, and in a short time succeeded either in bringing them to submission or driving them from the island. The gnome *Mooaleo* was the most difficult to vanquish. It avoided the prince, and for some time managed to keep beyond the influence of the charmed spear-point; but the monster was finally caught within the boundaries of a circular line scratched with the talisman upon the surface of the earth beneath which it was burrowing, and thereby brought to terms. It could not pass the line no matter how far below the surface it essayed to do so. Heaving the earth in its strength and wrath, it chafed against the charmed restraint that held it captive, and finally plunged downward within the vertical walls of its prison. But there was no path of escape in that direction. It soon encountered a lake of fire, and was compelled to return to the surface, where it humbled itself before the prince, and promised, if liberated, to quit the island for ever. Kaululaau obliterated sixty paces of the line of imprisonment, to enable *Mooaleo* to pass to the sea, into which the hideous being plunged and disappeared, never to be seen again on Lanai. [21:229–230]

***Ka Moolelo o Eleio* (The Tradition of Eleio)** The tradition of Eleio is set in the time of Kaka'alaneo's rule over Maui, Lāna'i, Moloka'i, and Kaho'olawe (ca. 1400), and was published by W. N. Pualewa, in the Hawaiian-language newspaper *Kuokoa* in 1863. The account tells us that Eleio was a famous *kūkini* associated with the court of the king. He was noted for his ability to travel the circuit of the island, to fetch a choice fish from one district and bring it to the court in another district, keeping it alive. When it was learned that Kelekeleioka'ula, Kaka'alaneo's wife, was expecting, the king granted Eleio the privilege of naming the child. Eleio stated his desire, that if it was a boy, he should be named Kaululā'au (The-forest-grove). When the child was born, it was indeed a boy, and he was named Kaululā'au. As the child grew, his mysterious manner and mischievous nature created many problems for his parents and the people of Maui. Eventually, the youth was banished from Maui and sent to Lāna'i to fend for himself. At that time in history, Lāna'i was reportedly inhabited by hordes of *akua* under the rule of Pahulu. While on Lāna'i, Kaululā'au was accompanied by his own personal god, Lono. Together, the two traveled about Lāna'i, tricking the ghosts, killing them, and setting the lands free from their dominion.[2]

In this version of the tradition, Kaululā'au traveled around Lāna'i. We are told that he has already killed many of Pahulu's minions, and that Pahulu then feigned friendship with Kaululā'au, telling him that he would help him seek out the other *akua* who remained on the island. Pahulu's real objective was to round up the remaining *akua* to fight and kill Kaululā'au. The party traveled around the island counterclockwise, leaving the Keōmuku region, passing through Ka'ena, Honopū, Kaumālapa'u, Kaunolū, and Mānele. The excerpts below cover the lands of the southern coast of Lāna'i between Kaunolū and Mānele.

Ka Moolelo o Eleio

A mamuli o keia olele ana a Pahulu; alaila, ua nee io aku no lakou a noho ma Honopu, aia ia wahi ma kahi e ane kokoke aku ana i ka pali o Kaholo, aka, o Kaumalapau nae kahi e pili pu ana me Kaholo.

A hiki lakou nei ma Honopu, a noho malaila i kekahi mau po, aole nae he akua oia wahi, no ka mea, ua kaapuni hele o

The Tradition of Eleio

Pahulu then flew on ahead, and they went on to stay at Honopū. This place is situated not too far away from the cliffs of Kaholo, though Kaumālapa'u is there, adjoining Kaholo.

They arrived at Honopū, and stayed there several nights. Pahulu had traveled all about the place, from one side to the other

[2] *Nupepa Kuokoa*, October 24 & 31, 1863.

REF-220

Pahulu ia mau la a me ia mau po ma ia apana mai o a o, mai ka a uka, aole ona halawai iki me ke akua, nolaila, aole o lakou kuleana e noho hou ai malaila.

Nolaila, ua nee hou aku la lakou a noho ma Kaunolu, a malaila a noho loihi hou lakou ma ia wahi, no ka mea, ua ike o Pahulu he wahi akoakoa ia o ke akua.

Nolaila, olelo aku la o Pahulu ia Kaululaau, "E aho e noho kakou ianei, no ka mea, ua ike mai nei au, aia iluna pono o Kahilikalani ke akua kahi i nohoai. Eia nae ka mea hai aku ia oe e Kaululaau, e luku auanei oe i ka nui o ke akua apau; ao ke akua auanei e kapaiʻna la o Kanemakua, alaila, mai pepehi auanei oe iaia no ka mea, he hana nui kana. O kana hana, oia ke kamaaina mau o keia wahi, a nana no e malama i kela i-a o ke kai. Oia ke akua, no ka mea, ina oia e make, aole mea nana e kiai pono i keia lae akua. No ka mea, malama paha e pau io ana ke akua o keia aina ma keia hana au e hana nei, a e noho mai ana paha ka mea i like pu me kou ano aʻu e ike aku nei. Alaila, ua koe iho la no ke kumu e laka mai ai o ke akua, a ma ona la e hiki ai ke kaumaha aku, a e lilo o Kanemakua i aumakua lawaia no ia poe."

Alaila, ua maikai ia mea i ko Kaululaau manao. A noho lakou malaila, me ka hana aku i kana oihana mau o ka pepehi aku i ke akua oia wahi, a malaila hoi o Kaululaau i ao ai i ka paeaea ana i ke akua, e like me ka hana ana o na kanaka o Molokai i pae mai ai ma Kahulehale, a no ka lehulehu o na hana maalea i loaa ia Kaululaau mamuli o ke aoao ana mai a kona akua a Lono, nolaila, ua pau na akua i ka make o Kaunolu.

A pau ka lakou hana ana mau Kaunolu, alaila, mano iho la lakou e haalele ia wahi a e nee hou aku ma kekahi wahi hou aku. Nee iki ae lakou a noho ma Mamaki, a malaila i luku ia aku ai . . .

of the land, and into the uplands, but he could find no akua in the district. Therefore, they had no reason to stay there for long.

Then they traveled once again, and stayed at Kaunolū. They remained at this place for quite a long time, because Pahulu knew that this was a place where the akua gathered.

Therefore Pahulu said to Kaululāʻau, "Let us stay here a while, for I see there atop Kāhilikalani, is the place where the akua reside. But this is what I have to tell you, Kaululāʻau, that you shall indeed destroy all the akua; but you should not kill the god called Kānemakua, for he has an important job here. His work, is that he is the native of this place, it is he who cares for the fish of the sea. He is the god, and if he should be killed, there shall be no other god who can watch over this godly point. So be careful, that you do not destroy the akua of this land as you do your work. From what I have seen, he is perhaps like you in what he does. So let him remain free, that he may be worshipped. Kānemakua will become the god of the fishermen of this place."

Kaululāʻau thought this was a good idea. So they dwelt there, and he did his work, killing all the akua of this place. Kaululāʻau then instructed them in praying to the gods, as he had done with the men of Molokaʻi, who had washed ashore at Kahāʻulehale. So it was that the multitudes do this, as Kaululāʻau had been instructed by his god, Lono. Thus vanquished, were the akua of Kaunolū.

So when their work at Kaunolū was completed, they then thought of leaving the place, and they went on a short distance and stayed at Māmaki. And there also destroyed them . . .

A pau ke koena o ke Akua o Kaunolu i ka lukuia, a pepehi pu ia kekahi akua opu ohao, o Kuahulua ka inoa oia akua, a no ka make ana oia akua ia Kaululaau, nolaila, hele hou ae ia lakou a noho ma Manele.

A malaila, ua noho loihi loa lakou i kekahi mau la ame kekahi mau po, a o ka Pahulu hana mau no i ka hele e nana i ke akua mao a maanei. A no ka halawai ole o lakou me ke akua, nolaila, hooholo lakou i ka olelo e pii o Kaululaau ame Lono iuka, a o Pahulu hoi, ua hele loa oia ma kahakai a hiki aku i Naha, a malaila oia e huli ae ai ia Kaululaau ma.

A o Kaululaau ma hoi, hele aku la laua mai Manele aku a pii aku a hiki i Kanauau, a malaila aku no a ke kuahiwi o Kaohai, a hele ae la no malaiala a Kahaalelepaakai, a ma ia kuahiwi aku no ka hele ana a hiki ae i Ohiahalo, a malaila aku ka hele ana hiki i ka mauna o Lanaihale, kahi hoi a Kaululaau i kapili ai i ka maka o ke akua i ke kepau.[1]

1 *Nupepa Kuokoa*, October 24 & 31, 1863.
2 Trans. K. Maly.

Thus the remaining akua of Kaunolū were destroyed, and there was also killed a god with a protruding belly. The name of this god was Kuahulua. When this god was killed by Kaululāʻau, they then continued their journey and stayed at Mānele.

They resided there for some time—a number of days and nights—and as was Pahulu's usual practice he went about looking here and there for the ghosts. Not encountering any, he went to tell Kaululāʻau and Lono that they should ascend to the uplands, while Pahulu would travel along the coast to Naha, and from there he would seek out Kaululāʻau and his companion.

Kaululāʻau folks went from Mānele, ascending up to Kanauau [Kāneuaʻu (also written Kaniuaʻu)], and from there up the mountain of Kaʻōhai. From there they went to Kahaʻalelepaʻakai, and that peak they went to ʻŌhiʻalalo. And from there they went to the mountain summit of Lānaʻihale, at the place where Kaululāʻau glued closed the eyes of the ghosts with the glue.[2]

Kealaikahiki: "Canoe Man's Path to Kahiki" The island of Lānaʻi plays a role in some traditions describing the arrival of the gods and people in Hawaiʻi. The famed Kealaikahiki, "canoe man's path to Kahiki," reportedly starts at Kaunolū on Lānaʻi.[3] The residency of the god-navigator Kāneʻāpua is commemorated in a place name to this day, as is the place called Mūki (Puuomūki), as a source of water, at Kaunolū. Below is one of the traditions of this god and his place in the life of the families of Lānaʻi.

He Moolelo no Wahanui me Kaneapua ma Lanai

O Wahanui kekahi alii o Oahu i holo i Kahiki. O Wahanui ke alii, o Kilohi ke kilo, o Moopuaiki ke kahuna a me na hookele moana. I ko lakou holo ana a pae ma Haleolono ma Molokai. I ka wanaao holo aku la lakou ma

A Tradition of Wahanui and Kāneʻāpua on Lānaʻi

Wahanui was a chief of Oʻahu who went to Kahiki. Wahanui was the chief, Kīlohi was the astronomer, and Moʻopuaiki was the navigator. They sailed and landed at Haleolono, Molokaʻi. In the early morn-

[3] cf. "He Moolelo no Makalei" in *Ka Hoku o Hawaii*, January 31 through August 21, 1928.

REF-221

ka pali o Kaholo ma Lanai, i ke ao ana, kaalo ae la lakou ma ka lae o Kaunolu, a ma ka hikina hema iki aku o laila, o ka Lae o Apua, ka inoa oia wahi a hiki i keia la. E noho ana kekahi kanaka o Kaneapua ka inoa. Kahea mai la ua kanaka nei, penei, "Ko ke waa, no wai he waa?" "No Wahanui."

"O Wahanui ke alii, o wai ke kahuna?" "O Moopuaiki." "O Moopuaiki ke kahuna, o wai ke kilo?" "O Kilohi." "He waa e holo ana i hea?" "He waa e holo ana i Kahikiku, i Kahikimoe, i Kahiki kapakapakaua a Kane, he waa e holo ana e keekeehi i ka houpo o Kane." "O kou houpo la hoi o ko ke kanaka, ka houpo la hoi o ke akua keehiia iho, a pau ola, a koe make. Pehea la hoi owau kekahi maluna o ka waa?"

Olelo mai o Kilohi ke kilo. "Ua piha loa ka waa, aole oe e hiki." I ka holo ana ma kekahi ma-ka-lae mai, loaa i ka ino, me ka makani, a me ka puahiohio, o ka huli waa, hoolana aku la, a komo i ka lulu o Kaunolu, a pae i Kaumalapau.

Ma ka moolelo o keia kanaka o Kaneapua, no Kahiki mai no oia, ua hele pu mai me kona mau kaikuaana a no ka wai ole, hoouna ia o Kaneapua, e pii i ka wai i uka o Miki, aia no ia wahi mauka o Lanai, aka, he kuko ua mau kaikuaana nei o Kaneapua, i ka aina momona o Kaneapua, oia ka aina i Kahalapiko nolaila, ua haalele ia o Kaneapua i Lanai, a ua moe i ko laila wahine, ua lilo i kupuna no kekahi poe.

Ua hana mau o Wahanui ma a no ka make pinepine, ua hooili ia maluna o ka waa, ma Kealaikahiki ma Kahoolawe ka holo ana i Kahiki. Ua olelo ia ma ka moolelo o Wahanui i holo ai i Kahiki, mai pilikia o Wahanui ma i ka moana a ua nalowale na aina,

ing, they sailed along the cliff of Kaholo, on Lānaʻi, at daylight, they passed by the point of Kaunolū. Just a little to the southeast of there, is the Point of ʻĀpua. That is the name of this place to the present day. There was dwelling there a man by the name of Kāneʻāpua. The man called out, thus, "The canoe, whose canoe is it?" "It is for Wahanui."

"So Wahanui is the chief, who is the priest?" "It is Moʻopuaiki." "So Moʻopuaiki is the priest, who is the astronomer?" "It is Kīlohi." "Where is the canoe sailing to?" "The canoe, is sailing to Kahikikū and Kahikimoe, Kahiki of the rain drops of Kāne, to tread upon the bosom of Kāne." "Your chest is that of a man, and to tred upon the bosom of Kāne, is the end of life, only death will remain. How about if I become one of them upon the canoe?"

Kīlohi, the astronomer said, "The canoe is completely loaded, you cannot come." As they sailed on by, passing a certain point, a storm arose, along with a wind and water spouts. Lest the canoe be overturned, they sheltered the canoe at Kaunolū, and then landed at Kaumālapaʻu.

In the story of this man, Kāneʻāpua, it is said that he came here from Kahiki. He came with his elder brothers, and because there was no water, they sent him to the uplands at Miki, to get some water. It is there in the uplands of Lānaʻi. But because the older brothers coveted the rich lands of Kāneʻāpua, that is the land of Kahalapiko, they abandoned Kāneʻāpua on Lānaʻi. He mated with a woman of that place, and became an elder of some of the people there.

Wahanui folks continued trying [to sail], and frequently came close to dying, as storms came upon the canoe at Kealaikahiki, Kahoʻolawe, where one sails to Kahiki. It is said in the tradition of Wahanui's sailing to Kahiki, that there was much trouble

o Kaneapua ka hookele i loaa ai na aina o Kahiki, oia ka hookele akamai loa, ua pau na hoku o ka lani a me ka lewa. . .[1]

that came upon them in the sea. When Kāneʻāpua became the steersman, they reached the lands of Kahiki. He was foremost of the navigators, and knew all of the stars of the sky and heavens. . .[2]

1 *Nupepa Kuokoa*, January 5, 1867, p. 1.
2 Trans. K. Maly.

Chiefly Lineages of Lānaʻi

It was after the events in which Kaululāʻau participated that we see references to chiefly lineages associated with Lānaʻi, and the island fell under the dominion of Maui rulers. The role and fate of Maui's chiefs in warfare with the chiefs of other islands also spilled over to Lānaʻi in the centuries following Kaululāʻau, and lasted through the time of Kamehameha I. In fact, a review of Lānaʻi's history since the time of western Contact reveals that the island and its people have been subjected to Maui's political policies throughout modern times.

Between the time of Kaululāʻau and his immediate peers until the middle 1700s, there are only a few notable references to chiefly associations on Lānaʻi and several passing references—generally one or two liners—to some event in which a chief visited or was associated with Lānaʻi. Samuel M. Kamakau made an interesting reference to Lānaʻi in his discussion of the Hawaiian nation in 1869:

Ka Moolelo o Hawaii—Helu 108

He aupuni kahiko loa ke aupuni Hawaii ma keia pae aina, aka, he aupuni liilii a mokuahana nae o ka noho ana, a ua lehulehu wale na ʻlii Moi ma keia mau pae aina, aole i lilo ka pae aina o Hawaii i ka Moi hookahi, i kekahi elua Moi o Maui, a he alii okoa ko Lanai, a pela ko Molokai, ko Oahu, a me ko Kauai. A ma ko Kamehameha ikaika i ke kaua a na ʻlii i kokua pu iaia ma ke kaua ana, ua huipuia ma ke aupuni hookahi ke aupuni Hawaii. Mai ia manawa mai a loaa wale mai ia kakou i ka poe o keia wa ke kapaia o keia mau pae moku ke Aupuni Hawaii.[1]

The History of Hawaii

The Hawaiian kingdom is an ancient kingdom in these islands, though it was a little kingdom and divided. There were many chiefs and Kings on these islands, the Hawaiian islands were not subject to one Sovereign. Once there were two Kings for Maui, with a different chief for Lanai, and the same for Molokai, Oahu and Kauai. As a result of Kamehameha's strength in battle, and with the chiefs that helped him in battle, the kingdom was unified as one Hawaiian nation. From that time until our present time, we are people of these islands, a Hawaiian Nation.[2]

1 *Nupepa Kuokoa*, March 18, 1869.
2 Trans. K. Maly.

According to Fornander, a review of genealogies and traditions indicated that Lānaʻi, while "independent at times," nonetheless shared a "political relation" with Maui a few generations after the cleansing of Lānaʻi by Kaululāʻau. This relationship was probably

REF-222

fortified during the reigns of Kiha-a-Pi'ilani and his son Kamalālāwalu [15:94, 207]. The research of Kamakau and Fornander make several passing references to the fact that in ca. 1500, Kiha-a-Pi'ilani[4] was for a time forced to hide on Lāna'i, until the path was open for his taking the throne from a cruel elder brother, Lono-a-Pi'ilani. Kiha-a-Pi'ilani's reign was one of progress and peace, though nothing more is mentioned of Lāna'i [23:22,15:87, 206].

Following Kiha-a-Pi'ilani's death, Kamalālāwalu became the king of Maui, attempted to invade the island of Hawai'i, and was killed. His son Kauhi-a-Kama took the throne, and was subsequently succeeded by his son, Kauhi. It is during the later years of Kamalālāwalu's reign that we find reference to a chief of Lāna'i. Fornander [13] published an account compiled from native informants whose narratives reference a king named Kūali'i who was said to have unified the Hawaiian islands several generations before Kamehameha I. Kūali'i was imbued with godlike characteristics, and reportedly lived between ca. AD 1555 and 1730. He was a sacred chief, feared by all, and famed for his strength. In ca. 1600, Hāloalena was the king of Lāna'i, though he ruled under the authority of Kamalālāwalu and Kauhi-a-kama. Fornander [13] reported that

> Haloalena, the chief of Lanai was considered a very good ruler. His great favorite pastime was the collection of the skeletons of birds. When the chief's bird tax was about due it was the usual custom of the agents to go out and proclaim the chief's wishes. [13:IV-422]

Hāloalena had the skeletons of the birds cleaned, prepared, and posed for safe keeping in one of several large storehouses on Lāna'i as his personal treasures. Kauhi, a mischievous son of Kauhi-a-Kama, destroyed all the skeletons and

> This was the cause of the hostilities between the king of Lanai and the king of Maui, and the reason why the king of Lanai wanted to be independent and not be any longer under the king of Maui. At this time the chiefs of Lanai were under the control of Kamalalawalu, king of Maui. [13:IV-424]

Kūali'i was drawn into the dispute, and settled it without bloodshed, though Hāloalena and Lāna'i remained under the Maui kingdom [13:IV-426].

It is not until the 1760s–1770s that we find references to Lāna'i, its people, and chiefs, having been drawn into the path of war between the kings of Hawai'i and Maui. This period of Lāna'i's history has a direct impact on the lands of the Ka'ā region, and several prominent native and foreign historians described this time in Lāna'i's history. Samuel M. Kamakau's series on Kamehameha I—which includes background information on the chiefs in historical events predating and during the youth of Kamehameha—names several chiefs from Lāna'i:

Ka Moolelo o Kamehameha I—Helu 5

I ka makahiki 1769, oia ka lawe ana o Kalaniopuu ia Hana a me ka puali hikina o Maui. I ka hoi ana o Kalaniopuu i Hawaii, a mahope iho o ia manawa, hele mai la o Kamehameha Nui ka Moi o Maui, a kaua ia Puna ke alii Kiaaina Kalaniopuu i hoonoho ai no ka puali hikina o Maui. He kaua kaulana keia no na aoao elua. Ma ka aoao o Kamehameha Nui, ka Moi o Maui, ua hui pu mai na'lii o Molokai, oia hoi o Kaohele, Kaolohaka a Keawe, o Awili, o Kumukoa, o Kapooloku; o na 'lii o Lanai, oia hoi o Namakeha, o Kalimanuia, o Keliiaa a me na 'lii o Maui.[1]

The History of Kamehameha—No. 5

In the year 1769, that is when Kalani'ōpu'u took Hāna and the eastern district of Maui. Kalani'ōpu'u then returned to Hawaii, after which time, Kamehamehanui went to make war on Puna, whom Kalani'ōpu'u had left in charge of the eastern district of Maui. This was a famous battle for both sides. On the side of Kamehameha Nui, the King of Maui, there were joined the chiefs of Moloka'i, being Kaohele, Kaolohaka a Keawe, Awili, Kumukoa, and Kapooloku; and the chiefs for Lāna'i, being Namakeha, Kalaimanuia, Keliiaa, and the other chiefs of Maui.[2]

1 *Nupepa Kuokoa*, December 1, 1866.
2 Trans. K. Maly.

Kalani'ōpu'u failed in an attempt to take control of Maui in ca. 1778, and took the battle directly to Lāna'i. Fornander [15] reported that

> Kalaniopuu ravaged the island of Lanai thoroughly, and the Lanai chiefs, unable to oppose him, retreated to a fortified place called "Hookio," inland from Maunalei. But being short of provisions, and their water supply having been cut off, the fort was taken by Kalaniopuu, and the chiefs were killed. This Lanai expedition is remembered by the name of Kamokuhi. [15:156–157]

Forty-five years after Kalani'ōpu'u's raid on Lāna'i, his granddaughter, Ke'ōpūolani, also the sacred wife of Kamehameha I and mother of his acknowledged heirs, died. She had been an early and influential convert to the Protestant mission, and her passing was documented in the *Missionary Herald*.

> Keopuolani was greatly beloved by her people . . . Her native disposition was remarkably amiable and conciliatory, and her treatment of her subjects was ever humane.
>
> We are informed by her biographer, who is a missionary at the Sandwich Island, that she was born on the island of Mowee [Maui], in the year 1773; that her father's family had governed the island of Owhyhee [Hawaii] for many generations; and that her mother's family belonged to the islands of Mowee, Woahoo [Oahu], Ranai [Lanai] and Morokai [Molokai]. Her grandfather was the king of Owhyhee when it was visited by Capt. Cook, in 1777 [1778].[5]

A Visit to Kaunolū in 1868

In 1868, Lot Kamehameha (Kamehameha V) visited his lands on the island of Lāna'i, and also visited Kaunolū where his grandfather, Kamehameha I, had resided for a time. It

[4] Kiha, son of Pi'ilani, who lived in about the fifth generation after Kaululā'au.

[5] "Keopuolani, Queen of the Sandwich Islands Died on September 16th, 1823, while in residence at Lahaina," *Missionary Herald*, July 1825:234–235.

REF-223

was reported by Walter Murray Gibson (1873) and Kenneth Emory (1924) that, while on this visit, a god-stone at Kaunolū was hidden at the King's orders, and that one of the men responsible for hiding the stone, was Keli'ihananui, an ancestor of several families of Lāna'i in the present day. The Hawaiian newspaper *Kuokoa* published part of a series of articles describing another visit to Lāna'i, and a trip to Kaunolū made in November 1868. Importantly, we learn the names of several of the *akua lawai'a* (fishermen's gods) of Kaunolū. Altogether, seven god stones are named, six in the coastal vicinity of Kaunolū, and another on the *kula* lands above it. Among the other important sites mentioned in the account are a reference to the house site of Nāhi'ena'ena (the sacred daughter of Kamehameha I), situated on the flats below the *heiau*, and the former trail leading to the altar of Kāne'āpua. Readers are also told of some of the practices associated with worship of the *akua lawai'a*, and the nature of the spring of Pā'ao, situated on the Kaunolū Valley floor.

Naue ana e ike i ka Mokupuni o Kaululaau.

Kaunolu.
He ahupuaa no keia o Kaunolu, hookahi kanaka i halawai pu me makou i laila o Mr. Makaena, he kamaaina ia oia wahi, nana i kuhikuhi pololei mai i na mea kaulana oia awa. Nana no hoi e malama ana i na mea kanu a ko kakou Haku Lani Kamehameha V. A wahi hoi ana, e hoi ae ana ua Imi Haku la i laila e lawaia ai, ke hiki ae iloko o Maraki, Aperila na malama kaili aku. Na mea kanu e ulu ana, ipu haole, ipu ala, kulina, uala, a pela aku. A e kukulu ia ana ka ia hale no ua Imi Haku la.

Na Akua Lawaia.
Kunihi, Hilinai, penei kona wahi moolelo. Ina he lawaia nui au, he lawaia kamaaina nae, a he lawaia malihini kekahi, a hoi mua mai ka lawaia, alaila oiala i ka la, ha_[1] ko_ kua me ka'u kaohi iloko ke alo i waho ke k_; a o ka lawaia malihini me kana _ i waho ke alo e hilinai like ai, a oia no kona mea i kapaia ai o Hilinai.

Traveling About to See the Island of Kaululā'au.

Kaunolu.
Kaunolū is an ahupua'a, and we met with one man there, Mr. Maka'ena, who is a native of that place. It was he who correctly pointed out the famous places of that bay. He is the one who attends to the things cultivated for our Royal Lord, Kamehameha V. He said that the Lord will return to go fishing here in the months of March and April, the months of line fishing for aku. The things planted (for the King) are water melons, cantaloupes, corn, sweet potatoes, and such. He (Maka'ena) is also building a house for the King.

The Fishermen's Gods.
Kunihi and Hilina'i, their story is thus. If you are the main fisherman, a native fisherman, and there is also a fisherman who is a stranger here, upon returning from fishing in the day, he will turn his back along with that of the paddler to (lean upon) the god; and the visiting fisherman will do the same, turning his back and leaning upon it, that is why he is called Hilina'i (to lean upon).

O Lahe ke kolu o na akua. __ __ ____ i ka'u wahine a ukiuki au, alaila, noho iho la au a hoi mai oe mai ka lawaia mai, alaila, pee ae la au me ke hiki o ka heiau me ko ike ole mai ia'u. Aia iloko o laila o kanemakua ka 4 o na akua. A nanea mai la kela i ka hele, he peku iki wale aku no ka'u a pa iki ia Lahe, oia hele no o ka lohe a na pepeiao o ka ia, o ka pau aku la no ia i ka holo, alaila, aole e loaa hou kana ia ke holo hou, a hana hou ia e ke kahuna.

O Namakaokaia ka 5 o na akua. Ia akua e mohai mua ai ke kahuna, i mea e oluolu mai ai ua mau aumakua la, alaila, loaa ka ia a Kalani ke'Lii. A lele wale ka pule ana a ke kahuna me ka n_kaka ole o ka puaa, alaila ua maikai, holo ke___ i ka hiaku, wili aku la hoi ke kahuna i ke kapa eleuli, a lohe ua kahuna la e awa mai ana na kanaka a penei: "A mau ke aku a Kalani e! alaila, ho·a iki ae ke kahuna, a ma@ hou ke aku a Kalani e,!! puoho loa kela, pau ka pilikia, aka hoi, ina aole e loaa ke aku a ke'lii, alaila, make ke kahuna, a i ole hoo__ ia ae la ka waha o kekahi kanaka i ka makau a kau i ka lele i panihakahaka no ke kahuna."

Pau kana hai ana mai i ka moolelo, __ ae la makou ma ia pali a loea ae la iluna o Kaihalulu, he heiau ia oia kahi e kaa ia ai kanaka i ka lele me he ahai maia la, alaila, alakai loa aku kela ia makou makai aku a hiki i ke kahuahale kula o Nahienena, o Kolokolo ka pali kahakai, ke kawa a Kahekili i hoiamo ai ke'lii o Mano, me he la he 80 kapuai ke kiekie mai ka __kai a luna. Hai maoli no ka a·i ke nana ae malalo.

Lahe is the third of the gods. Say if my wife had a disagreement with me, and I was upset. I may go off and sit alone, and then you come back from fishing. Then I go and hide on the side of the heiau, without you seeing me. Inside there, is Kānemakua, the 4th of gods. Now while he (the one who returned from fishing), is there relaxing, and I would go quickly go over to touch Lahe (thinking of him). Then by going there, the ears of the fish hear, and that is the end of his going, he shall not get fish again, until he goes to the kahuna.

Nāmakaokai'a is the 5th of the gods. It is the first god that the kahuna makes an offering to, as a means of appeasing all the 'aumākua. Thus, the King and chiefs shall catch fish. When the priest releases the prayer, and if the pigs were not moving about, then it is good. The King can go aku fishing. The kahuna will twist about the black kapa cloth, and he will hear the people calling thus, "Many aku are caught by the King! The kahuna shall light a small fire and then the King will get more aku. They shall cry out, and the troubles are finished. But, if the King does not catch any aku, the priest would be killed, or perhaps the jaw bone of one of the priestly attendants might be made into a hook and set on the altar, in place of the priest."

When he (Maka'ena) finished telling his story, we ascended the cliff, and reached the top of Kaihālulu, it is the heiau where men were placed on the altar like a bunch of bananas. He then took us a little below there on the flats, to the house of Nāhi'ena'ena. Kolokolo is there on the seaside cliff, as is the diving spot of Kahekili, where the King of Maui would leap, feet first into the water. It is perhaps 80 feet high, from the water's surface to the top. Looking down, it seems that one would truly break his neck.

REF-224

Kuhikihi mai la kela i kahi e pu ai iluna o Kaneapua, ke ono ia o na akua lawaia, ke ku la ka makou ahu nui maluna iho o kona akua. He puni o lalo i ke kai i ka wa hohonu. Aole hiki o kamaaina ke pu, no ka mea, ua hanee ke alanui; i keia mau kupueu onioni wale ia ae no. Hoi mai auau kai a hoi mai e hoopau i ka hea-kai o ka ili.

O Paao ka inoa oia luawai kakahe mai la o Mr. Pali mamua, a iho iho i lalo o ka luawai; e kahea mai ana na wahi kamaaina ia me ka leo puiwa penei: "E! mai iho oe i lalo me kou kai." Eia ka he punawai eepa keia. Na ua o Mr. Makaena i hoauau mua ia Pali-opio, a na Pali-opio hoi i hoauau mai ia makou. Ina no na maloo ka mea kai o ka ili, a iho ae i lalo e ____ ai, he awaawa loa ka wai e like me ke kai maoli. Aia ka huihui a hana hou ia e ka poe akamai e kalokalo aku ai i na aumakua, alaila ono ke inu ae.

Pau ae la, kau iluna o na lio a hoi mai; ke haawi aku nei no na malihini i ke aloha nona, no kona kuhikuhi pololei i na mea hou o laila. Hiki mai la makou i ke kula, i laila o Makauwahine ka hiku o na akua, ke kaikuahine o Kaneapua, mai Kauai mai kona hele ana e ike i ke kaikunane; loaa a i ka mai wahine, ku ka hale pe-a i laila, pa-u mai la no i ka puakala. A oia ka mea i ooi ole ai ka puakala oia wahi ke lei ae i a-i. I ka ike kamaka maoli ana aku nei, he like me ka pohaku a kakou e ike mau nei, pela no ke anoo kela poe pohaku, hookahi no mea nui o Kaneapua, aole no hoi ano nui, eia ka hoi he akua iho la ia. He keu no hoi ka hana naaupo o ka wa kahiko, ka hoomana i na mea a na lima o ke Akua Mana Loa Hookahi i hana ai; a ke kamau mai nei no ia hana naaupo a na kupuna o kakou i hala aku la i kekahi o na hanauna opio o kaua e noho mai nei. Aole i pau loa ia anoano ino o ke kuhihewa.[2]

He then showed us the place where one climbs to the top of Kāne'āpua, the sixth of the fishermen's gods. From where we stood, we could see the large altar with the god atop it. It is completely surrounded by the sea at high tide. The natives can no longer go up, for the trail has collapsed; so it is that we, these rascals, just went around it. We then went swimming and casting.

Pā'ao is the name of the waterhole there. Mr. Pali was the first to go into the waterhole; the native then called out in surprise, "Don't go in with your salty water." For this is indeed a mysterious spring. Then Mr. Maka'ena went to bathe, then Pali Junior. And after Pali Junior, we went to bathe. If the one who goes inside has dry salt water on him, and he pours the water upon himself, it will be bitter, just like pure salt water. But if the people are smart, they offer the kalokalo prayer to the 'aumākua, and the water is sweet to drink.

When we finished there, we got on the horses to continue on our way. We offered our aloha to him (Maka'ena), for his pointing out these places to us visitors. We then reached the kula lands, and there was Makuawahine, the seventh of the gods. She is the sister of Kāne'āpua, who came from Kaua'i, in search of her elder brother; she then had her period and there was built a menstrual house for her there. She wore the puakala (Argemone alba) as her skirt. That is the reason why the puakala of this place is not thorned, and why it may be worn as a neck lei. Upon seeing it, it is like any stone that we may see, and that is the nature of those stones. The biggest one is Kāne'āpua, though it is not that big, he is himself a god. It is so amazing, this foolish work of olden times, to worship the things made by hands, rather that which was made by the one all-powerful God. And there still continues some of this foolish

work of those ancestors of ours who have passed on. Being done by the young generation who live here.[3]

1 An underscore (_) denotes illegible text.
2 *Nupepa Kuokoa*, January 16, 1869, p. 4.
3 Trans. K. Maly.

Accounts of Kamehameha I at Kaunolū, 1873

Walter Murray Gibson, who accompanied and hosted Kamehameha V while on his visit to Lāna'i in 1868, penned several accounts of Lāna'i, documenting facts of history as conveyed to him by the late King, other chiefs, and native residents of the island. On March 21, 1873, as a part of the tradition of Puhi o Ka'ala, the newspaper, "Nu Hou," published by Gibson, included descriptions of Kaunolū, and events around the life of Kamehameha I, while residing on Lāna'i. Gibson wrote:

> We commence the publication of a Hawaiian legend, or story, which was partly written in 1868, during a visit of His Majesty Kamehameha V on Lanai, and at his request ... This story is based upon this amount of fact. The land, the heiau or temple, and the spouting cave all exist as described ... The events connected with the visit and residence of Kamehameha the Great, are not only rife in the traditions of the islanders, but were vouched for in conversations with the author, by the late Governor Kekuanaoa, who was with the Conqueror in one of his expeditions to Lanai. Another historical authority was Piianaia, whose memory was rich with the legends of his native isles ...
>
> Lanai is an island of many legends, stories and songs ... Here dwelt Kane, who crossed the seas from western isles ... His kindred, Kanekoa, Kaneloa; and those fish gods, the Neptunes of the Pacific, had their chosen seat among the bold bluffs upon the ocean beaten coast of Ululaau, the ancient name of Lanai. It was a sacred isle, and its central land, named Kealia Kapu, or Tabooed Kealia, was a Pahonua or place of refuge. Upon its soil and that of the bordering land of Kaunolu are the remains of a great temple, which once was a shelter to the fugitive vanquished warrior—to the servant fleeing from a chief's anger, and even to the victim escaping from bloody sacrifice. Its ruins are still revered by ancients of the isle. But a little while ago when the Fifth Kamehameha was there, the natives, at his command, moved and hid away its great stone fish god; and in these very days anxious fishers have been known to make their secret offerings within the temple grounds in order to propitiate the olden deities of the seas.
>
> This temple, or Heiau of Kaunolu, is on the southwestern coast of Lanai and its ruins lie within the mouth of a deep ravine, whose extending banks run out into the sea and form a bold, bluff-bound bay. On the top of the western bank there is a stone-paved platform, called the Kuaha, or Floor of Offering. Outside of this, and separated by a narrow alley way, there runs a broad high

REF-225

wall, which quite encircles the Kuaha. Other walls and structures lead down the bank, and the slope is terraced and paved down to the tide-worn stones of the ever-sounding shore.

Kāne'āpua

At the beach there is a break; a great block of the bluff has been rent away by some earth shake, and stands out like a lone tower, divided from the main by a gulf of the sea. Its high red walls beetle from their tops, upon to which neither man nor goat can climb. But you can behold on the flat summit of this islet bluff portions of ancient work, of altars and walls, and no doubt a part of the mainland temple, to which this fragment once was joined. But man can visit this lone tower's top no more, and his feet can never climb its overhanging walls.

Village about Kaunolū Described

Inland from the temple there are many remains of the hales, or huts of the people of the past. The stone foundations of their cabins, the enclosures for swine, the round earth ovens, and other traces of a throng of people, cover many acres of beach and hill-side. This was a kulanakauhale, or town, famed as an abode of gods and a refuge for those who fled for their lives; but it drew its people mainly through the fame of its fishing ground, which swarmed with kala, ohua, bonito, and the varied life of the Hawaiian seas.

Residence of Kamehameha I at Kaunolū

To this famed fishing ground came the great hero of Hawaii to tax the deep, when he had subdued this and the other isles. He came with his fleets of war canoes; with his faithful koas or fighting men, with his chiefs, and priests, and women, and their trains. He had a hale here. Upon the craggy bluff that forms the eastern bank of the bay there is a lonely pa, or wall, and stones of an ancient halepakui, or fort, overlooking the temple, town and bay. The kanaka of this day speaks of it with subdued voice, and he steps carefully around this ground as he points out to you the Lanai home of the conqueror of the eight lands and seas, Kamehameha the Great.

The stout Son of Umi came to Kealia for sport rather than for worship. Who so loved to throw the maika ball, or hurl the spear, or thrust aside the many javelins flung at his naked chest, as the chief of Kohala? He rode gladly on the crests of the surf waves. He delighted to drive his canoe alone out into the storm. He fought with the monsters of the deep, as well as with men. He captured the great mano, the shark that abounds in the bay; and he would clutch in the fearful grip of his hands the deadly puhi, the great jawed eel or

snake of these seas, the terror of fish and men, and hence his dread name of Puhikapa, the Devourer of the Seas.

When this warrior king came to Kaunolu, the islanders thronged to the shore to pay homage to the great chief, and to lay at the feet of their sovereign, as was their wont, and as they do at this day on the visit of his illustrious grandson [Kamehameha V], the products of the isle; the taro, the yam, the pala, the cocoanut, ohelo, banana and sweet potato. They piled up a mound of food before the door the king's pakui, along with a clamorous multitude of fat poi-fed dogs, and of fathom long swine.

Besides this tribute of the men, the workers of the land, the women filled the air with the sweet odors of their floral offerings. The maidens were twined from head to waist with leis or wreathes of the nauu [nā'ū], which is Lanai's own lovely jasmine—a rare gardenia, whose sweet aroma ladens the breeze, and leads you to the bush seeking it afar off. These garlands were fastened to the planted pili thatch of the king's pakui; they were placed on the necks of the young warriors, who stood around the Chief; and around his royal brows they twined an odorous crown of maile.[6]

Subsequently, Gibson revisited some of the history of Kaunolū, and added a few additional observations:

Lanai.

About five miles along the coast westward of Manele we come to the Heiau of Halulu, to the site of a residence of Kamehameha the Great, and of a once populous fishing village, in a ravine that lies between the lands of Kaunolu and Kealia Kapu. This latter land was a place of refuge ... The walls of the Heiau, the altar floor, or kuahu, and other portions of the rude structure are in a good state of preservation. The Heiau, the stone lines of the old Kamehameha residence, and of numerous ancient halepilis cover a space of a couple of acres on both sides of the ravine. Fish abound at this point, and it was a favorite fishing resort of the First Kamehameha; and we had the honor to entertain here at one time the Fifth of the Kamehamehas, who came here to gratify his native taste of sport in the sea. He also spent a few days, in a small bay, Honopu, a few miles west of Kaunolu, where there are five remarkable natural columns; one apparently over 100 feet high, and about 20 feet diameter at the base, and the others varying from 80 to 60 feet in height. There is a large rock on the brink of the sea, just round the point on the western side of this bay, where the King would sit and angle, and this has been named Pohakualii or Royal Rock, and we have named Honopu, King's Bay.

But to return to our Heiau. On its western side, is a natural gap like a gate way in a wall of rock that lines the brink of a precipice about 150 feet above the sea. The old native priest Papalua, who was our guide told us, that the

[6]Walter Murray Gibson in *Nu Hou*, March 21, 1873, p. 3.

REF-226

Great Kamehameha would sometimes make men, whom he wished to punish, jump from this gap into the sea and some would be hurt or killed. But there is a native now on Lanai named Lono, who will readily make this leap of 150 feet into the tide fretted gulf.[7]

Pu'u o Miki

Pu'u o Miki is translated as "Hill of Miki," Miki meaning "the adept one." This is a feature near the project area. It was identified as Site 142 by Emory in 1924 during his archaeological inventory survey on Lāna'i [10]. The area of Miki, Emory's Site 138, formerly had residences and dry land cultivation in traditional times. It also was the site of an early plantation camp.

"He Moolelo no Makalei" (A Tradition of Mākālei): Kealaikahiki at Kaunolū and noted Places of Lāna'i Named for Former Residents

The story of Mākālei—beginning in the Kekaha region of North Kona, Hawai'i—includes rich narratives describing ancient fishing customs, gods, prayers, and traditions of places. The tradition provides information on various locations around the islands of Hawai'i, Lāna'i, O'ahu, and Kaua'i, and is set around ca. AD 1200, by association with 'Olopana's reign on O'ahu. It was submitted to the native language newspaper *Ka Hoku o Hawaii* by noted Hawaiian historian J.W.H.I. Kihe in 1928. The following narratives, translated by Maly, are excerpted from the larger account, and focus on selected accounts of fishing, people, and history from Lāna'i, with reference to Kealaikahiki and other noted places on the island.

The Supernatural A'u—A'u-lele-o-ka-moana

While fishing off of the ko'a of 'Āwini, Kohala, Mākālei hooked a great fish. The fish rose to the water's surface and rested calmly, for it had pulled out three ka'au lengths of line. Mākālei then saw the great kiwi (sword) of the fish and knew that this fish was an A'u-lele-o-ka-moana (Leaping swordfish of the deep sea). Now while Mākālei had been pulling at his line, the fish had taken him to the open ocean. Hawai'i had fallen behind him, and he was now near, on the side of the channel between Moloka'i and Lāna'i. Seeing that this A'u-lele-o-ka-moana had taken him this far, Mākālei called to his ancestress—

E Hina-i-ka-malama-o-Kā'elo,	O Hina in the season of Kā'elo,
Pa'a 'ia a pa'a ka i'a a kāua!	Secure and bind this fish of ours!

By now, the sun was setting, and Mākālei was traveling outside of the point of Keka'a at Kā'anapali, and he continued to hold back the fish. Darkness covered everything and Mākālei could no longer see the land, yet the fish continued to

[7] Walter Murray Gibson in *Nu Hou*, September 12, 1873, p. 3.

lead him on. Mākālei called again to his ancestress—"O Hina in the season of Kā'elo, secure and bind this fish of ours!"

During that night, Mākālei and this supernatural fish of 'Āwini encircled Lāna'i two times. In the early light of day, the fish began to tire, and Mākālei then pulled the fish close to the canoe. The size of this fish was truly unbelievable. It was almost seven anana (fathoms) long.

Aku Fisheries of Kaunolū, Lāna'i, and Ke-ala-i-Kahiti

Mākālei secured the great fish A'uleleokamoana on his line and then landed at Ka'ōhai along the shores of Ka-ulu-lā'au (Lāna'i). The shore was filled with people, and Mākālei gave the fish to the residents, who kindly welcomed him and pleasantly cared for him. Now while he was staying on Lāna'i, he was greatly esteemed by the kama'āina, and he asked them if there was a ko'a (fishing station shrine) at this place. The natives told him, "Kaunolū and Ke-ala-i-Kahiti are the famous ko'a. There are many other ko'a, but these are the foremost."

One day, Mākālei went with the people to the shore of Kaunolū and saw the ko'a; indeed the natives of this shore were fishing there. Looking upon this scene, Mākālei told the native residents which were with him, "This kind of fishing is a game for the children of my land." The kama'āina then asked, "Which land is that?" Mākālei answered—

> It is Ka'elehuluhulu at Kona, Hawai'i; where the dark clouds settle upon the mountain in the rising calm, where the sun appears upon the back and sets at one's face. The land of Kona is indeed famous for its' calm and gentle seas, [the land which is] also known for the streaked ocean where the 'Eka breezes gently blow!

Mākālei then asked, "Do you have an uhi (pā hi-aku), or mother of pearl aku lure, like the type being used by those fishermen?" Mākālei then took out his lure and showed it to those people who were with him. One person then told Mākālei, "The aku lures are cared for by the fishermen themselves for it is in their knowledge to care for the lures." Mākālei then said, "If you have an 'ohe (aku line boom) for us, I can try to use my lure Kolomikimiki. It is my inheritance from my ancestress Hina-i-ka-malama-i-kā'elo."

One of the people told Mākālei, "Let us go to that canoe which is resting on the shore, it belongs to my elder brother, Ke'ōmuku who is the head fisherman of this place at Kaunolū." They then went down to speak with Ke'ōmuku, asking that he give them an 'ohe hī aku (aku line boom), which he did. Ke'ōmuku then asked, "Who is your fisherman?" And the people told him it was the young stranger. Ke'ōmuku then asked, "Do you have a lure with which to fish?" And they responded that the youth did indeed have a lure, and that was why they

REF-227

were asking for the boom. Ke'ōmuku then told them, "So you have gotten your aku fisherman after all."

They then paddled towards the place where the canoes were at rest upon the water. Mākālei then set his lure down, and he then asked his companions, "What are your names, that I may call to you to paddle as is my rule at the time of fishing. If the canoe does not move when I call out to the kāohi (paddlers who position and/or hold a canoe in place while aku fishing) to paddle, the lure will not be drawn through the water. Indeed, the fishermen lives (has luck) by the moving of the canoe." They then told Mākālei their names; Pali was the man at the front (ihu) of the canoe, Malama was the man at the mast brace (ku kia), Pālāwai was the man at the bailing seat (kā i nā liu), and the man at the inner outrigger boom (kua 'iako) was Hopu.

When Mākālei mā reached the canoe fleet, all of the fishermen were waiting for the aku to begin moving. To that time the aku had not yet appeared, and the sun was already drawing to mid-day. Mākālei then called to Pali, Malama, Pālāwai, and Hopu, "Paddle for the Mākālei, fisherman of the long day." Mākālei then called to his ancestress—

E Hina-i-ka-malama-o-Kā'elo	Hail Hina of the season of Kā'elo
Ku'u kupuna wahine o ka lā o lalo	My ancestress of the sun which is below (to the south)
E pāpale i ke aloha hōmai	Your love overshadows, reaches down
I makana na'u na Mākālei	As a gift for me, for Mākālei
Ho'āla ia mai ke kahuli	Arise o fish which upsets the canoe
Ke ka'awili, ka ho'olili, ka holopapa	The fish which twists, which causes ripples on the water's surface, and travels at the lower stratum
Ke aku i ka hale o ke ko'a	The aku which is at the house, the ko'a
o Kaunolū i ke ala i Kahiki	of Kaunolū at the path to Kahiki
I ke hālukuluku i ka māpuna	Striking at the spring,
I ka piko o Wākea	At the umbilical of Wākea
Ka i'a alaka'i noho i ke ko'a	The lead fish dwells at the ko'a
I ka hale o ka i'a	Which is the house of the fishes

When Mākālei ended his chant the aku began to strike at all sides around them. Mākālei then held securely to the lure line and pulled the quivering aku to the canoe. He then called to Pali, telling him to take up the aku and place it at the bow of the canoe. Mākālei then took up the other aku without any errors; and the aku were like snarling, raging dogs. When the canoe was filled, he called to Pālāwai to bail their canoe, and he called to Hopu, Pali, and Malama telling him, "Our canoe is filled, paddle towards the shore, to the land ko'a which is by the house where the canoe carriers await." Now when Mākālei mā finished

fishing, the aku also stopped rising to the surface and remained in the depths without rising again.

When they landed their canoe upon the shore, Mākālei took up the first caught aku from Pali at the bow of the canoe, and then told his kāohi, "Divide all the fish as you desire, giving some to those people who had carried the canoes, and to the people who dwell in the houses without fish. If there are any fish left, give them to the dogs and pigs, and do not worry about me. This one fish is all that I need."

Now this was something new to those people at this place, that Mākālei should give them all the fish, and keep only one for himself. The people were greatly surprised for there were no other fishermen at this place who had ever given so much. The people thought, "This person is no fisherman, but instead he is an 'aumakua for us."[8]

The fame of Mākālei's deeds went around the island of Lāna'i-a-Kaululā'au, from the 'okina (land divisions) of Ka'ā, Kaunolū, and Ka'ōhai on the island of Lāna'i. Because of these deeds of our alert one [Mākālei], a beautiful young girl of Lāna'i went to Mākālei with her mother to ask that he become the young girl's husband. The name of this girl was Mauna-lei, and her mother was Lāna'i-hale, and Pālāwai, who was one of Mākālei's paddlers was the father of this beauty of the land of the god Pahulu; the one for whom it is said "Eia kau wahi e Pahulu - Here is your portion Pahulu!"[9]

Mākālei then asked the maiden that she excuse him, "There have been many people which have sought to arrange a marriage, and not one of them have I agreed to." Mākālei then told Maunalei mā, " I will have no thoughts of marriage until I see the island of Kaua'i. Until this thought has been fulfilled, I cannot consider marriage." Lāna'ihale then said, "If that is so, perhaps the two of you could dwell under a palau (betrothal agreement), until the time for marriage is right." But Mākālei explained that that could not be done, "I would not bind any woman to an agreement, for then if some fine man came along, then she would be unhappy. Therefore, I ask you to forgive me, and do not let these thoughts become unjust." Because of his just words, the people felt certain that Mākālei was indeed a chief.

Now one day while the canoe fleet was out 'aku fishing, Mākālei went with his kāohi Pālāwai, who was the father of the maiden named Maunalei. When they reached the ko'a, the aku were seen swimming, Mākālei turned and tossed out his lure and quickly secured ten fish. When Mākālei mā rested, they saw that it had been a great a'u (sword fish) which drove the aku to their canoe. Mākālei

[8]May 29, 1928.

[9]Pahulu (Nightmare) was the king of the *akua* who inhabited Lāna'i, and who were killed by the chief Kaululā'au. Pahulu was the last *akua* killed and his spirit infested a *weke* (goatfish) that is now called *weke pahulu.* Natives of Lāna'i throw the bones and head of *weke pahulu* into the cooking fire and utter this saying to ward off nightmares.

REF-228

then took his line and tied one of the aku to his lure, he then threw the baited lure behind the canoe and as it fell, the a'u took the aku. The a'u ran along the water's surface thrusting it's sword all about. The canoe fleet scattered as those people on the canoes were fearful that they would be pierced by the a'u.

Mākālei held tight to the line, and A'ulele traveled out to the dark blue-green sea, to where the islands were seen to sit low upon the water, and Wai'ale'ale barely rose above the horizon. As the sun began to descend, Mākālei called to his ancestress—

E Hina-i-ka-malama-o-Kā'elo,	Hail Hina of the season of Kā'elo,
Pa'a 'ia a pa'a ka i'a a kāua!	Secure and hold tight this fish of ours!

A'ulele then dove towards—Kaua'i moku lehua pane'e lua i ke kai (Kaua'i, island of the lehua forests which appear to travel towards the sea).[10]

2.2 Historical Events: Transitions in Land Use and Population on Lāna'i

In the 1770s, around the time of western Contact with Hawaiians, Kalani'ōpu'u, sovereign of Hawai'i Island, attempted to take the Maui group of islands by force. Repelled from Maui, the invading force settled on Lāna'i for a time and reportedly killed many of the native residents and laid the land to waste [15; 23]. Apparently, Lāna'i's native population never recovered from this event. In 1804, the first major epidemic brought to the islands on foreign ships swept through the group. It is estimated that by 1805, from Ni'ihau to Hawai'i 150,000 Hawaiians died.[11] On Lāna'i the decline didn't end. One estimate of the native population on Lāna'i in ca. 1793 is 6,000 [4].[12] By 1823, Mission Station Journals estimate the population on Lāna'i to be between 2,000 and 3,000 people, and by the early 1890s the population was around 200. By 1902, the native population dropped to 80 residents, most of whom were descendants of Lāna'i's long-term native families. One can only guess how much traditional knowledge of place, practices, and traditions was lost as the population fell from 6,000 to 80 in a little more than a century.

With the exception of the periods from 1854 to 1864 and 1899 to 1901, there were no increases in the population on Lāna'i. The two periods of increase were tied to western initiatives, the first being an experiment by members of the Mormon Church to establish a station on Lāna'i between 1854 and 1864. This period led to an increase of more than 300 Hawaiians and a few foreigners, with the majority living in the *ahupua'a* of Pālāwai, and regular travel between the upland settlement and the Mānele landing. The experiment was in decline by 1858, and though there was a revival between late 1861 and 1864, the Pālāwai experiment was terminated, and the native population continued its historic decline. The second period of growth, between 1899 and 1901, occurred when the Maunalei Sugar

[10] June 5, 1928. Trans. K. Maly.
[11] *Pacific Commercial Advertiser*, Nov. 6, 1864.
[12] Archaeological fieldwork conducted over the last decade supports this estimate, which is higher than that given by Kenneth Emory in 1924.

Company brought in some 600 non-Hawaiian laborers to operate a sugar plantation along the windward section of Pālāwai Ahupua'a.

One significant contribution to the decline in Lāna'i's ability to support the resident population was the introduction of grazing herbivores—goats, sheep, and cattle—which were raised to provide foreign vessels with a meat source. These animals, along with the Scandinavian roof rat, produced a rapid and devastating impact on the ability of Lāna'i's forest to draw moisture from the wind-borne clouds and develop groundwater resources. In addition to the introduction of herbivores, the western demand for staple crops such as potatoes, along with the demand for *'iliahi* as a trade item, and the hunger for firewood to be used in processing whale blubber, led to the clearing of vast tracts of land. Just as the Hawaiians had no immunities or natural protection from introduced diseases, the native plants, animals, and ecosystems were also unprepared for the impacts of human clearing of the landscape and foraging animals that browsed and trampled everything that was visible, thus killing the land.

In light of the incredible population losses on Lāna'i, we are fortunate that any traditional knowledge of place survived. A number of historical accounts—those recorded by native residents, visitors, and in various government documents—shed light on a wide range of aspects of the history of Lāna'i's people. The historical records below provide us with glimpses into the changes on Lāna'i, with specific references to Pālāwai and Kama'o between ca. 1820 and the early 1900s. Unfortunately, it does not appear that any descriptions of the significant *heiau* at Kaupakuea near the Pālāwai-Kama'o boundary survived.

Lāna'i in 1823 William Ellis, an English missionary who worked with the early Protestant missionaries in the Hawaiian islands, described Lāna'i, the nature of its resources, and the estimated population in the early 1820s:

> RANAI, a compact island, seventeen miles in length and nine in breadth, lies north-west of Tahaurawe, and west of Lahaina, in Maui, from which it is separated by a channel, not more than nine or ten miles across. Though the centre of the island is much more elevated than Tahaurawe, it is neither so high nor broken as any of the other islands: a great part of it is barren, and the island in general suffers much from the long droughts which frequently prevail; the ravines and glens, not-withstanding, are filled with thickets of small trees, and to these many of the inhabitants of Maui repair for the purpose of cutting posts and rafters for their small houses.
>
> The island is volcanic; the soil shallow, and by no means fertile; the shores, however, abound with shell-fish, and some species of medusae and cuttle-fish. The inhabitants are but few, probably not exceeding two thousand. Native teachers are endeavouring to instruct them in useful knowledge and religious truth, but no foreign missionary has yet laboured on this or the neighboring island of Morokai, which is separated from the northern side of Ranai, and the eastern end of Maui, by a channel, which, though narrow, is sufficiently wide for the purposes of navigation. [9:6–7]

REF-229

A Protestant mission station was established in Lāhaina in 1823, and was responsible for West Maui, Lāna'i, Moloka'i, and Kaho'olawe. Mission station leaders were tasked with overseeing the spiritual, educational, and health needs of island residents. In addition to the Protestant missionaries, Lāna'i experienced a period of development as a Mormon mission station from late 1853 to early 1864. As noted above, the "experiment" brought an increase in Lāna'i's Hawaiian population, with Hawaiians from other islands moving to Lāna'i, and also fostered some significant changes on the island, notably in the area of land tenure. The work of the various missionaries and their associates resulted in the creation of an important record of history on the island. Excerpts of reports, personal journals, and articles published in Hawaiian and missionary papers—documenting Lāna'i population statistics, land use, health, and development of churches and schools—provide important records from Lāna'i.

> The islands of Ranai and Morokai have, till within a few weeks, been entirely without teachers. To the former [Lāna'i], I last week sent a man, who is to act as superintendent of four schools, which are to embrace all the people of the island. There are a few people there, who have frequently visited Lahaina, and when here, have always been in our schools. From among this number, the superintendent is to select four assistants; and thus I hope all the people will have it in their power to learn to read and write, and to acquire, by means of our books, many of the first principles of Christianity. Of the number of pupils which will be embraced in these schools, I can form no estimate, as I have yet received no report, and the island has never been explored by any of our number . . .
>
> The communications between the two last mentioned islands and Lahaina, are frequent, and even constant. There is scarcely a day, but canoes pass and repass. Almost the only communication is by canoes, though small vessels occasionally visit Morokai. The inhabitants of those islands have very little communication with any other place except Lahaina. If therefore they are illuminated at all, they must derive their light from this station. Tawawa [Kahoolawe], too communicates with no other island except Maui, though there are few inhabitants there, and those mostly fishermen, who are not permanent residents.[13]

A Visit to Lāna'i in July 1828 The earliest eyewitness description of travel on Lāna'i was penned in 1828, when William Richards, in the company of Kamehameha I's sacred daughter, Princess Nahi'ena'ena, made a visit to the island. The journal notes were forwarded to the secretary of the American Board of Commissioners of Foreign Missions (ABCFM)[14] through a communication on December 25, 1834, and the excerpts from the

[13] August 9, 1825, Letter of William Richards Describes Progress of Instruction—Four Schools Established on Lanai, *Missionary Herald*, June 1826:174-175.

[14] Kepā and Onaona Maly researched the American Board of Commissioners of Foreign Missions (ABCFM) collection at Harvard in 2004, and subsequently digitized it for return to Hawai'i. This journal, along with thousands of other records of importance to Hawaiian history, have been lost to Hawai'i for 177

journal cited below describe conditions on Lāna'i at the time. It is notable that there is a discussion on the practice of people living near the shore, where there is easy access to fisheries and brackish water sources; the occurrence of an upland plantation moistened by the cloud and fog drip—the bench lands above the Pālāwai Basin; and the practice of the people to travel seasonally between the coastal region and the uplands to tend their plantations of dry land *kalo* and other crops.

> As it is especially desirable that you have correct information respecting all our fields of labor, I prepare in this letter to give you some account of Lanai, the little island which lies directly opposite Lahaina & about seven miles, distant. You will perceive by the accompanying map,[15] that its greatest length is about 17 ½ miles and its greatest breadth is about 12 miles. The land rises from the shore to the interior, and terminates in lofty points. The sides of the mountains are cut up by innumerable ravines or alternate ridges and hollows. But these valleys are not like the valleys on the windward side of the other islands, furnished with openings & rivulets.
>
> There is but one permanent brook on the island, and that is so small that it is all lost in a few small talo[16] ponds, and their fare does not reach the shore except in the wet seasons of the year. There is not a well of good water on the island, except such as are prepared after the manner of the Hebrews. These wells, though few on Lanai, are common at many parts of the Sandwich Islands. They are either natural or artificial pits, sometimes only a few feet in diameter, and at other times many yards. They are so prepared as that when it rains the water for a distance may flow into them. There are steps to go down into them, but they are not often very deep. In places where they are exposed[17] to direct light & from the wind, they are uniformly covered and even where they are not thus exposed they are often covered, to prevent the water from drying up as soon as it would otherwise. Some of these wells are never exhausted even though they are not replenished for eight or nine months. Others which are small, depend entirely on the almost nightly rains which fall on most of the high mountains of the Sandwich Islands, though in many places these rains are little more than heavy dews.
>
> There are many people who make no use of water for washing either themselves or their clothes, except the dew or water on the grass and some times, there is so little of this that they resort to the juice of the succulent plant which they collect. Most of these people however, have two places of residence, and only spend a part of the year on the mountain where there is also a great scarcity of water. In the sea shore, both at Lanai and throughout the islands, with few exceptions, there is a full supply of brackish water, but such as none can drink except those who are accustomed to it. I know not a single well on

years and are seen here in print for the first time.

[15] The map referred to by Richards was not found in files with this letter and cannot now be identified.

[16] Here Richards is referring to *kalo*, or taro.

[17] Page 1 - Reel 797:762.

REF-230

the Sandwich Islands, supplied with water from the bottom, except such as are on the sea shore on a level with the sea.

Owing to the scarcity of water on Lanai, the inland is barren almost beyond conception. I have recently been quite round the island, and visited every principal village on the island except one, and during my whole tour, I saw but one good well of water; and no spring or brook, and I saw nothing growing which was suitable for food, either for man or beast, and nothing grows except sea weeds and sea grass. I should except a few cocoanut trees and two or three[18] or four have trees.

Most of the people live near the shore for the purpose of taking fish in which the shores of Lanai abound, and a considerable portion of their vegetable food they receive from Lahaina, in barter for fish. There is however one inland plantation of some extent, which furnishes considerable food. It is watered by the mist or light rain which falls during the night, in sufficient quantities for the growth of potatoes and in wet seasons some upland - taro is raised. There are few people that reside at that place constantly, but considerable number who reside generally on the shore, go up & spend a month or two at a time so as to keep their land under cultivation, and then return again to the sea side where they can have abundance of fish, and water too, such as it is for there is a plenty of that which is brackish.

The numbers of inhabitants on the island, has been estimated at about 1600; but at the present time I think there are not so many though there has been no regular census of the island taken & it is impossible to make such an estimate as can be relied upon.

The island is always under the same governance as the island of Maui, but the direct care of it has for years been given to Kapeleaumoku, an elderly man, who is a member of our church, and a man of established reputation...

In a letter of mine written Oct. 15th, 1828[19] I alluded to a tour around the island of Lanai, made by myself in company with the Princess, and promised a full account of it. The following is from my journal kept at that time, but which was never sent.[20]

July 24, 1828 – Thursday.

A few missionaries located at the principal places on each of the islands exert an important influence not only over those inhabitants who receive their constant instruction, but also over all the inhabitants of the several islands. This they do, in part, through the chiefs in part, through native teachers, but principally, in consequence of the roving habits of the people which induce them often to visit the principal places by which means they are brought under the occasional sound of the gospel and for a season under the direct influence of missionary instruction.

[18]Page 2 - Reel 797:763.
[19]Page 3 - Reel 797:764.
[20]At this point Richards inserts lengthy narratives from his personal journal of 1828, and his visit to Lāna'i with Chiefess Nahi'ena'ena and the near loss of Kapeleaumoku while traveling from Lāhaina to Lāna'i.

The chiefs too are after calling the people to the places where they reside to do work for them. In the winter & spring of 1832, all the able bodied men of Maui, Molokai & Lanai were called to Lahaina, and most of them spent several weeks there. It is probable that scarcely a year passes in which most of the people are not thus called to the residence of the chiefs.[21]

The following are extracts from the Lahaina Report dated October 15, 1828. It mentions the people of Lanai assembling for prayer and instruction, as well as population and school enrollment statistics.

You are already aware that this place is the centre of missionary operations for Maui, Molokai, Lanai, and Kahoolawe. Lahaina is the only place where there is regular preaching. It is, however, by no means the only place where people assemble for religious worship on the Sabbath. There are not less than twenty places on this island, and several on Molokai and Lanai, where people assemble for prayer and instruction. The native teachers take the direction of the meetings, occupying the time in reading and teaching the various Scripture tracts and other books, and conclude with prayer. By this course the people are inspired with a reverence for the Sabbath; and though the teachers are themselves extremely ignorant, yet they are able, in this manner, to communicate some instruction, and the people are thereby kept from assembling for vicious purposes, and worse than idle conversation.

Examination of the Schools

During the summer and early part of the fall of 1828, subsequently to the arrival of the late reinforcements, owing to an increase of their numbers, the missionaries at Lahaina were enabled to make tours over Maui and the small island adjacent, for the purpose of preaching the Gospel, examining the schools, and giving the people such counsel and encouragement as their circumstances required ...

Table 1: No. of Scholars

Island	Sch'ls.	Mal.	Fem.	Writers	Readers	Total
Ranai	11	236	249	31	201	485

... A great proportion of the pupils are persons of middle age, and still they have learnt to read the Scriptures. According to the estimate we made, only one fifth of the scholars are under fourteen years of ages.

The people of every district which we visited were addressed particularly on this subject, both by ourselves and the princess [Nahienaena]. We have

[21]Wm. Richards to Rev. Rufus Anderson, Secretary of the ABCFM, Recounting Trips to Lanai in 1828 and 1834 [page 17 - Reel 797:778].

REF-231

received the fullest evidence that our exertions have not been in vain. Since our return from the tour of the island, about 5,000 spelling books have been called for, principally to establish schools among children. This increases the whole number enrolled in the schools to about 18,000; viz. 15,500 to this island [Maui]; 1,000 to Molokai; and 700 to Ranai. It is not probable that, with the present population, so large a number as this can ever appear at an examination. But 18,000, we think less than the full number of those who are now enrolled in the schools under the direction of this station . . .

The population of Maui has been heretofore estimated at 20,000, that of Molokai at 3,000 or 4,000, and that of Ranai at 2,000 or 3,000, making the whole population on these three islands not more than 27,000. The present estimate represents the population as probably amounting to 37,000. Upon comparing with this the number of learners in the schools on these islands, as just given, it will be seen that almost half the whole population, of both sexes, and all ages, are in the schools; a larger portion of the people, probably, than are enjoying the advantages of instruction in any other country on the globe.[22]

2.3 Land Tenure

The *Māhele 'Āina* of 1848 set the foundation for fee-simple property rights in the Hawaiian Islands. As a part of major ethnographic work conducted by Kepā and Onaona Maly for the development of the Lāna'i Culture & Heritage Center, a full history of land tenure on Lāna'i in the period between 1848 and 1960 has been conducted and made available to the public.[23]

The narratives below summarize the *Māhele 'Āina* on Lāna'i, drawn from a review of all records compiled as a part of the *Māhele 'Āina* of 1848, with subsequent actions of the Land Commission and government through issuance of Royal Patents on the Awards.

2.3.1 Māhele 'Āina Statistics on Lāna'i

- A total of 110 claims which could be verified for Lāna'i were recorded. These include both chiefly and commoner/native tenant claims.
- 105 claim records were located in the volumes of the Native Register.
- 88 claim records were located in the volumes of the Native Testimony.
- 2 claim records were located in the volumes of the Foreign Register.
- 21 claim records were located in the volumes of the Foreign Testimony.
- 64 of the claims were surveyed and recorded in the Māhele Award Survey Books.
- 51 claim records were recorded in the volumes of the Royal Patent Books.

The combined claims from Lāna'i represent 331 separate documents (some overlapping in records of the Native and Foreign Books):

[22] *Missionary Herald*, July 1829:208–211.
[23] Lāna'i Culture & Heritage Center, http://www.lanaichc.org/.

- 56 claims were awarded. Of those awarded, five claimants were chiefly awardees, who received entire *ahupua'a*.
- 51 awards made to native tenants and individuals of lower chiefly lineage, totaled a little over 600 acres of the approximately 89,000 acres of land on Lāna'i.

2.3.2 Place Names Referenced in Claims by Applicants

A total of 86 place names is in the records provided to the Land Commissioners. The names from Kaunolū and Kalulu are cited in table 2.

Table 2: Place names recorded during the *Māhele*

Names of Places and 'Ili	Ahupua'a	Names of Places and 'Ili	Ahupua'a
Ahua	Kaunolu	Ahupau	Kalulu
Haupu	Kaunolu	Ailau	Kalulu
Kaapela	Kaunolu	Elialii	Kalulu
Kuapohaku	Kaunolu	Iomo	Kalulu
Leiehaka	Kaunolu	Kahawainui	Kalulu
Makapeapea	Kaunolu	Kamoku	Kalulu
Miki	Kaunolu	Kanaiu	Kalulu
Miloonohi	Kaunolu	Kapano kai	Kalulu
Moanauli (Moenauli)	Kaunolu	Kapano uka	Kalulu
Namakaokahai	Kaunolu	Kapano	Kalulu
Neua (Newa)	Kaunolu	Keawaiki	Kalulu
Nihokele (Nihokela)	Kaunolu	Kiholena	Kalulu
Pakihi	Kaunolu	Kukuihapuu	Kalulu
Paooole	Kaunolu	Pueo	Kalulu
Punanana	Kaunolu		

2.3.3 Disposition of Ahupua'a and Konohiki Claims on Lāna'i

As a part of the *Māhele*, the King and Chiefs were required to file their claims for personal lands, determine how to pay for their lands—usually by giving up certain lands, in lieu of cash payment—and to claim the *kapu* fish and wood of their land. The latter items were the *konohiki* rights to resources with which the *konohiki* would sustain themselves and generate revenues for their support. In eliciting claims and documentation of rights, the chiefs began submitting letters for the record to the Minister of the Interior.

There were only limited letters submitted for Lāna'i. Of particular interest is a letter dated August 26, 1852 from Noa Pali to Keoni Ana, Minister of the Interior, documenting the *kapu* or *konohiki* fish and trees for 11 of Lāna'i's 13 *ahupua'a* (table 3).

2.3.4 Buke Māhele (Land Division Book), 1848

In preparation for the final division of lands between the king, *konohiki*, and government, a *Buke Māhele* was kept as a log of the agreed upon division. This book is the basis of

REF-232

Table 3: Forbidden fish of the *konohiki* and the prohibited woods

Konohiki	Land	Fish	Wood
Mataio Kekuanaoa	Kaa	Uhu	Koko
Mataio Kekuanaoa	Kaohai	Hee	Naio
Nahaolelua	Maunalei	Hee	Kukui
Kanaina	Mahana	Hee	Ahakea
Kanaina	Paomai	Hee	Aiea
Haalelea	Palawai	Anae	Ahakea
Kaeo	Kealia [Kapu]	Uhu	—
Kaahou	Kamao	Hee	Koko
Ii	Kalulu	Hee	Ahakea
Pali	Kamoku	Uhu	Koko
Pali	Kealia [Aupuni]	Uhu	Koko

Your Highness, this is for you to decide in your office.*

*Hawaii State Archives, Interior Department Lands.

the Crown and Government land inventory now known as the Ceded Lands. There are 13 *ahupua'a* on Lāna'i. Disposition of 10 *ahupua'a* was recorded in the *Buke Māhele* (1848) and before the Land Commissioners. Three *ahupua'a* were apparently dropped through an oversight on the part of the king, Commissioners, and staff. Titles confirmed at the close of the Land Commission are presented in table 4.

The following is a translation of a Land Commission document from the Native Register. It is from the claimants on Lāna'i and describes the land to which they stake claim. Reproductions of the original document are included as figures 3 and 4.

> Aloha to you Commissioners who Quiet Land Claims of the Hawaiian Kingdom. We hereby petition to enter our claims on the Island of Lanai.
>
> Here are our claims — moo (planting parcel) lands; kula (open plains and planting) lands; the mountains; the wood, woods to be taken under the Konohiki; fishes, fishes to be taken under the Konohiki; the length is from the moana (open ocean) to the fishery of Kaholo; from one fishery to the other fishery. We are the people in the Ahupuaa of Palawai, Pawili, Kaunolu, Kalulu, Maunalei and Mahana. Here are our names:

Helu	Name	Helu	Name	Helu	Name
10024	Lono	10042	Nakalo	10025	Kaneakua
10043	Paele	10026	Papalua	10044	Kapahoa
10027	Nalimu	10045	Haalu	10028	Oawa
10046	Nalei	10029	Apolo (See O)	10047	Pauahi
10030	Napuulu	10048	Haole	10031	Palaau
10049	Moo	10032	Pakele (See O)	10050	Wailaia
10033	Kaia	10051	Kalamau	10034	Nakuala
10052	Kuakaa	10035	Naehulua	10053	Kapuhi
10036	Paaoao	10054	Elikai	10037	Pamioa
10055	Kunea	10038	Kaiole	10056	Keaka
10039	Puupai	10057	Ohoe	10040	Pohano
10058	Kaunele (See O)	10041	Kanekeleia		

That is the end.[24]

2.3.5 Ali'i and Native Tenant Claims from Kaunolū and Kalulu Ahupua'a

[24] *Helu* 10041 (Recorded with *Helu* 10024), Kanekeleia (and Lono et al.), Palawai, Native Register 6:510–511, Lanai, February 12, 1848, translated by Maly.

Table 4: Disposition of *ahupua'a*

Ahupua'a	Claimant	Disposition	Buke Māhele (1848)
Kaa	Victoria Kamamalu	Awarded	Page 4, Jan. 27, 1848
Kalulu	Daniela Ii	Crown	Testimony of M. Kekauonohi, Dec. 1847
Kamao	Kahanaumaikai	Government	Page 47, Jan. 31, 1848
Kamoku	No record	Crown	Record of Boundary Commission (1877)
Kaohai	M. Kekuaiwa (M. Kekuanaoa)	Awarded	Page 14, Jan. 27, 1848
Kaunolu	Kelliahonui	Government	Page 130, Feb. 9, 1848; Page 209, Mar. 8, 1848
Kealia Aupuni	Kahanaumaikai	Government	Page 47, Jan. 31, 1848; Page 209, Mar. 8, 1848
Kealia Kapu	Iosua Kaeo	Awarded	Page 34, Jan. 28, 1848
Mahana	Wm. C. Lunalilo	Government	Page 22, Jan. 28, 1848
Maunalei	Pane (Fanny Young)	Awarded	Page 161, Feb. 12, 1848
Palawai	M. Kekauonohi	Awarded	Page 26, Jan. 28, 1848
Paomai	No record	Crown	Testimony of C. Kanaina, Dec. 1847
Pawili	Wm. C. Lunalilo	Government	Page 21, Jan. 28, 1848; Page 207, Mar. 8, 1848
'Ili of Kaumalapau 1 & 2	Oleloa (wahine)	Government	Page 105, Feb. 7, 1848; Page 209, Mar. 8, 1848

REF-233

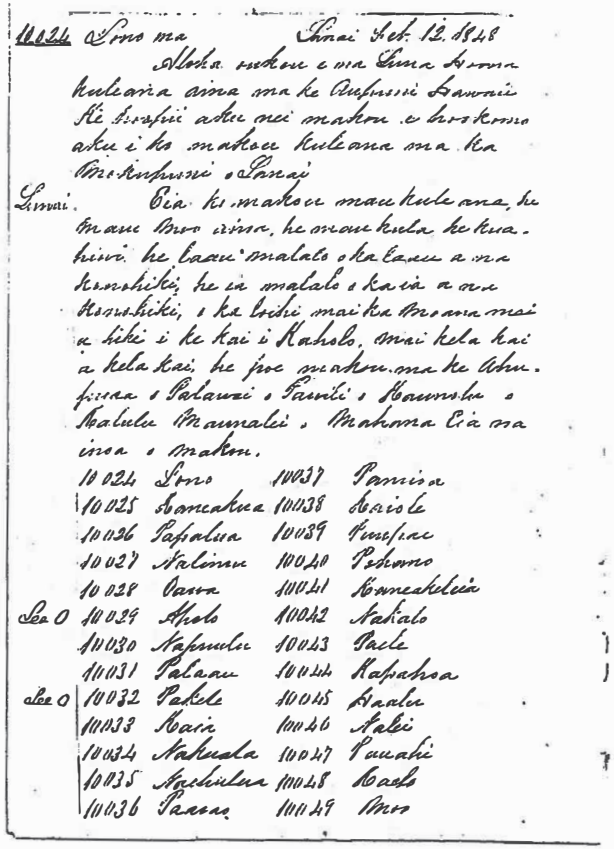


Figure 3: Page 1, *Helu* 10041, Kanekeleia (and Lono et al.), Pālāwai, Native Register 6:510–511, Lāna'i, February 12, 1848.

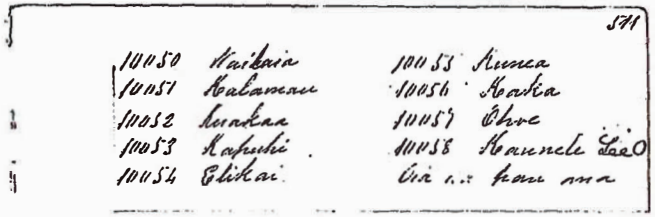


Figure 4: Page 2, *Helu* 10041, Kanekeleia (and Lono et al.), Pālāwai, Native Register 6:510–511, Lāna'i, February 12, 1848.

Kaunolū is comprised of 7,860 acres and is one of the four *ahupua'a*—the others are Pālāwai, Kalulu, and Pa'awili—that cross the island of Lāna'i, spanning both the *Kona* and *Ko'olau* regions of the island. Dixon et al. suggest that this is because when Maui chief Kaka'alaneo divided the island in the fifteenth century, the *ali'i* who ruled those *ahupua'a* were "too powerful or influential to relinquish their relationship to resources on the opposite side of the island" [8:136].

The leeward point of Kaunolū marks "Ke ala i Kahiki" (the path to Kahiki), and is commemorated as the landing place of the ancient gods on Lāna'i. On the leeward side, the *ahupua'a* is fronted by the deepsea fishery of Kāholo. The land then takes in the steep sea cliffs of Pali Kāholo, crosses through the Pālāwai Basin, ascends the mountain to Pu'u Ali'i, one of the major peaks of Lāna'i Hale, and then continues to the ocean on the windward side. Supplied by water sources in the Kaunolū-Keālia Kapu gulch, the leeward coast of Kaunolū was the religious, political, and social center of Lāna'i. The gods were also said to resort to a spring located in the basin at Pu'u o Miki. While the bench lands and forest zone further inland provided shelter for numerous inhabitants pursuing extensive agricultural activity, the deep valleys and mountain lands provided residents with springs and valuable forest resources. The leeward forest zone at Hi'i was also the site of a significant mountain *heiau*.

On the windward side, Kaunolū shared Hauola Gulch, in which water flowed seasonally, with Kalulu; the *ahupua'a* extended down to the shore where springs and rich reef-sheltered fisheries supported the native tenants. On its eastern, windward side, Kaunolū is bounded by Pālāwai Ahupua'a to the mountain peak of Lāna'i Hale, where it joins with Keālia Aupuni, Keālia Kapu, and then continues down the mountain, through forest and basin, to the ocean. Keali'iahonui originally claimed Kaunolū but relinquished it to the Government Land inventory.

Kaunolū is also the name given to a village on the southwest coast. The meaning of Kaunolū is not certain; however, Emory suggested that it could be translated as "To give property on a wager secretly" [10:32].

REF-234

There are no specific records documenting the *kapu* fish and wood for Kaunolū. Traditional accounts celebrate the *kawakawa* (bonito) fisheries of Kāholo, along with documentation of a wide range of other fishes known in the region. Kingdom Law of 1846, listed a *kapu* on the *kawakawa* fisheries of Lāna'i.

The following is a report of M. Kekauonohi to Iolani Hale, dated December 15, 1847. It shows that Kaunolū was one of her lands.

Eia ka'u mau aina o Kamehameha I i ike ai mai Hawaii a Kauai.	Here are my Lands from Kamehameha I, known from Hawaii to Kauai:
...	...
Kalulu, Lanai	Kalulu, Lanai
Kaunolu, "	Kaunolu, "
Kaohai, "	Kaohai, "
...	...
Oia ko'u i lohe, a i ike no ke Lii.	That is what I have heard and known from the King.
Owau no ke ka mahalo,	I am yours with appreciation,
M. Kekauonohi[1]	M. Kekauonohi[2]

1 Hawaii State Archives, Interior Department Lands.
2 Trans. K. Maly.

Below is another report, from C. Kanaina to the Minister of the Interior, dated December 1847, where Kanaina lists the lands of the king.

Na Aina Ponoi o ka Moi a'u i ike ai, a i lohe ai ma keia Pae Aina:	The King's own lands that I have seen and heard of in these Islands.
... Helu 4 Mokupuni o Lanai	... Number 4 Island of Lanai
Kaunolu	Kaunolu
Kaohai	Kaohai
Kalulu	Kalulu
Paomai ...[1]	Paomai ...[2]

1 Hawaii State Archives, Interior Department Lands.
2 Trans. K. Maly.

Kalulu is translated literally as "the shelter," and contains 6,078 acres. Kalulu is one of three unique *ahupua'a* divisions on Lāna'i. On the *Kona* side of the island, Kalulu is bounded by Kamoku on the north. It then runs across the island, passing the western banks of Pālāwai Basin, up the mountain, and then continues to the *Ko'olau* coast, bounding Maunalei on the north. Along its southern boundary, in both the *Kona* and *Ko'olau* regions, Kalulu is bounded by Kaunolū Ahupua'a. The *Kona* and *Ko'olau* coasts of Kalulu take in two significant fisheries—one being a part of the deep sea fisheries of Kāholo (shared with Kaunolū), and the other being the nearshore reef-lined fisheries of the windward coast. In the Pālāwai Basin and mountain lands were extensive agricultural fields, ranging from open *kula* lands noted for sweet potato plantings, to forest-sheltered

dryland field systems. The forest resources included stands of *koa* and other native woods, and small valleys and gulches where water sources were found. Daniel I'i claimed Kalulu as his personal property during the *Māhele*, but relinquished it to the king, who retained it as a Crown Land. *He'e* was the *kapu* fish, and *'ahakea* was the *kapu* wood.

Table 5 lists Land Commission Awards of native tenants who filed claims for *kuleana* (fee-simple property rights) in 1847–1855 to land in Kaunolū and Kalulu. The claims reveal some of the activities that occurred in the lands of Kaunolū and Kalulu. Registered Map 2227 (fig. 5) shows the claims in Kaunolū and Kalulu.

Table 5: Native tenants of Kaunolū and Kalulu Ahupua'a

LCA Helu	Claimant	'Ili, Ahupua'a	Claims
520	Daniela Ii	Kalulu	Ahupua'a; relinquished
3719B	Kalaihoa	Kalulu	—
6814	Pakele	Haupu & Kuapohaku, Kaunolu	1 uala patch, and 2 moku mauu*
6815	Kaiwi	Ahua, Paooole, Kaunolu	1 moku mauu, 2 houses, 3 mala uala,† 1 ipu field, 1 ko patch
6816	Naholowaa	Namakaokahai & Ahua, Kaunolu	8 mala uala
6817	Kawaihoa	Paooole, Kaunolu	1 moo uala‡ and 1 moo mahakea§
6818	Haole	Kaunolu	1 mala uala and 1 moku mauu
6819	Kamakahiki	Punanana, Kaunolu	2 moo uala, 1 mala ko,¶ 1 moku mauu
6820	Kanohohookahi	Nihokela, Kaunolu	1 house lot and 1 moku mauu
6821	Kuheleloa	Makapeapea, Kaunolu	1 moo uala, 1 moku mauu, and 1 house lot
6822	Kahukilani	Miki, Kaunolu	1 house lot and 1 mala uala
6823	Muhee	Kaunolu	1 kihapai of sweet potato and banana
6823B	Wahahee	Kaunolu	—
6824	Napuulu	Ahua, Kaunolu	1 pauku planted with ipu and uala, 2 moo planted in ipu and uala, and 1 house lot
6825	Kalaniwahine	Miki, Kaunolu	1 house lot and kula
6826	Kalawala	Iamo, Kalulu	
6827	Laupahulu (Palaau)	Kahawainui, Kalulu	3 moku mauu
6828	Keamo	Kaiholena, Kalulu	1 kihapai of uala, ipu, wauke, and a house
6829	Maawe	Kanaiu & Kapano, Kalulu	Some mala uala and maia, 1 house lot
6831	Oioi	Kapanokai, Kalulu	1 moku mauu
6832	Kele	Ailau, Kalulu	
6833	Kaaiai	Ahupau & Eliaili, Kalulu; Kamoku	2 moku mauu, 1 house lot

*Grass land/pasture sections.
†Sweet potato patch.
‡Dryland sweet potato patch.
§Fallow parcel.
¶Sugarcane patch.

Continued on next page

REF-235

Continued from previous page

LCA Helu	Claimant	'Ili, Ahupua'a	Claims
6834	Kaukapala	Kalulu	
6835	Kalawaia	Kaholo, Kalulu	
6836	Muhee (Wahahee)	Kaholo, Kalulu	
6837	Malulu	Pakihi and Kaupu and Lele-haka, Kaunolu	1 house lot, 2 moku mauu
6839	Kalehuamakanoe	Kaunolu	—
6846	Malulu	Pakihi, Kaunolu	—
6891	Kauwe	Kalulu	
8556	Kaauwaeaina	Kapano uka & Pueo, Kalulu	1 moku mauu
10030	Napuulu	Kaunolu	—
10031	Palaau	Kalulu	
10032	Pakele	Kaunolu	—
10033	Keie	Kalulu	
10037	Pamioa	Kaa, Kaunolu	—

2.3.6 Palapala Sila Nui, 1855–1867: Royal Patent Grant Lands on Lāna'i

At the same time the *Māhele 'Āina* was being undertaken, it was realized that many native tenants were not receiving lands claimed, or in the case of environmentally stressed areas, they were not able to claim adequate land areas to support their families. As a result, the king signed into law an act giving applicants the right to apply for larger tracts of land from the inventory of government lands set aside for the support of government operations. All Royal Patent Grants issued on Lāna'i are listed in table 6.

Table 6: Royal Patent Grants on Lāna'i

Grant No.	Grantee	Location	Acreage	Book	Year
1928	Koiku	Pawili	34.93	10	1855
1929	Kekua	Pawili	18.57	10	1855
1930	Nalimakaua	Pawili	31.96	10	1855
1931	Makaiholoae	Pawili	18.30	10	1855
2214	Lonopaawela	Pawili	1.64	12	1857
2903	Puupai	Pawili and Kealia Aupuni	52.00	14	1863
2971	Kapahoa	Pawili	33.00	14	1864
3029	Nahuina and Keliihue	Kalulu	236.68	14	1866
3030	Kapeleaumoku	Pawili	32.00	14	1866
3031	Kaaina	Kealia Aupuni	99.07	14	1866
3032	Pali	Kaunolu	29.00	14	1866
3033	Keamo	Kaunolu	20.85	14	1866
3045	Wm. Beder	Kaunolu	128.00	14	1867

Figure 5: Registered Map 2227. F. E. Harvey, Surveyor, December 1903. Note the Land Commission Awards in Kaunolū and Kamoku Ahupua'a.

REF-236

2.3.7 Boundary Commission Surveys and Testimonies

Following the *Māhele 'Āina*, there was a growing movement to fence off land areas and control access to resources which native tenants had traditionally been allowed to use. By the 1860s, foreign land owners and business interests petitioned the Crown to have the boundaries of their respective lands—which were the foundation of plantation and ranching interests—settled. In 1862, the king appointed a Commission of Boundaries, a.k.a. the Boundary Commission, whose task was to collect traditional knowledge of place, pertaining to land boundaries and customary practices, and determine the most equitable boundaries of each *ahupua'a* that had been awarded to *ali'i*, *konohiki*, and foreigners during the *Māhele*. The commission proceedings were conducted under the courts and as formal actions under the law. As the commissioners on the various islands undertook their work, the kingdom hired or contracted surveyors to begin the surveys, and in 1874, the Commissioners of Boundaries were authorized to certify the boundaries for lands brought before them.[25]

Primary records in this collection from Lāna'i were recorded from 1876 to 1891. The records include testimonies of elder *kama'āina* who were either recipients of *kuleana* in the *Māhele*, holders of Royal Patent Land Grants on the island, or who were the direct descendants of the original fee-simple title holders, as recorded by the surveyors/commissioners. The resulting documentation covers descriptions of the land, extending from ocean fisheries to the mountain peaks, and also describes traditional practices; land use; changes in the landscape witnessed over the informants' lifetime; and various cultural features across the land.

The native witnesses usually spoke in Hawaiian, and in some instances, their testimony was translated into English and transcribed as the proceedings occurred. Other testimonies from Lāna'i have remained in Hawaiian, untranslated, until development of a manuscript for the Lāna'i Culture & Heritage Center.[26] Translations of the Hawaiian-language texts below were prepared by Kepā Maly. The descriptions and certificates of boundaries for the *ahupua'a* of Lāna'i are from the notes of W. D. Alexander, who worked for the Boundary Commission. The notes, dated 1875–76, give boundary information collected from *kama'āina*. The following are excerpts from Alexander's notes.

> At Halepalaoa March 28th, '76.
>
> Hoa, an old Kamaaina states that the boundary between Kaohai and Paawili begins at the inlet of the sea a little south of the Church, & thence follows the bottom of the kahawai to the top of the mountain.
>
> Kaumalapau & Kalama are both Ilis of Kamoku. Three lands run across from sea to sea, viz., Palawai, Kalulu, & Kaunolu...
>
> April 3rd. 76. Monday.
>
> Keliihue widow of Nahuina, was born on Kalulu, & testifies that the boundary between Kalulu and Kamoku comes down from a hill known as Puunene

[25] W. D. Alexander in *Thrum's Hawaiian Annual*, 1891:117–118.
[26] See http://www.lanaichc.org.

> down the North bank of the Kapano valley to the Govt. road, passing near Kawaonahele's house, keeping straight on across a side ravine coming in from the north, called Keaakū, to the top of the north wall of the Palawai crater at a place called Pulehuloa, near Keliihananui's house.
>
> Kalulu & Kaunolu
>
> The boundary between Kalulu & Kaunolū begins at a small hill north of the heiau of Maiaele near the shore, & passes a little south of the sheep pen at Puu Ulaula, at some rocks in the path.
>
> The boundary between Kaunolū & Kealia Kapu, begins at the sea at a Kapu rock south of the great heiau, & follows up the centre of the Kaunolū gulch.
>
> Names of villages on the shore of Kealia Kapu were Kapalaoa, Mamaki, Kuahulua nui & Kuahulua iki.[27]
>
> Kealia Kapu & Kaunolu
>
> ... between Kaunolu & Kealia Kapu.
>
> The branches of the deep ravine above mentioned are Waiakeakua nui, Waiakeakua iki & Waiakaahu towards the S.E. The boundary between Kaunolu & Kealia Kapu comes down a more northerly branch which meets the deep ravine above mentioned some distance to the west. It then follows down the main Kaunolū gulch which is formed by their junction x that of a third ravine from the N.E., and at the foot of the terrace where it enters the crater is called the Kauhee gulch. A large rock is shown just below the Govt. road, where Makalena set his compass. From this rock Pohakuloa, the line runs straight across the crater to a point a little N, of a white house, belonging to Ohua. Thence to head of the gulch which reaches the sea near the heiau.[28]

Below is a letter from M. D. Monsarrat, a surveyor, to W. D. Alexander dated 1877. There is some description of Monsarrat's process, as well as the areas of Lāna'i which he has already surveyed. He mentioned he has surveyed Kaunolū.

> Palawai, Lanai
>
> Since writing my last letter I have found an old Kamaaina by the name of Pali who has been absent for some time. He gives his age at ninety nine and is pretty helpless as I had to lift him off and on his horse. I could not get him to come for less than two dollars a day but I think that he is worth it as he seems to be very honest. He puts Kamoku boundary the same as Keliihue and not wrongly as Papalua did.
>
> I have surveyed Kaunolu boundary on this side of the mountain, also both sides of Palawai from the top of the mountain to the South wall of Palawai

[27] W. D. Alexander, LANAI (Memo.), 1875–76, Register Book No. 153, p. 14–24. Pages 1–13 in this book contain memos and maps of land holdings at Nu'uanu, O'ahu. Lāna'i notes begin at page 14. Alexander also uses macron accents on certain place and people names as indicated in the citations here.
[28] Ibid., p. 27.

REF-237

crater from there to the sea. I will leave until I return from the other side of the mountain, where I intend starting early Monday morning. Don't you think that I had better survey the boundary between the government land of Kamao and Kaohai which is very short and will survey with Paawili on the upper side of the island to Palawai form a survey of Kaohai. I have started to carry a set of triangles around from Puu Manu to Halepalaoa and find that it can be done with little effort and few triangles. When I was in Lahaina Mr. Gibson spoke of having me stop here and complete the survey of the island as he is very anxious for a map.

It is beginning to get very dry here and water scarce. Potatoes are also very scarce and expensive. Pai ai are a dollar apiece in Lahaina now having jumped from seventy five cents since I came over...

As soon as I finish Kaunolu I will send you the notes of survey as the minister of interior is very anxious to get them. Mr. Gibson is going to start his men shearing at Palawai in a few day[s]. Hoping to hear from you soon. I remain yours.[29]

The following Boundary Commission document gives testimonies of the surveyor Monsarrat, as well as the *kama'āina* Pali on the boundaries of lands on Lāna'i. Pali states that Kaunolū is a government land and Kalulu is a Crown land.

Hooponopono Palena Aina a ke Komisina

Ma ka la 14 o Julai, A.D. 1877, ua waiho mai o Prof. W.D. Alexander he palapala noi i ke Komisina Palena Aina o Maui, no ka hooponopono ana i na palena o kahi mau aina i pau i ka Anaia o ka Mokupuni o Lanai. Oia hoi o "Palawai" no W.M. Gibson Esq. "Kaohai" no Ka Mea Kiekie R. Keelikolani; "Kalulu," "Kamoku," he mau Aina Lei Alii; "Kamao," "Kealia," "Pawili," & "Kaunolu," he mau Aina Aupuni.

Ma ka la 17 o Sepatemaba, A.D. 1877, ua noho ka Aha a ke Komisina e hoolohe no ke noi maluna'e. O M.D. Monsarrat (Hope Ana Aina Aupuni) ka mea i hiki mai ma ka aoao o ka mea noi. A no ka mea hoi nana no i Ana ia mau aina apau. A ua hoomana pu ia mai no hoi oia e Jno. O. Dominis e lawelawe

Decision of Boundaries by the Commission

On the 14th day of June, A.D. 1877, Prof. W.D. Alexander, set before the Boundary Commissioner of Maui, an application to Certify the boundaries of several lands which have all been surveyed on the Island of Lanai. They being, "Palawai" of W.M. Gibson Esq. "Kaohai" of Her Highness R. Keelikolani; "Kalulu" and "Kamoku," Crown Lands; "Kamao," "Kealia," "Pawili," & "Kaunolu," Government Lands.

On the 17th day of September, A.D. 1877, the Commission convened to hear the above applications. M.D. Monsarrat (Assistant Government Surveyor) was present on behalf of the applicant. Also as the one who Surveyed all of the lands. Jno, O Dominis was authorized to bring the mat-

[29] M. D. Monsarrat (Surveyor) to W. D. Alexander (Surveyor General), June 2, 1877, Hawai'i State Archives, DAGS 6 Box 1 - Survey.

imua o ke Komisina ma na mea e pili ana i na Aina Lei Alii ma Lanai.

Hoohikiia a olelo mai:

Na'u no i Ana keia mau aina a pau; ua hele pu au me na kamaaina ma na palena apau o keia mau Aina. A ua lokahi lakou apau, ua pono, a ua pololei ka'u ana ana. O Rev. N. Pali ko'u alakai nui nana i kuhikuhi, a ua make iho nei kekahi. No ka hiki ole ana mai o Pali i keia la, ua hoopono ka Aha a hiki mai oia noho hou.

Ma ka la 30 o Sepatemaba 1877, ua hiki mai o Pali, a ua noho hou ka Aha. Hoohikiia o Pali a olelo mai:

O Pali au, he kamaaina au no Lanai, na ko'u mau makua i kuhikuhi mai ia'u. A no ko'u noho konohiki ana hoi malalo o Kauikeaouli maopopo loa ia'u na palena. Noho Konohiki au no "Kalulu," " Kamoku." He mau aina Aupuni o Kamao, Kealia, Pawili, ame Kaunolu. Maopopo loa ia'u.[1]

ter forward to the Commission by those adjoining the Crown Lands on Lanai.

Sworn and stated:

I surveyed all these lands; I went along all the boundaries of these lands with natives. They were all in agreement, My surveys are correct and true. Rev. N. Pali was my primary guide, he pointed out things, others have since passed away.

Because Pali did not arrive this day, the Commission moved Await his arrival before reconvening.

On the 30th day of September, 1877, Pali arrived, and The Commission reconvened. Pali Sworn and stated:

I am Pali. I am a native of Lanai, my parents pointed them (the boundaries) out to me. And as a result of my having been Land overseer under Kauikeaouli, the boundaries are known to me. I was the Konohiki of "Kalulu" and "Kamoku." Kamao, Kealia, Pawili, and Kaunolu are Government lands. I know them well.[2]

1 Palawai Ahupuaa, Island of Lanai, Boundary Commission Volume No. 1, p. 108-110, No. 34, Keena Kiaaina o Maui, Lahaina, September 17, 1877.

2 Trans. K. Maly.

The following is from the Boundary Commission. It certifies the boundaries determined through the survey of Monsarrat.

Olelo Hooholo

Ke hooholo nei au. O na palena o na aina apau ma Lanai i anaia e M.D. Monsarrat, oia hoi o "Palawai" no W.M. Gibson, " Kaohai" no ka Mea Kiekie R. Keelikolani, "Kalulu" a me "Kamoku" he mau aina Lei Alii ame "Kamao," "Kealia," "Pawili" & "Kaunolu" he mau aina Aupuni, e like me na ana pakahi i hoikeia maloko nei, ua pono a ua pololei.

Kakauia ma Lahaina i keia la 30 o Sept. 1877.

Decision

I hereby move. The boundaries of all the lands on Lanai, surveyed by M.D. Monsarrat, they being, "Palawai" of W.M. Gibson, "Kaohai" of Her Highness, R. Keelikolani, "Kalulu" and "Kamoku" Crown Lands, and "Kamao," "Kealia" [Aupuni], "Pawili" & "Kaunolu," being Government lands, as uniformly surveyed and given within, are right and correct.

Signed at Lahaina, this 30th day of Sept. 1877.

REF-238

Komisina P. A. Apana Elua, ko H. P. A.[1] Commissioner L.B.,[2] Second District, of the H. I.[3]

1 Boundary Commission Volume No. 1, Palawai Ahupua'a, Island of Lanai, p. 113.
2 Commissioner of Land Boundaries.
3 Trans. K. Maly.

These are the metes and bounds of Kaunolū Ahupua'a from the survey of Monsarrat for the Boundary Commission:

Commencing at a pile of stones over a cross cut in a large stone (the same being the point of Commencement of Kalulu Survey) at the edge of precipice a few feet from the sea. The boundary runs:

1. N 87° 20' E true 2551 feet along Kalulu to a pile of stones on side Hill. Thence:
2. N 76° 00' E true 3206 feet along Kalulu to a rock marked with a cross.
3. N 54° 17' E true 6694.5 feet along Kalulu passing between Maakuia's house & his sheep pen to a point 14 feet East of a rock with a cross cut in it.
4. N 56° 15' E true 7944.6 feet along Kalulu to a pile of stones on South edge of Palawai Crater.
5. N 53° 14' E true 13359 feet along Kalulu across crater passing West of school house to a point on terrace marked with Mamane post.
6. N 44° 00' E true 3935 feet along Kalulu across terrace and to a red wood post on the top of a hill called Puu Alii.
7. N 52° 7' E true 9290 feet along Kalulu across Maunalei and Kalulu valleys to a red wood post on East edge of latter gulch. Thence:
8. N 20° 1' E true 9729.5 feet Along Kalulu down the East edge of Kalulu valley to a rock on edge of valley marked with a cross.
9. N 36° 4' E true 5878.5 feet along Kalulu to a red wood post on sea shore. Thence:
10. S 44° 7' W true 5581 feet along shore.
11. S 48° 1' W true 1510 feet along shore to a red wood post. Thence:
12. S 37° 9' W true 10808 feet along Palawai up ridge to a red wood post on the top of a red hill.
13. S 48° 12' W true 6071 feet along Palawai up ridge and across a small gulch and up another ridge to a red wood post. Thence:
14. S 30° 33' W true 1564 feet along Palawai up a path that follows up ridge to a red wood post. Thence:
15. S 1° 30' W true 4425 feet along Palawai across the large valley of Palawai to highest point of the Island. Thence:
16. N 38° 35' W true 3565 feet along Paawili & Kealia Aupuni.
17. N 72° 00' W true 1025 feet along Kealiakapu. Thence:
18. S 32° 10' W true 1660 feet along Kealiakapu down ridge to a point marked by two Triangular pits and bottle at the edge of a gulch.

19. Thence down the bottom of this gulch and up the main gulch to a point on South bank marked by two Tri. pits and buried bottle; which point bears S 61° 45' W true 3482 feet from last point.[30]
20. Thence down the bottom of the main gulch to a point on East bank marked by two Tri. pits & bottle which bears from last point S 36° 21' W true 930 feet.
21. Thence still down the bottom of the gulch to a point on East bank marked by two Tri. pits and bottle which bears from last mentioned point S 18° 7' E true 538 feet.
22. Thence still down the bottom of the gulch (which where it enters the crater is called the Kauhe) to a large rock at mouth on lower side of the road marked with a cross, and called "Pohakuloa;" which rock bears S 46° 20' W true 2450 feet from last mentioned point.
23. S 44° 8' W true 13375 feet along Kealiakapu across the crater to a point marked by two Tri. pits a little S.E. of a white house belonging to Ohua.
24. S 62° 24' W true 5889 feet along Kealiakapu to a point marked by two Tri. pits and a post near an old house site.
25. S 42° 27' W true 1698 feet along Kealiakapu to a point marked by two Tri. pits.
26. S 48° 30' W true 1275 feet along Kealiakapu to a point marked by two Tri. pits.
27. S 32° 55' W true 3125 feet along Kealiakapu to rock marked with a cross.
28. S 18° 11' W true 1637 feet along Kealiakapu to rock marked thus — in a clump of rocks.
29. S 25° 00' W true 2280 feet along Kealiakapu to a rock marked with a cross at the Commencement of a small gulch.
30. Thence down the bottom of said gulch and large gulch (that reaches the sea near the Heiau) to a point marked by a cross on the S.E. side of the gulch at a bend in it which point bears from last point S 27° 23' W true 3663 feet.
31. Thence down the bottom of the gulch passing to the N.W. of a well in the gulch (which well belongs to Kealiakapu) to a large rock marked with a cross and from thence to the sea at a point on the shore at the middle of the harbor; which point bears from the rock on the side of the gulch at the bend S 33° 57' W true 1343 feet.
32. Thence following the sea shore to point of Commencement. The traverse along the shore being as follows:
    1. N 56° 7' W true 150 feet.
    2. N 27° 54' W true 4387 feet.
    3. N 39° 14' W true 4234 feet.

[30]Page 119.

REF-239

4. N 31° 35' W true 1640 feet.
5. N 18° 23' W true 3142 feet to point of Commencement.

Surveyed by M.D. Monsarrat, Assistant

Hawaiian Government Survey.

Lanai, June 1877.

Hanaia a hooholoia e a'u ma Lahaina i ka la 29 & 17 o Sept. A.D. 1877.

Komisina P. A. o Maui, 2nd Jud. Circuit.[31]

The following are the metes and bounds of the Crown Land of Kalulu, as surveyed by M. D. Monsarrat in 1877.

Commencing at a pile of stones over a cross cut in a stone (the same being the point of commencement of Kaunolu Survey) at the edge of precipice a few feet from sea. The boundary runs:

1. N 87° 20' E true 2557 feet along Kaunolu to a pile of stones on side hill. Thence
2. N 76° 00' E true 3206 feet along Kaunolu to a rock marked with a cross. Thence
3. N 54° 17' E true 6694.5 feet along Kaunolu passing between Maakuia's house and his sheep pen to a point 14 feet East of a rock with a cross cut on it.
4. N 56° 15' E 7944.6 feet along Kaunolu to pile of stones on South edge of Palawai Crater. Thence
5. N 53° 14' E true 13359 feet along Kaunolu across Crater passing West of school house to a point on terrace marked by a Mamane post. Thence
6. N 44° 00' E true 3935 feet along Kaunolu across terrace to a red wood post on the top of a hill called Puu Alii.
7. N 52° 7' E true 9290 feet along Kaunolu across Maunalei and Kululu valleys to a red wood post on East edge of latter valley. Thence
8. N 20° 1' E true 9729.5 feet along Kaunolu down the East ridge of Kalulu valley to a rock on edge of valley marked with a cross.
9. N 36° 4' E true 5878.5 feet along Kaunolu to a red wood post on seashore. Thence
10. N 46° 2' W true 6285 feet along seashore to a red wood post a little N. E. of a small creek (said post being at N. E. corner of Maunalei). Thence
11. S 28° 27' W true 10676 feet along Maunalei up slope to a pile of stones on a hill called "Wawaeku."
12. S 6° 25' W true 9370 feet along Maunalei up gulch of Waiakapua to a red wood post on summit of a hill called "Wahane." Thence

[31] *Translation*: Executed and moved by me at Lahaina on the 29th & 17th day of Sept. A.D. 1877. Commissioner of Land Boundaries, Maui, 2nd Jud. Circuit. *Citation*: Kaunolu Ahupuaa, Island of Lanai, Boundary Commission Volume No. 1, p. 119-120, No. 37. Survey of the Government Land of Kaunolu, Lanai.

13. N 74° 1' W true 5235 feet along Maunalei along Northern edge of Papalahoomoe gulch to its junction with Maunalei valley and across said valley to a red wood post on the summit of a hill called "Puukukai" on West edge of valley. Thence
14. S 0° 41' W 3555 feet along Mahana and Paomai to a red wood post on ridge that comes down from the central mountain range (said post being on North edge of valley that contains the water hole of Kaiholena). Thence
15. S 45° 49' W true 1067.9 feet along Kamoku across valley passing to the S. E. of above mentioned water hole to a point on ridge marked with Triangular pits and ditch thus said point a little East of Puupane.
16. Thence along Kamoku down the N.W. edge of the Kapano valley to the Government road, passing near Kawaonahele's house keeping straight on across a side ravine coming in from the North (called Keaaku) to a red wood post at the top of the North wall of the Palawai Crater at a place called "Pulehuloa," near Kealiihananui's house, which red wood post bears S 44° 53' W true 8052 feet from last mentioned point on ridge. Thence
17. S 65° 44' W true 4939.3 feet along Kamoku along North edge of crater to a point a little North of a cactus clump; marked by two triangular pits. Thence
18. S 46° 19' W true 10141.4 feet along Kamoku down road to a cross cut in a stone amongst a lot of stones at the former site of an old Heiau called "Ili o Lono." Thence
19. S 72° 48' W true 2080 feet along Kamoku to head of gulch. Thence
20. S 84° 40' W true 2594 feet along Kamoku to a cross cut in a stone on South edge of gulch.
21. S 88° 46' W true 5225.9 along Kamoku down South edge of gulch to a stone marked with cross; on edge of gulch a little above a branch that runs into the main gulch from the South.
22. S 86° 27' W true 3254 feet along Kamoku down South edge of gulch to a pile of stones (on edge of same) over a cross cut in a large stone to the South of Kaumalapau Harbor (the same pile of stones being the point of Commencement of Kamoku survey).
23. Thence along seashore to Commencement. Traverse along the shore being as follows:
    1. S 27° 00' W true 1,212 feet.
    2. S 22° 57' E true 5915 feet to Commencement.

Area 5945.19 Acres.
Exclusive of Awards.
Surveyed by M.D. Monsarrat, Assistant
Hawaiian Government Survey
Lanai, June 1877.[32]

[32] Kalulu Ahupuaa, Island of Lanai, Boundary Commission Volume No. 1, p. 112-113, No. 36. Survey of the

REF-240

On March 23, 1866, Walter M. Gibson applied to the Minister of the Interior, F. W. Hutchinson, for a lease on the government lands on Lāna'i, including lands in Kaunolū and Kalulu. With his application, Gibson submitted a sketch map, included here as figure 6.

> In compliance with your request I have the honor to lay before the Department, a statement respecting Government lands on Lanai.
>
> There are six ahupuaas of land belonging to Government on the island, named: Kamao, Paawili, Kealia, Kalulu, Kaunolu, and Kamoku; comprising about 24,000 acres, with a population of 80 persons. About one eighth of this surface is good arable "dry" land; perhaps one half is more or less adapted for grazing; and the remaining three eights, the portion bordering on the beach, an utter barren waste.
>
> I made application to the Department in October 1862 to lease all of these lands. My application was favorably entertained by the Department, but owing to want of proper surveys, a lease was not made out at the time, as I was informed by letter, written by authority of His Majesty, then Minister. A copy of this letter, dated Feb. 20th, 1863 is enclosed.
>
> Feeling myself fortified by a guarantee from the Department, I proceeded to make improvements; to enclose lands with stone wall, to make roads, construct dwelling for laborers, and cultivate on the Government lands, until my operations were interrupted by a lease of Kamoku, the most important of these lands, by the Department, to another party. I had expended much labor on Kamoku, which was thus rendered fruitless.
>
> However, I would still propose to the Government to lease the five lands, Kamao, Paawili, Kealia, Kalulu, and Kaunolu. They are now mere commons, upon which roam many thousand head of sheep and goats that do not yield one cent of revenue to the Government...
>
> Accompanying this, a rough draft map of Lanai.[33]

Six months later, on September 18, 1866, Gibson applied again to the Minister of the Interior.

> I beg to be informed if the Government lands in this island have been rented or leased. A certain number of natives whom I opposed in their destruction of the little shrubbery of the island, in order to make charcoal, assert that the land is in their possession, and have attempted to subject me to a great deal of annoyance.
>
> I cannot believe in the truth of their assertion that such a lease has been made, in view of the pledge given to me by your predecessor in office, his Majesty.
>
> I am not at all anxious to lease all the Government lands on Lanai. The bulk of these lands, comprised in the districts named Kaunolu, Kalulu and

Crown Land of Kalulu, Lanai.

[33] Hawaii State Archives, Interior Department Lands.

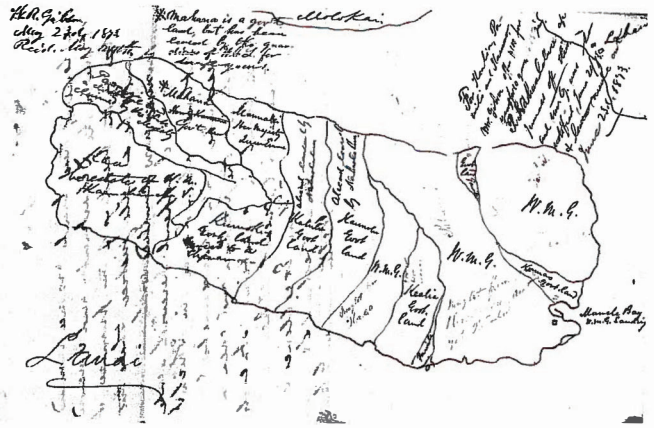


Figure 6: Sketch map of Lāna'i by W. M. Gibson, May 23, 1866 (Hawaii State Archives).

REF-241

Kamoku, can be better utilized by the native residents at present, and I should waive any pretensions I may have in respect to them; but the smaller lands of Kamao, Paawili, and Kealia, which comprise about one fourth of the Govt. lands, I desire to lease, as they adjoin my own lands.

Your Excellency will observe in the rough draft map I left at the Interior Office, that the lands of Pawili and Kealia are enclosed between my lands of Palawai and Kealia Kapu. Kamao is a barren corner, lying between my lands Palawai, and the leased land Kaohai. There are not more than half a dozen families residing on these small lands, and little or no stock upon them, and they may be properly detached from the bulk of the Govt. lands on the Western half of the island, where the chief part of the population resides.

I trust that some equitable adjustment of these lands will shortly be made, and I beg to be notified respecting any contemplated disposal of them by lease or otherwise ...

P.S. It is proper to mention that I have made improvements on Kamao, Pawili, and Kealia, and it would be an act of gross injustice were I to be dispossessed of the advantages to be derived from them, without being allowed a proper opportunity to enter into competition for leasing the lands upon which the improvements are situated, especially in view of the solemn pledge given me by the Interior Department.[34]

The following correspondences detail the matter of leasing government lands on Lāna'i to Gibson. The first is from Chas. T. Gulick, Interior Department clerk, to P. Nahaolelua, the governor of Maui and regards the receipt of Gibson's application. The attached sketch mentioned is included here as figure 7.

Ua loaa mai i ke Keena nei, he palapala noi na Walter Murray Gibson (Kipekona) e makemake ana e hoolimalima i ke kahi mau Aina Aupuni ma Lanai. Eia ko lokou mau inoa: Kamao, Pawili, Kealia Aupuni, Kaunolu ame Kalulu. I ke wa ia L. Kamehameha ke Kalaiaina, ua ae mai no oia iaia no ka hoolimalima i ua mau aina nei, a mahope iho o kona pa ana a me ka hana ana i ke kau wahi pono maluna o ka aina, aka, i kona noho alii ana, ua hoonele ia, ua o Kipekona. Ua waiho pu mai no hoi o Kipekona i ka palapala a Stephen Spencer, ke kakauolelo a ke Kuhina Kalaiaina e hooia aku ana ia Kipekona i ka ae ana o ke 'lii, oiai kona wa e noho ana ma ka Oihana. E nana

There was received at this Office, an application from Walter Murray Gibson (Kipekona), desiring to lease some of the Government Lands on Lanai. Here are their names: Kamao, Pawili, Kealia Aupuni, Kaunolu and Kalulu. At the time that L. Kamehameha was the Minister of the Interior, he agreed to lease the lands to him, should he build the walls at appropriate places on the land. But when he became King, Gibson was deprived of the right. Gibson has sent the application to Stephen Spencer, secretary of the Minister of Interior, who confirms that the King agreed to it when he was in the office. Will you please look into this and tell me what you think

[34]Hawaii State Archives, Interior Department Lands.

iho oe iloko o keia hana a e hoike koke mai i kou manao e pili ana no kana noi. Ke hooili ia aku nei he kii, e hoomaopopoana i ka waiho ana o na Aina. Aole no he kii pololei loa aka ma ke ano nui no nae.[1]

about this request. There is attached, a sketch that shows the location of the lands. It is not an accurate sketch but gives a general rendering.[2]

1 Hawaii State Archives, Interior Department Book, Volume 12:251–252.
2 Trans. K. Maly.

Governor Nahaolelua replies to Gulick with the following, dated May 28, 1873, which essentially asks that the lease request by Gibson be denied so as not to deprive the natives of access to the lands. Nahaolelua plainly expresses that Gibson is an untrustworthy individual. Gibson had claimed no more than a half-dozen families resided on the lands; however, Nahaolelua says that "quite a number of natives" live on the lands, who would thus be dispossessed should Gibson acquire the lease.

Ua loaa mai ia'u kau palapala o ka la 26 o nei malama e pli ana i ka Palapala noi a W. Gibson "e hoolimalima kekahi mau aina ma Lanai" eia ko lakou mau inoa, Kamao, Pawili, Kealia, Kaunolu, ame Kalulu.

A ke olelo mai nei i ka wa ia L. Kamehameha ke Kalaiaina, ua ae mai oia ia aina ka Hoolimalima i ua mau aina nei, ua pololei kela mau olelo, maanei au e hoakaka ai ina kumu i nele ai o Gibson i ua mau aina nei i i ka wa i noho Moi iho nei of Kamehameha V.

Ua lohe ka moi ina hana a W. Gibson, ma ia hope mai. Eia ka mua, Puhi ae la o Gibson i ke ahi a pau loa aku ka mauu o ka aina i ka a ia e ka ahi. A olelo iho la o Gibson i kanaka o Lanai he mea waiwai ole ka Hanai holoholona, o ka mahiai oia ka mea waiwai o ka aina a a he mea hooikaika no hoi ia i ke kino o ke kanaka a he mea no hoi ia e nui ai ka hanau ana a na keiki. Ia lohe ana o kanaka ia mau olelo lawe aku la lakou ina hipa e kuai me Gibson he mahina hookahi a oi ae paha nui loa na Hipa a Gibson, aka, aole i mahiia ua wahi nei i pau i ke ahi, ua lohe Moi i keia hana Gibson.

Eia kekahi ua olelo o Gibson i na Hoahanau o ka Hoomana Molemona e lawe mai i ko Kauai, ko Oahu, Molokai, Maui, Hawaii i no Dala no ke kuai ana i ka aina ma Lanai

I received your letter of the 26th day of this month, relative to the application of W. Gibson, "to lease some lands on Lanai," these being their names, Kamao, Pawili, Kealia, Kaunolu and Kalulu.

And that during the time that L. Kamehameha had the Interior, he had consented that he was to get the lease of said lands. That statement is true. Here I will explain the reasons why Gibson was refused said lands during the time that Kamehameha V was King.

The King had heard after that what Gibson had done. This is the first: Gibson set fire to the grass on the land and was all burnt up by the fire, then Gibson said to the natives of Lanai, that there was no benefit from raising animals, that farming is what will enrich the land, and will make the body of the person strong, and would be the means of having a lot of children born. When the natives heard these words, they took their sheep to sell to Gibson, and in one month and a little over, Gibson had plenty of sheep, but the place which had been burnt was not cultivated, the King heard of these doings of Gibson.

Here is another, Gibson told the members of the Mormon Religion on Kauai, Oahu, Molokai, Maui, and Hawaii, to secure money to buy land on Lanai, that is Palawai. Gib-

REF-242

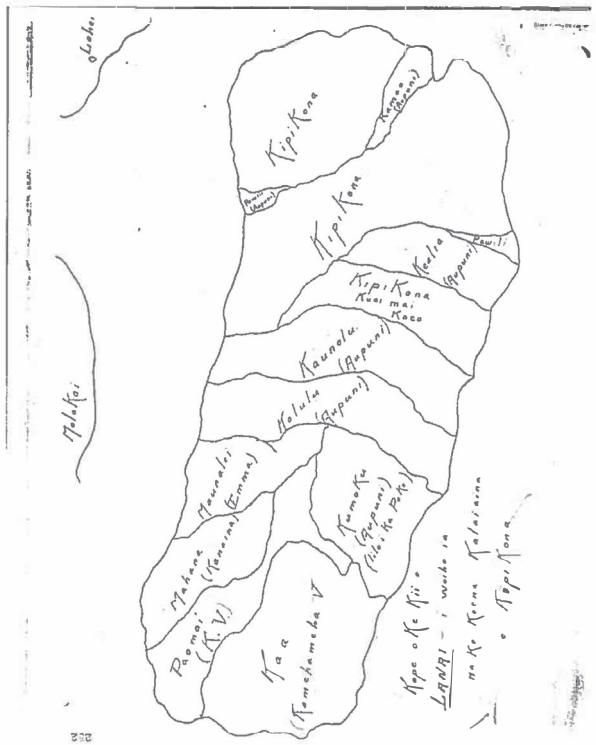


Figure 7: Sketch map depicting disposition of lands of Lāna'i by W. M. Gibson, May 26, 1873 (Hawaii State Archives).

ia Palawai, no ka Ekalesia ka olelo ana a Gibson no lakou ua aina nei, aka i ka hana nae, o ka Palapala Kuai o ua aina nei o Palawai, o ka inoa wale no o Gibson kai kakauia ma ka Palapala Kuai ame kona Hooilina. Nele iho la ka Ekalesia Molemona, ma keia mau hana akamai a Gibson i haule malna o ka Lahui Hawaii.

Ua komo ka manao kanalua iloko o ka Moi no ka haule ana iho o keia mau pilikia maluna o kekahi o kona mau makaainana, oia ke kumu i nele ai o Gibson i ka aina ole.

Eia kekahi hana akamai a Gibson i hana mai e ka poe o Lanai. Kuai iho nei o Gibson i ka aina ia Kaa a lilo ia ia kukulu aku nei i ka Pa i ua aina nei o Kaa. Lawe aku nei ka Hipa ana i Kaa mai Palawai aku pau pu aku nei me ka hipa a Kanaka, a komo iloko o ka Pa o Kaa a noho ilaila. Elua paha pule, lawe hou mai Kaa mai a hiki i Palahai, hui hou me ka Hipa a kanaka a komo hou iloko o kela pa, ike aku nei kanaia i ka lakou aia iloko o ka Pa me ko lakou Hoailona, kii aku nei e hoihoi mai, olelo maikai mai la no o Gibson, pela iho. Pilikia wau i keia manawa e holo ana wau i Lahaina a hiki keia i Lahaina nei, a hala kekahi mau la holo aku la kela i Honolulu a hala kekahi mau la malaila a hoi maila kii aku la ka mea hipa a hookuuia maila na makua ale no ka mea i hoailonaia a o na keiki paa aku iloko ka Pa, aka aia no i Lanai ka poe i ike ia Gibson i ka hana penei.

Nolaila he hai wale aku no keia i ko'u manai, aole kupono keia Hoa Hoolimalima ke aeia mai nae keia olelo a ka mea iaia ka mana o keia hana oia hoi o ke Kuhina Kalaiaina "E.O. Hall." A he nui no ka poe kanaka o Lanai e noho ana maluna o keia mau aina, aka he mahalo au ia Gibson i ka hana akamai.[1]

son said it was to belong to the Religion and to be their land, but when the deed of said land of Palawai was made out, only Gibson's name was written on the deed, and to his heirs. The Mormon Religion had nothing. Because of these smart doings of Gibson, and which fell upon the Hawaiian Nation, doubt was entered into the King's mind of this distress having fallen on some of his subjects, that is the reason why Gibson was without any land.

Here is another smart doing of Gibson which was reported by the people of Lanai. Gibson bought the land of Kaa, and it became his, a pen was built on said land of Kaa, then he took his sheep to Kaa from Palawai, the native sheep went too, and entered the pen at Kaa and remained there about two weeks. Then they were taken again from Kaa to Palawai, they mixed again with the natives' sheep and again entered that pen. The natives saw that theirs were inside the pen, having their marks. They went after them to bring them back. Gibson said very nicely to them, wait a while, I am busy now, I am going to Lahaina. And when he got to Lahaina, and some days passed, then he went to Honolulu. And after some days were passed there, he came back. The owner of the sheep went to get his, and only the parent sheep which had the mark was released, and the ewes were kept in the pen. But, they are still on Lanai who saw Gibson doing this.

Therefore, I am only letting you know what I think, that the lease to this fellow is unsatisfactory. If this report, however, is acceptable to the one in authority over such matters, that is, the Minister of the Interior, "E.O. Hall." And there are quite a number of natives living on these lands. But I do admire Gibson for being so smart.[2]

1 Hawaii State Archives, Interior Department Lands.
2 Trans. K. Maly.

REF-243

Governor Nahaolelua writes again to Gulick on June 5, 1873.

Ua loaa mai ia'u kau palapala o ka la 2, o June nei, ua ike au i na mea i haiia mai. He nui io no ka poe e noho ana ma kekahi o keia mau aina o Kalulu, ame Kaunolu, a ma Pawili kekahi mau mea, a o Kamao ame Kealia, aole maopopo loa ia ia'u, no ka mea ua ano huikau ko lakou noho ana.

Your letter of the 2nd day of June was received, and I note what is said. It is true that there are quite a number of persons living on some of these lands of Kalulu and Kaunolu, and there are some on Pawili, and I am not quite familiar with Kamao and Kealia, because their living together is rather mixed up.

A ma ka ninau hoi no ko lakou mau kuleana a noho hoolimalima paha, he kuleana no kakahu poe o lakou, aka he kuleana liilii no.

As to inquiry about their awards or occupancy under lease. Some of them have awards, but they are small ones. Therefore, they leased these lands from the Government but under the instructions of the Minister of the Interior to me, the same as now. And about my animals, I too have paid towards said lease.

Nolaila, ua hoolimalima no kakou i ua mau aina nei me ke Aupuni mamuli no nae o ke Kauoha a ke Kuhina Kalaiaina ia'a e like no me keia manawa. A no ka'u mau wahi holoholona o wau no kekahi i uku ia Hoolimalima ana.

Iloko oia hoolimalima ana, ua hookaa pono no kanaka ina makahiki Eha, a i ka lima o ka makahiki, ua koe nae $265. i kaa ole mai, a o ka nui o na Dala i kaa mai $1735.00. Oia iho la ka loaa ame ke koena.

During that lease, the natives paid properly for four years, and during the fifth year, there was a balance of $265. which remained unpaid. The amount of money that was paid was $1735.00 that is the receipts and the balance.

Ina no e lilo o Kalulu ame Kaunolu ia Gibekona a kahi no ia i lehulehu ai ona kanaka, aole no he nui loa o na kanaka ma Lanai, oia wale no ka'u mea hai aku.[1]

If Kalulu and Kaunolu are given to Gibson, those are the places where there are a number of natives. There are not very many natives on Lanai. That is all I wish to tell you.[2]

1 Hawaii State Archives, Interior Department Lands.
2 Trans. K. Maly.

Governor Nahaolelua writes the following to the Minister of the Interior, E. O. Hall on June 13, 1873.

Ua loaa mai ia'u kau palapala, ua ike au ina olelo i haiia mai. E pono nae e helu aku au ia oe ina aina o Lanai a pau: Pawili, Kamao, eha Kealia, Kaunolu, Kalulu, Kamoku & Paomai, pau na aina aupuni a lilo aku la ia Gibesona, Eono aina, a koe iho la Ekolu aina.

I received your letter, and noted what is said therein.

I have better give you a list of all the lands on Lanai: Pawili, Kamao, four Kealia, Kaunolu, Kalulu, Kamoku & Paomai. These are all the Government lands, and Gibson has acquired six lands, and three lands remain.

Aka, ua pono iho la no ia e like me ka mea i holo ia oukou, a o ka uku Kupono i

But it is all right according to what have been decided by you people. And the

ko'u manai oia mau aina eono, Elua Haneri Dala i ka makahiki, a o na aina hou i koe no ka hoolimalima mua, Elua Haneri ia. Oia ko'u manao...[1]

proper rent for these six lands, according to my belief, is Two Hundred Dollars per annum, and for the remaining lands for the first lease Two Hundred. That is what I think.[2]

1 Hawaii State Archives, Interior Department Lands.
2 Trans. K. Maly.

E.O. Hall responds to Governor Nahaolelua on June 16, 1873 with the following letter, which proposes a rental rate to be paid by Gibson for government lands on Lāna'i.

Ua loaa mau kau palapala o ka la 13 o Iune nei. Me neia na manao o ke 'Lii a me na Kuhina, no na aina ma Lanai.

Your letter of the 13th of June, has been received. This is the opinion of the King and the Ministers, regarding lands of Lanai.

O na aina o Kaunolu a me Kalulu, no na makaainana ia mau aina, a nau no e ohi i na dala, e like ma na makahiki i hala.

The lands of Kaunolu and Kalulu, the residents shall occupy those lands, and that you collect the rent of same, as had been the custom for the past years.

O na aina o Kealia, Pawili 2, a me Kamao, e hoolimalima ia Gibesona no na dala $100.00 i ka makahiki. Pehea ia?

The lands of Kealia, Pawili 2[1] and Kamao, shall be leased to Gibson at $100.00 a year. How about that?

O ka aina o Kamoku, ua lilo i ka Pake; pela kuu lohe. Pehea? Ehia mak. ka lilo ana, a ehia dala i ka mak.

The land of Kamoku is occupied by a Chinaman, so I hear. How many years was it leased for, and how much a year?

O ka aina o Mahana, he aina aupuni ia. Ia wai la ka lilo ana i keia manawa? Ua manao ia C. Kanaina. Aole ka.

That land of Mahana is a Government land. Who is occupying it at the present time? It was thought that C. Kanaina had it. It is not so.

O Paomai, ua ninau no wau ia oe no keia aina. E pane mai, ke oluolu oe ...[2]

As to Paomai, I have already inquired of you in regard to this land. Would you kindly reply ...[3]

1 In the context of the land description it appears that Pawili 2 is the section of Pāwili that runs into the basin, between Pālāwai and Keālia Aupuni. Based on surveys and testimony, this section of Pāwili crosses from windward to leeward Lāna'i, but on the leeward side is cut off from the coast near the 'Eho'ehonui boundary marker.
2 Hawaii State Archives, Interior Department Book, Volume 12:276.
3 Trans. K. Maly.

Then, in 1899, after the death of Gibson, Gibson's estate trustee Cecil Brown wrote to J. F. Brown, the Commissioner of Public Lands, to extend the lease of government lands of Lāna'i.

> Cecil Brown Administrator and Trustee of the Estate of W.M. Gibson, deceased, with the Will annexed. Hereby makes tender the surrender to the Hawaiian Land Commission, leases held by the Estate of W.M. Gibson of Government lands as follows to wit on condition hereafter stated.

REF-244

1. Lease No. 168 of the lands of Pawili, Kamao and Kealia Aupuni Rental $150.00 per Annum. Expires June 23rd, 1908.
2. Lease No. 220 Lands of Mahana, Rental $100.00 per Annum. Expires November 1st, 1907.
3. Lease No. 279 Land of Kaunolu, Rental $250.00 per Annum. Expires February 9th, 1907.

Also the land of Kalulu as tenant at will, Rental $200.00 per annum.

The Estate paying for the four leases $700.00 per annum.

It is hereby proposed to surrender the said leases provided a new lease will be granted for the whole area of lands in said four leases be granted to the Administrator of said Estate of W.M. Gibson at an annual rental of Twenty Five Hundred ($2500.00) Dollars for a term of lease of Twenty One years from date hereof.

To be granted without Competition.

J. F. Brown writes to Sanford B. Dole, proposing that grazing and sugarcane cultivation might be possible on the lands leased to the W. M. Gibson Estate in the following letter, dated March 9, 1899.

> Enclosed please find copy of an application on behalf of W.M. Gibson Estate for surrender and for releasing of certain Public Lands held by Gibson Estate on the Island of Lanai.
>
> The total area concerned in this application is about 29,341 acres.
>
> The larger part of this is grazing and mountain land but a portion on a rough estimate not less than 2000 acres might be adapted to cane growing if supplied with water. This area of 2000 acres, say below 600 feet level, would be found on the lands of Mahana, Kaunolu and Kalulu named above, these being on N.E. side where plantation site is proposed. The lands of Paawili, Kamao and Kealia may or may not be included in proposed plantation site. If so included, the possible cane area would be largely increased. I do not understand that any authority exists under the law for the lease without competition asked for by applicants, but for the satisfaction of applicants who desire the matter to be brought before the Executive, I would respectfully refer the same to their opinion at a convenient early date.[35]

The document below conveys lands (fee-simple and leasehold), livestock, and personal property on the island of Lāna'i from the Gibson Estate to Charles Gay, as ordered by court decision.

> This Indenture made this 28th day of August A.D. 1902, between Albert Barnes, Commissioner, of Honolulu, Island of Oahu, Territory of Hawaii of the first part, and Charles Gay of Makaweli, Island of Kauai, in said Territory, of the second part.

[35]FO & Ex. 1899 Pub Lands Comm.

> Whereas, in proceedings duly taken in the Circuit Court of the First Judicial Circuit of said Territory at Chambers in Equity, by and between Gustave Kunst, designs of S.M. Damon, J.H. Fisher, and H.E. Waity, copartners under the firm name of Bishop & Company, Plaintiffs and H.N. Pain and Elise S. U. Neumann, sole devisee and Executive under the last Will and testament of Paul Neumann, deceased, and Henry Holmes, Trustee of Elsie S.V. Neumann, and S.M. Damon, S.E. Damon and H.E. Waity, copartners doing business under the firm name and style of Bishop & Company defendants to enforce the Decree of Foreclosure and Sale theretofore made and filed in the suit of S.M. Damon et al vs. Cecil Brown, Administrator with the Will annexed of Walter Murray Gibson and Trustees of the Estate of said Walter Murray Gibson, deceased, under said Will et al., it was ordered adjudged and decreed by an order made on the 24th day of June A.D. 1902 by the Honorable George D. Gear, Second Judge of the said Circuit Court that the said Decree of Foreclosure and Sale be enforced by a sale of all and singular the real and personal property and assets of the estate of the said Walter Murray Gibson, deceased, hereinafter set forth, and that the same be sold at public auction in said Honolulu at the front door of the Court House (Aliiolani Hale), by and under the direction of the said Albert Barnes, who was by said Decree appointed a Commissioner to sell the said property and was duly authorized to give public notice of, make arrangements for and conduct the sale as set forth in said order.
>
> And whereas, the said Commissioner, pursuant to the said order and direction, after giving public notice of the time and place of sale as in said order required did, on the sixteenth day of August A.D. 1902, at the front door of the Court House (Aliiolani Hale) in said Honolulu expose to sale at public auction all and singular the said premises and property with the appurtenances at which sale the said premises and property hereinafter described were sold to the said Charles Gay for the sum of One Hundred and Eight Thousand Dollars ($108,000.00) that being the highest sum bid for the same, and Whereas the proceedings of said Commissioner in the premises were duly reported to the said court, and the sale approved and confirmed on the 25th day of August A.D. 1902, as by the records of said court more fully appears, and the said Commissioner was thereupon by an order of said court then made, directed to execute to said Charles Gay a conveyance of said premises and property, pursuant to the sale so made as aforesaid ...
>
> And the said Albert Barnes, Commissioner, as aforesaid, doth hereby covenant with the said Charles Gay and his heirs and assigns that notice of the time and place of said sale was given according to the order of said Court, and that the said premises and property were sold accordingly at public auction as above set forth.
>
> **Schedule "A"**
>
> **Fee Simple.**
>
> First. All that tract or parcel of land situate on the Island of Lanai, containing Five Thousand Eight Hundred and Ninety-Seven and 1-10 (5897, 1-10) acres,

REF-245

and known as the Ahupuaa of Palawai, and comprised in Royal Patent No. 1093 ...

Fourteenth. All that land described in Royal Patent 4767, L.C.A. 10041 conveyed by John S. Gibson to W.M. Gibson by deed dated July 17, 1876 of record in liber 47 fol. 49...

Leases

First. All leases of land on the Island of Lanai held by said Walter Murray Gibson on August 31st, 1887, so far as he had the right to assign the same without incurring any forfeiture...

Personal Property

First. All those flocks of sheep on the 20th day of June A.D. 1902 or thereabouts of mixed ages and sexes, on said day depasturing, running or being upon the said Island of Lanai and also all that herd of cattle and all horses on said 20th day of June, 1902, also depasturing and running upon the said Island of Lanai on said day, all formerly belonging to the Estate of Walter M. Gibson, deceased, together with all the natural increase of the said flocks and herds, and also all the wool, then upon the said sheep and which has since that time been produced and shorn from said sheep, and their said increase save and except such sheep, cattle and wool as have been sold with the consent of the said plaintiff.

Second. All wool presses, wagons, carts, harnesses, tools implements, chattels and effects belonging to said Walter Murray Gibson on said August 31st, 1887, situated on the Island of Lanai, at said time and now in and upon said lands or any of them.

The flocks of sheep and their increase are now estimated at about 18,000 head.

The herd of cattle with their increase are now estimated at about 240 head.

The herd of horses with their increase are now estimated at about 210 head.

In witness whereof the said Albert Barnes has hereunto set his hand and seal the day and year first above written ...[36]

2.4 Ranching Operations on Lānaʻi, 1854–1951

Goats, sheep, cattle, the European boar, and horses were introduced to the islands between 1778 and 1810. During those early years, Kamehameha I and his chiefs placed *kapu* over the newly introduced animals to ensure that their populations would grow. In the fifty-year period from 1780 to the 1830s, populations of these non-native animals—like the *hipa* (sheep) and *puaʻa bipi* or *pipi* (wild steer or cattle), and *kao* (goats)—grew to become a great nuisance to the Hawaiian population, and had devastating effects on the Hawaiian environment.

Records indicate that the first of these introduced ungulates were brought to Lānaʻi around the 1830s, where a few native tenants, living under landed chiefs, managed the

[36] Bureau of Conveyances, Liber 242, p. 91–95.

populations. In 1848, a new system of land management was instituted in the Hawaiian Kingdom, and individuals of means were granted large tracts of land. When fee-simple title to land was granted to native Hawaiians and foreign residents who had sworn oaths of allegiance to the king, formal efforts at controlling the *hipa*, *pipi*, *kao*, and other grazers were initiated.

Ranching was a part of Lānaʻi's history for close to 100 years, in the period from ca. 1854 until closure of the ranch in 1951. Initially, Mormon elders brought livestock to Lānaʻi as a part of their effort to establish a mission in the uplands at Pālāwai. In 1862, Walter Murray Gibson took over the Mormon settlement, and focused the livestock efforts on herds of sheep and goats, of which nearly 100,000 roamed the island, almost uncontrolled by the 1890s. As a result, Lānaʻi suffered from rapid deforestation and a drying up of the island's water resources. This impacted every other aspect of life on Lānaʻi and was one of the contributing factors to the continual decline in the native population of the island.

From 1910 to 1951, Lānaʻi ranch operations focused on cattle and a steady decline in the population of other livestock. The steady transition to cattle grazing led to the eradication of tens of thousands of goats, sheep, and pigs—many driven over the cliffs of Kaʻāpahu in Kaʻā—in an effort to reduce impacts on the steadily decreasing pasturage. In 1914, the *Maui News* reported on a visit by rancher-investor J. T. McCrosson to Lānaʻi under the heading "Big Improvements on Lanai." McCrosson makes specific reference to the leeward pastures on the island, extending from the 150 ft. to 1,000 ft. elevation.

> I spent a week on Lanai inspecting the ranch. The lee side of the island is greener that it has been for years. The finest *Pili* grass pastures in the Territory extend in a broad belt the whole length of the island, from 150 feet above sea level to about 1000 feet elevation. The belt varies from a quarter to two miles wide. Up in the shallow crater that occupies the center of Lanai a good many hundred acres have been plowed and planted in Rhodes grass and Paspalum. It formerly took twenty acres of the wild pasture land to support a bullock. The Paspalum pastures now fatten fifty head of stock on every hundred acres.[37]

In 1929, L. A. Henke published *A Survey of Livestock in Hawaii*,[38] which included the following description of the Lānaʻi Ranch operations. Henke notes that a water line system and extensive fences were made on the island. Describing the basic ranching operations on Lānaʻi, Henke reported

> The Island of Lanai, while primarily given over to the growing of pineapples since 1924, still has an area of 55,000 acres of fairly well grassed but rocky and rather arid country extending in a belt around the 55 miles of coast line of Lanai, that are utilized as ranch lands and carry about 2,000 Herefords and 180 horses. This belt is from two to four miles wide and extends from the sea to about 1,000 feet in elevation.

[37] *Maui News*, October 24, 1914, p. 5, c. 1.
[38] University of Hawaii Research Bulletin No. 5, Honolulu, Hawaiʻi.

REF-246

The total area of the Island is about 140 square miles and it ranges in height from sea level to about 3,376 feet elevation, with an average annual rainfall on a great part of the uplands of about 34 inches.

In 1922 before the upper lands were given over to the more profitable pineapples an area of some 2,000 acres had been planted to Pigeon peas (Cajanus indicus) and Paspalum dilatatum. On the lower, rather rocky, present ranch lands the algaroba tree (Prosopsis juliflora) is valuable because of its bean crop, and Koa haole (Leucaena glauca) and Australian salt bush (Atriplex semibaccata) are considered desirable forage crops. It is planned to further improve the lower pastures by additional planting of the above crops and by light stocking and resting present pastures.

In the future the ranch will not do much more than raise beef and saddle horses for the pineapple plantation needs. The ranch, though a part of the Hawaiian Pineapple Company's property, still operates as the Lanai Company, Ltd.

The Hawaiians formerly herded goats, probably for their skins on the uplands of Lanai, and some agricultural work was done by Walter Murray Gibson, who arrived in 1861, in connection with the Mormon Church. Gibson acquired considerable land and when he died in 1888 his daughter, Talula Lucy Hayselden, became the owner. Gibson and the Hayseldens developed a sheep ranch on the island, much of which was then owned by the Government and by W.G. Irwin.

Irwin later acquired the Government lands and the Hayseldens about 1902 sold out to Charles Gay and nearly the whole island of 89,600 acres was combined under the ownership of Charles Gay, which passed to Irwin in 1910 and from him to John D. McCrosson and associates in the same year, when the Lanai Company, Ltd., was formed. Their interests were sold in 1917 to H.A. and F.F. Baldwin, who in turn sold the property to the Hawaiian Pineapple Co., Ltd., in December 1922, who are the present owners.

Mr. Gay continued with the sheep ranch started by Gibson and Hayselden, probably carrying as high as 50,000 at times, but when the Lanai Company, Ltd., was started in 1910 they changed to cattle and put in extensive provisions for water and fences, and a count in April 1911, gave 20,588 sheep and 799 head of cattle. At the end of 1920 there were only 860 sheep and early in 1923 a count showed that the number of cattle had increased to 5,536 and besides 4,462 had been sold during the previous five years. Reduction of the herd to make room for pineapples was started on a large scale in 1924, and from the end of 1922 to October 1928, 6,764 head of cattle were sold.

Mr. Moorhead was manager for the Hayseldens, Mr. Gay managed his own property for a time, Lt. Barnard was manager for the Lanai Company in 1910, and G.C. Munro, the present manager, took charge in 1911. [19:51–52]

The ranch ended operations in 1951 when the Hawaiian Pineapple Company decided to focus all its efforts on the pineapple plantation.

2.5 Hawaiian Pineapple Company

James Dole, owner of the Hawaiian Pineapple Company, purchased the island of Lāna'i on December 5, 1922. The purchase price of the island was $1.1 million. Nearly $2 million was spent on improvements to the island, for the development of macadamized roads and the town of Lāna'i City. In 1926, Dole hosted a tour of the plantation and developing city. The 150-person tour of politicians, businessmen, and friends were impressed with the progress that had been made in the short time on Lāna'i [29].

Lāna'i had been often overlooked because the appearance of the island from offshore was dry and desolate, but Dole saw that inland are some arable lands. There were 20,000 acres of land suited to pineapple on the island of Lāna'i—Hawaiian Pineapple Company considered it as the last of the desirable acreage left in Hawai'i. The soil and conditions were desirable, but many improvements had to be made. Many miles of cactus had to be dragged out and removed from the landscape. The Hawaiian Pineapple Company built a harbor at Kaumalapau with a breakwater made of a solid rock cliff that they had busted and transferred. Roads from the fields to the harbor were paved. One of Hawaiian Pineapple Company's old photos shows neat rows of pineapple, with Lāna'i City in the background. Lāna'i City was developed for the workers that were brought over [18:17–23].

Miki Camp, ca. 1924–1938 Hawaiian Pineapple Company built several outlying camps from the main Lāna'i City. One of these camps was Miki Camp, so called because of its proximity to the storied place called Puu o Miki. The camp was situated southeast of the present Maui Electric Company (MECO) power plant on Miki Road.

Several oral history interviews have been conducted with elder *kama'āina* of the plantation era who resided at Miki Camp during their youth. Mrs. Susan Minami Miyamoto penned some of her recollections of the camp, and Mr. Tamo Mitsunaga and friends drafted a map of the camp as they recalled it from their youth. Mrs. Miyamoto's recollections and Mr. Mitsunaga's map follow below (fig. 8).

Camps of Lanai

There were several camps when I was growing up on Lanai. Three of my siblings were born on Lanai, the first in Namba Camp in 1926, next in Crusher Camp in 1929, and the last in Lanai City in 1932.

Namba Camp was situated at the foot of the hill to the right as you leave the city to go to Manele. The camp was named after Mr. Namba who was in charge of construction workers. Workers were mostly Japanese with a few Koreans who spoke fluent Japanese.

Workers lived rent free in simple cottages, the only furniture being a simple dining table with long benches at each side. The single men lived in one long building with no furniture. Each man had a designated area in the room marked by a single length of mat with a large trunk or basket at the foot of the mat holding his worldly goods. There were nails pounded at the head of the mat to hang their clothes.

REF-247

Company trucks picked up the men each morning to go to their work site, and returned at pau hana. School children were picked up by a van which first picked up children from Kaumalapau Camp. We dubbed this van the "Black Maria". The van was driven by Mr. Okamoto, Roy Okamoto's grandfather. It was all purpose used as a hearse or ambulance and for other transportation as needed.

The company had many cattle on the island: There were wire fencing strung along Kaumalapau Highway at the top of the hill, and we children ran amongst the cattle to return home from the pathway at the top of the hill.

It was Prohibition Era and my grandma who lived with us, brewed "sake" a Japanese drink made from special rice, brewed in large crocks. Somehow word would get out to the camp that the inspector was coming, and the crocks would be hidden in the thick panini (cactus) bushes until it was safe to bring them home. These crocks would sometimes be stolen from their hiding places.

There were no cars in the camp. An employee of Okamoto Store would come every week or so to take orders for whatever we needed and delivery was made on his next visit. Goods were charged to employee's bango number (employment number) and payment made to the store on payday.

The Medicine Man, as we called him, would come from one of the pharmaceutical houses in Honolulu to fill a large bag for each family filled with medicine for all kinds of illnesses. On his next visit he would note whatever was used since his last visit and collect money for the used drugs. The bag would then be refilled for his next visit. This practice went on for a long time even after the company built a hospital in 1924.

There were outhouses for our use. We had no toilet paper, Sears Roebuck Catalogs were most coveted for use, newspapers were also put to use. There was a bath house tended by one of the women. She would fill the tubs with water. Fire wood was used to heat the water. This bathhouse was a good social gathering place. We would sit around on the bench built inside the tub and talk story.

Crusher Camp came into being in the late 1920's when men who worked with stones were moved to this camp which had a large stone crusher. Stones were plentiful when fields were cleared for pineapple fields. The camp was situated in what is now the end of the airplane runway. It was under the care of Mr. Murayama, and it was men from this camp who worked on the stone wall along Kaumalapau Harbor. It will attest to the good workmanship of these men as it is still standing, having weathered many storms.

Miki Camp was the last, and most well-known of these camps. It was a large camp built on the hill behind what is now the Electric Plant. There were two stables cared for by Matahei Oyama and Shiro Mitsunaga. They were used to house the mules used for plowing the pineapple fields. The Mitsunaga family was the last to leave this camp. Mrs. Hisako Mitsunaga remembers coming to Miki Camp as a bride from Maui. She says their family was the last to leave Miki Camp in 1938. All of the houses were moved to the city.

By this time Filipino workers were starting to come in, and there were Japanese and Filipino workers in camp, and even one Mexican.

Life in the camps was simple. A favorite sport for the boys was climbing the water tanks and lining the rim of these tanks with what was called "tori Mochi", a gluey substance. The birds would get stuck and were gathered for food.

There was also Kaumalapau Camp. There are a few families still living there. There were mostly Japanese and Hawaiian dock workers, and also independent fishermen. By 1935, most of the families had moved to the city.

Life in the camps was simple and fun, and remembered by most with fond nostalgia.[39]

2.6 Archaeological Background

A few archaeological studies have been conducted in the general vicinity of the Miki Basin 200 Acre Industrial Development project area (see fig. 1, p. 4). The earliest survey by Emory [11] records the baseline data for the area. Emory's survey is reviewed in section 2.6.1. Subsequent studies focused on retracing Emory's work in order to inventory the sites that he originally recorded. These studies are discussed in section 2.6.2. The last phase of archaeological research has been in support of recent land developments and is discussed in section 2.6.3.

2.6.1 Emory Survey

The earliest archaeological investigation on Lānaʻi Island was conducted by Emory [11] in the 1920s. This investigation was the first archaeological and ethnographic study of Lānaʻi Island. In this work, Emory broadly summarizes Hawaiian cultural traditions of Lānaʻi and includes discussions on the traditional oral histories, place names, *material culture*, and archaeology. The work is geographically organized around an inclusive gazetteer that is keyed to numbers on an accompanying map. Since Emory's work was focused on ethnography as well as archaeology, these numbers refer to places of cultural interest in a general sense and may or may not be considered archaeological sites in their conventional sense—as locations that display evidence of past human behavior. Nevertheless, archaeological sites were included in Emory's survey of Lānaʻi Island, but, like many of his contemporaries, his focus was on larger archaeological sites, most notably the village of Kaunolū located on the southwestern shore of Lānaʻi.

State Inventory of Historic Places archaeological site numbers were later assigned for Emory's sites. The concordance of State Inventory of Historic Places site numbers to their descriptions by Emory is annotated in the margins of Emory's typescript on file in the State Historic Preservation Division.[40] Emory mentioned petroglyphs located in Miki Basin; however, they were not published and were never assigned archaeological site numbers.

[39]Notes by Susan Minami Miyamoto.
[40]Report number L-00006, on file at the State Historic Preservation Division, Kapolei, HI [11].

REF-248

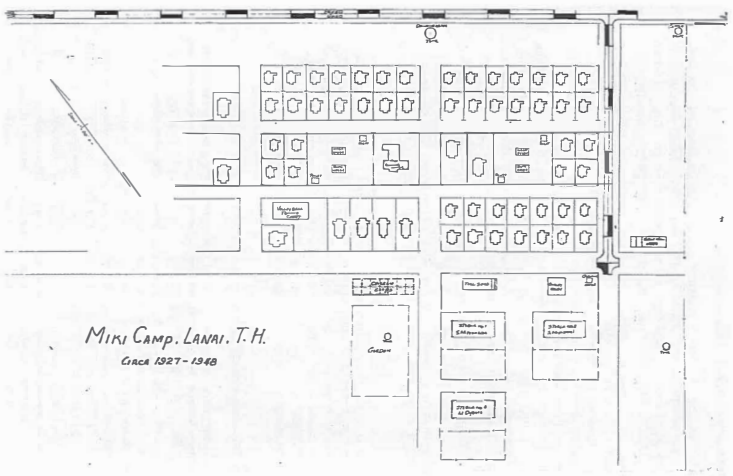


Figure 8: Sketch map of Miki Camp drafted by Tamo Mitsunaga and friends. Note that the 1948 should be 1938.

2.6.2 Late Twentieth-Century Investigations

There was a general dearth of archaeological work conducted on Lānaʻi between the 1920s and the 1970s. The next period of archaeological investigations at Lānaʻi was due to the statewide inventory of archaeological sites that occurred in the mid-1970s. This study was focused toward the relocation of previously identified sites, and the consolidation of that information into the new State Inventory of Historic Places system. It was during this effort that Emory's sites were designated their State Inventory of Historic Places numbers.

In general, the statewide inventory left the identification of new archaeological sites as a task to be completed for future surveys. Due to this, no new archaeological sites were recorded in the vicinity of the Mīki Basin 200 Acre Industrial Development.

Following his work on the statewide inventory of historic places, Robert Hommon produced a paper that outlined his general impression of the archaeology of Lānaʻi Island. He noted that Lānaʻi Island contained the greatest degree of relatively untouched archaeology in the Hawaiian archipelago. He states,

> Through a happy set of circumstances, the archaeology of Lanaʻi is almost entirely intact. Despite the fact that nearly 20% of the area of the island is under cultivation for pineapple, less than 2% of the archaeological features recorded by Emory in the early 1920's have been destroyed in the process. [20:1]

He then argued, given the completeness of the archaeological record, that an island-wide research design should be developed in order to direct future investigations. This recommendation also appears to respond to a development plan that was proposed by Castle and Cooke that would have substantially altered the interior and northeast shore of the island. It appears that this broad-scale development of Lānaʻi has not occurred, and no comprehensive island-wide research design is known to have been written.

2.6.3 Cultural Resources Management Studies

In 1985, Ahlo [1] recorded Site 50-40-98-01531 during investigations associated with a proposed sanitary landfill located west of Lānaʻi Airport (see fig. 1, *a*, p. 4). The site is located in Kaumālapaʻu Gulch and comprises two eroding fire-pit features recorded as Sites 1 and 3, both of which contained charcoal and organic material. Data recovery excavations were recommended for both fire-pit features.

In 1987, Site 50-40-98-01531 was relocated by Kam [22] during a field inspection to determine the mitigation requirements of the previously identified cultural resources within the sanitary landfill project area (see fig. 1, *a*, p. 4). During the inspection, a *midden* scatter and rock alignment were recorded. However, no site numbers were assigned at that time. The two components of Site 50-40-98-01531 were relocated during the project, and it was determined that one of the fire-pit features, Site 1, had been impacted during grading for a nearby road. The other feature, Site 3, was relocated outside of the landfill project area. It was recommended that the area be re-examined by a qualified

REF-249

archaeologist and the identified cultural resources be mitigated prior to construction activities.

Later that same year, Walker and Haun [31] conducted a pedestrian survey and data recovery excavations for the identified cultural resources. During the project, 11 test units were excavated and surface collection of the previously identified midden scatter was conducted. A total of eight archaeological sites were investigated during the project (see fig. 1, *a*, p. 4).

Site 50-40-98-01531 This site was relocated during the project and two ash concentrations were observed. A single test unit was excavated at each ash concentration to search for possible subsurface remains. A total of five basalt flakes, a radiocarbon sample, and a small amount of shell midden were recovered during excavations. The radiocarbon sample was submitted but proved insufficient for dating. The site was interpreted as a temporary habitation area.

Site 50-40-98-01532 This site comprised the previously identified midden scatter and two ash concentrations, likely fire-pit features. Five test units were excavated in and adjacent to the midden scatter and a single shell scraper was collected from its surface. Two of the test units yielded subsurface deposits. The first, TU-1, contained the remnants of a fire-pit feature, seven basalt flakes, and two shell scrapers. A radiocarbon sample was collected from the fire-pit feature for analysis. TU-5 was excavated close to TU-1 and yielded three basalt flakes. A radiocarbon sample was also collected from the surface of one of the ash concentrations. Both radiocarbon samples collected yielded calibrated date ranges between AD 1460 and 1952. The site was interpreted as being used for temporary habitation.

Site 50-40-98-01533 This site comprised two single-course rock alignments. No artifacts were observed on the surface and no artifacts were collected from either of the two test units excavated. The alignments were interpreted as terraces used for dryland agriculture.

Site 50-40-98-01534 This site comprised two basalt *cobble* rock mounds. The mounds were sorted but had no facing of any kind. No test units were excavated and no artifacts were collected from the area. However, historic artifacts were present on and around the two features. The rock piles were interpreted as being prehistoric agricultural clearing mounds, but due to the presence of historic artifacts, that determination cannot be proven with any certainty.

Site 50-40-98-01535 This site was described as a 4 m long curved wall constructed of sub-angular basalt cobbles stacked 50 cm high. No test units were excavated and no artifacts were collected from the area. It was interpreted as being used as a temporary shelter or a modern hunter's blind.

Site 50-40-98-01536 This site comprised a soil and rock terrace and a rock alignment. No artifacts were collected from the surface of the site and a single test unit was excavated within the terrace. A radiocarbon sample was collected from the test unit for analysis and yielded a calibrated date range between AD 1450 and 1954. The site was interpreted as being used for rain-fed agriculture.

Site 50-40-98-01537 This site was described as a rectangular rock mound constructed of sub-angular boulders piled one to two courses high. A test unit was excavated

to bisect the mound and determine its function. No artifacts were observed in and around the mound and no artifacts were collected from the test unit. The mound was interpreted as being a trail marker associated with the Kaumālapa'u Trail located south of the site.

Site 50-40-98-01538 This site is a complex composed of four rock alignments and a rock mound. No artifacts were observed or collected from the site and no test units were excavated. Due to its location near Site 50-40-98-01533 and the lack of portable remains, it was interpreted as being a prehistoric rain-fed agricultural complex.

Based on the radiocarbon date ranges, the sanitary landfill project area and associated sites located at the head of Kaumālapa'u Gulch were interpreted as having been occupied in the mid- to late fifteenth century with re-occupations continuing into the late eighteenth century. Although the area was likely used for temporary habitation and dryland agriculture, the initial occupation of the area and subsequent re-occupations cannot be determined by calibrated date ranges. The wide date ranges, which span five centuries, lack the precision required to be informative. Following data recovery excavations, the sites were deemed insignificant and no further work was recommended.

In 1989, an on-site assessment of the Lāna'i Airport was conducted by Sinoto [28] (see fig. 1, *b*, p. 4). This included a literature review of the area and a pedestrian survey of the airport expansion area. Two surface scatters of lithic materials were observed during the assessment. Due to this, an archaeological inventory survey of the airport expansion area was recommended.

Borthwick et al. [3] conducted the archaeological inventory survey for the proposed expansion to Lāna'i Airport in 1990 (see fig. 1, *b*, p. 4). The airport is located east of the Miki Basin 200 Acre Industrial Development. A total of seven surface scatters of stone artifacts were found. Limited test excavations consisting of eight backhoe trenches determined that there were no subsurface deposits in the area. The stratigraphy in the trenches showed that the area had been under commercial cultivation for many years. The survey determined that agricultural activities would have destroyed any deposits present, diminishing the need for further work. Only on-call monitoring was recommended.

In 2009, a cultural impact assessment and field inspection was conducted prior to improvements to Lāna'i Airport [5; 24] (see fig. 1, *b*, p. 4). Again, no surface or subsurface cultural materials or historic properties were identified due to the previous disturbances mentioned in the 1990 survey.

An archaeological assessment for proposed runway improvements to Lāna'i Airport was completed in March of 2013 by Lee-Greig and Hammatt [25] (see fig. 1, *b*, p. 4). Twenty-four backhoe trenches were excavated. The results of the investigation are consistent with the findings from the 1990 survey. No historic properties and no intact subsurface features were documented during the project.

In August of 2013, an archaeological inventory survey for the Central Services Warehouse and Miki Basin pipeline replacement was conducted [6]. The Central Services Warehouse is located within the current project area along Miki Road and adjacent to the existing Maui Electric Company power plant and its associated facilities (see fig. 1, *c*, p. 4). The

REF-250

pipeline runs northeast from the warehouse. A pedestrian survey of the warehouse area was conducted, and a total of eight backhoe trenches were excavated in the undeveloped portion of the parcel. A large portion of the area showed signs of surface disturbance and no artifacts or cultural deposits were present on the surface or in any of the backhoe trenches excavated.

In March of 2014, an archaeological assessment was conducted for the Lāna'i contractor's housing [7]. The parcel is located on 14 acres of land north of the current project area and adjacent to Miki Road (see fig. 1, *d*, p. 4). During the project, a pedestrian survey of the parcel was conducted and 12 backhoe trenches were excavated. No cultural materials or deposits of any kind were documented due to use of the area for pineapple cultivation over a long period of time.

3 Methods

The principal investigator for the archaeological inventory survey was Thomas S. Dye, PhD. The survey was conducted between May 5 and May 9, 2014 by T. S. Dye & Colleagues BA-level archaeological technician Nathan DiVito with the assistance of Kaulana and Gaelyn Kaho'ohalahala, Katrina Gillespie, Ben Ostrander, Kamakani Palolo, Kalei Ropa, and Zeth Kipi from the Culture and Historic Preservation department of Pulama Lāna'i. During the project, a 200 acre parcel of land was surveyed.

A 100 percent pedestrian survey was conducted over the entire project area except for the portion that had been previously surveyed. The survey included a visual inspection of the project location for artifacts, cultural deposits, fire-pit features, lithic scatters, and surface architecture. The survey consisted of numerous transects spaced at 10 m intervals.

Subsurface testing of the project area included the excavation of 31 backhoe trenches. Backhoe trenches were excavated to a depth of approximately 145 cm below ground surface, measured 3 to 4 m in length, and were 1 m wide. Backhoe trenching was conducted with a backhoe and operator provided by Pulama Lāna'i.

Digital photographs were taken throughout the survey to record the progress of the work and provide a record of the exposed stratigraphy and photographs of each backhoe trench profile and its location on the landscape were taken. A photo log was kept in the field notebook indicating the subject of the photograph, the direction the camera was pointing, and other information as appropriate.

The location of each trench excavation was recorded with a differentially corrected Global Positioning System (GPS) device. Stratigraphic information was recorded in a field notebook and a stratigraphic profile was recorded for each backhoe trench. Stratigraphic information was recorded with the method described by Harris [17]. Sediment deposits were assigned a *unit of stratification number*, referred to here as a *context*. Stratigraphic profiles were recorded and illustrated in the field notebook. Profile illustrations were drawn to a scale of 1:10. The profile information adequately defined the *stratigraphic relationships* of each context.

A depositional *phase* model was developed to explain the origin of the observed material. *Phasing* is an analytic method of correlating deposits with similar character and stratigraphic position [17:105]. The same stratigraphic contexts were observed at each test trench. A general depositional pattern was observed in the field; this pattern is brought out by assigning each context with similar content and stratigraphic position to one of the phases described below:

Phase 1 Naturally deposited terrestrial sediments.
Phase 2 Cultural deposits.
Phase 3 Plow zone/secondarily deposited soils.

Sediment samples were collected and recorded in a bag list kept in the field notebook. All identified stratigraphic contexts are listed in appendix A. All samples collected during the project are listed in appendix B. All artifacts collected are listed and described in appendix C.

In the laboratory, the context descriptions and bag list were entered into the T. S. Dye & Colleagues, Archaeologists database. Sediments were described for texture using the method described by Thien [30], and for color with reference to a Munsell® soil color chart [16]. Profile illustrations were scanned and drafted using vector graphics software. All artifacts collected during the project were scanned and digitally recorded using a flatbed scanner.

Prior to the survey, a review of all available historical literature and previous archaeological studies was conducted. In addition, longtime Lāna'i residents—Kepā Maly, the Vice President of Culture and Historic Preservation for Pulama Lāna'i; Kaulana Kaho'ohalahala; and the staff of the Pulama Lāna'i Culture and Historic Preservation department—were consulted for their knowledge and insight on the project areas.

All artifacts and samples collected during the project were analyzed at laboratory facilities provided by the Culture and Historic Preservation department of Pulama Lāna'i. All project documentation and notes will be permanently stored at the T. S. Dye & Colleagues, Archaeologists laboratory. All sediment samples collected were discarded in the areas from which they came and all artifacts collected during the project will be permanently stored at facilities provided by Pulama Lāna'i.

4 Field Results

A 100 percent pedestrian survey was conducted for the Miki Basin 200 Acre Industrial Development. Visibility within the parcel was poor due to tall grasses and dense vegetation. Soil was only visible between and under low-lying plants, in and along deer trails that cross the area, and within two drainage cuts that run north to south across the northern portion of the parcel. Black plastic fragments and tubing, indicative of pineapple cultivation, were observed over the entire parcel. No Land Court Awards or previously recorded archaeological sites were present within the parcel.

During the pedestrian survey, two isolated finds of secondarily deposited adze rejects, a secondarily deposited historic artifact scatter, a secondarily deposited lithic scatter,

REF-251

and an exposed fire-pit and lithic scatter, Site 50-40-98-1980, were documented (fig. 9). The two isolated finds are secondarily deposited adze rejects that were present on the ground surface of the project area, Context 0. They have been broken during the adze manufacturing process. No other cultural materials were observed or collected around the finds.

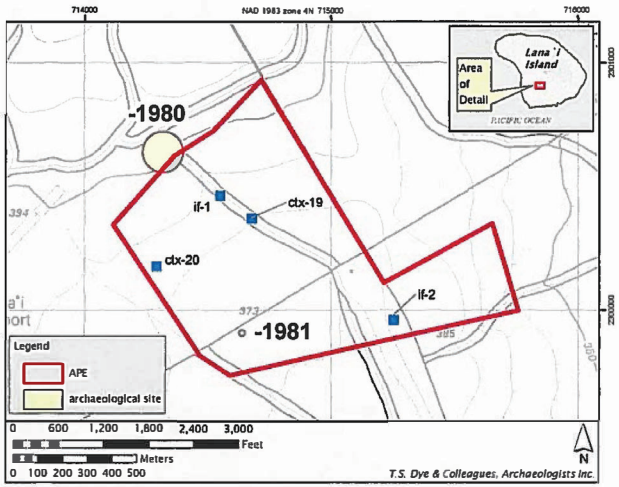


Figure 9: Location of historic properties, Sites 50-40-98-1980 and 50-40-98-1981; artifact scatters, Contexts 19 and 20; and isolated finds 1 and 2, within the Miki Basin 200 Acre Industrial Development area.

The secondarily deposited lithic scatter, Context 19, was located in and along an eroded drainage in the northern portion of the project area (fig. 9). The scatter was approximately 20 m in diameter and comprised 20 or more pieces of flaked basalt. A waterworn cobble *manuport* and a fragment of an adze reject were collected from the scatter (fig. 10). The scatter is located on a slope and appears to have been secondarily deposited as a result of water erosion along the drainage cut (fig. 11).

The historic artifact scatter, Context 20, is located along the western boundary of the parcel and was approximately 30 m in diameter (fig. 9). Four pieces of semi-porcelain

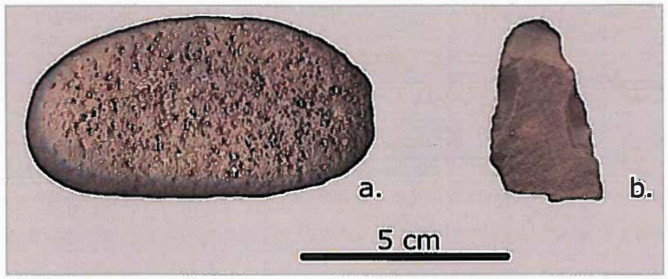


Figure 10: Artifacts collected from the Context 19 lithic scatter: *a*, waterworn cobble mauport; *b*, adze reject, distal portion.

Figure 11: Photograph of a portion of the Context 19 lithic scatter and an eroded drainage cut, looking northwest. Note that Site 50-40-98-1980 is located at the top of the drainage in the eroded area in the background of the photo. The scale is marked in decimeters.

ceramic, two pieces of white earthenware ceramic, and a piece of clear bottle glass were collected from the scatter (fig. 12). An aqua blue "brandy" style bottle lip was also observed within the scatter but was not found during surface collection.

The base fragment of a semi-porcelain cup with a partial maker's mark was the only artifact from the scatter that had diagnostic characteristics (fig. 12, *a*). The partial maker's mark read "...MARK/MADE IN JAPAN" around a rising sun logo. In August of 1921, the United States Customs Bureau required all Japanese ceramics to be marked with "JAPAN" or "Made in Japan" as "Nippon" was used on imported Japanese ceramic up until that time. Imports of Japanese ceramics ceased in 1941 due to World War II and did not resume until the end of the war in 1945. The hand painting on a piece that is part of the same

REF-252

vessel (fig. 12, *b*) also suggests that it was produced prior to World War II. Taking this into consideration, it is likely that the piece was produced between 1921 and 1941. Since there are no known historic habitation sites in the area in which the scatter was found, it is likely to be associated with Miki Camp, a camp established for the workers of the plantation in the early 1920s which would have been occupied until at least 1947. It is located along Miki Road south of the project parcel and would have been the closest known habitation area to be occupied during the 1921–1941 time period.

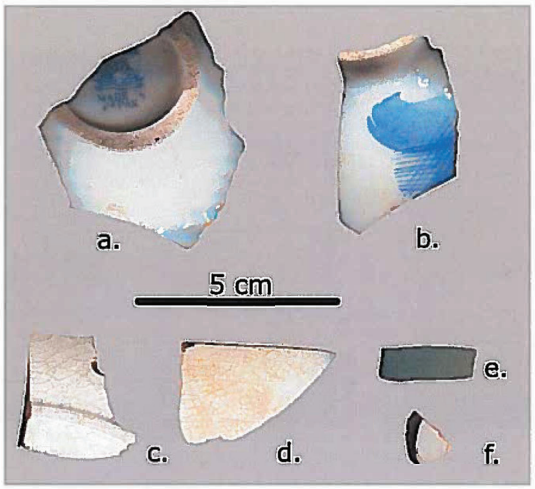


Figure 12: Ceramics collected from the Context 20 artifact scatter: *a*, semi-porcelain base sherd with partial maker's mark; *b*, hand-painted cobalt blue semi-porcelain body sherd; *c*, undecorated white earthenware base sherd; *d*, undecorated white earthenware rim sherd; *e*, green glazed semi-porcelain rim sherd; *f*, undecorated semi-porcelain body sherd.

Site 50-40-98-1980 is located in the northernmost portion of the project area in a highly eroded area along the fence line boundary with the Lāna'i Airport within and adjacent to the same drainage cut where the Context 19 lithic scatter was recorded (fig. 9). The site comprises two separate components, a lithic scatter and an eroded and exposed fire-pit.

The first component, the Context 18 lithic scatter, is located on the crest of a slope and extends south along a drainage cut. The scatter was approximately 30 × 120 m and contained 30 or more pieces of flaked basalt. All of the artifacts that were observed and

collected from the scatter came from within or adjacent to the existing drainage in areas that lacked vegetation. A cowry shell fragment and several pieces of branch coral were observed within the scatter. Three adze rejects, a hammerstone, a waterworn pebble manuport (possibly a sling stone), and a piece of branch coral were collected from the scatter (fig. 13). No artifacts were observed or collected in the vegetated areas around the drainage. This suggests that the artifacts have either moved downslope from a higher location as a result of water erosion or that the site has eroded and deflated over time. In either case, the artifacts would have been secondarily deposited from their original position.

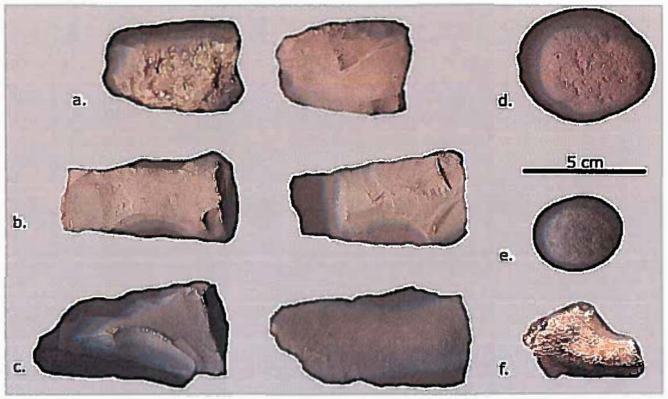


Figure 13: Artifacts collected from the Context 18 lithic scatter, part of Site 50-40-98-1980: *a*, dorsal and ventral views of an adze reject, distal portion; *b*, dorsal and ventral views of an adze reject, proximal portion; *c*, dorsal and ventral views of an adze reject, distal portion; *d*, waterworn cobble hammerstone; *e*, waterworn pebble manuport (possible sling stone); *f*, branch coral. The three adze rejects are depicted with the dorsal side to the left and the ventral side to the right.

The second component of Site 50-40-98-1980 was an exposed fire-pit remnant recorded as Context 15. It is located within the Context 18 lithic scatter on the crest of the slope in a heavily eroded area. The fire-pit remnant was observed over an approximately 75 cm diameter area and had exposed charcoal and a few small cobble-size fire-affected rocks on the surface and eroding downslope. No black plastic or tubing was observed in or around the fire-pit because the plow zone layer, Context 1, had completely eroded away. It is likely that the fire-pit had originally been truncated by the Context 1 plow zone soil.

REF-253

Following documentation of the fire-pit on the surface, the fire-pit was bisected twice to determine its size and stratigraphic position (fig. 14).

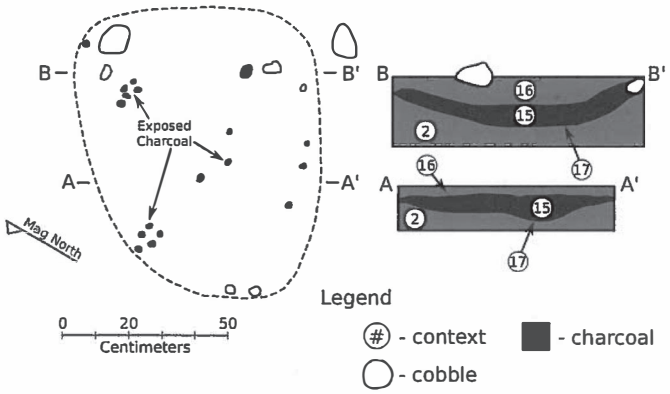


Figure 14: Sketch map and cross section drawing of a subsurface fire-pit recorded as Site 50-40-98-1980.

The first bisection point, A to A', cut the fire-pit in half to expose the stratigraphic section. Following bisection, a 15 cm deep profile was exposed. Context 16, a loose red silty clay loam sediment, was present from the current ground surface to a depth of 3 cm. It appears that the sediment has been deposited over the fire-pit due to water erosion along the drainage. The fire-pit, Context 15, is a band of charcoal that extends from 3 cm below surface to a depth of 12 cm. The fire-pit at this location is approximately 60 cm wide and is basin shaped. The interface between the Context 15 fire-pit and the material it had been dug into, the Context 2 dark reddish brown silty clay loam hard pan soil, was recorded as Context 17. The Context 2 soil was present to the base of excavation at 15 cm below surface.

The second bisection point, B to B', was cut just in front of the two rocks that were exposed on the surface. Following bisection, a 20 cm deep profile was exposed. Context 16, a loose red silty clay loam sediment, was present from the current ground surface to a depth of 6 cm. The sediment has been deposited over the fire-pit due to water erosion along the drainage. The fire-pit, Context 15, is a curved band of charcoal that extends from 6 cm below surface to a maximum depth of 15 cm. The fire-pit at this location is approximately 75 cm wide and is basin shaped. The interface between the Context 15 fire-pit and the material it had been dug into, the Context 2 dark reddish brown silty clay

loam hard pan soil, was recorded as Context 17. The Context 2 soil was present to the base of excavation at 20 cm below surface. A charcoal sample was collected from each profile after bisection for wood taxa identification and ^{14}C analysis.

In addition to the pedestrian survey, 31 backhoe trenches were excavated within the project area (fig. 15). The purpose of the backhoe trenches was to search for subsurface cultural deposits and to record the soils and depth of the plow zone within the parcel. A single *historic property*, a subsurface fire-pit, was identified in Backhoe Trench 21 during trenching and was recorded as Site 50-40-98-1981. No artifacts were collected from any of the trenches excavated.

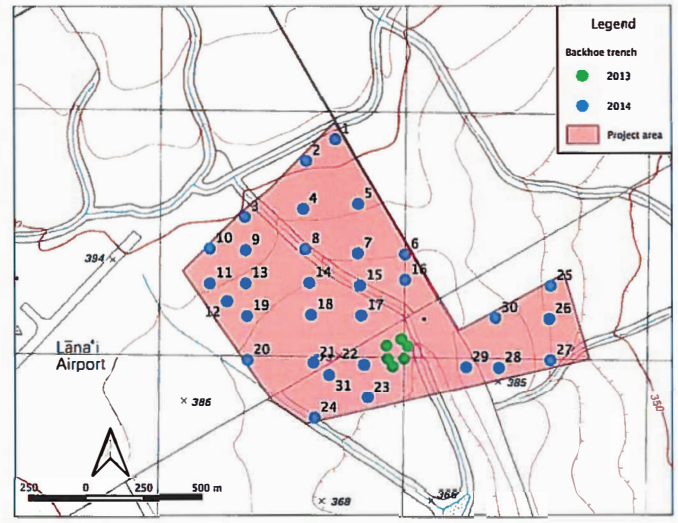


Figure 15: The proposed Miki Basin 200 Acre Industrial Development project area showing the locations of Backhoe Trenches 1-31. The trench locations from the DiVito and Dye [7] investigation are also shown. No trenches were placed in the developed area where the existing Maui Electric Company (MECO) facility lies.

Backhoe Trenches 1-5 were excavated in the northeasternmost portion of the project area and had similar soils (fig. 16, table 7). They contained the plow zone soil, Context 1, to depths ranging from 35 to 45 cm below surface. Context 1 overlay Context 2, a

REF-254

dark reddish brown silty clay loam hardpan soil present to depths ranging from 65 to 105 cm below surface. Context 2 overlay Context 9, a dark brown silty clay loam present to depths ranging from 100 to 130 cm below surface. It overlay Context 8, a dark reddish brown silty clay loam with gray and red degrading rock fragments present to the base of excavation in each trench.

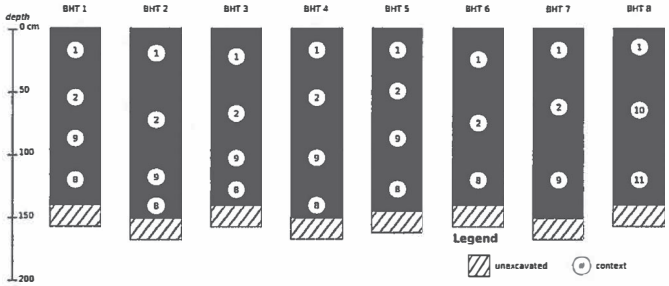


Figure 16: Stratigraphic profiles for Backhoe Trenches 1–8.

Table 7: Sediment descriptions for Backhoe Trenches 1–8

Context	Phase	Depth*	Description	Interpretation
Backhoe Trench 1				
1	3	0–35	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; *moderately sticky, moderately plastic; abrupt, smooth* lower boundary	Secondary deposition event
2	1	35–75	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; *gradual*, smooth lower boundary	Natural deposition process
9	1	75–100	Dark brown (7.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; *clear, wavy* lower boundary	Natural deposition process
8	1	100–140+	Dark reddish brown (5YR 3/2) terrestrial very gravelly silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process

* Centimeters below surface.

Continued on next page

Continued from previous page

Context	Phase	Depth*	Description	Interpretation
Backhoe Trench 2				
1	3	0–40	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
2	1	40–105	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
9	1	105–130	Dark brown (7.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; clear, wavy lower boundary	Natural deposition process
8	1	130–150+	Dark reddish brown (5YR 3/2) terrestrial very gravelly silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process
Backhoe Trench 3				
1	3	0–45	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
2	1	45–90	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
9	1	90–115	Dark brown (7.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; clear, wavy lower boundary	Natural deposition process
8	1	115–140+	Dark reddish brown (5YR 3/2) terrestrial very gravelly silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process
Backhoe Trench 4				
1	3	0–35	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
2	1	35–75	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
9	1	75–130	Dark brown (7.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; clear, wavy lower boundary	Natural deposition process

* Centimeters below surface.

Continued on next page

REF-255

Continued from previous page

Context	Phase	Depth*	Description	Interpretation
8	1	130–150+	Dark reddish brown (5YR 3/2) terrestrial very gravelly silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process
Backhoe Trench 5				
1	3	0–35	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
2	1	35–65	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
9	1	65–110	Dark brown (7.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; clear, wavy lower boundary	Natural deposition process
8	1	110–145+	Dark reddish brown (5YR 3/2) terrestrial very gravelly silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process
Backhoe Trench 6				
1	3	0–50	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
2	1	50–100	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
8	1	100–140+	Dark reddish brown (5YR 3/2) terrestrial very gravelly silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process
Backhoe Trench 7				
1	3	0–35	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
2	1	35–90	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
9	1	90–150+	Dark brown (7.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process

* Centimeters below surface.

Continued on next page

Continued from previous page

Context	Phase	Depth*	Description	Interpretation
Backhoe Trench 8				
1	3	0–30	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
10	3	30–100	Dark reddish brown (2.5YR 2.5/4) terrestrial silty clay loam; moderately sticky, moderately plastic; *diffuse*, wavy lower boundary	Natural deposition event
11	1	100–140+	Red (2.5YR 4/8) terrestrial gravelly silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process

* Centimeters below surface.

Backhoe Trenches 7, 10, 12–15, 17–21, and 31 were all excavated in the same general area and had similar soils (fig. 17, table 8). They contained the plow zone soil, Context 1, to depths ranging from 35 to 50 cm below surface. Context 1 overlay Context 2, a dark reddish brown silty clay loam hardpan soil present to depths ranging from 80 to 130 cm below surface. Context 2 overlay Context 9, a dark brown silty clay loam present to the base of excavation in each trench. This was the most commonly observed profile within the project parcel.

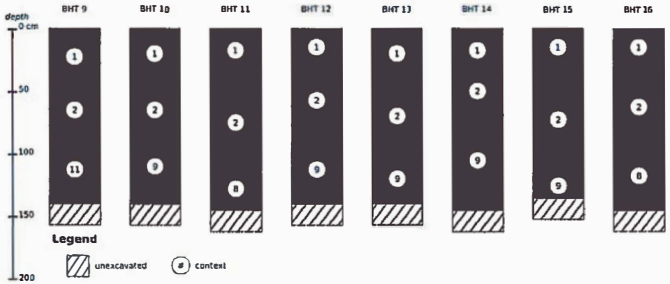


Figure 17: Stratigraphic profiles for Backhoe Trenches 9–16.

REF-256

Table 8: Sediment descriptions for Backhoe Trenches 9–16

Context	Phase	Depth*	Description	Interpretation
Backhoe Trench 10				
1	3	0–50	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
2	1	50–80	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
9	1	80–140+	Dark brown (7.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process
Backhoe Trench 11				
1	3	0–35	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
2	1	35–115	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
8	1	115–145+	Dark reddish brown (5YR 3/2) terrestrial very gravelly silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process
Backhoe Trench 12				
1	3	0–30	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
2	1	30–85	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
9	1	85–140+	Dark brown (7.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process
Backhoe Trench 13				
1	3	0–40	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event

* Centimeters below surface.

Continued on next page

Continued from previous page

Context	Phase	Depth*	Description	Interpretation
2	1	40–100	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
9	1	100–140+	Dark brown (7.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process
Backhoe Trench 14				
1	3	0–35	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
2	1	35–65	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
9	1	65–145+	Dark brown (7.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process
Backhoe Trench 15				
1	3	0–30	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
2	1	30–115	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
9	1	115–135+	Dark brown (7.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process
Backhoe Trench 16				
1	3	0–35	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
2	1	35–90	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
8	1	90–145+	Dark reddish brown (5YR 3/2) terrestrial very gravelly silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process

* Centimeters below surface.

Continued on next page

REF-257

Continued from previous page

Context	Phase	Depth*	Description	Interpretation
Backhoe Trench 9				
1	3	0–45	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
2	1	45–85	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
11	1	85–140+	Red (2.5YR 4/8) terrestrial gravelly silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process

* Centimeters below surface.

Backhoe Trench 21 contained a subsurface cultural deposit recorded as Site 50-40-98-1981 (see fig. 9, p. 77). The deposit, documented as Context 12, was a truncated fire-pit remnant exposed in the southern profile of the trench (fig. 18). The fire-pit has been truncated by the plow zone layer, Context 1, present to a depth of 35 cm below surface. It appears to have been hit by a plow moving east to west as the charcoal from the fire-pit is scattered an additional 65 cm to the west along the bottom of the Context 1 plow zone layer. The fire-pit is approximately 65 cm in width, approximately 10 cm thick, basin shaped, and is present between 35 and 45 cm below surface. A single rounded volcanic cobble was observed within the feature. The fire-pit has been excavated into Context 2, a dark reddish brown silty clay hardpan soil present to a depth of 100 cm below surface. The interface between the fire-pit and the Context 2 soil it had been excavated into was recorded as Context 13. Context 2 overlay Context 9, a dark brown silty clay loam present to the base of excavation at 150 cm below surface. A charcoal sample was collected from the Context 12 fire-pit for wood taxa and ^{14}C analysis.

Backhoe Trench 31 was excavated near Backhoe Trench 21 to search for any additional fire-pit features or associated cultural materials. Backhoe Trench 31 contained the same stratigraphic profile as documented in Backhoe Trench 21. A water line excavation trench with an associated 6 in. PVC pipe was observed in the eastern profile of the backhoe trench. It was recorded as Context 14 and was approximately 25 cm in width and extended to a depth of 140 cm below surface. No additional cultural deposits were documented and no cultural materials were collected from the trench.

Backhoe Trenches 6, 11, 16, and 24 also had similar soils (fig. 19, table 9). They contained the plow zone soil, Context 1, to depths ranging from 35 to 50 cm below surface. Context 1 overlay Context 2, a dark reddish brown silty clay loam hardpan soil present to depths ranging from 70 to 115 cm below surface. Context 2 overlay Context 8, a dark reddish brown silty clay loam with gray and red degrading rock fragments to the base of excavation in each trench.

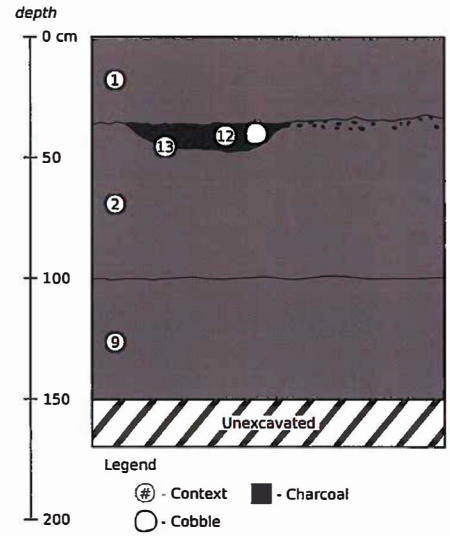


Figure 18: Stratigraphic profile for the Context 12 fire-pit located in Backhoe Trench 21. The feature was later designated Site 50-40-98-1981.

Table 9: Sediment descriptions for Backhoe Trenches 17–24

Context	Phase	Depth*	Description	Interpretation
Backhoe Trench 17				
1	3	0–40	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
2	1	40–85	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
9	1	85–135+	Dark brown (7.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process

* Centimeters below surface.

Continued on next page

REF-258

Continued from previous page

Context	Phase	Depth*	Description	Interpretation
Backhoe Trench 18				
1	3	0–40	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
2	1	40–75	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
9	1	75–150+	Dark brown (7.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process
Backhoe Trench 19				
1	3	0–40	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
2	1	40–130	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
9	1	130–150+	Dark brown (7.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process
Backhoe Trench 20				
1	3	0–35	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
2	1	35–110	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
9	1	110–140+	Dark brown (7.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process
Backhoe Trench 21				
1	3	0–35	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
12	2	35–45	Black (5YR 2.5/1); very abrupt, *irregular* lower boundary	Cultural deposition event

* Centimeters below surface.

Continued on next page

Continued from previous page

Context	Phase	Depth*	Description	Interpretation
2	1	45–100	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
9	1	100–150+	Dark brown (7.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process
Backhoe Trench 22				
1	3	0–55	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
2	1	55–140+	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process
Backhoe Trench 23				
1	3	0–45	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
2	1	45–120	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
7	1	120–145+	Dark reddish brown (5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process
Backhoe Trench 24				
1	3	0–50	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
2	1	50–70	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
8	1	70–150+	Dark reddish brown (5YR 3/2) terrestrial very gravelly silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process

* Centimeters below surface.

Backhoe Trenches 23 and 29 were excavated along the southernmost portion of the project area. They contained the plow zone soil, Context 1, to depths ranging from 40 to 45 cm below surface. Context 1 overlay Context 2, a dark reddish brown silty clay loam

REF-259

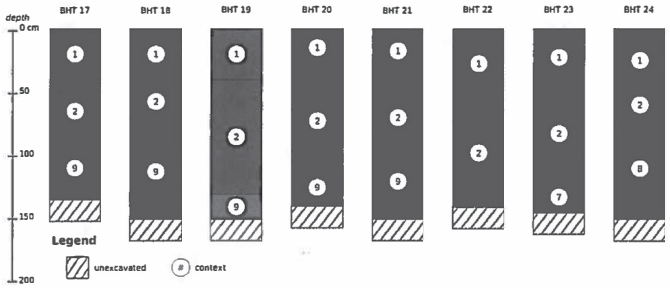


Figure 19: Stratigraphic profiles for Backhoe Trenches 17–24. Note that Backhoe Trench 21 contained the Context 12 fire-pit. See figure 18.

hardpan soil present to depths ranging from 115 to 120 cm below surface. Context 2 overlay Context 7, a dark reddish brown silty clay loam present to the base of excavation in each trench.

Backhoe Trenches 25 and 30 were excavated within the northernmost portion of the parcel located on the east side of Miki Road. They contained the plow zone soil, Context 1, to depths ranging from 35 to 40 cm below surface. Context 1 overlay Context 2, a dark reddish brown silty clay loam hardpan soil present to depths ranging from 65 to 70 cm below surface. Context 2 overlay Context 3, a brown silty clay loam present to the base of excavation in each trench.

Backhoe Trenches 26 and 27 were excavated within the easternmost portion of the parcel located on the east side of Miki Road (fig. 20, table 10). They contained the plow zone soil, Context 1, to depths ranging from 35 to 40 cm below surface. Context 1 overlay Context 2, a dark reddish brown silty clay loam hardpan soil present to depths ranging from 75 to 110 cm below surface. Context 2 overlay Context 6, a very dark gray silty clay loam with degrading rock fragments present to the base of excavation in each trench.

Table 10: Sediment descriptions for Backhoe Trenches 25–31

Context	Phase	Depth*	Description	Interpretation
Backhoe Trench 25				
1	3	0–40	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event

* Centimeters below surface.

Continued on next page

Continued from previous page

Context	Phase	Depth*	Description	Interpretation
2	1	40–70	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
3	1	70–140+	Strong brown (7.5YR 4/6) terrestrial silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process
Backhoe Trench 26				
1	3	0–40	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
2	1	40–110	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
6	1	110–150+	Very dark gray (5YR 3/1) terrestrial very stony silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process
Backhoe Trench 27				
1	3	0–35	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
2	1	35–75	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
6	1	75–145+	Very dark gray (5YR 3/1) terrestrial very stony silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process
Backhoe Trench 28				
1	3	0–30	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
4	1	30–60	Dark reddish brown (2.5YR 3/4) terrestrial gravelly silty clay loam; moderately sticky, moderately plastic; diffuse, irregular lower boundary	Natural deposition process
5	1	60–145+	Dark reddish brown (2.5YR 2.5/4) terrestrial very gravelly silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process

* Centimeters below surface.

Continued on next page

REF-260

Continued from previous page

Context	Phase	Depth*	Description	Interpretation
Backhoe Trench 29				
1	3	0–40	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
2	1	40–115	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
7	1	115–135+	Dark reddish brown (5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process
Backhoe Trench 30				
1	3	0–35	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
2	1	35–65	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
3	1	65–150+	Strong brown (7.5YR 4/6) terrestrial silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process
Backhoe Trench 31				
1	3	0–25	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; abrupt, smooth lower boundary	Secondary deposition event
2	1	25–85	Dark reddish brown (2.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; gradual, smooth lower boundary	Natural deposition process
9	1	85–150+	Dark brown (7.5YR 3/4) terrestrial silty clay loam; moderately sticky, moderately plastic; base of excavation	Natural deposition process

* Centimeters below surface.

Four of the backhoe trenches contained unique or anomalous profiles. The first, Backhoe Trench 8, contained the plow zone soil, Context 1, to a depth of 30 cm below surface. Context 1 overlay Context 10, a dark reddish brown secondarily deposited plow zone soil with plastic fragments and tubing present to a depth of 100 cm below surface. Context 10 overlay Context 11, a red gravelly silty clay loam with degrading rock present to the base of excavation at 140 cm below surface.

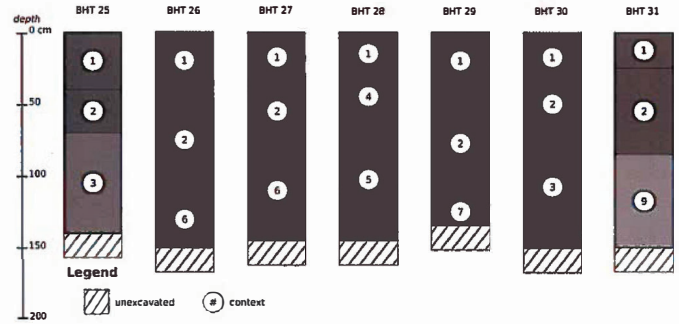


Figure 20: Stratigraphic profiles for Backhoe Trenches 25–31.

Backhoe Trench 9 contained the plow zone soil, Context 1, to a depth of 45 cm below surface. Context 1 overlay Context 2, a dark reddish brown red silty clay hardpan soil present to a depth of 85 cm below surface. Context 2 overlay Context 11, a red gravelly silty clay loam present to the base of excavation at 140 cm below surface.

Backhoe Trench 22 contained the plow zone soil, Context 1, to a depth of 55 cm below surface. Context 1 overlay Context 2, a dark reddish brown silty clay loam hardpan soil present to the base of excavation at 140 cm below surface.

Backhoe Trench 28 contained the plow zone soil, Context 1, to a depth of 30 cm below surface. Context 1 overlay Context 4, a dark reddish brown silty clay loam with degrading rock fragments present to a depth of 60 cm below surface. Context 4 overlay Context 5, a dark reddish brown silty clay loam with red and black degrading rock fragments present to the base of excavation at 145 cm below surface.

5 Summary and Conclusions

At the request of Pulama Lāna'i, T. S. Dye & Colleagues, Archaeologists has completed an archaeological inventory survey for the Mīki Basin 200 Acre Industrial Development. Pedestrian survey and subsurface testing were conducted to determine the presence or absence of historic properties and cultural materials within the Mīki Basin 200 Acre Industrial Development. During the project, a 100 percent pedestrian survey of the area was conducted and 31 backhoe trenches were excavated. Black plastic fragments, indicative of pineapple cultivation, were observed within the surface layer of soil over the entire project area.

The pedestrian survey resulted in the identification and documentation of a secondarily deposited historic artifact scatter, a secondarily deposited lithic scatter, and an historic

REF-261

property, Site 50-40-98-1980. Because the two secondary artifact scatters lack integrity of setting, location, and association with other sites and features, they do not represent historic properties and no further investigations of the scatters are warranted.

Subsurface testing included the excavation of 31 backhoe trenches. A truncated fire-pit feature, designated Site 50-40-98-1981, was documented in one of the backhoe trenches. All of the backhoe trenches contained plow zone soils overlying natural hardpan and natural silty clay loam, some of which had degrading rock fragments. No artifacts were collected from any of the trenches excavated.

Both historic properties are evaluated as significant for the important information on Hawaiian history and prehistory that they have yielded. The Miki Basin 200 Acre Industrial Development will have an adverse effect on both historic properties and it is recommended that a data recovery plan be developed for Sites 50-40-98-1980 and 50-40-98-1981, and that this plan be implemented prior to proposed construction activities within the parcel.

It is further recommended that the data recovery plan develop research questions that can be addressed with data yielded by the following laboratory tasks.

Site 50-40-98-1980 Analysis of the wood charcoal collected from the Context 15 fire-pit for taxa identification and ^{14}C dating. Analysis of artifacts collected from the Context 18 lithic scatter to further investigate the tool-making reduction sequence utilized on the island [32].

Site 50-40-98-1981 Analysis of the wood charcoal collected from the Context 12 fire-pit for taxa identification and ^{14}C dating.

A Stratigraphic Contexts

Context	Description
0	Surface of the project area.
1	Dark reddish brown silty clay loam plow zone soil with black plastic fragments and tubing throughout.
2	Dark reddish brown silty clay loam hardpan soil.
3	Brown silty clay loam.
4	Dark reddish brown silty clay loam with degrading rock fragments throughout.
5	Dark reddish brown silty clay loam with red and black degrading rock fragments throughout.
6	Very dark gray silty clay loam with degrading rock fragments throughout.
7	Dark reddish brown silty clay loam.
8	Dark reddish brown silty clay loam with gray and red degrading rock fragments.
9	Dark brown silty clay loam.
10	Secondarily deposited plow zone soils with plastic fragments and tubing.
11	Orange brown silty clay loam with degrading rock throughout.
12	Fire-pit located in Backhoe Trench 21.
13	Interface between the Context 12 fire-pit and the material it had been excavated into, Context 2.

Continued on next page

Continued from previous page

Context	Description
14	Excavation trench for a 6 in. PVC waterline.
15	Fire-pit remnant exposed on the surface of the Context 2 soil.
16	Secondarily deposited silty clay loam sediment covering the Context 15 deposit.
17	Interface between the Context 15 fire-pit and the soil it had been excavated into, Context 2.
18	Surface scatter of flakes, coral, a cowry shell fragment, two adze rejects, and two possible hammerstones located near the Context 15 fire-pit.
19	Surface scatter of flakes and a single hammerstone.
20	Historic artifact scatter located on the ground surface.

B Field Catalog

Catalog	Site	Unit	Context	Contents
1	No site number	Backhoe Trench 30	1	Sediment
2	No site number	Backhoe Trench 30	2	Sediment
3	No site number	Backhoe Trench 30	3	Sediment
4	No site number	Backhoe Trench 28	4	Sediment
5	No site number	Backhoe Trench 28	5	Sediment
6	No site number	Backhoe Trench 27	6	Sediment
7	No site number	Backhoe Trench 29	7	Sediment
8	No site number	Backhoe Trench 16	8	Sediment
9	No site number	Backhoe Trench 5	9	Sediment
10	No site number	Backhoe Trench 8	10	Sediment
11	No site number	Backhoe Trench 8	11	Sediment
12	No site number	Backhoe Trench 21	12	Charcoal sample
13	No site number	Ground surface	15	Charcoal sample
14	No site number	Ground surface	20	Artifacts
15	No site number	Isolated Find 1	0	Adze reject
16	No site number	No unit	19	Artifacts
17	No site number	No unit	18	Artifacts
18	No site number	No unit	18	Artifacts
19	No site number	Isolated Find 2	0	Adze reject

C Artifact List

Bag	Material	Class	Period*	#	Wt.†	Whole	Notes
15	stone	adze reject	trad.	1	86.1		Discarded due to a transverse fracture sustained during flaking; length 6.7 cm; width 3.7 cm; thickness 1.9 cm

* trad. = Traditional, hist. = Historic; † Weight in grams.

Continued on next page

REF-262

Continued from previous page

Bag	Material	Class	Period*	#	Wt.†	Whole	Notes
19	stone	adze reject	trad.	1	242.5		Adze reject proximal end. Sustained a transverse fracture while attempting to remove flakes across the dorsal side; length 6.0 cm; width 3.4 cm; thickness 2.2 cm
Context 18							
17	coral	manuport	trad.	1	30.7		Length 5.4 cm; width 3.4 cm; thickness 2.1 cm
17	stone	adze reject	trad.	1	126.8		Proximal end of an adze reject discarded due to an end shock fracture; length 7.8 cm; width 4.2 cm; thickness 2.7 cm
17	stone	adze reject	trad.	1	76.4		Distal end of an adze reject, likely broken off due to an end shock fracture. The artifact has *cortex* on its dorsal side and shows evidence of problems thinning the cross section of the artifact during flaking; length 6.0 cm; width 3.9 cm; thickness 1.9 cm
17	stone	adze reject	trad.	1	110.5		Distal portion of a large flake with signs of heavy step fracturing along one edge. It is likely to have been discarded due to a transverse fracture sustained during flaking along the edge in addition to trouble removing flakes across the artifact. Made of a dark gray fine-grained basalt; length 8.5 cm; width 4.6 cm; thickness 2.3 cm
18	stone	hammerstone	trad.	1	144.5		Large waterworn pebble manuport with battering on at least one edge from use as a hammerstone; length 5.8 cm; width 5.2 cm; thickness 3.6 cm

* trad. = Traditional, hist. = Historic; † Weight in grams.

Continued on next page

Continued from previous page

Bag	Material	Class	Period*	#	Wt.†	Whole	Notes
18	stone	waterworn pebble	trad.	1	53.8		Waterworn pebble manuport, possibly a sling stone; length 3.9 cm; width 3.3 cm; thickness 2.8 cm
Context 19							
16	stone	adze reject	trad.	1	20.6		The distal end of an adze reject broken due to an end shock fracture during flaking; length 4.8 cm; width 2.6 cm; thickness 1.2 cm
16	stone	waterworn cobble	trad.	1	142.2		Small waterworn cobble manuport; length 8.7 cm; width 4.6 cm; thickness 2.8 cm
Context 20							
14	ceramic	semi-porcelain	hist.	1	26.7		Undecorated base sherd with footring and partial cobalt blue maker's mark that reads "TRADEMARK/MADE IN JAPAN" with a rising sun logo between the lettering. "Made in Japan" maker's marks on ceramics were required starting in 1921 and continued to 1941. Part of the same vessel as the hand-painted fragment; length 5.7 cm; width 5.3 cm; thickness 0.6 cm
14	ceramic	semi-porcelain	hist.	1	12.6		Body sherd with footring and a hand-painted cobalt blue design with crisscrossing lines. Part of the same vessel as the sherd with the maker's mark; length 5.1 cm; width 3.0 cm; thickness 0.6 cm
14	ceramic	semi-porcelain	hist.	1	0.9		Rim sherd that is undecorated on the inside and has a green glaze on the outside; length 2.4 cm; width 0.8 cm; thickness 0.2 cm

* trad. = Traditional, hist. = Historic; † Weight in grams.

Continued on next page

REF-263

Continued from previous page

Bag	Material	Class	Period*	#	Wt.†	Whole	Notes
14	ceramic	semi-porcelain	hist.	1	0.4		Undecorated body sherd; length 1.3 cm; width 1.2 cm; thickness 0.3 cm
14	ceramic	white earthenware	hist.	1	6.7		Undecorated rim sherd; length 4.0 cm; width 2.5 cm; thickness 0.6 cm
14	ceramic	white earthenware	hist.	1	6.7		Undecorated body sherd with footring; length 3.1 cm; width 2.9 cm; thickness 0.6 cm
14	glass	bottle	hist.	1	19.0		Clear glass bottle shoulder shard; length 5.4 cm; width 3.6 cm; thickness 0.6 cm

* trad. = Traditional, hist. = Historic; † Weight in grams.

Glossary

abrupt A transition between *horizons* that is 0.5 cm or greater but still less than 2 cm. See also horizon.

caldera A caldera is a cauldron-like volcanic feature usually formed by the collapse of land following a volcanic eruption. They are sometimes confused with volcanic craters.

Christmas berry The ornamental tree, *Schinus terebinthifolius*, known for its bright red berry-like fruits.

clay Fine earth particles less than 0.002 mm.

clear A transition between horizons that is 2 cm or greater but still less than 5 cm. See also horizon.

cobble Rock fragment ranging from 76 mm to less than 250 mm.

Contact A period in Hawaiian history marked by the arrival of Captain James Cook in 1778 and characterized by the social changes that eventually brought about the end of traditional Hawai'i.

context A unit of stratification associated with a natural or cultural process or event.

cortex The weathered outer rind that covers the unweathered inner material of a piece of tool stone.

diffuse A transition between horizons that is 15 cm or greater. See also horizon.

fee simple An estate of inheritance, held without limitation to a particular class of heirs; unconditional inheritance.

fire-pit A pit of varying depth, often bowl shaped at the base, usually identified by a concentration of charcoal and/or burned material in the fill, especially at the feature interface.

gradual A transition between horizons that is 5 cm or greater but still less than 15 cm. See also horizon.

guava The historically introduced tree or shrub, *Psidium guajava*, common in Hawai'i today.

historic property According to Hawai'i Administrative Rules §13-198-2, an "historic property" is any building, structure, object, district, area, or site, including underwater site, that is significant in the history, architecture, archaeology, or culture of the state of Hawai'i, its communities, or the nation.

irregular A soil boundary in which the depth of undulation is greater than its width.

manuport A natural object found in an unnatural position, having been carried there by man.

material culture In *rock art* recording, a category which includes images that are cultural objects, e.g., spears, paddles, gourds, cape, etc.

midden A heap or stratum of refuse normally found on the site of an ancient settlement. In Hawai'i, the term generally refers to food remains, whether or not they appear as a heap or stratum.

moderately plastic A 4 mm diameter roll of soil will support itself if held on end, but a 2 mm diameter roll of soil will not.

moderately sticky Soil adheres to both fingers, after release of pressure and stretches some on separation of fingers.

phase A grouping between an individual unit of stratification and a *period*: several units of stratification make up a phase and several phases compose a period.

phasing Arrangement of the stratification into a stratigraphic sequence, and the division of the sequence into phases and periods. See also *periodization*.

project The archaeological investigation, including laboratory analyses and report preparation. See also *undertaking*.

significance A quality of a historic property that possesses integrity of location, design, setting, materials, workmanship, feeling, and association. The qualities are set out in SHPD administrative rule §13-275-6, *Evaluations of Significance*.

site The fundamental unit of archaeological investigation, a location that exhibits material evidence of past human activity.

smooth A soil boundary which is planar with few or no irregularities.

stone Rock fragment ranging from 250 mm to less than 600 mm.

stratigraphic relationships These are either of a superpositional nature, where one deposit lies above another, or they are made up of correlations, where strata or features have been cut into isolated parts by later digging.

sugarcane A grass, *Saccharum officinarum*, widely grown in warm regions as a source of sugar. See also *kō*.

unit of stratification number A number assigned to each natural and man-made layer, upstanding stratum, and vertical and *horizontal feature interface*. Once numbered, each unit will automatically have a set of stratigraphic relationships which must be defined and recorded.

wavy A soil boundary in which the width of undulation is greater than its depth.

REF-264

Hawaiian Terms

ahu Heap, pile; altar, shrine, cairn.
ahupua'a Traditional Hawaiian land division, usually extending from the uplands to the sea.
'āina Land, earth.
akua God, goddess, spirit, ghost, devil, image, corpse.
'alae A bird, *Fulica americana alae*, the mudhen or Hawaiian gallinule. See also *'alae kea*.
ali'i Chief, chiefess, officer, ruler, monarch, peer, head man, noble, aristocrat, king, queen, commander.
aloha Love, affection, compassion, mercy, sympathy, etc.
'apapane A honeycreeper, *Himatione sanguinea* with crimson body and black wings and tail, found on all the main Hawaiian Islands. Its feathers occasionally were used for featherwork.
'aumakua Family or personal gods, deified ancestors who might assume the shape of animals, rocks, clouds, or plants.
'awa A shrub, *Piper methysticum*, the root of which is the source of a narcotic drink of the same name used in ceremonies, prepared formerly by chewing, later by pounding.
hale House, building, station, hall.
he'e Octopus.
heiau Traditional Hawaiian place of worship.
helu To count, number, compute, take a census, figure enumerate, list, include, impute; to assess, as taxes; to chant a list of names, as of genealogy; including, counting, enumeration, census, list, rate, number, figure, total, inventory; statistics.
'ili A land section, next in importance to *ahupua'a*, and usually a subdivision of an *ahupua'a*.
'iliahi Native trees and shrubs belonging to the genus *Santalum*, or sandalwood. Traditionally, it was powdered and mixed with coconut oil to make perfume for *kapa*.
imu Underground oven.
ipu The gourd, *Lagenaria siceraria*.
Kahiki Tahiti, foreign land.
kahuna Priest, sorcerer, magician, wizard, minister, expert in any profession.
kala A generic name for fish in the Unicornfish genus *Naso*. It is generally caught in nets or with a spear. The flesh has a strong odor and is rarely eaten raw; it is often broiled or partially dried and broiled.
kalo The taro, *Colocasia esculenta*, was a staple food in traditional Hawai'i and all parts of the plant were used. The rootstock was baked or steamed, then eaten sliced or pounded to make *poi*, raw taro was also grated and mixed with coconut milk to make desserts, the leaves, leaf stems and flowers were also used in cooking. Medicinally the leaves and rootstock were used to treat many ailments. The plant was also used ritually, as bait for fish, glue, and to make dye.
kama'āina Native-born, one born in a place, host.
kapa Tapa cloth, as made from *wauke* or *māmaki* bark.
kapu Taboo, prohibition; special privilege or exemption from ordinary taboo; sacredness;

prohibited, forbidden; sacred, holy, consecrated; no trespassing, keep out.
kāula Prophet, seer, magician.
kawakawa Bonito, little tunny (*Euthynnus yaito*).
kīhāpai Small land division, smaller than a *paukū*; cultivated patch, garden, orchard, field, small farm.
kō Sugarcane, *Saccharum officinarum*, was introduced to Hawai'i by Polynesian settlers, who cultivated it widely. The stalk was chewed between meals for its sweetness, brought on long journeys to ease hunger, and eaten in times of famine; juice from the stalk was fed to nursing babies, and used as a sweetening agent in medicinal herbal concoctions; the leaves were used as thatching for houses; the leaf midrib was used for plaiting braids that were made into hats; the stem of the flower was used to make darts for a child's game.
ko'a Shrine, often consisting of circular piles of coral or stone, built along the shore or by ponds or streams, used in ceremonies as to make fish multiply; also built on bird islands, and used in ceremonies to make birds multiply.
koa haole A historically introduced small tree, *Leucaena glauca*.
Kona Leeward sides of the Hawaiian Islands. Name of a leeward wind.
konohiki Head man of an *ahupua'a* land division under the chief; land or fishing rights under control of the *konohiki*. See also *ahupua'a*.
Ko'olau Windward sides of the Hawaiian Islands.
kākini Runner, swift messenger, as employed by old chiefs, with a premium on their speed.
kukui The candlenut tree, *Aleurites moluccana*, introduced to Hawai'i by Polynesian settlers. The outer husk of the fruit or nut was used to make a black dye for tapa and tattooing; sap from the fruit was used as medicine to treat thrush, and used as a purgative; the hard shell of the nut was used in *lei* making; the kernel of the nut was the source of an oil that was burned for illumination and also used as a wood varnish for surfboards and canoes; the kernel was also chewed and spit on rough seas to calm the ocean and baked kernels were mixed with salt and chili pepper to make a relish (*'inamona*); the trunk was used to make canoes and floats for fishing nets; a reddish dye was made from the bark and/or root; a gum exuded from wounded bark was used to treat tapa; the flower was mixed with sweet potato to treat thrush; the leaves were used in a poultice for swelling and infection.
kula 1. Plain, field, open country, pasture; land with no water rights. 2. School.
kuleana Right, title, property, portion, responsibility, jurisdiction, authority, interest, claim, ownership.
lawai'a Fisherman; to catch fish.
lehua The flower of the *'ōhi'a* tree, *Metrosideros polymorpha*; also the tree itself. See also *'ōhi'a lehua*.
lei Garland, wreath.
mahalo Thanks, gratitude.
Māhele The mid-nineteenth century land division responsible for the introduction of fee simple land title in Hawai'i.
mai'a All kinds of bananas and plantains.

REF-265

maika Ancient Hawaiian game suggesting bowling.

maile A native twining shrub, *Alyxia olivaeformis*, used in traditional Hawaiian religion to evoke Laka, the goddess of hula. *Maile* sticks gummed with lime were used as part of a rig to catch birds.

māla Garden, plantation, patch, cultivated field.

māmane A native tree, *Sophora chrysophylla*, that thrives at high altitudes. Traditionally the wood was used for a variety of wood implements, and also in *hōlua* sleds. The flower was used medicinally as an astringent.

manō Shark. In Hawaiian culture, there are two classes of sharks. *Manō kānaka* are sharks with human affiliations, and *manō i'a* are wild sharks. *Manō kānaka* were revered and cared for, and were *akua* or *'aumakua*.

mō'ī King, queen, sovereign, monarch, or a rank of chiefs who could succeed to the government but who were of lower rank than chiefs descended from the god Kāne.

mo'o 1. Narrow strip of land, smaller than an *'ili*; 2. Lizard, reptile of any kind, dragon, serpent; water spirit.

naio A native tree, *Myoporum sandwicense*, with hard, dark, yellow-green wood. The wood was used traditionally for the main timbers of houses.

pala A native fern (*Marattia douglasii*), with a short trunk and large, long-stemmed, much divided, dark green fronds. In time of famine, the thick, starchy, hoof-shaped bases of the frond stems, which cover the short trunk, were eaten after being baked in an *imu* overnight. The mucilaginous water resulting from slicing and soaking the raw stems in water was used medicinally. Pieces of the fronds mixed with *maile lei* enhanced their fragrance. The fern was also used in *heiau* ceremonies.

pānini A cactus, *Opuntia megacantha*, introduced to Hawai'i in the 1800s. The Hawaiian name means "unfriendly wall." Hawaiians made a fermented drink from the fruits and also ate them raw.

paukū A land section smaller than a *mo'o*.

pili A native grass, *Heteropogon contortus*, whose leaves were used traditionally as house thatch.

pipi 1. Hawaiian pearl oyster, *Pinctada radiata*. In songs this is known as the *i'a hāmau leo o 'Ewa*, 'Ewa's silent sea creature—it was believed that talking would cause a breeze to ripple the water and frighten the *pipi*. 2. Cattle.

poi The Hawaiian staff of life, made from cooked taro corms, or rarely breadfruit, pounded and thinned with water.

pua kala A native perennial herb, *Argemone glauca*, whose seeds mixed with a yellow sap from the stalk were used as a narcotic for pain relief; the sap was also used to treat warts.

pūhi Any eel.

pule Prayer, magic spell, incantation, blessing.

'uala The sweet potato, *Ipomoea batatas*, introduced to Hawai'i by Polynesian settlers, was a staple food. The tuber was cooked whole and eaten or it was made into poi and mixed with coconut milk to make a dessert; it was used as bait for mackerel fishing; and to make a fermented drink called 'uala 'awa'awa. The vine made a *lei* which was worn by nursing mothers to ensure a good flow of milk; when dried, the vine was also used as padding underneath floor mats. All parts of the plant were used as food for pigs. Kamapua'a was the god of the sweet potato.

uhu An adult fish in the family Scaridae.

'ulu 1. Discoidal, smooth stone as used in *'ulu maika* game; 2. Breadfruit, *Artocarpus altilis*.

wahine Woman, lady, wife; sister-in-law, female cousin-in-law of a man.

wauke A small tree or shrub, *Broussonetia papyrifera*, whose bark was made into *kapa* cloth. The inner bark was used to make cordage, and the shoots were used to treat childhood diseases. The leaves, along with banana and taro leaves, were used ceremonially to wrap the bodies of *ali'i* after death.

weke Certain species of Mullidae, surmullets, or goatfish, which have large scales and are usually found in reefs. Red and light-colored *weke* were popular as offering to the gods.

Abbreviations

ac. A unit of land area equal to 4,840 square yards (0.405 hectare).

AD *Anno Domini*, the Christian era in the Gregorian calendar, starting from the year AD 1 as the calculated year in which Christ was born.

cm The centimeter, a derived unit of length in the International System of Units, equal to 10^{-2} m. See also m.

GPS Global Positioning System, operated by the government of the United States. The term is often used for the unit used to communicate with the GPS.

in. A unit of linear measure equal to one twelfth of a foot (2.54 cm).

LCA Awards issued by the Board of Commissioners to Quiet Land Titles between 1846 and 1855 to persons who filed claims to land between 1846 and 1848.

m The meter, a base unit of length in the International System of Units, equal to the length of the path traveled by light in vacuum during a time interval of 1/299,792,458 of a second.

USGS A federal agency that provides reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect the quality of life.

Bibliography

1. Ahlo, H. M. (1985, April). *An Archaeological Survey of the Proposed Lanai Sanitary Landfill Site, Lanai, Hawaii.* Prepared for M & E Pacific, Inc. Hamilton M. Ahlo.

2. Beckwith, M. (1970). *Hawaiian Mythology.* Honolulu: University of Hawaii Press.

3. Borthwick, D. F., R. Chiogioji, and H. H. Hammatt (1990, May). *Archaeological Survey and Testing for the Proposed Lāna'i Airport Expansion.* Prepared for Lanai Company, Inc. Cultural Surveys Hawaii.

REF-266

4. Bowser, G. (1880). *The Hawaiian Kingdom Statistical and Commercial Directory and Tourists Guide.* Honolulu: Bowser and Co.

5. Dagan, C. P. M., T. L. Lee-Greig, and H. H. Hammatt (2009, August). *Cultural Impact Assessment For the Lāna'i Airport Improvements Project in Kamoku, Kalulu, and Kaunolu Ahupua'a, Lahaina District, Island of Lāna'i, TMK: (2) 4-9-002:041.* Prepared for Munekiyo & Hiraga, Inc. Wailuku, HI: Cultural Surveys Hawaii.

6. DiVito, N. J. and T. S. Dye (2013, September). *Archaeological Inventory Survey of the Miki Basin Pipeline Replacement, the Central Services Warehouse, and a Multi-Purpose Field, Lands of Kaunolū and Kamoku, Lāhaina District, Lāna'i Island TMK: (2) 4-9-002:001 and TMK: (2) 4-9-014:011.* Prepared for Pūlama Lāna'i. T. S. Dye & Colleagues, Archaeologists.

7. DiVito, N. J. and T. S. Dye (2014, April). *Archaeological Assessment for the Lāna'i Contractor Housing Project, Lands of Kalulu and Kamoku, Lāhaina District, Lāna'i Island, TMK: (2) 4-9-002:001.* Prepared for Pūlama Lāna'i. Honolulu: T. S. Dye & Colleagues, Archaeologists.

8. Dixon, B., M. Major, and D. Lazzaro (1992, October). *Kaunolū: An Archaeological Inventory Survey and Mapping of State Site 50-40-98-25, Kaunolū and Keāliakapu Ahupua'a, Lāna'i, Hawai'i.* Prepared for Lana'i Company and Castle and Cooke. Honolulu: Anthropology Department, B.P. Bishop Museum.

9. Ellis, W. (1963). *Journal of William Ellis.* Honolulu: Advertiser Publishing Company.

10. Emory, K. P. (1924a). *The Island of Lanai; a Survey of Native Culture.* Number 12 in Bernice P. Bishop Museum Bulletin. Honolulu, Hawaii: Bishop Museum Press.

11. Emory, K. P. (1924b). Lana'i fieldnotes. On file at SHPD, Kapolei, HI.

12. Foote, D. E., E. L. Hill, S. Nakamura, and F. Stephens (1972). *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii.* Washington, DC: U.S. Department of Agriculture, Soil Conservation Service in cooperation with the University of Hawaii Agricultural Experiment Station.

13. Fornander, A. (1916). *Fornander Collection of Hawaiian Antiquities and Folk-lore,* Volume 4, Part 1 of *Memoirs of the B. P. Bishop Museum.* Honolulu: Bishop Museum Press. Translations revised and illustrated with notes by Thomas G. Thrum.

14. Fornander, A. (1973). *An Account of the Polynesian Race, Its Origin and Migrations.* Rutland, VT: Charles E. Tuttle Company.

15. Fornander, A. (1996). *Ancient History of the Hawaiian People to the Times of Kamehameha I.* Honolulu: Mutual.

16. GretagMacbeth (2000). *Munsell® Soil Color Charts.* New Windsor, NY: GretagMacbeth.

17. Harris, E. C. (1989). *Principles of Archaeological Stratigraphy* (Second ed.). London: Academic Press.

18. Hawaiian Pineapple Company, Ltd. (1927). *What It Means to Grow Big in Twenty-Five Years: Sixty Pictures and a Few Paragraphs That Tell a Story and Mark a 25th Birthday, December Fourth 1901 to December Fourth 1926.* Honolulu: Hawaiian Pineapple Company, Ltd.

19. Henke, L. A. (1929). *A Survey of Livestock in Hawaii.* Number 5 in Research Publications. Honolulu: University of Hawaii.

20. Hommon, R. J. (1974). *Comments on the Archaeological Sites on the Island of Lanai.* Anthropology Department, B.P. Bishop Museum.

21. Kalākaua, K. D. L. (1990 [1888]). *The Legends and Myths of Hawaii: The Fables and Folk-Lore of a Strange People.* Rutland, VT: Charles E. Tuttle.

22. Kam, W. (1987, March). *Field Inspection Report and Recommendations, Proposed Lanai Sanitary Landfill, Kaumalapau, Lahaina, Island of Lanai.* Prepared for M & E Pacific, Inc. Honolulu: Department of Land and Natural Resources.

23. Kamakau, S. M. (1961). *Ruling Chiefs of Hawaii.* Honolulu: Kamehameha Schools Press.

24. Lee-Greig, T. L. and H. H. Hammatt (2009, July). *An Archaeological Field Inspection and Literature Review for the Lāna'i Airport Improvement Project, Kamoku, Kalulu, and Kaunolu Ahupua'a, Lahaina District, Lāna'i Island, TMK: (2) 4-9-002:041* (Draft ed.). Prepared for Munekiyo & Hiraga, Inc. Wailuku, HI: Cultural Surveys Hawaii.

25. Lee-Greig, T. L. and H. H. Hammatt (2013, March). *An Archaeological Assessment for the Proposed Lāna'i Airport Runway Improvements, Kamoku, Kalulu, and Kaunolū Ahupua'a, Lāhainā District, Lāna'i Island, TMK: (2) 4-9-002:041.* Prepared for RM Towill Corporation. Wailuku, HI: Cultural Surveys Hawaii.

26. Macdonald, G. A. and A. T. Abbott (1970). *Volcanoes in the Sea: The Geology of Hawaii.* Honolulu: University of Hawaii Press.

27. Pukui, M. K., S. H. Elbert, and E. T. Mookini (1974). *Place Names of Hawaii.* Honolulu: University of Hawaii Press.

28. Sinoto, A. (1989, December). *Letter to Mr. Reginald Suzuka Dated December 20, 1989 Regarding Lanai Airport Surface Assessment Report.* Prepared for Park Engineering. Honolulu: Anthropology Department, B.P. Bishop Museum.

29. Smith, J. G. and H. E. Dougherty. Lanai: "The Pineapple Kingdom". Pamphlet containing reprints of newspaper articles published in *Honolulu Advertiser,* February 1-2, 1926.

30. Thien, S. (1979). A flow diagram for teaching texture-by-feel analysis. *Journal of Agronomic Education 8,* 54-55.

REF-267

31. Walker, A. T. and A. E. Haun (1987, October). *Archaeological Reconnaissance Survey and Limited Data Recovery Excavations, Proposed Sanitary Landfill Site, Land of Kamoku, Lahaina District, Island of Lanai (TMK:4-9-02:por. 1).* Prepared for M & E Pacific. Hilo, HI: Paul H. Rosendahl, PhD.

32. Weisler, M. (1990). A technological, petrographic, and geochemical analysis of the Kapohaku adze quarry, Lanai, Hawaiian Islands. *New Zealand Journal of Archaeology 12*, 29–50.

REF-268

STATE HISTORIC PRESERVATION DIVISION ARCHAEOLOGICAL INVENTORY SURVEY ACCEPTANCE LETTER

APPENDIX

D-2

REF-269

DAVID Y. IGE
GOVERNOR OF
HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
FIRST DEPUTY

M. KALEO MANUEL
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, HI 96707

August 4, 2020

IN REPLY REFER TO:
Log No.: 2020.01586
Doc. No.: 2008AM02
Archaeology

Glen Ueno, Administrator
County of Maui
Department of Public Works
Development Services Administration Division
250 South High Street
Wailuku, Maui, Hawai‘i 96793

Dear Glen Ueno:

SUBJECT: **Chapter 6E-42 Historic Preservation Review –**
Miki Basin Industrial Park Project
Archaeological Inventory Survey
Kamoku Ahupua‘a, Lāhaina District, Lāna‘i Island
TMK: (2) 4-9-002:061 por.

This letter provides the State Historic Preservation Division's (SHPD) review of the draft report titled, *Archaeological Inventory Survey for the Miki Basin 200 Acre Industrial Development* (DiVito et al., May 2018), produced by T.S. Dye and Colleagues, Archaeologist, Inc. (TSD) for the Pūlama Lāna‘i, Miki Basin Industrial Park project. SHPD received a draft environmental assessment (EA) report (Ho‘okuleana LLC, June 2020) for the project on December 5, 2019 (Log No. 2019.02674) and a final EA report on July 8, 2020 along with a cover letter prepared on behalf of Pūlama Lāna‘i, an HRS 6E Submittal Form, the subject archaeological inventory survey (AIS) report (Log No. 2020.01586).

The Miki Basin Industrial Park project is a 200-acre master-planned light and heavy industrial development on land adjoining the Lāna‘i Airport, the Maui Electric Company (MECO) 5-acre power plant and the existing 20-acre Miki Basin Industrial Condominium. The current submittal does not include a permit set, however Pūlama Lāna‘i indicates the proposed 200-acre Miki Basin Industrial Park is planned to be developed incrementally over a 30-year period.

TSD initially completed the subject AIS in 2016 (Log No. 2016.02655) and the report was subsequently withdrawn by Pūlama Lāna‘i. TSD conducted additional archaeological work in the project area and presented the findings from both survey efforts in the current AIS report (DiVito et al., May 2018). The report indicates the AIS was conducted to identify historic properties and cultural materials in the project area to support a proposed zoning change and construction activities associated with the Miki Basin Industrial Park project.

The subject AIS report includes a detailed analysis of historic land use, cultural practices in the area, an artifact analysis section, a summary of previous archaeological investigations, and the results of the archaeological testing. The survey included a 100 percent coverage pedestrian survey of the project area conducted using transects spaced at 10-meter (m) intervals. Subsurface testing of the project area included the excavation of 31 backhoe trenches. The test trenches were excavated to 145 cm below ground surface, measured 3 to 4 m in length, and were each 1 m wide. The GPS data for the locations of each trench excavation was recorded and the locations are depicted on a map of the project area. The report includes soil descriptions using Munsell colors and USDA descriptions and attributes.

TSD identified two historic properties during AIS testing (Table 1). SIHP # 50–40–98–1980 is comprised of two features including a lithic scatter and an eroded exposed fire-pit. SIHP # 50-40-98-1981 is a subsurface truncated fire-pit feature. TSD assessed SIHP # 50–40–98–1980 and 50–40–98–1981 as significant for the information on Hawaiian history and prehistory that they have yielded. The report indicates the Miki Basin Industrial Park project will adversely impact both historic properties and it is recommended that data recovery excavation be conducted as mitigation for SIHP #s 50-40-98-1980 and 50-40-98-1981.

Table 1: Historic properties identified within the current project area.

SIHP # 50-40-98-	Formal Type	Significance Assessment	Description	Mitigation
1980	artifact scatter and fire-pit	d	Surface lithic scatter and exposed fire-pit	Data recovery
1981	fire-pit	d	Subsurface fire-pit (Backhoe Trench 21)	Data recovery (tested)

The report meets the minimum requirements of HAR §13-275-6. **It is accepted**. Please send two hard copies of the document, clearly marked FINAL, along with a copy of this acceptance letter and text-searchable PDF version of the report to the Kapolei SHPD office, attention SHPD Library. Additionally, please send a digital copy of the final AIS report (DiVito et al., May 2018) to lehua.k.soares@hawaii.gov.

The current submittal includes a cover letter from Pūlama Lānaʻi dated July 5, 2020 that requests an HRS 6E-42 project effect determination of "*effect, with proposed mitigation commitments*," with mitigation in the form of data recovery. Honua Consulting recommends that a data recovery plan be developed for SIHP #s 50–40–98–1980 and 50–40–98–1981 and a program of archaeological monitoring for the Miki Basin Industrial Park project.

SHPD concurs with the significance assessments and mitigation recommendations for SIHP #s 50–40–98–1980 and 50–40–98–1981. However, the **SHPD notifies the County of Maui** that our office has not yet received a County permit submittal triggering an HRS 6E-42 review. Therefore, our division cannot make a project effect determination at this time.

SHPD requests to be consulted prior to the issuance of any permits associated with the Miki Basin Industrial Park project on the subject property, allowing our division the opportunity to review the proposed project and to make an HRS 6E project effect determination in accordance with HAR §13-284-3 and, if necessary, any appropriate mitigation.

Please contact Andrew McCallister, Historic Preservation Archaeologist IV, at Andrew.McCallister@hawaii.gov or at (808) 692-8010 for matters regarding archaeological resources or this letter.

Aloha,

Alan Downer

Alan S. Downer, PhD
Administrator, State Historic Preservation Division
Deputy State Historic Preservation Officer

cc: Keiki-Pua S. Dancil, Pūlama Lānaʻi, kdancil@pulamalanai.com
Trisha Kehaulani Watson, Honua Consulting, watson@honuaconsulting.com
Kurt Matsumoto, Pūlama Lānaʻi, kmatsumoto@pulamalanai.com
Daniel E. Orodenker, Land Use Commission, daniel.e.orodenker@hawaii.gov

CULTURAL IMPACT ASSESSMENT AND DETERMINATION AND SUPPORTING MATERIALS

APPENDIX

D-3

REF-272

Ka Pa‘akai Analysis and Determination

REF-273

4348 Wai`alae Ave #254•Honolulu Hawai`i 96816•T: (808) 392-1617•F: (888) 392-4941•E-Mail: admin@honuaconsulting.com

MEMORANDUM

To: **Keiki-Pua S. Dancil, Ph.D.**
Fr: **Trisha Kehaulani Watson, J.D., Ph.D.**
Re: ***Ka Pa'akai* Analysis and Determination**
Date: **September 17, 2021**

***Ka Pa'akai* Analysis**

Article XII, Section 7 of the Hawai'i Constitution obligates the State Land Use Commission ("LUC") to protect the reasonable exercise of customarily and traditionally exercised rights of native Hawaiians to the extent feasible when granting a petition for reclassification of district boundaries. In order to effectuate the State's obligation to protect native Hawaiian customary and traditional practices while reasonably accommodating competing private interests, the Hawai'i Supreme Court provided the following analytical framework as an outcome of *Ka Pa'akai O ka 'aina v. Land Use Commission (94 Hawai'i 31,7 P.3d 1068, September 11, 2000)*. The framework is referred to as *Ka Pa'akai Analysis* and consists of three parts:

1. Identify the scope of "valued cultural, historical and natural resources" in the petition area, including to the extent to which traditional and customary rights and practices are exercised in the affected area;
2. Determine the extent to which those resources, including traditional and customary native Hawaiian rights, will be affected or impaired by the proposed action; and
3. Identify feasible actions, if any, that should be taken by the LUC to reasonably protect Native Hawaiian rights and practices if they are found to exist.

Pūlama Lāna'i is processing an application to reclassify 200 acres from the State Land Use ("SLU") Agricultural District into the SLU Urban District for an industrial area on the island of Lāna'i. The proposed boundary amendment is on a portion of TMK (2) 4-9-002:061. The land is adjacent to other industrial parcels such as the Lāna'i Airport, Hawaiian Electric Fossil Fuel Power Plant, and Miki 20-acre industrial park (see Figure 1). The existing condition of the land is former pineapple fields that have lain fallow for over 30 years.

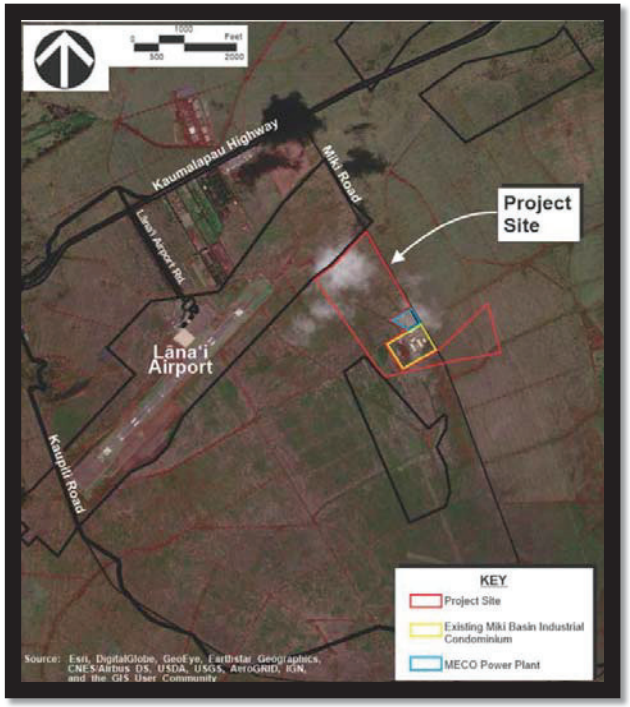


Figure 1: Miki Basin Industrial Park Project Area Map, provided by Munekiyo Hiraga.

Although Honua Consulting did not complete the Archaeological Inventory Survey ("AIS") for the Miki Basin 200 Acre Industrial Development (DiVito, Maly, and Dye 2018), we have reviewed the survey and have worked on multiple projects on Lāna'i for Pūlama Lāna'i as the archaeological consultant. In addition, Nathan DiVito is currently employed by Honua Consulting, and Thomas Dye, Ph.D. (Principal of T.S. Dye & Collegues, Archaeologist, Inc.) has provided Honua Consulting with archives of studies performed by his firm for Pūlama Lāna'i since closing his business upon retirement.

Honua Consulting has reviewed the archaeological materials in the Draft Environmental Assessment ("Draft EA") for the District Boundary Amendment Application. These materials included the following:

- Archaeological Inventory Survey ("AIS") for the Miki Basin 200 Acre Industrial Development (DiVito, Maly, and Dye 2018)

REF-274

- State Historic Preservation Division ("SHPD")Archaeological Inventory Survey Acceptance Letter (August 2020)
- Supporting Documentation on Cultural Impact Assessment Requirement
    - Letter from Kepā Maly to Kurt Matsumoto dated September 24, 2019
    - Letter from Kepā Maly to Kurt Matsumoto dated June 26, 2020
    - Interview with Laʻikealoha Hanog by Honua Consulting on August 21, 2021
    - Interview with Kumu Hula Pualani Kauila by Honua Consulting on August 19, 2021

***Ka Paʻakai* Analysis and Recommended Determination**

Based on the guidelines set forth in *Ka Paʻakai*, the Hawaiʻi Supreme Court provided government agencies an analytical framework to ensure the protection and preservation of traditional and customary Native Hawaiian rights while reasonably accommodating competing private development interests. This is accomplished through:

1) The identification of valued cultural, historical, or natural resources in the project area, including the extent to which traditional and customary Native Hawaiian rights are exercised in the project area.
2) The extent to which those resources—including traditional and customary Native Hawaiian rights—will be affected or impaired by the proposed action; and
3) The feasible action, if any, to be taken to reasonably protect Native Hawaiian rights if they are found to exist.

This assessment was completed throughout numerous documents, which are identified in this memo. These various documents thoroughly identified valued cultural, historical, and natural resources in the project area, including the extent to which traditional and customary Native Hawaiian rights are exercised in the project area.

The following is based on the information provided in the archaeological materials in the Draft EA, which included interviews, letters, the AIS and SHPD's acceptance letter of the AIS.

Cultural Resources and Traditional Cultural Practices

Kepā Maly recently retired from Pūlama Lānaʻi as the Cultural Advisor. He is also one of the co-authors of the SHPD accepted AIS and author of two letters attesting to the extensive outreach and research of the project area in regard to a cultural impact assessment. In his letter, he stated the following:

> *Based on the detailed ethno-historical research conducted for the ahupuaʻa in which the "Miki Basin Industrial Park" project is situated and on my personal knowledge and experience, having lived on Lānaʻi and worked with elder Hawaiian residents of Lānaʻi from the 1960s to present day, no traditional or customary practices will be impacted by the proposed Miki Basin Industrial Park.*

Honua Consulting reached out to three native Hawaiian community members (Solomon Pili Kahoʻohalahala, Laʻikealoha Hanog, and Kumu Hula Pualani Kauila) recently to conduct telephone interviews, Solomon Pili Kaho'ohalahala did not respond to the interview request.

There were references to gathering of ʻaʻalii and ʻuhaloa in the project area for adornments and laʻau lapaʻau by one of the interviewees. Therefore, per the Ka Paʻakai analysis, the first test identified cultural resources and traditional practices in the project area.

The second test considers potential impacts to these resources and practices resulting from the proposed project. Both ʻaʻalii and ʻuhaloa are common throughout the Pālāwai-Miki Region of Lānaʻi and prevalent in the surrounding areas of the project, which is also noted by Kepā in his letter dated September 24, 2019. The project is not anticipated to affect the availability of these cultural resources and the project will not affect access to these resources in the region. Therefore, the project is not anticipated to have an impact on this practice in the ahupuaʻa.

Both interviewees also mentioned deer hunting for subsistence. Although not a traditional cultural practice due to the lack of deer present in pre-contact Hawaiʻi, it should be noted that Pūlama Lānaʻi manages hunting in the area and deer is abundant in the vicinity of the project area. The project will not affect access to deer for subsistence hunting.

One of the interviewees mentioned a cave in the project area and the use as a lookout for canoes. In the AIS, the extensive research did not reveal either a cave or the use of the area as a lookout for canoes.

Due to the project's lack of impact to traditional or customary practices, feasible action to be taken to reasonably protect Native Hawaiian rights is not required.

Recommended Determination

Based on the review of the archaeological materials provided and the additional interviews conducted, the proposed 200-acre project area is not anticipated to affect the rights customarily and traditionally exercised and does not affect or impair any Hawaiʻi State Constitution, Article XII, Section 7 uses, or the feasibility of protection of those uses. We recommend that the LUC make a consistent finding of fact(s) and/or conclusion(s) of law.

REF-275

Confirmation Letters for Cultural Impact Assessment and Determination

REF-276

September 24, 2019

Kurt Matsumoto, COO
Pulama Lānaʻi
733 Bishop Street Suite 2000
Honolulu, HI 96813

Re: Archaeological Inventory Survey for the Miki Basin 200 Acre Industrial Development TMK (2) 4-9-002:061 (portion)
Dye, DiVito and Maly (May 9, 2018)

Mr. Matsumoto:

This letter confirms that, although not titled as such, the Archaeological Inventory Survey cited above included research compliant with guidelines for development of a cultural impact assessment study (CIA), required by the Hawaiʻi Supreme Court's holding in Ka Paakai O Ka Aina v. Land Use Commission, State of Hawaiʻi, 7 P.3d 1068, 94 Hawaiʻi 31 (2000).

The study includes descriptions of traditional knowledge of place, and traditional and customary practices as documented in Hawaiian language accounts from Lānaʻi. There also cited important historical accounts penned by foreign residents and visitors, documenting the changes in land use, access and residency from the 1840s to the 1950s. As a result of the rapid decline of the native Hawaiian population on Lānaʻi, and early control of nearly all the land on the island by non-native business interests, little documentation pertaining to the extent to which traditional and customary native Hawaiian rights might be exercised in the petition area survived the passing of time. No native tenant kuleana (property rights) or Royal Patent Grants were issued for lands within the petition area. By the 1870s control of the petition area lands was held under one individual, who also posted notices advising against trespass. By the 1920s, the entire area was dedicated to cultivation of pineapple (see Figure 1). Through the 1930s, the petition area included a residential field camp for Japanese employees of the plantation and their families.

Cultivation of pineapple and maintenance of support infrastructure such as road ways, water lines and stockpile sites was the only land use in the area until the close of the plantation in 1992. The Petition Area was completely cleared and cultivated in pineapple for nearly 70 years. The land was bulldozed, plowed, graded, and planted with pineapples multiple times during that period. Because of the heavy use of pesticides and growth hormones, it would have been highly unlikely that plants of medicinal or other cultural uses would have been gathered across these fields. Since the close of the pineapple plantation in 1992, a few native plant species have volunteered across the nearly 20,000 acres of former pineapple fields. Most notable are the indigenous ʻaʻaliʻi (Dodonaea viscosa), ʻilima (Sida fallax), naio (Myoporum sandwicense), and the ʻuhaloa (Waltheria indica). While each of the plants have cultural value and uses, none are rare, and all grow throughout the Pālāwai-Miki Region of Lānaʻi.

Figure 1. Pineapple Field Harvest in Miki Basin Fields – Miki Camp in Background (left). HAPCo Photo No. 525, August 31, 1928 (Lānaʻi Culture & Heritage Center Collection).

There was no evidence of any protected cultural practices occurring on the site. Therefore, the project will not have any significant negative impact on traditional and customary practices.

Should you have any further questions, please let me know.

ʻO wau no me ka haʻahaʻa,

Kepā Maly
P.O. Box 631500
Lānaʻi City, Hawaiʻi 96720

REF-277

June 26, 2020

Kurt Matsumoto, COO
Pūlama Lānaʻi
733 Bishop Street Suite 1500
Honolulu, HI 96813

Re: Cultural Impact Assessment for the Miki Basin 200 Acre Industrial Development TMK (2) 4-9-002:061 (portion) Dye, DiVito and Maly (May 9, 2018)

Mr. Matsumoto:

This letter confirms that a cultural impact assessment study (CIA) was prepared for the Miki Basin Industrial project consistent with the requirements by the Hawaiʻi Supreme Court's holding in Ka Paakai O Ka Aina v. Land Use Commission, State of Hawaiʻi, 7 P.3d 1068, 94 Hawaiʻi 31 (2000)

Based on the detailed ethno-historical research conducted for the ahupuaʻa in which the "Miki Basin Industrial Park" project is situated and on my personal knowledge and experience, having lived on Lānaʻi and worked with elder Hawaiian residents of Lānaʻi from the 1960's to present day, no traditional or customary practices will be impacted by the proposed Miki Basin Industrial Park.

In fact, over the last twenty plus years, native Hawaiian and non-Hawaiian residents of Lānaʻi have provided testimony and support for development of the industrial area project as a means of promoting community sustainability and entrepreneurial opportunities.[1]

Over the last 50 years I have been involved in many consultation interviews with elder kamaʻāina from Lānaʻi who have broad knowledge of the history and issues on the island. In addition, I have interviewed several elder residents of Miki Camp, which was in the immediate vicinity.

I have interviewed people, with both traditional and historical knowledge of Kalulu and Kaunolū ahupuaʻa where the proposed Miki Basin Industrial Park is situated.

I have reviewed earlier cultural resource management studies of the area and included native resident testimonies from records of the Māhele ʻĀina, Royal Patent Grants and Boundary Commission proceedings (1848-1876), as cited in the Miki Basin report.

In the late 1980s, the community engaged in planning discussions on a wide range of topics. They sought to address concerns about protection of Lānaʻi City, land use, zoning, adaptive new uses, including shifting the industrial use of the former Machine Shop Fleet and Labor Yard, from the heart of town. The vision was to relocate heavy and light industrial uses to the area of Miki Basin, and adaptively reuse the town site as a community heritage and educational center, and also enhance small business initiatives.

[1] Maui County General Plan 2030 Lānaʻi Community Plan. Process on plan update can be found in various versions of the process at this website http://mauicounty.us/lanaicommunityplan/

DocuSign Envelope ID: B5E4A525-47E6-41A8-BE66-2570DAF7F414

The Lānaʻi Community Plan, which provides "...strategic planning goals, policies, and actions, to guide decision-making and implementation through 2030"[2] includes, "[T]he Airport Area conceptual plan's goals are to improve the experience of flying into Lānaʻi by improving transportation facilities, and to consolidate industrial uses."[3] The plan outlines:

> "The existing industrial uses on Miki Road will be expanded in a proposed industrial area of approximately 200 acres, divided into approximately 100 acres each of light and heavy industrial. Light industrial uses in Lāna`i City will also be moved and consolidated in this area. It will also serve as a staging area for shipments from the harbor to be distributed closer to town."[4]

"To update the Lāna`i Community Plan, the Department of Planning's Long Range Planning Division worked with the Lāna`i community, stakeholders, agencies, the Lāna`i CPAC, the Lāna`i Planning Commission, and the County Council between 2010 and 2015."[5]

The Community Plan Advisory Committee members included native Hawaiian residents and a cross-section of community members including: Christine Costales, Deborah de la Cruz, Joseph Felipe, Reynold "Butch" Gima (Chair), Ernest Magaoay, Matt Mano, Ron McOmber, Stanley Ruidas (Vice Chair), Alberta DeJetley, Charles Kaukeano, Jarrod Barfield, Jeofrey Baltero, and Caron Green.[6]

There were twenty three CPAC (Community Plan Advisory Committee) meetings held from January – September 2013, where the community could attend and provide testimony to shape the Community Plan.[7] Furthermore, there were two Public Workshops[8] held on April 4 and April 6 2013 where the community could express their opinions and hear from their neighbors regarding Island-wide, and Lanai City specific issues and ideas. There were sixty two community members in attendance.[9]

No one stated any concerns about the use of the Miki Basin site for industrial use and on one stated that there were any traditional or customary practices in this area. There was support for the industrial use in this area.

On October 22, 2018, Pūlama Lānaʻi held a Community Meeting to discuss the Miki Basin Light & Heavy Industrial Project. There were thirty seven community members in attendance.

[2] Ordinance 4343 Bill No. 67 (2016) Draft 1 "A Bill for an Ordinance Amending Section 2.80B.070, Maui County Code, to adopt the updated Lanai Community Plan, page 13 of 198 in pdf, downloaded from this website link: https://www.mauicounty.gov/DocumentCenter/View/105983/2016-Lanai-Community-Plan-?bidId=
[3] Ordinance 4343 Bill No. 67 (2016) Draft 1 "A Bill for an Ordinance Amending Section 2.80B.070, Maui County Code, to adopt the updated Lanai Community Plan, page 110 of 198 in pdf, downloaded from this website link: https://www.mauicounty.gov/DocumentCenter/View/105983/2016-Lanai-Community-Plan-?bidId=
[4] Ordinance 4343 Bill No. 67 (2016) Draft 1 "A Bill for an Ordinance Amending Section 2.80B.070, Maui County Code, to adopt the updated Lanai Community Plan, page 110 of 198 in pdf, downloaded from this website link: https://www.mauicounty.gov/DocumentCenter/View/105983/2016-Lanai-Community-Plan-?bidId=
[5] Ibid at page 17 of 198.
[6] Document can be downloaded here: http://mauicounty.us/wp-content/uploads/2015/01/011abill01-Exhibit-1-May-28.pdf , See section 1.1 page 12, section 1.2 page 97, and section 1.3 page 16.
[7] https://www.mauicounty.gov/DocumentCenter/View/83364/CPAC-2013-Meeting-Schedule?bidId=
[8] https://www.mauicounty.gov/ArchiveCenter/ViewFile/Item/17757
[9] https://www.mauicounty.gov/ArchiveCenter/ViewFile/Item/17962

Community members were encouraged to provide input, concerns, anticipated impacts at and following this meeting and no one stated any concerns or knowledge of any traditional and customary practices in this area. There was support for industrial use in this area.

No evidence of any protected cultural sites or practices was found in these various forms of ethno-historical documentation. Therefore, the project will not have any significant negative impact on traditional and customary practices.

Should you have any further questions, please let me know.

'O wau no me ka ha'aha'a,

DocuSigned by:
Kepa Maly
1307C3DF871740C4

Kepa Maly
P.O. Box 631500
Lāna'i City, Hawai'i 96720

REF-279

The table below provides additional detail about the meetings described above, including specific comments from the attendees describing their support of a consolidated industrial area in the Miki area.

Please note that the County's minutes reflected some incorrect spelling of names, Pūlama Lānaʻi has made the correction (highlighted) for record keeping. For your reference, we have also underlined individuals with Hawaiian ancestry. Only Matt Mano and Stacie Koanui Nefelar and Kaulana Kahoʻohalahala are representative of multi-generational Hawaiian families of Lānaʻi.

Meeting Name	Date	Attendees	Notes	Link
Lāna`i CPAC Mtg. 1	1/9/2013	**Community Plan Advisory Committee** Chris Costales, Deborah Yooko de la Cruz, Joe Felipe, Butch Gima, Ernest Magaoay, Matt Mano, Ron McOmber, Stan Ruidas, Alberta DeJetley, Charles Kaukeano, Jarrod Barfield, Caron Green **County of Maui - Planning Department** Will Spence, Director, Kathleen Kern, Long-Range Planning, Mary Jorgensen, Long-Range Planning, David Yamashita, Long-Range Planning **County of Maui - Corp Counsel** Mike Hopper **Consultants** Jen Maydan, Chris Hart & Partners **Public** Carolyn and Walter Triber, John Ornellas, Christie Costales, Robin Kaye, Kurt Matsumoto, Sally Kaye, Chet Zoll, Joseph Felipe, Donovan Kealoha, Stacie Koanui Nefalar, Chris Lovvorn, Pat Drennan, Ed Jensen, Andrea de la Cruz, Bradford Oshiro, Pat Reilly	"Kathleen Kern asked each member to identify the top issues/problems facing Lāna`i." (Page 5 of 8) "Alberta: • Lack of light industrial space, including storage space for small businesses" (Page 6 of 8)	https://www.mauicounty.gov/ArchiveCenter/ViewFile/Item/17640

Lāna`i CPAC Mtg. 3	1/23/2013	**Community Plan Advisory Committee** Chris Costales, Deborah Yooko de la Cruz, Joe Felipe, Butch Gima, Caron Green, Matt Mano, Ron McOmber, Stan Ruidas, Alberta DeJetley, Charles Kaukeano. **County of Maui - Planning Department** David Yamashita, Long-Range Planning, Kathleen Kern, Long-Range Planning Mary Jorgensen, Long-Range Planning **Consultants** Jen Maydan, Chris Hart & Partners **Public** Lisa Kaniho, David Green, David Tanoue, Kurt Matsumoto, Pat Reilly, Carolyn & Walter Triber, Steven Luliti, David Embrey, Pam Alconcel, Nancy Rajaei, Michelle Fujie, Jason Gill, David Gardner, Sue Murray, Henry Clay Richardson, Sally & Jim Clemens, Kathy & Stu Marlow, Ron Gingerich, John Stubbart, Doug Williams, Natasha Inaba, Don Jackson, Judith Stilgenbauer, Mark Sacco, Chris Andrus, Jessica Smith, Anthony Pacheco, Sherri Williams, Simon Seisho Tajiri	"Joe supports the idea of moving the industrial are to Miki Basin and creating a museum at the labor/base yard." (Page 7 of 9)	https://www.mauicounty.gov/ArchiveCenter/ViewFile/Item/17642

Lāna`i CPAC Mtg. 4	6-Feb-13	**Community Plan Advisory Committee** Chris Costales, Deborah de la Cruz, Ernest Magaoay, Butch Gima, Caron Green, Matt Mano, Ron McOmber, Stan Ruidas, Alberta DeJetley, Charles Kaukeano **County of Maui - Planning Department** David Yamashita, Long-Range Planning Kathleen Kern, Long-Range Planning Mary Jorgensen, Long-Range Planning Doug Miller, Long-Range Planning **Consultants** Jen Maydan, Chris Hart & Partners **Public** Pat Reilly, Sue Murray, Wallace Stalker, Diane Preza, Roselani Kaho'ohalahala, Kaulana Kaho'ohalahala, Simon Tajiri, Charlotte Menze, Michael Hurte, Nicholas E. Palumbo II, Mark Sacco, Henry Clay Richarson, Elaine Londreur, Robin Kaye, Keoki Kerr, Chester Koga	"He noted that if the community is going to have opportunities to have businesses then they will need land. All the community got is hotels and they didn't get the light industrial land." (Page 4 or 8)	https://www.mauicounty.gov/ArchiveCenter/ViewFile/Item/17660
Lāna`i Community Plan Update Public Workshops	April 4 & 6, 2013	62 People (see notes for Lanai CPAC Mtg. 10)		https://www.mauicounty.gov/DocumentCenter/View/84254/040413-Public-Workshops-Flyer?bidId=

Lāna`i CPAC Mtg. 10	24-Apr-13	**Community Plan Advisory Committee Attendees** Chris Costales, Deborah de la Cruz, Butch Gima, Caron Green, Ron McOmber, Alberta DeJetley, Stan Ruidas **County of Maui - Planning Department Attendees** Kathleen Kern, Long-Range Planning Mary Jorgensen, Long-Range Planning Doug Miller, Long-Range Planning **Public Attendees** Winnie Basques, Dave Green, Kepa Maly, Lynn McCrory, Meilani Aki, Howard MacNair, Donna MacNair, Alan Chun, Tom Hoen, Chester Koga, David Tanoe, John Stubbart, Charlie Palumbo, Ron Gingerich, Judi Riley, Bridgette Beatty, Linda Morgan, Natasha Inaba, Joelle Aoke, Kanish Tulbera, Bryan Jacalne, Sadie Schilling, Alicia Ebding, Michelle Fujiie	"Mary presented a brief summary of the April 4th Island-wide Public Workshop that was attended by 62 people. A summary table for housing types and density per acre showed the highest preference was for 2-4 unit buildings such as single family with ohana, duplex, multi-generational (more than one kitchen), or four-plex. A summary table for recreational references by location showed high scores for forest restoration, historical site visits and restoration. Finally Mary reviewed three maps from the April 4th Public Workshop that the public drew locations for, and commented on, preferred future development alternatives. Ron asked when the CPAC will see a complete summary of the workshop results. Mary replied that a summary will be posted on the website once it is completed." (Page 2 of 4) "Mary encouraged the CPAC members to draw on the base map the locations of new growth areas and note what type of development they would like to see in these areas." (Page 3 of 4) "Alberta said that the State does not want to see any farms within a one mile radius around the airport." (Page 3 of 4)	https://www.mauicounty.gov/ArchiveCenter/ViewFile/Item/17962

Lāna`i CPAC Mtg. 12	22-May-13		"The CPAC also requested to see the proposed footprint of the 200 acres of light and heavy industrial lands." (Page 2 of 2) "Motion: Support the concept of adding 100 acres of light industrial and 100 acres of heavy industrial land in the Miki Basin. Passed -All were in favor." (Page 2 of 2)	https://www.mauicounty.gov/ArchiveCenter/ViewFile/Item/18022

Interview with La‘ikealoha Hanog

REF-285

4348 Wai`alae Ave #254•Honolulu Hawai`i 96816•T: (808) 392-1617•F: (888) 392-4941•E-Mail: admin@honuaconsulting.com

Interview with La‘ikealoha Hanog

Interviewer: Matthew Sproat
Interviewee: La‘ikealoha Hanog
Date: August 21, 2021
Location: via phone

Biography
Ms. Hanog works in food and beverage service for Hale o Manele (Trilogy Wedding and Event) on the island of Lāna‘i. She was born on the island of Maui and raised on Lāna‘i, where she still lives.

Overview
As a seventh-generation family of Lāna‘i, Ms. Hanog possesses a robust knowledge base of the project area’s environment and relevance to traditions and customs. She recounted the various plants and animals known to the project area as well as associated traditions and customs. Ms. Hanog expressed her concerns regarding the myriad impacts to access and habitat that the project would create.

General Discussion
Ms. Hanog is associated with the project area through collecting and harvesting. She uses some of the plants that are known to be in the project area’s region. Most recently, she and other practitioners go to the area to collect native Hawaiian plants. The plants are used for medicinal purposes, adornments, and gifts.

When asked about freshwater aquifers in the project area, Ms. Hanog explained that there are aquifers at various places across the island, but that the wells are located further mauka of the project area.

Ms. Hanog could not recount any cultural stories associated with the project area. However, in her personal narrative, she recounted that she and her family would use the area for traditional gathering.

Cultural Resources
Ms. Hanog explained the various flora that are in the project area and their uses. ‘A‘ali‘i is used for adornments. ‘Uhaloa is found here and used for medicinal purposes. There is also ilima and lantana. Regarding fauna, Ms. Hanog mentioned she had seen pueo recently, and noted that it has been a long time since she had seen them. She also noted that there are deer, pheasants, and quail in the area. She mentioned that during her grandparents’ time, pheasants were abundant. Unfortunately, now they are more scarce.

Traditions and Customs
Ms. Hanog uses the project area to gather plants for traditional medicine and adornments. She made special mention that she uses the area to gather plants primarily because of access. It is easier to gather plants in this area as opposed to the eastern shoreline or Manele bay. Ms. Hanog also noted that her husband is a hunter, and harvests deer in the area to feed her family and other members of the community. Due to the remote geography of Lāna‘i, gathering and hunting are inextricably tied to livelihood and subsistence.

Impacts
First, Ms. Hanog explained that the project could impact access to the area to collect cuturally important plants. The buildings and footprint of the project may impact plant life, as well as the associated traffic the project would create. The project could also affect the deer population in the area, which her husband harvests via archery. Ms. Hanog also noted that the project would disrupt the habitat and nesting grounds of birds such as pueo and pheasant.

Second, Ms. Hanog noted that more broadly, there are concerns about projects which are designed to bring more people to Lāna‘i. With no free-flowing surface water on Lāna‘i, there are real concerns of how further development will affect water resources and the environment more broadly.

Ms. Hanog is not aware of any iwi in the area, however she did mention that there are burials (including her ‘ohana) mauka of the project area.

Mitigation Meaures & Recommendations
Ms. Hanog said that she would prefer the project not go through. If the project does proceed, she hopes that there is something in writing to ensure protection and health of native plants. Regarding the native fauna, she hopes the project would be mindful of their habitat (including deer). The deer are already stressed due to the dry weather.

Ms. Hanog recommended that resources of Lāna‘i be made a priority, and to focus on the projects and developments that are already underway and causing impacts. She noted that the population of Lāna‘i has increased and raised concerns that the resources cannot sustain a growing population.

REF-286

Interview with Kumu Hula Pualani Kauila

REF-287

Interview with Kumu Hula Pualani Kauila

Interviewer: Matthew Sproat
Interviewee: Pua Kauila
Date: August 19, 2021
Location: via phone

Biography
Ms. Kauila is a retired educator of Hawaiian Studies at the University of Hawai‘i, Mānoa. She was born and raised on the island of Lāna‘i, at Kō‘ele Ranch. When she was born, her grandfather was the head wrangler for Kō‘ele Ranch. Her father and uncles were also workers on the ranch. At the age of 6, she left Lāna‘i and moved to Maui, but spent her summers working on Lāna‘i. She currently lives in Honolulu. She is a Kumu Hula and cultural practitioner.

Overview
Ms. Kauila is associated with the project area through her personal narrative. She possesses a robust knowledge about Lāna‘i, its history, and its people. Overarchingly, she is concerned that the project will further develop Lāna‘i at the expense of its long-time residents who have called Lāna‘i home for generations.

General Discussion
Ms. Kauila explained the modern history of Lāna‘i, which was used as cattle ranchland for the people of Maui, Moloka‘i, and Lāna‘i, before the pineapple industry purchased 90% of the island. During ranch times, the project area near the airport was known as the “piggery”.

Ms. Kauila noted that Hawaiians lived on ocean land, which is why those areas today are not developed; these lands were passed down through inheritence or were old kuleana lands. She also explained that because the island is so small, and given its history, the people of Lāna‘i are very closed to new things happening.

Cultural Resources
Ms. Kauila explained that, according to the oral traditions of when Lāna‘i was inhabited by ghosts, there was a cave in the project area (facing the ocean side). This was where Kaulula‘au stayed. In this cave, which opens and closes to certain people, are remnants of cultural artifacts including canoes, ipu, and capes.

Regarding flora and fauna, Ms. Kauila noted that pueo are very well known in the area. She sees them often when she returns home. She could not identify any native plants in the area but noted that she would have to refer the interviewer to another individual.

Traditions and Customs
Ms. Kauila explained that hunters use the area to hunt axis deer for their own subsistence. Historically, she noted that the area was used as a look-out to see when other canoes were approaching the island.

Impacts

Ms. Kauila explained that the people of Lāna‘i will be opposed to any industrial or commercial areas built on the land. She noted the negative impact of visitors on the island. Because the island is so small, any further development will negatively impact the island itself. She raised questions such as: would the development deface the island? Would it impact the people coming in to hunt? She firmly believes an industrial area will limit what that side of the island can access, whether for hunting or agricultural purposes.

Mitigation Meaures & Recommendations
Ms. Kauila said that there must be community engagement. Everyone must be able to voice their opinions. Her recommendation is to have the local community drive the process.

REF-288

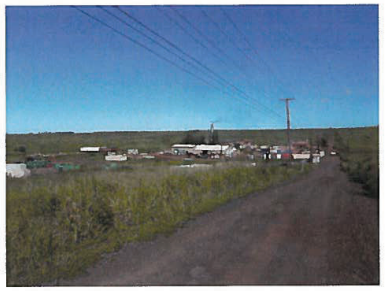
PHASE I ENVIRONMENTAL SITE ASSESSMENT

APPENDIX E

REF-289

PHASE I
ENVIRONMENTAL SITE ASSESSMENT

Miki Basin
200 Acre Property
Proposed Industrial Area
Miki Road
(SE of Existing Airport Runway)
Lanai City, Hawaii



April 3, 2014

TRC Project No: 215880

Prepared For:

Lanai Resorts, LLC
733 Bishop Street, Suite 2000
Pacific Guardian Center – Makai Tower
Honolulu, Hawaii 96813

Prepared By:

TRC – 677 Ala Moana Blvd., Suite 920
Honolulu, Hawaii 96813
(808) 728-4111
(808) 638-5649

Ron Landolt
Project Coordinator
TRC Environmental Professional

Kacey Swindle
Industrial Hygienist

TRC

TABLE OF CONTENTS

Page No.

EXECUTIVE SUMMARY **1**

1.0 INTRODUCTION **3**

1.1 PURPOSE AND SCOPE OF SERVICES 3
1.2 ADDITIONAL SERVICES 4
1.3 LIMITATIONS AND DEVIATIONS 4
1.3.1 Accuracy and Completeness *4*
1.3.2 Warranties and Representations *5*
1.3.3 Continued Validity/User Reliance *5*
1.3.4 Deviations to ASTM E 1527-13 Standard *6*
1.3.5 Significant Assumptions *6*

2.0 SITE DESCRIPTION **7**

2.1 SITE LOCATION AND LEGAL DESCRIPTION 7
2.2 SITE IMPROVEMENTS 7
2.3 CURRENT AND HISTORICAL SITE USE 7
2.3.1 Current Site Use(s) *7*
2.3.2 Previous Owner and Operator Information *7*
2.4 PHYSICAL SETTING 7

3.0 USER PROVIDED INFORMATION **9**

3.1 TITLE & JUDICIAL RECORDS FOR ENVIRONMENTAL LIENS OR ACTIVITY AND USE LIMITATIONS 9
3.2 SPECIALIZED KNOWLEDGE 9
3.3 PROPERTY VALUE REDUCTION ISSUES 9
3.4 COMMONLY KNOWN OR REASONABLY ASCERTAINABLE INFORMATION 9
3.5 REASON FOR CONDUCTING PHASE I 9

4.0 RECORDS REVIEW **10**

4.1 SOURCES OF INFORMATION 10
4.2 HISTORICAL USE INFORMATION 10
4.2.1 Site History *10*
4.2.2 Adjoining Property and Surrounding Property History *11*
4.3 DATABASE REPORT 11
4.4 PREVIOUS REPORTS 13
4.5 OTHER ENVIRONMENTAL RECORD SOURCES 13

5.0 SITE RECONNAISSANCE **15**

5.1 METHODOLOGY AND LIMITING CONDITIONS 15
5.2 INTERIOR AND EXTERIOR SITE OBSERVATIONS 15
5.2.1 Hazardous Substances *16*
5.3 ADJOINING AND SURROUNDING PROPERTIES RECONNAISSANCE 16
5.3.1 Adjoining Properties *16*
5.3.2 Surrounding Properties *16*

REF-290

6.0 INTERVIEWS **17**
7.0 FINDINGS, OPINIONS AND CONCLUSIONS **18**
7.1 RECs 18
7.2 HRECs 18
7.3 *DE MINIMIS* CONDITIONS 18
7.4 DATA GAPS 18
8.0 REFERENCES **19**
9.0 ADDITIONAL SERVICES **20**

Figures

Figure 1: Site Location Map
Figure 2: Site Location Map – Aerial Photograph

Appendices

Appendix A: Database Radius Report
Appendix B: User Questionnaire(s)
Appendix C: Historical Research Documentation
Appendix D: Photograph Log
Appendix E: Other Reference Information
Appendix F: TRC Staff and Environmental Professional Qualifications/Resumes
Appendix G: Environmental Professional Statement

EXECUTIVE SUMMARY

Subject to the qualifications and limitations stated in Section 1 of this report, TRC Environmental Corporation (TRC) was retained by Lanai Resorts, LLC to perform a Phase I Environmental Site Assessment (ESA) of approximately 200 acres of undeveloped land primarily located on the west side of Miki Road with approximately 35 of the 200 acres located on the east side of Miki Road. The Site is three and a half miles east of the Pacific Ocean and begins approximately 0.7 miles south of Kaumalapau Highway in Lanai City, Maui County, Hawaii (herein referred to as the "Site"). TRC's assessment was conducted in connection with the Clients' planned renovation of the Site to include light and heavy industrial areas. The Phase I ESA described in this report was performed in accordance with the scope and limitations of the American Society of Testing and Materials Practice E 1527-13 *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (ASTM E 1527-13). Limitations and/or deviations from the ASTM E 1527-13 standard are described in Section 1.3 of this report.

The Site is currently undeveloped land.

No transformers were observed on the Site. Utility owned pole-mounted transformers are located adjacent to the property area. It is unknown if the transformers may contain polychlorinated biphenyls (PCBs).

Based on information obtained from the site reconnaissance and available information, no underground storage tanks (USTs) or above ground storage tanks (ASTs) are located on the Site.

Freedom of Information Act (FOIA) record reviews were completed by TRC of Hawaii Department of Health's (DOH) available records. DOH records did not indicate any concerns associated with the Site.

As a result of the Phase I ESA, including but not limited to our visual observation of the Site; review of historical information, environmental databases, and information provided by the User; interviews with the current Site representative; and TRC's professional judgment, no *recognized environmental conditions* (RECs) associated with the Site, as defined by the ASTM E 1527-13 standard, were identified.

However, potential Vapor Encroachment Conditions (VECs) were identified with respect to the permanently out of use underground storage tank (UST) listing for the nearby Lanai Airport and the following listings for the Maui Electric Company (MECO) facility: Resource Conservation and Recovery Act (RCRA) Conditionally Exempt Small Quantity Generator (CESQG), Toxic Chemical Release Inventory System (TRIS), PCB Activity Database System (PADS) and SPILLS. As such, vapor encroachment onto the Site from this adjacent property could be a possibility, and based on Clients perceived risk, liability and/or corporate policy, may warrant further investigation; however, based on the lack of reported releases and/or associated regulatory status, the Lanai Airport UST and MECO facility identified as VECs have not likely caused a vapor encroachment onto the Site.

REF-291

Legal Notice

This document was prepared by TRC solely for the benefit of the Clients. With regard to third-party recipients of this document, neither TRC nor the Clients, nor any of their respective parents, affiliates or subsidiaries, nor any person acting on their behalf: (a) makes any warranty, expressed or implied, with respect to the use of any information or methods disclosed in this document; or (b) assumes any liability with respect to the use of any information or methods disclosed in this document. Any third-party recipient of this document, by its acceptance or use of this document, releases TRC and the Clients, their parents, affiliates and subsidiaries, from any liability for direct, indirect, economic, incidental, consequential or special loss or damage whether arising in contract, warranty, express or implied, tort, or otherwise, and irrespective of fault, negligence, and strict liability.

This Executive Summary is part of this complete report; any findings, opinions or conclusions in this Executive Summary are made in context with the complete report. TRC recommends that the User read the entire report for all supporting information related to findings, opinions and conclusions.

1.0 INTRODUCTION

TRC has prepared this Phase I ESA for Lanai Resorts, LLC (hereinafter "Clients" or "Users").

This report was prepared for and may be relied upon by Clients for the purposes set forth herein; it may not be relied on by any party other than the Clients and reliance may not be assigned without the express approval of TRC. Authorization for third party reliance on this report will be considered by TRC if requested by the Clients. TRC reserves the right to deny reliance on this report by third parties.

1.1 Purpose and Scope of Services

The following Phase I ESA was performed for the Site identified as Miki Basin – Proposed Industrial Area 200 Acre Property primarily located on the west side of Miki Road with approximately 35 of the 200 acres located on the east side of Miki Road. The Site is approximately three and a half miles east of the Pacific Ocean and begins approximately 0.7 miles south of Kaumalapau Highway in Lanai City, Maui County, Hawaii (hereinafter the "Site"). A Site location map is included as **Figure 1**. This Phase I ESA has been prepared by TRC in accordance with the American Society for Testing and Materials E 1527-13 *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (ASTM E 1527-13) and is intended for the sole use of Clients/Users. TRC was authorized to perform this assessment by signed proposal dated February 26, 2014, from Mr. Thomas A. Hoen of Lanai Resorts, LLC (Clients).

The purpose of this assessment is to identify *Recognized Environmental Conditions* (RECs) at the Site, as defined by the ASTM E 1527-13 standard. The completion of this Phase I ESA report may be used to satisfy one of the requirements for the Users to qualify for the *innocent landowner*, *contiguous property owner*, or *bona fide prospective purchaser* limitations pursuant to Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), thereby constituting *all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice* as defined by 42 U.S.C. §9601(35)(B) of CERCLA.

TRC understands that this assessment is not funded with a federal grant awarded under the U.S. EPA Brownfields Assessment and Characterization program.

The Scope of Services for this Phase I ESA included the following tasks:

- Site and vicinity reconnaissance;
- Site and vicinity description and physical setting;
- Historical source review and description of historical Site conditions;
- Interviews with owners, operators, and/or occupants of the Site, and/or local officials;
- Review of environmental databases and regulatory agency records;
- Review of previous environmental reports/documentation, as applicable;
- Review of environmental liens, if requested by the Users; and

REF-292

- Preparation of a report summarizing findings, opinions and conclusions.

Pursuant to the ASTM E 1527-13 standard, recommendations to conduct Phase II sampling or other assessment activities are not required to be included in this report. TRC can provide such recommendations upon request.

1.2 Additional Services

Items outside the scope of the ASTM E 1527-13 standard include, but are not limited to:

• Asbestos • Radon • Lead-based paint • Lead in drinking water • Wetlands • Regulatory compliance • Cultural and historic resources	• Industrial hygiene • Health and safety • Ecological resources • Endangered species • Indoor air quality including vapor intrusion • Biological agents • Mold

1.3 Limitations and Deviations

1.3.1 Accuracy and Completeness

The ASTM E 1527-13 standard recognizes inherent limitations for Phase I ESAs that apply to this report, including:

- Uncertainty Not Eliminated – No Phase I ESA can wholly eliminate uncertainty regarding the potential for RECs in connection with a property. Data gaps identified during this Phase I ESA are listed in Section 7.4.
- Not Exhaustive – A Phase I ESA is not an exhaustive investigation.
- Past Uses of the Property – A review of standard historical sources at intervals less than five years is not required.

The Clients is advised that the Phase I ESA conducted at the Site is a limited inquiry into a property's environmental status, cannot wholly eliminate uncertainty, and is not an exhaustive assessment to discover every potential source of environmental liability at the Site. Therefore, TRC does not make a statement i) of warranty or guarantee, express or implied for any specific use; ii) that the Site is free of RECs or environmental impairment; iii) that the Site is "clean"; or iv) that impairments, if any, are limited to those that were discovered while TRC was performing the Phase I ESA. This limiting statement is not meant to compromise the findings of this report; rather, it is meant as a statement of limitations within the ASTM standard and intended scope of this assessment. Specific limitations identified during the Site reconnaissance are described in Section 5.1. Subsurface conditions may differ from the conditions implied by surface observations, and can be evaluated more thoroughly through intrusive techniques that are beyond

the scope of this assessment. Information in this report is not intended to be used as a construction document and should not be used for demolition, renovation, or other construction purposes.

This report presents TRC's site reconnaissance observation, findings, and conclusions as they existed at the time of the Site reconnaissance. TRC makes no representation or warranty that the past or current operations at the property are, or have been, in compliance with all applicable federal, state and local laws, regulations and codes. TRC makes no guarantees as to the accuracy or completeness of information obtained from others during the course of this Phase I ESA report. It is possible that information exists beyond the scope of this assessment, or that information was not provided to TRC. Additional information subsequently provided, discovered, or produced may alter findings or conclusions made in this Phase I ESA report. TRC is under no obligation to update this report to reflect such subsequent information. The findings presented in this report are based upon reasonably ascertainable information and observed Site conditions at the time of the assessment.

This report does not warrant against future operations or conditions, nor does it warrant against operations or conditions present of a type or at a location not assessed. Regardless of the findings stated in this report, TRC is not responsible for consequences or conditions arising from facts that were not fully disclosed to TRC during the assessment.

An independent data research company provided the government agency database referenced in this report. Information regarding surrounding area properties was requested for approximate minimum search distances and was assumed to be correct and complete unless obviously contradicted by TRC's observations or other credible referenced sources reviewed during the assessment.

TRC is not a professional title insurance or land surveyor firm and makes no guarantee, explicit or implied, that any land title records acquired or reviewed, or any physical descriptions or depictions of the property in this report, represent a comprehensive definition or precise delineation of property ownership or boundaries.

1.3.2 Warranties and Representations

This report does not warrant against: (1) operations or conditions which were not evident from visual observations or historical information provided; (2) conditions which could only be determined by physical sampling or other intrusive investigation techniques; (3) locations other than the Clients-provided addresses and/or legal parcel description; or (4) information regarding off-site location(s) (with possible impact to the Site) not published in publicly available records.

1.3.3 Continued Validity/User Reliance

This report is presumed to be valid, in accordance with, and subject to, the limitations specified in the ASTM E 1527-13 standard, for a period of 180 days from completion, or until the Clients obtains specific information that may materially alter a finding, opinion, or conclusion in this report, or until the Clients is notified by TRC that it has obtained specific information that may

REF-293

materially alter a finding, opinion, or conclusion in this report. Additionally, pursuant to the ASTM E 1527-13 standard, this report is presumed valid if completed less than 180 days prior to the date of acquisition of the property or (for transactions not involving an acquisition) the date of the intended transaction.

1.3.4 Deviations to ASTM E 1527-13 Standard

No significant deviations or deletions to the ASTM standard were made during this Phase I ESA.

1.3.5 Significant Assumptions

During this Phase I ESA, TRC relied on database information; interviews with Site representatives, regulatory officials, and other individuals having knowledge of Site operations; and information provided by the Users as requested in our authorized Scope of Work. TRC has assumed that the information provided is true and accurate. Reliance on electronic database search reports is subject to the limitations set forth in those reports. TRC did not independently verify the information provided. TRC found no reason to question the validity of the information received unless explicitly noted elsewhere in this report. If other information is discovered and/or if previous reports exist that were not provided to TRC, our conclusions may not be valid.

2.0 SITE DESCRIPTION

2.1 Site Location and Legal Description

The Site is identified as portion of Tax Lot 4-9-002:001 and consists of approximately 200 acres of undeveloped land primarily located on the west side of Miki Road with approximately 35 of the 200 acres located on the east side of Miki Road. The Site is approximately three and a half miles east of the Pacific Ocean and begins approximately 0.7 miles south of Kaumalapau Highway in Lanai City, Maui County, Hawaii. The Site is currently owned by Lanai Resorts, LLC. A Site location map is included as **Figure 1**.

2.2 Site Improvements

Current on-site improvements are listed in the following table.

Site Feature	Description
Building (stories)	None
Construction date	N/A
Exterior areas	N/A
On-site roads/rail lines	Miki Road
Other large equipment	Utility owned and operated pole-mounted transformers were located adjacent to the property. The transformers were either not accessible or not labeled, and it is and unknown if the transformers may contain PCBs.
Potable water supply	N/A
Sewage disposal system	N/A
Heating/Cooling System	N/A
Back-Up fuel source	N/A
Electricity supplier	Property doesn't currently have service; however, Maui Electric Company serves the entire island.
Storm water system	Runoff

2.3 Current and Historical Site Use

2.3.1 Current Site Use(s)

The Site is currently undeveloped.

2.3.2 Previous Owner and Operator Information

The Site is believed to have always been undeveloped and utilized for agricultural purposes associated with the island's pineapple plantation.

2.4 Physical Setting

According to the United States Geological Survey (USGS) topographic map, Lanai City, HI quadrangle dated 1992, the Site is located approximately three and a half miles to the east of the

REF-294

Pacific Ocean, the Site topographic elevation is approximately 1,247 feet above mean sea level (MSL), and local topography slopes to the west-southwest. Based on local topography and historical environmental reports provided to TRC, as applicable, the assumed direction of shallow ground water flow is to the west-southwest towards the Pacific Ocean. However, a subsurface investigation would be required to determine actual ground water flow direction.

The database radius report supplied by Environmental Data Resources, Inc. (EDR) of Shelton, Connecticut was reviewed to obtain information regarding the dominant soil composition in the Site vicinity. This information is summarized below:

Hydric Status:	Unknown
Soil Surface Texture:	Silty Clay Loam
Soil Component Name:	Molokai
Deeper Soil Types:	Molokai Silty Clay Loam

Please refer to the Geocheck Physical Setting Source Summary of the EDR report presented in **Appendix A** for further information regarding the soil composition in the Site vicinity.

Per Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map 150030500F (Panel 500 of 825), dated September 19, 2012, the Site is located in Zone X (unshaded). According to FEMA's Flood Zone Designations, Zone X represents a minimal flood hazard; that is those areas outside the Special Flood Hazard Area (SFHA) and higher than the elevation of the 0.2-percent-annual-chance flood. The FEMA Flood Insurance Rate Map is provided in **Appendix E**.

3.0 USER PROVIDED INFORMATION

According to the ASTM E 1527-13 standard, certain tasks that may help identify the presence of RECs associated with the Site are generally conducted by the Phase I ESA User. These tasks include: reviewing title records for environmental liens or activity and land use limitations; providing specialized knowledge related to RECs at the Site (e.g., information about previous ownership or environmental litigation); and providing explanations for significant reduction in the Site purchase price. A list of requested information was included in TRC's proposal date and executed February 26, 2014 (see Section 1.1). The information was provided by the User on March 20, 2014 and is included in **Appendix B**.

3.1 Title & Judicial Records for Environmental Liens or Activity and Use Limitations

The User did not provide any information regarding environmental concerns associated with title or judicial records, or the existence of environmental liens or activity and use limitations (AULs) for the Site. Completion of an additional title and judicial record search was requested by the User.

The environmental lien and AUL search report supplied by EDR of Shelton, Connecticut indicated environmental liens and AULs were not found for the Site and a copy of the EDR search report is included in **Appendix C**.

3.2 Specialized Knowledge

The User did not provide any specialized knowledge related to potential RECs at the Site.

3.3 Property Value Reduction Issues

The User did not provide any property valuation reduction issues regarding the Site.

3.4 Commonly Known or Reasonably Ascertainable Information

TRC was supplied with commonly known and/or reasonably ascertainable information regarding the Site by Mr. Thomas A. Hoen of Lanai Resorts, LLC. This information was used during this Phase I ESA and has been incorporated in this report as applicable.

3.5 Reason for Conducting Phase I

TRC understands that the Users require a Phase I ESA as part of a study to pursue land use approval to use the land as an industrial park. According to the Users, the land is currently zoned as agricultural.

REF-295

4.0 RECORDS REVIEW

4.1 Sources of Information

Information regarding Site and vicinity historical uses was obtained from various publicly available and practically reviewable sources including: aerial photographs; topographic maps; city directories; local municipal records; an environmental database report; and interviews with Site representative(s) and regulatory agency official(s), as necessary. The historical documents were obtained from Environmental Data Resources (EDR) and are included in **Appendix C**.

4.2 Historical Use Information

Historical use information regarding the Site and surrounding properties was obtained from available municipal records as well as aerial photographs (scale: 1" = 750') dated 1952; aerial photographs (scale: 1" = 500') dated 1992; topographic maps dated 1984 and 1992; and city directories from 1997, 1999 and 2103.

4.2.1 Site History

Operational History

Year	Site History
1920 – Present	Lanai City was reportedly first developed in the early 1920's. The Site appears undeveloped.

It does not appear that topographic contours in the Site area have significantly changed during the time period reviewed.

Hazardous Substances

No hazardous substances or petroleum products were observed at the Site during the Site reconnaissance.

4.2.2 Adjoining Property and Surrounding Property History

Year	Adjoining Property History
1993 – Present	Review of historic aerial photographs and topographic maps depict the area to the northwest of the site as property used for the Lanai Airport. According the Maui County Tax Assessor Website, the MECO Power Plant Facilities were developed with three large warehouse structures in 1996 north of the warehouse structure. All other areas surrounding the Site are depicted as undeveloped land utilized for agricultural and pineapple plantation activities. Pineapple plantation activities ceased operation in 1992.
1977 – 1992	Review of historic aerial photographs and topographic maps depict the area to the northwest of the site as area property used for the Lanai Airport. A storage warehouse structure is reportedly developed to the west of Miki Road to the east of the Site in 1977. All other areas surrounding the Site are depicted as undeveloped land utilized for agricultural and pineapple plantation activities
1952 –1976	Review of historic aerial photographs and topographic maps depict the area to the northwest of the site as area property used for the Lanai Airport. All other areas surrounding the Site are depicted as undeveloped land utilized for agricultural and pineapple plantation activities.
1920 – 1952	Lanai City was reportedly first developed in the early 1920's. The Site appears undeveloped.

4.3 Database Report

A database search report that identifies properties listed on state and federal databases within the ASTM-required radii of the Site was obtained from EDR and is included in **Appendix A**. The environmental database report identified 21 properties/listings. These properties included those that could be mapped and those that could not (i.e., orphan properties).

Subject Site

The Site was not identified within any of the databases searched with the identified ASTM-required radii of the Site.

Adjacent and Surrounding Properties

TRC evaluated the following factors to determine whether additional environmental records with respect to the adjoining and/or surrounding properties should be reviewed:

(1) Whether the property is up-gradient or down-gradient of the Site based on the local topography and the assumed south-southwest shallow ground water flow direction;

(2) Property case status (e.g., whether the Hawaii Department of Health has issued a No Further Action letter, etc.);

(3) Type of database and whether the presence of contamination is known; and

(4) The distance between the listed property and the Site.

REF-296

In addition, the *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) *42 U.S.C. § 9601(22)* defines a "release" as "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment or discharging of barrels, containers, and other closed receptacles containing any hazardous substances or pollutant or contaminant)." According to CERCLA, the term "environment" includes (A) the navigable waters, the waters of the contiguous zone, and the ocean waters…and (B) any other surface water, groundwater, drinking water supply, land surface or subsurface strata…" Given that CERCLA and the *All Appropriate Inquiries Final Rule 40 CFR Part 312* do not differentiate by form (e.g., solid, liquid, vapor) of the release to the environment, Section 2.1 of ASTM E1527 Standard indicates that, "Vapor migration must be considered no differently than contaminated groundwater migration in the Phase I investigation." Vapor intrusion generally occurs when there is a migration of volatile chemicals from contaminated groundwater or soil into an overlying building. Volatile chemicals can emit vapors that may migrate through subsurface soils and into indoor air spaces of overlying buildings. Volatile chemicals may include volatile organic compounds, select semi-volatile organic compounds, and some inorganic analytes. In accordance with ASTM E2600 - 10 *Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactions*, listings for potential volatile organic compounds (VOC) impacted properties located within 1,760-foot radius of the Site and listings for potential petroleum-impacted properties located with a 520-foot radius of the Site were reviewed as a component of this investigation. Potential Vapor Encroachment Conditions (VECs) were identified for properties located within the referenced radii.

Based on this evaluation, TRC limited the review of additional environmental records to the properties listed below, since the potential for contamination to be migrating to the Site from the other properties identified by the database search is considered low.

Facility Name and/or Address	Lanai Airport – Lanai City, HI
Approximate Location Relative to Site	0.001 miles to the northwest
EDR Map No.	1
Databases	UST
Description/ID Number	UST – U003222164
Presumed Hydrogeologic Setting	Up-gradient
Database Review Summary	This property had one 350 gallon UST that was reportedly closed in 1994 and currently listed as Permanently Out of Use. This facility is within the 520-foot radius for potential petroleum-impacted properties and is within the 1,760-foot radius for potential VOC-impacted properties and meets the definition of a VEC based on ASTM 2600 – 10. However, based on the current regulatory status, it is not expected that vapor migration is presently a concern to the Site.

Facility Name and/or Address	Maui Electric Company – 1001 N Miki Road, Lanai City, HI
Approximate Location Relative to Site	Southeast of the Site property boundary
EDR Map No.	Orphan Listing
Databases	RCRA-CESQG, PADS, SPILLS, US AIRS, AIRS, TRIS, HAZNET and FINDS
Description/ID Number	Reference Database Report in Appendix A.
Presumed Hydrogeologic Setting	Cross-gradient
Database Review Summary	This property has multiple listings including three small quantity spills and is a generator of small quantities of hazardous waste; however two of the three listings have been reported as cleaned up with No Further Action (NFA) status issued. The property is also equipped with AST's associated with the power generation plant. This facility is within the 520-foot radius for potential petroleum-impacted properties and is within the 1,760-foot radius for potential VOC-impacted properties and meets the definition of a VEC based on ASTM 2600 – 10. However, based on the current regulatory status, it is not expected that vapor migration is presently a concern to the Site.

According to the regulatory database report, EDR did not identify any historical auto stations (i.e., gasoline stations, filling stations, automobile repair shops, auto service stations, etc.) or historical cleaners (e.g., dry cleaners, laundromats, laundry services, wash & dry establishments, etc.) within ¼ of a mile of the Site.

4.4 Previous Reports

No environmental reports related to the Site were provided to TRC for review and inclusion into this report.

4.5 Other Environmental Record Sources

Per the ASTM standard, local or additional state records were reviewed to enhance and supplement the ASTM-required federal and state records reviewed and discussed earlier in this report. Local sources that were contacted to obtain this information include: the Hawaii Department of Health, the Lanai Fire Station, the Maui County Tax Assessor, and the Maui County Department of Environmental Management. Information from these sources is discussed below:

Source	Available Information
Hawaii Department of Health	According to information provided via online public records, the Hawaii Department of Health does not appear to have any records pertaining to the Site.

REF-297

Source	Available Information
Maui County Tax Assessor	According to information provided via online public records, the Maui County Tax Assessor has identified the Site as a portion of Tax Lot 4-9-002:001. Additional property size and ownership information was also provided. MECO Power Plant facility is identified as Tax Lot 4-9-002-050 and is 5 acres.
Maui County Environmental Management Department	According to information provided via online public records, the Maui County Environmental Management Department does not appear to have any records pertaining to the Site.
Maui County – Planning Department	Lanai Fire Department Captain, Todd McDonald, was unaware of any chemical spills or hazardous waste concerns at the Site.

5.0 SITE RECONNAISSANCE

5.1 Methodology and Limiting Conditions

Ms. Kacey Swindle and Mr. Ron Landolt conducted a Site reconnaissance of accessible areas on and around the Site on March 11, 2014, for the purpose of identifying potential RECs, and were unaccompanied during the Site reconnaissance. Photographs taken during the reconnaissance are provided in **Appendix D**.

5.2 Interior and Exterior Site Observations

Unless otherwise noted, the items listed in the table below appeared in good condition with no visual evidence of staining, deterioration or a discharge of hazardous materials; and there are no records of a release in these areas. Items where further description is warranted are discussed in the section(s) following the table.

Item	Present (Yes/Yes-Historic/No)	Description
Hazardous material storage or handling areas	No	
Aboveground storage tanks (ASTs) and associated piping	No	
Underground storage tanks (USTs) and associated piping	No	
Drums & containers (≥5 gallons)	No	
Odors	No	
Pools of liquid, including surface water bodies and sumps (handling hazardous substances or substances likely to be hazardous only)	No	
Polychlorinated Biphenyls (PCBs) / Transformers	No	
Stains or corrosion	No	
Drains & sumps	No	
Pits, ponds & lagoons	No	
Stressed vegetation	No	
Historic fill or any other fill material	No	
Waste water (including storm water or any discharge into a drain, ditch, underground injection system, or stream on or adjacent to the Site)	No	
Wells (including dry wells, irrigation wells, injection wells, abandoned wells, or other wells)	No	
Septic systems or cesspools	No	

REF-298

5.2.1 Hazardous Substances

Hazardous substances and petroleum products were not observed at the Site during the Site reconnaissance.

5.3 Adjoining and Surrounding Properties Reconnaissance

5.3.1 Adjoining Properties

Direction from Site	Current Land Use Description
North	Undeveloped land with Kaumalapau Highway beyond
East	MECO Power Plant Facility and the storage warehouse, metal scrapyard and Maui disposal Sites are located to the east of the Site property boundary along with Miki Road followed by undeveloped land
South	Undeveloped land
West	Undeveloped land with the Lanai City Airport to the northwest

TRC observed one 55 gallon metal drum partially filled with gasoline, one 55 gallon plastic drum partially filled with oil and one 5 gallon bucket with an unknown material located on a wooden pallet in an unsecured plastic truck bed liner in the metal scrapyard area located on the existing industrial facility owned and operated by Lanai Resorts, LLC to the east of the Site and south of the MECO facility. Reportedly these materials were in the process of being removed from the site, and TRC did not observe any evidence of spills or releases associated with the materials.

5.3.2 Surrounding Properties

The local setting is predominantly undeveloped land with the exception of the MECO Plant and the existing Lanai Resorts, LLC industrial facility between the Site and Miki Road as well as the Lanai City airport to the northwest of the Site.

6.0 INTERVIEWS

The following persons were interviewed to obtain historically and/or environmentally-pertinent information regarding RECs associated with the Site.

- Mr. Thomas A. Hoen of Lanai Resorts, LLC – *Director of Development and Construction*
- Mr. Wayne Ishizaki of Lanai Resorts, LLC – *Site Contact*
- Mr. Todd McDonald of Lanai Fire Department - *Chief*

The information provided by each is discussed and referenced in the text and/or provided below. Other references and sources of information are included in **Appendix E**.

Mr. Hoen was unaware of any hazardous materials incidents, spills, illegal dumping, or any other potential environmental threats or conditions that may pose a past, present, or material threat of release to the Site.

Mr. Ishizaki was unaware of any hazardous materials incidents, spills, illegal dumping, or any other potential environmental threats or conditions that may pose a past, present, or material threat of release to the Site.

Mr. McDonald was unaware of any hazardous materials incidents, spills, or any other potential environmental threats or conditions that may pose a past, present, or material threat of release to the Site.

REF-299

7.0 FINDINGS, OPINIONS AND CONCLUSIONS

Potential findings can include RECs, historical RECs (HRECs), and *de minimis* conditions, pursuant to the ASTM E 1527-13 standard.

RECs are defined as the presence or likely presence of any *hazardous substances* or *petroleum products* on a property under conditions that indicate an existing release, a past release, or a *material threat* of a release of any *hazardous substances* or *petroleum products* into structures on the property or into the ground, ground water, or surface water of the property. The term includes *hazardous substances* or *petroleum products* even under conditions in compliance with laws. The term is not intended to include *de minimis* conditions that generally do not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.

HRECs are defined as an environmental condition which in the past would have been considered a REC, but which may or may not be considered a REC currently.

TRC has performed a Phase I ESA in conformance with the scope and limitations of ASTM Practice E 1527-13 at the 200 acre property located on the west side of Miki Road with approximately 35 of the 200 acres located on the east side of Miki Road in Lanai City, Maui County, Hawaii (Site); see **Appendices F and G**. Deviations from this practice are described in Section 1.3 of this report.

7.1 RECs

This assessment has revealed no evidence of RECs in connection with the Site.

7.2 HRECs

This assessment has revealed no evidence of HRECs in connection with the Site.

7.3 *De Minimis* Conditions

This assessment has revealed no evidence of *de minimis* conditions in connection with the Site.

7.4 Data Gaps

TRC has made an appropriate inquiry into the commonly known and reasonably ascertainable resources concerning the historical ownership and use of the Site back to the first development per 40 CFR Part 312.24 (*Reviews of Historical Sources of Information*). TRC did not identify any data gaps during this assessment.

8.0 REFERENCES

Description/Title of document(s) received or agency contacted	Date information request filled/date of agency contact	Information Updated	Reference source
Environmental Data Resources	March 10, 2014	N/A	http://www.edrnet.com/
Federal Emergency Management Agency	March 31, 2014	N/A	http://www.fema.gov/
Hawaii Department of Health	March 10, 2014	N/A	http://health.hawaii.gov
Maui County Fire Department	March 11, 2014	N/A	Chief Todd McDonald via in person interview
Maui County – Assessor, Planning, Environmental Management	March 12, 2014	N/A	http://www.co.maui.hi.us

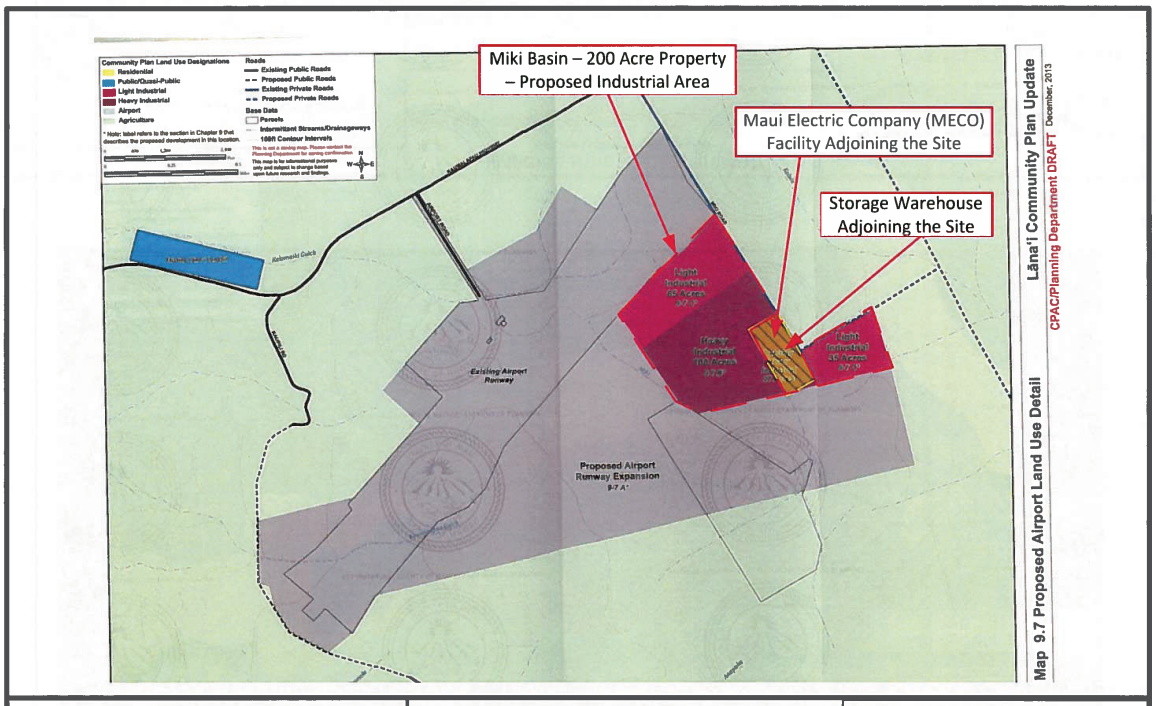
REF-300

9.0 ADDITIONAL SERVICES

No additional services were performed for the Site during this Phase I ESA.

FIGURES

REF-301



LEGEND

Approximate Property Boundary

Existing Heavy Industrial Adjoining the Site

N

Source: Client Provided Site Map

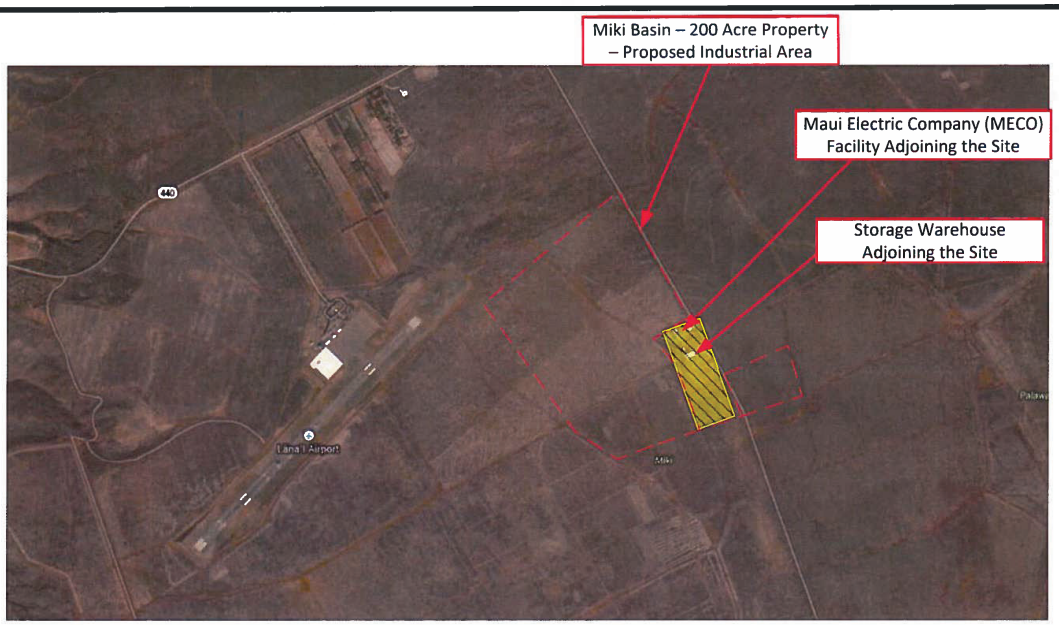
ENVIRONMENTAL SITE ASSESSMENT
SITE LOCATION MAP

MIKI BASIN – 200 ACRE PROPERTY – PROPOSED INDUSTRIAL AREA
MIKI ROAD
LANAI CITY, HAWAII

TRC Project No.: 215880		Figure: 1
Drawn by: K. Swindle	Reviewed by: R. Landolt	Date: 4/3/14

TRC

677 Ala Moana Boulevard, Suite 920
Honolulu, Hawaii 96813



LEGEND

Approximate Property Boundary

Existing Heavy Industrial Adjoining the Site

N

Source: googlemaps.com

ENVIRONMENTAL SITE ASSESSMENT
AERIAL PHOTOGRAPH

MIKI BASIN – 200 ACRE PROPERTY – PROPOSED INDUSTRIAL AREA
MIKI ROAD
LANAI CITY, HAWAII

TRC Project No.: 215880		Figure: 2
Drawn by: K. Swindle	Reviewed by: R. Landolt	Date: 4/3/14

TRC

677 Ala Moana Boulevard, Suite 920
Honolulu, Hawaii 96813

REF-302

APPENDIX A

DATABASE RADIUS REPORT

Miki Basin - 200 Acre Industrial Site
Miki Road & Kaumalapau Highway
Lanai City, HI 96763

Inquiry Number: 3875991.2s
March 10, 2014

The EDR Radius Map™ Report with GeoCheck®

EDR® Environmental Data Resources Inc

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

FORM-LBC-KKT

REF-303

TABLE OF CONTENTS

SECTION	PAGE
Executive Summary	ES1
Overview Map	2
Detail Map	3
Map Findings Summary	4
Map Findings	7
Orphan Summary	8
Government Records Searched/Data Currency Tracking	GR-1

GEOCHECK ADDENDUM

Physical Setting Source Addendum	A-1
Physical Setting Source Summary	A-2
Physical Setting SSURGO Soil Map	A-5
Physical Setting Source Map	A-11
Physical Setting Source Map Findings	A-13
Physical Setting Source Records Searched	A-9

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Disclaimer - Copyright and Trademark Notice

This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. **NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OF DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT.** Purchaser accepts this Report "AS IS". Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2014 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc., or its affiliates, is prohibited without prior written permission.

EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

MIKI ROAD & KAUMALAPAU HIGHWAY
LANAI CITY, HI 96763

COORDINATES

Latitude (North):	20.7904000 - 20' 47' 25.44"
Longitude (West):	156.9375000 - 156' 56' 15.00"
Universal Tranverse Mercator:	Zone 4
UTM X (Meters):	714689.2
UTM Y (Meters):	2300187.0
Elevation:	1247 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	20156-G8 ISLAND OF LANAI OE NW, HI
Most Recent Revision:	Not reported

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ..... National Priority List
Proposed NPL ..... Proposed National Priority List Sites
NPL LIENS ..... Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ..... National Priority List Deletions

REF-304

Federal CERCLIS list

CERCLIS..... Comprehensive Environmental Response, Compensation, and Liability Information System
FEDERAL FACILITY..... Federal Facility Site Information listing

Federal CERCLIS NFRAP site List

CERC-NFRAP..... CERCLIS No Further Remedial Action Planned

Federal RCRA CORRACTS facilities list

CORRACTS..... Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF..... RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG..... RCRA - Large Quantity Generators
RCRA-SQG..... RCRA - Small Quantity Generators
RCRA-CESQG..... RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

US ENG CONTROLS..... Engineering Controls Sites List
US INST CONTROL..... Sites with Institutional Controls
LUCIS..... Land Use Control Information System

Federal ERNS list

ERNS..... Emergency Response Notification System

State- and tribal - equivalent CERCLIS

SHWS..... Sites List

State and tribal landfill and/or solid waste disposal site lists

SWF/LF..... Permitted Landfills in the State of Hawaii

State and tribal leaking storage tank lists

LUST..... Leaking Underground Storage Tank Database
INDIAN LUST..... Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

INDIAN UST..... Underground Storage Tanks on Indian Land
FEMA UST..... Underground Storage Tank Listing

State and tribal institutional control / engineering control registries

ENG CONTROLS..... Engineering Control Sites

INST CONTROL..... Sites with Institutional Controls

State and tribal voluntary cleanup sites

INDIAN VCP..... Voluntary Cleanup Priority Listing
VCP..... Voluntary Response Program Sites

State and tribal Brownfields sites

BROWNFIELDS..... Brownfields Sites

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS..... A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

DEBRIS REGION 9..... Torres Martinez Reservation Illegal Dump Site Locations
ODI..... Open Dump Inventory
INDIAN ODI..... Report on the Status of Open Dumps on Indian Lands

Local Lists of Hazardous waste / Contaminated Sites

US CDL..... Clandestine Drug Labs
CDL..... Clandestine Drug Lab Listing
US HIST CDL..... National Clandestine Laboratory Register

Local Land Records

LIENS 2..... CERCLA Lien Information

Records of Emergency Release Reports

HMIRS..... Hazardous Materials Information Reporting System
SPILLS..... Release Notifications
SPILLS 90..... SPILLS 90 data from FirstSearch

Other Ascertainable Records

RCRA NonGen / NLR..... RCRA - Non Generators
DOT OPS..... Incident and Accident Data
DOD..... Department of Defense Sites
FUDS..... Formerly Used Defense Sites
CONSENT..... Superfund (CERCLA) Consent Decrees
ROD..... Records Of Decision
UMTRA..... Uranium Mill Tailings Sites
US MINES..... Mines Master Index File
TRIS..... Toxic Chemical Release Inventory System
TSCA..... Toxic Substances Control Act
FTTS..... FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
HIST FTTS..... FIFRA/TSCA Tracking System Administrative Case Listing

REF-305

SSTS	Section 7 Tracking Systems
ICIS	Integrated Compliance Information System
PADS	PCB Activity Database System
MLTS	Material Licensing Tracking System
RADINFO	Radiation Information Database
FINDS	Facility Index System/Facility Registry System
RAATS	RCRA Administrative Action Tracking System
RMP	Risk Management Plans
UIC	Underground Injection Wells Listing
DRYCLEANERS	Permitted Drycleaner Facility Listing
AIRS	List of Permitted Facilities
INDIAN RESERV	Indian Reservations
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
LEAD SMELTERS	Lead Smelter Sites
2020 COR ACTION	2020 Corrective Action Program List
EPA WATCH LIST	EPA WATCH LIST
COAL ASH DOE	Steam-Electric Plant Operation Data
PCB TRANSFORMER	PCB Transformer Registration Database
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
US FIN ASSUR	Financial Assurance Information
US AIRS	Aerometric Information Retrieval System Facility Subsystem
PRP	Potentially Responsible Parties
Financial Assurance	Financial Assurance Information Listing

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	EDR Proprietary Manufactured Gas Plants
EDR US Hist Auto Stat	EDR Exclusive Historic Gas Stations
EDR US Hist Cleaners	EDR Exclusive Historic Dry Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF	Recovered Government Archive Solid Waste Facilities List
RGA LUST	Recovered Government Archive Leaking Underground Storage Tank
RGA HWS	Recovered Government Archive State Hazardous Waste Facilities List

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

State and tribal registered storage tank lists

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the Department of Health's Listing of Underground Storage Tanks.

A review of the UST list, as provided by EDR, and dated 12/04/2013 has revealed that there is 1 UST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
LANAI AIRPORT (PMID LNY620123)	LANAI AIRPORT	WNW 0 - 1/8 (0.001 mi.)	1	7

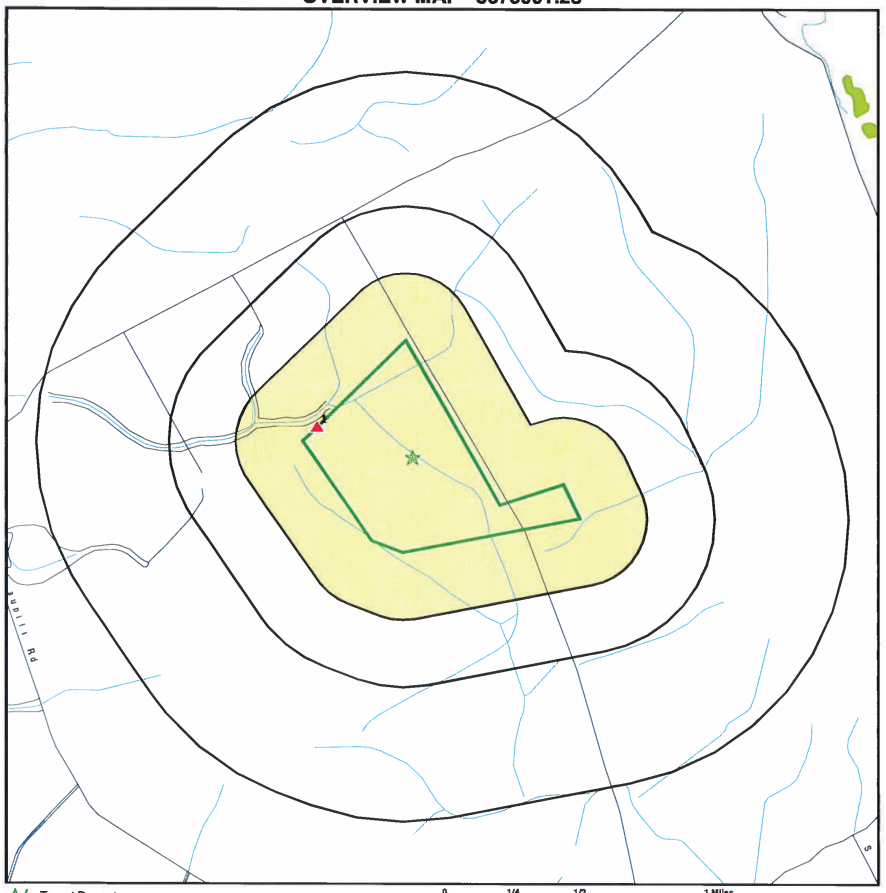
REF-306

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 20 records.

Site Name	Database(s)
CASTLE & COOKE - MANELE BAY	US AIRS
MAUI ELECTRIC CO - MIKI BASIN	FINDS, US AIRS
DOLE PLANTATION	RCRA-TSDF, CERC-NFRAP, RCRA NonGen / NLR, FINDS
LANAI LANDFILL	SHWS, RGA HWS
DOLE PLANTATION (PALAWAI & 5319 BA	SHWS, RGA HWS
LANAI LDFL	CERC-NFRAP
LANAI DUMP SITE PALAWI BASIN	CERC-NFRAP
LANAI DRUM SITE NO. 3	CERC-NFRAP
LANAI DRUM SITE NO. 2	CERC-NFRAP
LANAI DUMP SITE	CERC-NFRAP
LANAI DRUM SITE NO. 1	CERC-NFRAP
TRANSPORTATION SECURITY ADMINISTRA	RCRA-CESQG
KAUMALAPAU PETROLEUM TERMINAL	RCRA-CESQG, FINDS
MIKI BASIN GENERATING STATION	RCRA-CESQG, PADS
FAA - LANAI	FINDS
CASTLE & COOKE - MANELE BAY	FINDS
MIKI BASIN PAVING & FENCING	FINDS
MORRIS, CHARLES AND ROSS, NORMAN -	FINDS
MIKI BASIN GENERATING STATION	SPILLS, AIRS
MAUI ELECTRIC CO LTD MIKI BASIN PO	HAZNET

OVERVIEW MAP - 3875991.2s



Target Property
Sites at elevations higher than or equal to the target property
Sites at elevations lower than the target property
Manufactured Gas Plants
National Priority List Sites
Dept. Defense Sites

0 1/4 1/2 1 Miles

Indian Reservations BIA
Oil & Gas pipelines from USGS
National Wetland Inventory

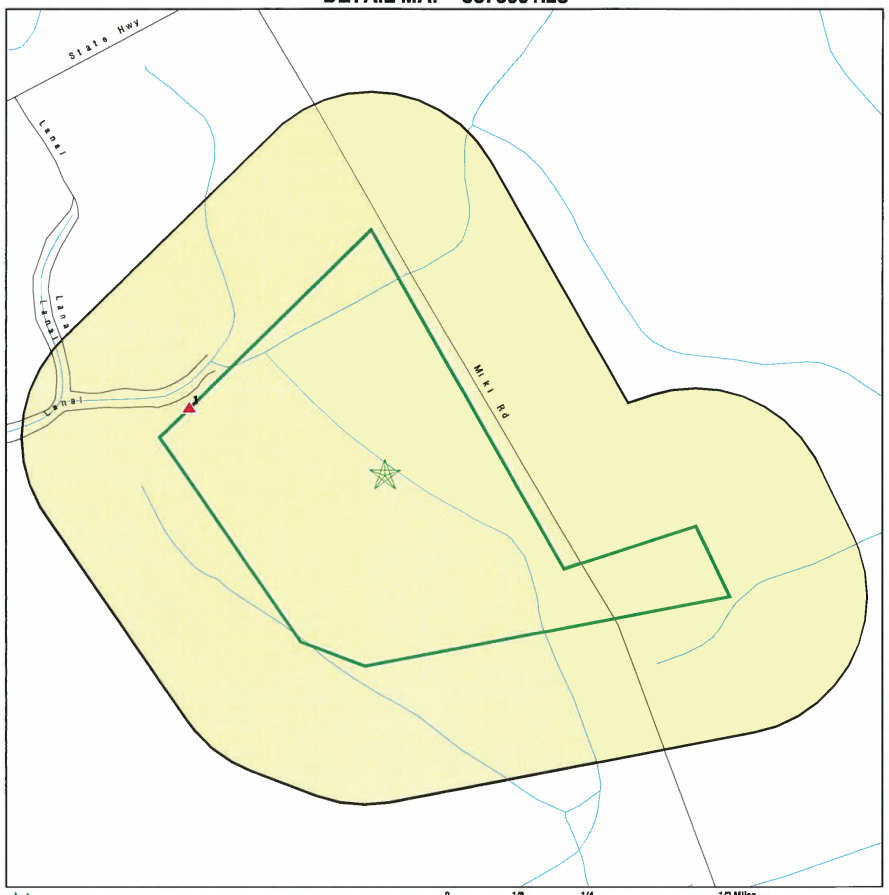
This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Miki Basin - 200 Acre Industrial Site ADDRESS: Miki Road & Kaumalapau Highway Lanai City HI 96763 LAT/LONG: 20.7904 / 156.9375	CLIENT: TRC CONTACT: Ron Landolt INQUIRY #: 3875991.2s DATE: March 10, 2014 5:26 pm

Copyright © 2014 EDR, Inc. © 2010 Tele Atlas Rel. 07/2009.

REF-307

DETAIL MAP - 3875991.2s



Target Property
Sites at elevations higher than or equal to the target property
Sites at elevations lower than the target property
Manufactured Gas Plants
Sensitive Receptors
National Priority List Sites
Dept. Defense Sites

0 1/8 1/4 1/2 Miles

Indian Reservations BIA
Oil & Gas pipelines from USGS

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Miki Basin - 200 Acre Industrial Site ADDRESS: Miki Road & Kaumalapau Highway Lanai City HI 96763 LAT/LONG: 20.7904 / 156.9375	CLIENT: TRC CONTACT: Ron Landolt INQUIRY #: 3875991.2s DATE: March 10, 2014 5:26 pm

Copyright © 2014 EDR, Inc. © 2010 Tele Atlas Rel. 07/2009.

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	TP		NR	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
CERCLIS	0.500		0	0	0	NR	NR	0
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site List								
CERC-NFRAP	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
LUCIS	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
State- and tribal - equivalent CERCLIS								
SHWS	1.000		0	0	0	0	NR	0
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.500		0	0	0	NR	NR	0
INDIAN LUST	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
UST	0.250		1	0	NR	NR	NR	1

REF-308

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INDIAN UST	0.250		0	0	NR	NR	NR	0
FEMA UST	0.250		0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
ENG CONTROLS	0.500		0	0	0	NR	NR	0
INST CONTROL	0.500		0	0	0	NR	NR	0
State and tribal voluntary cleanup sites								
INDIAN VCP	0.500		0	0	0	NR	NR	0
VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US CDL	TP		NR	NR	NR	NR	NR	0
CDL	TP		NR	NR	NR	NR	NR	0
US HIST CDL	TP		NR	NR	NR	NR	NR	0
Local Land Records								
LIENS 2	TP		NR	NR	NR	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0
SPILLS	TP		NR	NR	NR	NR	NR	0
SPILLS 90	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
DOD	1.000		0	0	0	0	NR	0
FUDS	1.000		0	0	0	0	NR	0
CONSENT	1.000		0	0	0	0	NR	0
ROD	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
TSCA	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
UIC	TP		NR	NR	NR	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
AIRS	TP		NR	NR	NR	NR	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
Financial Assurance	TP		NR	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR US Hist Auto Stat	0.250		0	0	NR	NR	NR	0
EDR US Hist Cleaners	0.250		0	0	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	TP		NR	NR	NR	NR	NR	0
RGA LUST	TP		NR	NR	NR	NR	NR	0
RGA HWS	TP		NR	NR	NR	NR	NR	0

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

REF-309

Map ID Direction Distance Elevation	Site	MAP FINDINGS	Database(s)	EDR ID Number EPA ID Number
1 **WNW** **< 1/8** **0.001 mi.** **7 ft.** **Relative:** **Higher** **Actual:** **1310 ft.**	**LANAI AIRPORT (PMID LNY620123)** **LANAI AIRPORT** **LANAI CITY, HI 96763** UST: Facility ID: 9-402985 Owner: STATE DOT - AIRPORTS DIVISION Owner Address: Not reported Ownder City,St,Zip: Lanai City, 96763 96763 Tank ID: R-1 Date Installed: Not reported **Tank Status: Permanently Out of Use** Date Closed: 06/29/1994 Tank Capacity: 350 Substance: Diesel		**UST**	**U003222164** **N/A**

Count: 20 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
LANAI	1003879123	LANAI LDFL	LANAI	96763	CERC-NFRAP
LANAI CITY	1015932482	FAA - LANAI	P.O. BOX 722		FINDS
LANAI CITY	1007447440	TRANSPORTATION SECURITY ADMINISTRA	KAUMALAPAU HWY	96763	RCRA-CESQG
LANAI CITY	1006819457	LANAI LANDFILL	KAUMALAPAU HWY	96763	SHWS, RGA HWS
LANAI CITY	1000146613	KAUMALAPAU PETROLEUM TERMINAL	KAUMALAPAU HIGHWAY		RCRA-CESQG, FINDS
LANAI CITY	1016070959	CASTLE & COOKE - MANELE BAY	MANELE BAY FACILITY		FINDS
LANAI CITY	1008382103	CASTLE & COOKE - MANELE BAY	MANELE BAY FACILITY	96763	US AIRS
LANAI CITY	S113183480	MAUI ELECTRIC CO LTD MIKI BASIN PO	1001 N MIKI RD	96763	HAZNET
LANAI CITY	S107769303	MIKI BASIN GENERATING STATION	1001 N MIKI RD	96763	SPILLS, AIRS
LANAI CITY	1010166528	MIKI BASIN PAVING & FENCING	MIKI ROAD		FINDS
LANAI CITY	1007092130	MIKI BASIN GENERATING STATION	1001 NORTH MIKI RD.	96763	RCRA-CESQG, PADS
LANAI CITY	1001024214	MAUI ELECTRIC CO - MIKI BASIN	1001 N MIKI RD	96763	FINDS, US AIRS
LANAI CITY	1006820213	DOLE PLANTATION (PALAWAI & 5319 BA	PALAWAI ST	96763	SHWS, RGA HWS
LANAI CITY	1000198027	DOLE PLANTATION	PALAWAI & 5319 BASINS	96763	RCRA-TSDF, CERC-NFRAP, RCRA NonGen / NLR, FINDS
LANAI ISLAND	1003879697	LANAI DUMP SITE PALAWI BASIN	BOUNDED BY FIELDS NO. 5429, 54	96763	CERC-NFRAP
LANAI ISLAND	1003879695	LANAI DRUM SITE NO. 3	NORTHWEST OF FIELD # 5319	96763	CERC-NFRAP
LANAI ISLAND	1003879694	LANAI DRUM SITE NO. 2	SOUTH OFF MIKI ROAD	96763	CERC-NFRAP
LANAI ISLAND	1003879696	LANAI DUMP SITE	SOUTEAST OF FIELD #5311	96763	CERC-NFRAP
LANAI ISLAND	1003879693	LANAI DRUM SITE NO. 1	SOUTHEND OF FIELD #53190	96763	CERC-NFRAP
MAUI COUNTY	1015780556	MORRIS, CHARLES AND ROSS, NORMAN -	SEE BELOW		FINDS

REF-310

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List
National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 01/28/2014
Number of Days to Update: 78

Source: EPA
Telephone: N/A
Last EDR Contact: 01/21/2014
Next Scheduled EDR Contact: 04/21/2014
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites
A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 01/28/2014
Number of Days to Update: 78

Source: EPA
Telephone: N/A
Last EDR Contact: 01/09/2014
Next Scheduled EDR Contact: 04/21/2014
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens
Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal Delisted NPL site list

DELISTED NPL: National Priority List Deletions
The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 01/28/2014
Number of Days to Update: 78

Source: EPA
Telephone: N/A
Last EDR Contact: 01/09/2014
Next Scheduled EDR Contact: 04/21/2014
Data Release Frequency: Quarterly

Federal CERCLIS list

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System
CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 94

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 02/28/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Quarterly

FEDERAL FACILITY: Federal Facility Site Information listing
A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 05/31/2013
Date Data Arrived at EDR: 07/08/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 151

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 01/10/2014
Next Scheduled EDR Contact: 04/21/2014
Data Release Frequency: Varies

Federal CERCLIS NFRAP site List

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned
Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 94

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 02/28/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report
CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

REF-311

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 10/02/2013
Date Made Active in Reports: 12/16/2013
Number of Days to Update: 75

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 01/02/2014
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 10/02/2013
Date Made Active in Reports: 12/16/2013
Number of Days to Update: 75

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 01/02/2014
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 10/02/2013
Date Made Active in Reports: 12/16/2013
Number of Days to Update: 75

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 01/02/2014
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 10/02/2013
Date Made Active in Reports: 12/16/2013
Number of Days to Update: 75

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 01/02/2014
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 10/02/2013
Date Made Active in Reports: 12/16/2013
Number of Days to Update: 75

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 01/02/2014
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Varies

Federal institutional controls / engineering controls registries

US ENG CONTROLS: Engineering Controls Sites List
A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 12/17/2013
Date Data Arrived at EDR: 01/14/2014
Date Made Active in Reports: 01/28/2014
Number of Days to Update: 14

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 12/09/2013
Next Scheduled EDR Contact: 03/24/2014
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls
A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 12/17/2013
Date Data Arrived at EDR: 01/14/2014
Date Made Active in Reports: 01/28/2014
Number of Days to Update: 14

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 12/09/2013
Next Scheduled EDR Contact: 03/24/2014
Data Release Frequency: Varies

LUCIS: Land Use Control Information System
LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 11/20/2013
Date Data Arrived at EDR: 11/21/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 95

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 02/14/2014
Next Scheduled EDR Contact: 06/02/2014
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System
Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 09/30/2013
Date Data Arrived at EDR: 10/01/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 66

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 02/07/2014
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Annually

State- and tribal - equivalent CERCLIS

SHWS: Sites List
Facilities, sites or areas in which the Office of Hazard Evaluation and Emergency Response has an interest, has investigated or may investigate under HRS 128D (includes CERCLIS sites).

Date of Government Version: 01/04/2014
Date Data Arrived at EDR: 02/26/2014
Date Made Active in Reports: 03/07/2014
Number of Days to Update: 9

Source: Department of Health
Telephone: 808-586-4249
Last EDR Contact: 02/26/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Semi-Annually

State and tribal landfill and/or solid waste disposal site lists

REF-312

SWF/LF: Permitted Landfills in the State of Hawaii
Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 09/17/2012
Date Data Arrived at EDR: 04/03/2013
Date Made Active in Reports: 05/10/2013
Number of Days to Update: 37

Source: Department of Health
Telephone: 808-586-4245
Last EDR Contact: 12/30/2013
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Varies

State and tribal leaking storage tank lists

LUST: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 12/04/2013
Date Data Arrived at EDR: 12/05/2013
Date Made Active in Reports: 12/10/2013
Number of Days to Update: 5

Source: Department of Health
Telephone: 808-586-4228
Last EDR Contact: 03/03/2014
Next Scheduled EDR Contact: 06/16/2014
Data Release Frequency: Semi-Annually

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 11/06/2013
Date Data Arrived at EDR: 11/07/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 29

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Quarterly

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 03/01/2013
Date Data Arrived at EDR: 03/01/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 42

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Quarterly

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 08/27/2013
Date Data Arrived at EDR: 08/27/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 66

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 09/12/2011
Date Data Arrived at EDR: 09/13/2011
Date Made Active in Reports: 11/11/2011
Number of Days to Update: 59

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 02/21/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 11/21/2013
Date Data Arrived at EDR: 11/26/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 90

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Semi-Annually

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 02/01/2013
Date Data Arrived at EDR: 05/01/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 184

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/30/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 02/13/2014
Date Data Arrived at EDR: 02/14/2014
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 10

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 08/27/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 49

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Quarterly

State and tribal registered storage tank lists

UST: Underground Storage Tank Database
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 12/04/2013
Date Data Arrived at EDR: 12/05/2013
Date Made Active in Reports: 12/10/2013
Number of Days to Update: 5

Source: Department of Health
Telephone: 808-586-4228
Last EDR Contact: 03/03/2014
Next Scheduled EDR Contact: 06/16/2014
Data Release Frequency: Semi-Annually

INDIAN UST R1: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 02/01/2013
Date Data Arrived at EDR: 05/01/2013
Date Made Active in Reports: 01/27/2014
Number of Days to Update: 271

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/30/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

REF-313

INDIAN UST R10: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 02/05/2013
Date Data Arrived at EDR: 02/06/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 65

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Quarterly

INDIAN UST R9: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 07/29/2013
Date Data Arrived at EDR: 07/30/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 129

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Quarterly

INDIAN UST R8: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 07/29/2013
Date Data Arrived at EDR: 08/01/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 92

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Quarterly

INDIAN UST R7: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 02/28/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 43

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 05/10/2011
Date Data Arrived at EDR: 05/11/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 34

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 02/13/2014
Date Data Arrived at EDR: 02/14/2014
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 10

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 11/21/2013
Date Data Arrived at EDR: 11/26/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 90

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Semi-Annually

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010
Date Data Arrived at EDR: 02/16/2010
Date Made Active in Reports: 04/12/2010
Number of Days to Update: 55

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 01/13/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Varies

State and tribal institutional control / engineering control registries

ENG CONTROLS: Engineering Control Sites
A listing of sites with engineering controls in place.

Date of Government Version: 01/04/2014
Date Data Arrived at EDR: 02/26/2014
Date Made Active in Reports: 03/07/2014
Number of Days to Update: 9

Source: Department of Health
Telephone: 404-586-4249
Last EDR Contact: 02/26/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Varies

INST CONTROL: Sites with Institutional Controls
Voluntary Remediation Program and Brownfields sites with institutional controls in place.

Date of Government Version: 01/04/2014
Date Data Arrived at EDR: 02/26/2014
Date Made Active in Reports: 03/07/2014
Number of Days to Update: 9

Source: Department of Health
Telephone: 808-586-4249
Last EDR Contact: 02/26/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 09/17/2013
Date Data Arrived at EDR: 10/01/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 66

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 01/03/2014
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Varies

REF-314

VCP: Voluntary Response Program Sites
Sites participating in the Voluntary Response Program. The purpose of the VRP is to streamline the cleanup process in a way that will encourage prospective developers, lenders, and purchasers to voluntarily cleanup properties.

Date of Government Version: 01/04/2014
Date Data Arrived at EDR: 02/26/2014
Date Made Active in Reports: 03/07/2014
Number of Days to Update: 9

Source: Department of Health
Telephone: 808-586-4249
Last EDR Contact: 02/26/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Varies

State and tribal Brownfields sites

BROWNFIELDS: Brownfields Sites
With certain legal exclusions and additions, the term 'brownfield site' means real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.

Date of Government Version: 01/04/2014
Date Data Arrived at EDR: 02/26/2014
Date Made Active in Reports: 03/07/2014
Number of Days to Update: 9

Source: Department of Health
Telephone: 808-586-4249
Last EDR Contact: 02/26/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Varies

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 09/24/2013
Date Data Arrived at EDR: 09/24/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 02/25/2014
Next Scheduled EDR Contact: 04/07/2014
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 11/04/2013
Next Scheduled EDR Contact: 02/17/2014
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US CDL: Clandestine Drug Labs
A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 12/04/2013
Date Data Arrived at EDR: 12/10/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 65

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/04/2014
Next Scheduled EDR Contact: 06/16/2014
Data Release Frequency: Quarterly

CDL: Clandestine Drug Lab Listing
A listing of clandestine drug lab site locations.

Date of Government Version: 08/04/2010
Date Data Arrived at EDR: 09/10/2010
Date Made Active in Reports: 10/22/2010
Number of Days to Update: 42

Source: Department of Health
Telephone: 808-586-4249
Last EDR Contact: 03/03/2014
Next Scheduled EDR Contact: 06/16/2014
Data Release Frequency: Varies

US HIST CDL: National Clandestine Laboratory Register
A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 09/01/2007
Date Data Arrived at EDR: 11/19/2008
Date Made Active in Reports: 03/30/2009
Number of Days to Update: 131

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/04/2014
Next Scheduled EDR Contact: 06/16/2014
Data Release Frequency: No Update Planned

Local Land Records

LIENS 2: CERCLA Lien Information
A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/06/2013
Date Data Arrived at EDR: 04/25/2013
Date Made Active in Reports: 05/10/2013
Number of Days to Update: 15

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

REF-315

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 01/03/2014
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 52

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 01/03/2014
Next Scheduled EDR Contact: 01/13/2014
Data Release Frequency: Annually

SPILLS: Release Notifications
Releases of hazardous substances to the environment reported to the Office of Hazard Evaluation and Emergency Response since 1988.

Date of Government Version: 01/04/2014
Date Data Arrived at EDR: 02/26/2014
Date Made Active in Reports: 03/10/2014
Number of Days to Update: 12

Source: Department of Health
Telephone: 808-586-4249
Last EDR Contact: 02/26/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Varies

SPILLS 90: SPILLS90 data from FirstSearch
Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 03/10/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/11/2013
Number of Days to Update: 39

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 10/02/2013
Date Made Active in Reports: 12/16/2013
Number of Days to Update: 75

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 01/02/2014
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Varies

DOT OPS: Incident and Accident Data
Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/07/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 42

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 02/06/2014
Next Scheduled EDR Contact: 05/19/2014
Data Release Frequency: Varies

DOD: Department of Defense Sites
This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 01/15/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites
The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 02/26/2013
Date Made Active in Reports: 03/13/2013
Number of Days to Update: 15

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 02/28/2014
Next Scheduled EDR Contact: 03/24/2014
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees
Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 01/24/2014
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 31

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 12/26/2013
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Varies

ROD: Records Of Decision
Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 11/25/2013
Date Data Arrived at EDR: 12/12/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 74

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 12/12/2013
Next Scheduled EDR Contact: 03/24/2014
Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites
Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010
Date Data Arrived at EDR: 10/07/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 146

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 02/25/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Varies

US MINES: Mines Master Index File
Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 08/01/2013
Date Data Arrived at EDR: 09/05/2013
Date Made Active in Reports: 10/03/2013
Number of Days to Update: 28

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 03/05/2014
Next Scheduled EDR Contact: 06/16/2014
Data Release Frequency: Semi-Annually

TRIS: Toxic Chemical Release Inventory System
Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

REF-316

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/31/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 44

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 02/26/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Annually

TSCA: Toxic Substances Control Act
Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2006
Date Data Arrived at EDR: 09/29/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 64

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 12/26/2013
Next Scheduled EDR Contact: 04/07/2014
Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 02/24/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 02/24/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

SSTS: Section 7 Tracking Systems
Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 01/28/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System
The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 07/20/2011
Date Data Arrived at EDR: 11/10/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 10/09/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Quarterly

PADS: PCB Activity Database System
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 06/01/2013
Date Data Arrived at EDR: 07/17/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 107

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 01/28/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 07/22/2013
Date Data Arrived at EDR: 08/02/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 91

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 12/09/2013
Next Scheduled EDR Contact: 03/24/2014
Data Release Frequency: Quarterly

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 09/30/2013
Date Data Arrived at EDR: 10/09/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 23

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 01/10/2014
Next Scheduled EDR Contact: 04/21/2014
Data Release Frequency: Quarterly

REF-317

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

FINDS: Facility Index System/Facility Registry System
Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 03/08/2013
Date Data Arrived at EDR: 03/21/2013
Date Made Active in Reports: 07/10/2013
Number of Days to Update: 111
Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 12/10/2013
Next Scheduled EDR Contact: 03/24/2014
Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System
RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35
Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

RMP: Risk Management Plans
When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 11/01/2013
Date Data Arrived at EDR: 12/12/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 63
Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

BRS: Biennial Reporting System
The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 02/26/2013
Date Made Active in Reports: 04/19/2013
Number of Days to Update: 52
Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 02/28/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Biennially

UIC: Underground Injection Wells Listing
A listing of underground injection well locations.

Date of Government Version: 02/07/2013
Date Data Arrived at EDR: 02/12/2013
Date Made Active in Reports: 04/09/2013
Number of Days to Update: 56
Source: Department of Health
Telephone: 808-586-4258
Last EDR Contact: 03/03/2014
Next Scheduled EDR Contact: 06/16/2014
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

DRYCLEANERS: Permitted Drycleaner Facility Listing
A listing of permitted drycleaner facilities in the state.

Date of Government Version: 01/01/2014
Date Data Arrived at EDR: 02/21/2014
Date Made Active in Reports: 03/07/2014
Number of Days to Update: 14
Source: Department of Health
Telephone: 808-586-4200
Last EDR Contact: 01/03/2014
Next Scheduled EDR Contact: 04/21/2014
Data Release Frequency: Varies

AIRS: List of Permitted Facilities
A listing of permitted facilities in the state.

Date of Government Version: 01/01/2014
Date Data Arrived at EDR: 02/21/2014
Date Made Active in Reports: 03/07/2014
Number of Days to Update: 14
Source: Department of Health
Telephone: 808-586-4200
Last EDR Contact: 01/03/2014
Next Scheduled EDR Contact: 04/21/2014
Data Release Frequency: Varies

INDIAN RESERV: Indian Reservations
This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34
Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 01/15/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Semi-Annually

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing
The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54
Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 01/20/2014
Next Scheduled EDR Contact: 05/05/2014
Data Release Frequency: Varies

COAL ASH DOE: Steam-Electric Plan Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76
Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 01/13/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Varies

EPA WATCH LIST: EPA WATCH LIST
EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 06/30/2013
Date Data Arrived at EDR: 08/13/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 31
Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 02/10/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Quarterly

REF-318

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 04/15/2013
Date Data Arrived at EDR: 07/03/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 72

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 01/02/2014
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List
The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 11/11/2011
Date Data Arrived at EDR: 05/18/2012
Date Made Active in Reports: 05/25/2012
Number of Days to Update: 7

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 02/14/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites
A listing of former lead smelter site locations.

Date of Government Version: 01/29/2013
Date Data Arrived at EDR: 02/14/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 13

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 01/03/2014
Next Scheduled EDR Contact: 04/21/2014
Data Release Frequency: Varies

FEDLAND: Federal and Indian Lands
Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 01/15/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: N/A

LEAD SMELTER 2: Lead Smelter Sites
A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)
The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/23/2013
Date Data Arrived at EDR: 11/06/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 30

Source: EPA
Telephone: 202-564-5962
Last EDR Contact: 12/26/2013
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data
A listing of minor source facilities.

Date of Government Version: 10/23/2013
Date Data Arrived at EDR: 11/06/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 30

Source: EPA
Telephone: 202-564-5962
Last EDR Contact: 12/26/2013
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Annually

Financial Assurance: Financial Assurance Information Listing
A listing of financial assurance information for underground storage tank facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 01/23/2014
Date Data Arrived at EDR: 01/24/2014
Date Made Active in Reports: 03/07/2014
Number of Days to Update: 42

Source: Department of Health
Telephone: 808-586-4226
Last EDR Contact: 01/13/2014
Next Scheduled EDR Contact: 03/31/2014
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information
All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 11/20/2013
Date Data Arrived at EDR: 12/03/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 72

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 02/14/2014
Next Scheduled EDR Contact: 06/02/2014
Data Release Frequency: Quarterly

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 08/17/2010
Date Data Arrived at EDR: 01/03/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 77

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 12/13/2013
Next Scheduled EDR Contact: 03/24/2014
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011
Date Data Arrived at EDR: 10/19/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 83

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 01/30/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

REF-319

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR US Hist Auto Stat: EDR Exclusive Historic Gas Stations
EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Cleaners: EDR Exclusive Historic Dry Cleaners
EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Cleaners: EDR Proprietary Historic Dry Cleaners - Cole

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: N/A
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Auto Stat: EDR Proprietary Historic Gas Stations - Cole

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: N/A
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List
The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Health in Hawaii.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/17/2014
Number of Days to Update: 200

Source: Department of Health
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank
The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Health in Hawaii.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/03/2014
Number of Days to Update: 186

Source: Department of Health
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA HWS: Recovered Government Archive State Hazardous Waste Facilities List
The EDR Recovered Government Archive State Hazardous Waste database provides a list of SHWS incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Health in Hawaii.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/08/2014
Number of Days to Update: 191

Source: Department of Health
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data
Source: Rextag Strategies Corp.
Telephone: (281) 769-2247
U.S. Electric Transmission and Power Plants Systems Digital GIS Data

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

REF-320

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.
Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

STREET AND ADDRESS INFORMATION

© 2010 Tele Atlas North America, Inc. All rights reserved. This material is proprietary and the subject of copyright protection and other intellectual property rights owned by or licensed to Tele Atlas North America, Inc. The use of this material is subject to the terms of a license agreement. You will be held liable for any unauthorized copying or disclosure of this material.

GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

MIKI BASIN - 200 ACRE INDUSTRIAL SITE
MIKI ROAD & KAUMALAPAU HIGHWAY
LANAI CITY, HI 96763

TARGET PROPERTY COORDINATES

Latitude (North):	20.7904 - 20' 47' 25.44"
Longitude (West):	156.9375 - 156' 56' 15.00"
Universal Tranverse Mercator:	Zone 4
UTM X (Meters):	714689.2
UTM Y (Meters):	2300187.0
Elevation:	1247 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	20156-G8 ISLAND OF LANAI OE NW, HI
Most Recent Revision:	Not reported

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

REF-321

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

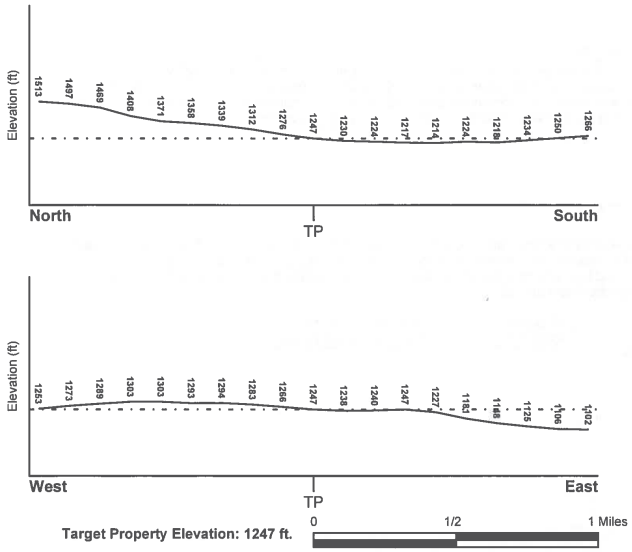
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General SSE

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Target Property Elevation: 1247 ft.

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
MAUI, HI	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: Not Reported

Additional Panels in search area: Not Reported

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
NOT AVAILABLE	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

REF-322

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

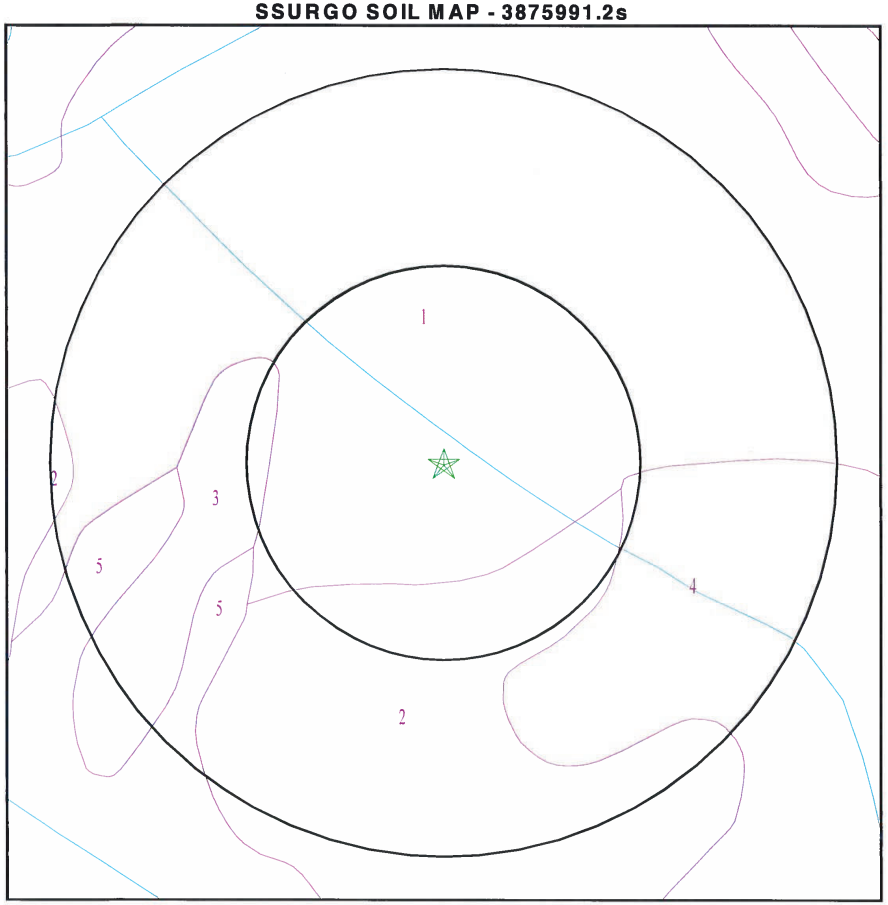
Era: -
System: -
Series: -
Code: N/A *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: -

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 3875991.2s



Target Property
SSURGO Soil
Water

SITE NAME: Miki Basin - 200 Acre Industrial Site ADDRESS: Miki Road & Kaumalapau Highway Lanai City HI 96763 LAT/LONG: 20.7904 / 156.9375	CLIENT: TRC CONTACT: Ron Landolt INQUIRY #: 3875991.2s DATE: March 10, 2014 5:26 pm

Copyright © 2014 EDR, Inc. © 2010 Tele Atlas Rel. 07/2009.

REF-323

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: Molokai

Soil Surface Texture: silty clay loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	14 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	CL-K (proposed)	Max: 14 Min: 4.23	Max: 7.8 Min: 6.6
2	14 inches	72 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	CL-K (proposed)	Max: 14 Min: 4.23	Max: 7.8 Min: 6.6

Soil Map ID: 2

Soil Component Name: Molokai

Soil Surface Texture: silty clay loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	14 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	CL-K (proposed)	Max: 14 Min: 4.23	Max: 7.8 Min: 6.6
2	14 inches	72 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	CL-K (proposed)	Max: 14 Min: 4.23	Max: 7.8 Min: 6.6

Soil Map ID: 3

Soil Component Name: Uwala

Soil Surface Texture: silty clay loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

REF-324

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	18 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	CL-K (proposed)	Max: 14 Min: 4.23	Max: 5 Min: 4.5
2	18 inches	57 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	CL-K (proposed)	Max: 14 Min: 4.23	Max: 6 Min: 5.1
3	57 inches	59 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	CL-K (proposed)	Max: 14 Min: 4.23	Max: 6 Min: 5.1

Soil Map ID: 4

Soil Component Name: Waikapu

Soil Surface Texture: silty clay loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	11 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	CL-K (proposed)	Max: 14 Min: 4.23	Max: 7.8 Min: 6.6
2	11 inches	59 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	CL-K (proposed)	Max: 14 Min: 4.23	Max: 7.8 Min: 6.6

Soil Map ID: 5

Soil Component Name: Uwala

Soil Surface Texture: silty clay loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	18 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	CL-K (proposed)	Max: 14 Min: 4.23	Max: 5 Min: 4.5

REF-325

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	18 inches	57 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	CL-K (proposed)	Max: 14 Min: 4.23	Max: 6 Min: 5.1
3	57 inches	59 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	CL-K (proposed)	Max: 14 Min: 4.23	Max: 6 Min: 5.1

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

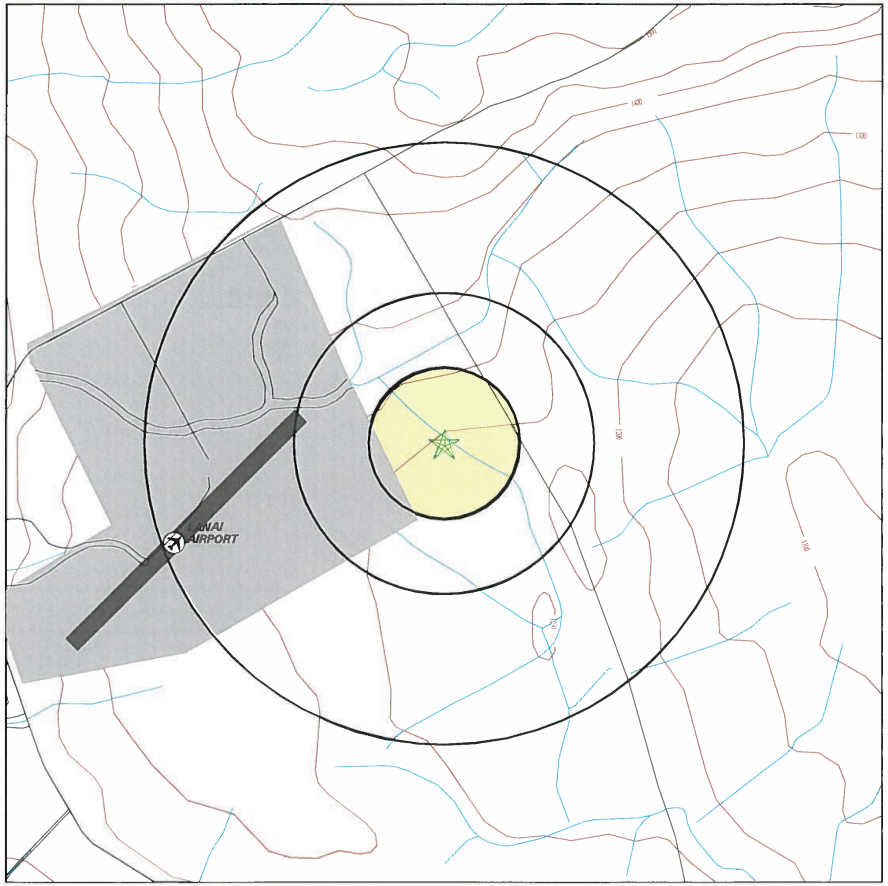
GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

REF-326

PHYSICAL SETTING SOURCE MAP - 3875991.2s



County Boundary
Major Roads
Contour Lines
Airports
Earthquake epicenter, Richter 5 or greater
Water Wells
Public Water Supply Wells
Cluster of Multiple Icons

0 1/4 1/2 1 Miles

Groundwater Flow Direction
GI Indeterminate Groundwater Flow at Location
GV Groundwater Flow Varies at Location

SITE NAME: Miki Basin - 200 Acre Industrial Site ADDRESS: Miki Road & Kaumalapau Highway Lanai City HI 96763 LAT/LONG: 20.7904 / 156.9375	CLIENT: TRC CONTACT: Ron Landolt INQUIRY #: 3875991.2s DATE: March 10, 2014 5:26 pm

Copyright © 2014 EDR, Inc. © 2010 Tele Atlas Rel. 07/2009.

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

Federal EPA Radon Zone for MAUI County: 3

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for MAUI COUNTY, HI

Number of sites tested: 70

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.057 pCi/L	100%	0%	0%
Living Area - 2nd Floor	0.000 pCi/L	100%	0%	0%
Basement	0.150 pCi/L	100%	0%	0%

REF-327

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

HYDROGEOLOGIC INFORMATION

AQUIFLOW[R] Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Well Index Database
Source: Commission on Water Resource Management
Telephone: 808-587-0214
CWRM maintains a Well Index Database to track specific information pertaining to the construction and installation of production wells in Hawaii

OTHER STATE DATABASE INFORMATION

RADON

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary faultlines, prepared in 1975 by the United State Geological Survey

REF-328

PHYSICAL SETTING SOURCE RECORDS SEARCHED

STREET AND ADDRESS INFORMATION

© 2010 Tele Atlas North America, Inc. All rights reserved. This material is proprietary and the subject of copyright protection and other intellectual property rights owned by or licensed to Tele Atlas North America, Inc. The use of this material is subject to the terms of a license agreement. You will be held liable for any unauthorized copying or disclosure of this material.

MIKI BASIN GENERATING STATION
1001 N MIKI RD
LANAI CITY, HI 96763

Inquiry Number:
March 31, 2014

EDR Site Report™

EDR® Environmental Data Resources Inc

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

REF-329

TABLE OF CONTENTS

The EDR-Site Report™ is a comprehensive presentation of government filings on a facility identified in a search of federal, state and local environmental databases. The report is divided into three sections:

Section 1: Facility Summary . . . . . **Page 3**

Summary of facility filings including a review of the following areas: waste management, waste disposal, multi-media issues, and Superfund liability.

Section 2: Facility Detail Reports . . . . . **Page 4**

All available detailed information from databases where sites are identified.

Section 3: Databases and Update Information. . . . . . **Page 6**

Name, source, update dates, contact phone number and description of each of the databases for this report.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Disclaimer - Copyright and Trademark Notice

This report contains information obtained from a variety of public and other sources reasonably available to Environmental Data Resources , Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. **NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANYSUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OR DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES.ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT.**Purchaser accepts this report "AS IS". Any analyses, estimates, ratings, or risk codes provided in this report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assesment performed by an environmental professional can produce information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2008 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc., or its affiliates, is prohibited without prior written permission.

EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.

SECTION 1: FACILITY SUMMARY

FACILITY AREA	FACILITY 1 **MIKI BASIN GENERATING STATION** 1001 N MIKI RD LANAI CITY, HI 96763 EDR ID #S107769303
WASTE MANAGEMENT Facility generates hazardous waste (RCRA)	NO
Facility treats, stores, or disposes of hazardous waste on-site (RCRA/TSDF)	NO
Facility has received Notices of Violations (RCRA/VIOL)	NO
Facility has been subject to RCRA administrative actions (RAATS)	NO
Facility has been subject to corrective actions (CORRACTS)	NO
Facility handles PCBs (PADS)	NO
Facility uses radioactive materials (MLTS)	NO
Facility manages registered aboveground storage tanks (AST)	NO
Facility manages registered underground storage tanks (UST)	NO
Facility has reported leaking underground storage tank incidents (LUST)	NO
Facility has reported emergency releases to the soil (ERNS)	NO
Facility has reported hazardous material incidents to DOT (HMIRS)	NO
WASTE DISPOSAL Facility is a Superfund Site (NPL)	NO
Facility has a known or suspect abandoned, inactive or uncontrolled hazardous waste site (CERCLIS)	NO
Facility has a reported Superfund Lien on it (LIENS)	NO
Facility is listed as a state hazardous waste site (SHWS)	NO
Facility has disposed of solid waste on-site (SWF/LF)	NO
MULTIMEDIA Facility uses toxic chemicals and has notified EPA under SARA Title III, Section 313 (TRIS)	NO
Facility produces pesticides and has notified EPA under Section 7 of FIFRA (SSTS)	NO
Facility manufactures or imports toxic chemicals on the TSCA list (TSCA)	NO
Facility has inspections under FIFRA, TSCA or EPCRA (FTTS)	NO
Facility is listed in EPA's index system (FINDS)	NO
Facility is listed in other database records (OTHER)	**YES - p4**
POTENTIAL SUPERFUND LIABILITY Facility has a list of potentially responsible parties PRP	NO
TOTAL (YES)	1

REF-330

MULTIMEDIA

Facility is listed in other database records

DATABASE: Other Database Records (OTHER)

MIKI BASIN GENERATING STATION
1001 N MIKI RD
LANAI CITY, HI 96763
EDR ID #S107769303

HI SPILLS:

Island:	Lanai
Supplemental Loc. Text:	Not reported
Case Number:	20100524-0912
HID Number:	Not reported
Facility Registry Id:	Not reported
Lead and Program:	HEER EP&R
ER:	None
Units:	Diesel Generator "EMD 3"
Substances:	Lube Oil
Less Or Greater Than:	Not reported
Numerical Quantity:	5
Units:	Gallons
Activity Type:	Response
Activity Lead:	Curtis Martin
Assignment End Date:	2010-05-24 00:00:00
Result:	SOSC NFA
File Under:	MECO-Lanai City Generating Station

Island:	Lanai
Supplemental Loc. Text:	Not reported
Case Number:	20070816-1030
HID Number:	Not reported
Facility Registry Id:	Not reported
Lead and Program:	HEER EP&R
ER:	No
Units:	Diesel Generating Unit 4
Substances:	Engine Oil 40SAE
Less Or Greater Than:	Not reported
Numerical Quantity:	5
Units:	Gallons
Activity Type:	Response
Activity Lead:	Paul Chong
Assignment End Date:	2007-09-14 00:00:00
Result:	SOSC NFA
File Under:	MECO-Lanai City Generating Station

Island:	Lanai
Supplemental Loc. Text:	Not reported
Case Number:	20121026-1501
HID Number:	Not reported
Facility Registry Id:	Not reported
Lead and Program:	HEER EP&R
ER:	None
Units:	MECO lub oil release
Substances:	Lube Oil
Less Or Greater Than:	>
Numerical Quantity:	5
Units:	Gallons
Activity Type:	Response
Activity Lead:	Curtis Martin
Assignment End Date:	Not reported
Result:	Not reported
File Under:	Not reported

AIRS:

Facility ID:	0030-06-C
Island:	Lanai
Mailing Address:	P.O. Box 398
Locale:	Not reported
Mailing City,St,Zip:	Kahului, HI 96732
Business Phone:	Not reported
Contact Name:	Michael Ribao
Contact Title:	Manager, Power Supply Department
Description:	Eight (8) Diesel Engine GeneratorsThis permit encompasses the following equipment:Attachment IIA:Unit Nos.Description1-61.0 MW General Motors Electro-Motive Division (EMD) diesel engine generators (DEGs) (model no. 567-C, serial nos. 51-H-164; 54-C-141; 56-F-135; 56-G-13; 56-H-59; and 62-J-72, respectively), fired on fuel oil no. 2

and spec used oil.Attachment IIB:Unit Nos.Description7,82.2 MW Caterpillar diesel engine generators (DEGs) (model no. 3608, serial nos. 6MC00475 and 6MC00476 respectively), fired on fuel oil no. 2 and spec used oil

REF-331

SECTION 3: DATABASES AND UPDATE DATES

To maintain currency of the following federal, state and local databases, EDR contacts the appropriate government agency on a monthly or quarterly basis as required.

Elapsed ASTM days: Provides confirmation that this report meets or exceeds the 90-day updating requirement of the ASTM standard.

DATABASES FOUND IN THIS REPORT

HI SPILLS: Release Notifications
Source: Department of Health
Telephone: 808-586-4249
Releases of hazardous substances to the environment reported to the Office of Hazard Evaluation and Emergency Response since 1988.

Date of Government Version: 01/04/2014
Database Release Frequency: Varies
Date of Last EDR Contact: 02/26/2014
Date of Next Scheduled Update: 06/09/2014

HI AIRS: List of Permitted Facilities
Source: Department of Health
Telephone: 808-586-4200
A listing of permitted facilities in the state.

Date of Government Version: 01/01/2014
Database Release Frequency: Varies
Date of Last EDR Contact: 01/03/2014
Date of Next Scheduled Update: 04/21/2014

MAUI ELECTRIC CO LTD MIKI BASIN
1001 N MIKI RD
LANAI CITY, HI 96763

Inquiry Number:
March 31, 2014

EDR Site Report™

EDR® Environmental Data Resources Inc

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

REF-332

TABLE OF CONTENTS

The EDR-Site Report™ is a comprehensive presentation of government filings on a facility identified in a search of federal, state and local environmental databases. The report is divided into three sections:

Section 1: Facility Summary . . . . . **Page 3**

Summary of facility filings including a review of the following areas: waste management, waste disposal, multi-media issues, and Superfund liability.

Section 2: Facility Detail Reports . . . . . **Page 4**

All available detailed information from databases where sites are identified.

Section 3: Databases and Update Information. . . . . . **Page 6**

Name, source, update dates, contact phone number and description of each of the databases for this report.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Disclaimer - Copyright and Trademark Notice

This report contains information obtained from a variety of public and other sources reasonably available to Environmental Data Resources , Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. **NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANYSUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OR DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES.ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT.**Purchaser accepts this report "AS IS". Any analyses, estimates, ratings, or risk codes provided in this report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assesment performed by an environmental professional can produce information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2008 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc., or its affiliates, is prohibited without prior written permission.

EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.

SECTION 1: FACILITY SUMMARY

FACILITY AREA	FACILITY 1 MAUI ELECTRIC CO LTD MIKI BASIN POWER PL 1001 N MIKI RD LANAI CITY, HI 96763 EDR ID #S113183480
WASTE MANAGEMENT Facility generates hazardous waste (RCRA)	NO
Facility treats, stores, or disposes of hazardous waste on-site (RCRA/TSDF)	NO
Facility has received Notices of Violations (RCRA/VIOL)	NO
Facility has been subject to RCRA administrative actions (RAATS)	NO
Facility has been subject to corrective actions (CORRACTS)	NO
Facility handles PCBs (PADS)	NO
Facility uses radioactive materials (MLTS)	NO
Facility manages registered aboveground storage tanks (AST)	NO
Facility manages registered underground storage tanks (UST)	NO
Facility has reported leaking underground storage tank incidents (LUST)	NO
Facility has reported emergency releases to the soil (ERNS)	NO
Facility has reported hazardous material incidents to DOT (HMIRS)	NO
WASTE DISPOSAL Facility is a Superfund Site (NPL)	NO
Facility has a known or suspect abandoned, inactive or uncontrolled hazardous waste site (CERCLIS)	NO
Facility has a reported Superfund Lien on it (LIENS)	NO
Facility is listed as a state hazardous waste site (SHWS)	NO
Facility has disposed of solid waste on-site (SWF/LF)	NO
MULTIMEDIA Facility uses toxic chemicals and has notified EPA under SARA Title III, Section 313 (TRIS)	NO
Facility produces pesticides and has notified EPA under Section 7 of FIFRA (SSTS)	NO
Facility manufactures or imports toxic chemicals on the TSCA list (TSCA)	NO
Facility has inspections under FIFRA, TSCA or EPCRA (FTTS)	NO
Facility is listed in EPA's index system (FINDS)	NO
Facility is listed in other database records (OTHER)	YES - p4
POTENTIAL SUPERFUND LIABILITY Facility has a list of potentially responsible parties PRP	NO
TOTAL (YES)	1

REF-333

MULTIMEDIA

Facility is listed in other database records

DATABASE: Other Database Records (OTHER)

MAUI ELECTRIC CO LTD MIKI BASIN POWER PL
1001 N MIKI RD
LANAI CITY, HI 96763
EDR ID #S113183480

HAZNET:

Year:	2003
Gepaid:	HIR000000141
Contact:	ED OYAMA
Telephone:	8085656453
Mailing Name:	Not reported
Mailing Address:	1001 N MIKI RD
Mailing City,St,Zip:	LANAI CITY, HI 96763
Gen County:	Not reported
TSD EPA ID:	CAT000646117
TSD County:	Not reported
Waste Category:	Polychlorinated biphenyls and material containing PCBs
Disposal Method:	Transfer Station
Tons:	0.35
Facility County:	99

Year:	2003
Gepaid:	HIR000000141
Contact:	ED OYAMA
Telephone:	8085656453
Mailing Name:	Not reported
Mailing Address:	1001 N MIKI RD
Mailing City,St,Zip:	LANAI CITY, HI 96763
Gen County:	Not reported
TSD EPA ID:	CAT000646117
TSD County:	Not reported
Waste Category:	Polychlorinated biphenyls and material containing PCBs
Disposal Method:	Disposal, Land Fill
Tons:	0.25
Facility County:	99

Year:	2003
Gepaid:	HIR000000141
Contact:	ED OYAMA
Telephone:	8085656453
Mailing Name:	Not reported
Mailing Address:	1001 N MIKI RD
Mailing City,St,Zip:	LANAI CITY, HI 96763
Gen County:	Not reported
TSD EPA ID:	CAT000646117
TSD County:	Not reported
Waste Category:	Liquids with polychloronated biphenyls >= 50 Mg./L
Disposal Method:	Transfer Station
Tons:	0.14
Facility County:	99

Year:	2002
Gepaid:	HIR000000141
Contact:	ED OYAMA
Telephone:	8085656453
Mailing Name:	Not reported
Mailing Address:	1001 N MIKI RD
Mailing City,St,Zip:	LANAI CITY, HI 96763
Gen County:	Not reported
TSD EPA ID:	CAT000646117
TSD County:	Not reported
Waste Category:	Polychlorinated biphenyls and material containing PCBs
Disposal Method:	Transfer Station
Tons:	2.45
Facility County:	99

Year:	2002
Gepaid:	HIR000000141
Contact:	ED OYAMA
Telephone:	8085656453
Mailing Name:	Not reported
Mailing Address:	1001 N MIKI RD
Mailing City,St,Zip:	LANAI CITY, HI 96763
Gen County:	Not reported
TSD EPA ID:	CAT000646117

TSD County:	Not reported
Waste Category:	Polychlorinated biphenyls and material containing PCBs
Disposal Method:	Disposal, Land Fill
Tons:	4.11
Facility County:	99

Year:	2001
Gepaid:	HIR000000141
Contact:	ED OYAMA
Telephone:	8085656453
Mailing Name:	Not reported
Mailing Address:	1001 N MIKI RD
Mailing City,St,Zip:	LANAI CITY, HI 96763
Gen County:	Not reported
TSD EPA ID:	CAT000646117
TSD County:	Not reported
Waste Category:	Polychlorinated biphenyls and material containing PCBs
Disposal Method:	Transfer Station
Tons:	0.15
Facility County:	99

Year:	2001
Gepaid:	HIR000000141
Contact:	ED OYAMA
Telephone:	8085656453
Mailing Name:	Not reported
Mailing Address:	1001 N MIKI RD
Mailing City,St,Zip:	LANAI CITY, HI 96763
Gen County:	Not reported
TSD EPA ID:	CAT000646117
TSD County:	Not reported
Waste Category:	Polychlorinated biphenyls and material containing PCBs
Disposal Method:	Disposal, Land Fill
Tons:	0.07
Facility County:	99

Year:	2000
Gepaid:	HIR000000141
Contact:	ED OYAMA
Telephone:	8085656453
Mailing Name:	Not reported
Mailing Address:	1001 N MIKI RD
Mailing City,St,Zip:	LANAI CITY, HI 96763
Gen County:	Not reported
TSD EPA ID:	CAT000646117
TSD County:	Not reported
Waste Category:	Polychlorinated biphenyls and material containing PCBs
Disposal Method:	Transfer Station
Tons:	0.77
Facility County:	99

Year:	2000
Gepaid:	HIR000000141
Contact:	ED OYAMA
Telephone:	8085656453
Mailing Name:	Not reported
Mailing Address:	1001 N MIKI RD
Mailing City,St,Zip:	LANAI CITY, HI 96763
Gen County:	Not reported
TSD EPA ID:	CAT000646117
TSD County:	Not reported
Waste Category:	Polychlorinated biphenyls and material containing PCBs
Disposal Method:	Disposal, Land Fill
Tons:	0.15
Facility County:	99

REF-334

SECTION 3: DATABASES AND UPDATE DATES

To maintain currency of the following federal, state and local databases, EDR contacts the appropriate government agency on a monthly or quarterly basis as required.

Elapsed ASTM days: Provides confirmation that this report meets or exceeds the 90-day updating requirement of the ASTM standard.

DATABASES FOUND IN THIS REPORT

CA HAZNET: Facility and Manifest Data
Source: California Environmental Protection Agency
Telephone: 916-255-1136
Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method.

Date of Government Version: 12/31/2012
Database Release Frequency: Annually

Date of Last EDR Contact: 01/17/2014
Date of Next Scheduled Update: 04/28/2014

MIKI BASIN GENERATING STATION
1001 NORTH MIKI RD.
LANAI CITY, HI 96763

Inquiry Number:
March 31, 2014

EDR Site Report™

EDR® Environmental Data Resources Inc

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

REF-335

TABLE OF CONTENTS

The EDR-Site Report™ is a comprehensive presentation of government filings on a facility identified in a search of federal, state and local environmental databases. The report is divided into three sections:

Section 1: Facility Summary . . . . . **Page 3**

Summary of facility filings including a review of the following areas: waste management, waste disposal, multi-media issues, and Superfund liability.

Section 2: Facility Detail Reports . . . . . **Page 4**

All available detailed information from databases where sites are identified.

Section 3: Databases and Update Information. . . . . . **Page 7**

Name, source, update dates, contact phone number and description of each of the databases for this report.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Disclaimer - Copyright and Trademark Notice

This report contains information obtained from a variety of public and other sources reasonably available to Environmental Data Resources , Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. **NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANYSUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OR DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES.ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT.**Purchaser accepts this report "AS IS". Any analyses, estimates, ratings, or risk codes provided in this report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assesment performed by an environmental professional can produce information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2008 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc., or its affiliates, is prohibited without prior written permission.

EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.

SECTION 1: FACILITY SUMMARY

FACILITY AREA	FACILITY 1 **MIKI BASIN GENERATING STATION** 1001 NORTH MIKI RD. LANAI CITY, HI 96763 EDR ID #1007092130 EPA #HIR000000141
WASTE MANAGEMENT Facility generates hazardous waste (RCRA)	**YES - p4**
Facility treats, stores, or disposes of hazardous waste on-site (RCRA/TSDF)	NO
Facility has received Notices of Violations (RCRA/VIOL)	NO
Facility has been subject to RCRA administrative actions (RAATS)	NO
Facility has been subject to corrective actions (CORRACTS)	NO
Facility handles PCBs (PADS)	**YES - p6**
Facility uses radioactive materials (MLTS)	NO
Facility manages registered aboveground storage tanks (AST)	NO
Facility manages registered underground storage tanks (UST)	NO
Facility has reported leaking underground storage tank incidents (LUST)	NO
Facility has reported emergency releases to the soil (ERNS)	NO
Facility has reported hazardous material incidents to DOT (HMIRS)	NO
WASTE DISPOSAL Facility is a Superfund Site (NPL)	NO
Facility has a known or suspect abandoned, inactive or uncontrolled hazardous waste site (CERCLIS)	NO
Facility has a reported Superfund Lien on it (LIENS)	NO
Facility is listed as a state hazardous waste site (SHWS)	NO
Facility has disposed of solid waste on-site (SWF/LF)	NO
MULTIMEDIA Facility uses toxic chemicals and has notified EPA under SARA Title III, Section 313 (TRIS)	NO
Facility produces pesticides and has notified EPA under Section 7 of FIFRA (SSTS)	NO
Facility manufactures or imports toxic chemicals on the TSCA list (TSCA)	NO
Facility has inspections under FIFRA, TSCA or EPCRA (FTTS)	NO
Facility is listed in EPA's index system (FINDS)	NO
Facility is listed in other database records (OTHER)	NO
POTENTIAL SUPERFUND LIABILITY Facility has a list of potentially responsible parties PRP	NO
TOTAL (YES)	2

REF-336

SECTION 2: FACILITY DETAIL REPORTS

WASTE MANAGEMENT

Facility generates hazardous waste

DATABASE: Resource Conservation and Recovery Information (RCRAInfo)

MIKI BASIN GENERATING STATION
1001 NORTH MIKI RD.
LANAI CITY, HI 96763
EDR ID #1007092130

RCRA-CESQG:

Date form received by agency:	03/19/2003
Facility name:	MIKI BASIN GENERATING STATION
Facility address:	1001 N MIKI RD LANAI CITY, HI 96763
EPA ID:	HIR000000141
Mailing address:	PO BOX 398 KAHULUI, HI 96733-6898
Contact:	DONN FUKADA
Contact address:	1001 N MIKI RD LANAI CITY, HI 96763
Contact country:	US
Contact telephone:	808-543-4525
Contact email:	Not reported
EPA Region:	09
Classification:	Conditionally Exempt Small Quantity Generator
Description:	Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:

Owner/operator name:	MAUI ELEC CO LTD
Owner/operator address:	Not reported Not reported
Owner/operator country:	US
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	01/01/1994
Owner/Op end date:	Not reported

Owner/operator name:	MAUI ELEC CO LTD
Owner/operator address:	Not reported Not reported
Owner/operator country:	US
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	01/01/1994
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	Yes
Used oil transfer facility:	No
Used oil transporter:	No

Historical Generators:

SECTION 2: FACILITY DETAIL REPORTS

...Continued...

Date form received by agency:	05/24/1995
Facility name:	MIKI BASIN GENERATING STATION
Site name:	MAUI ELECTRIC CO LTD MIKI BASIN POWER PL
Classification:	Small Quantity Generator

Hazardous Waste Summary:

Waste code:	D001
Waste name:	IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.
Waste code:	D006
Waste name:	CADMIUM
Waste code:	D008
Waste name:	LEAD
Violation Status:	No violations found

REF-337

SECTION 2: FACILITY DETAIL REPORTS

...Continued...

WASTE MANAGEMENT

Facility handles PCBs

DATABASE: PCB Activity Database System (PADS)

MIKI BASIN GENERATING STATION
1001 NORTH MIKI RD.
LANAI CITY, HI 96763
EDR ID #1007092130

PADS:

EPAID:	HIR000000141
Facility name:	MIKI BASIN GENERATING STATION
Facility Address:	1001 NORTH MIKI RD. LANAI CITY, HI 96763
Facility country:	US
Generator:	Yes
Storer:	No
Transporter:	No
Disposer:	No
Research facility:	No
Smelter:	No
Facility owner name:	MAUI ELECTRIC CO., LTD
Contact title:	Not reported
Contact name:	Donn Fukuda
Contact tel:	(808)543-4525
Contact extension:	Not reported
Mailing address:	P.O. Box 630608 Lanai City, HI 96763
Mailing country:	US
Cert. title:	Not reported
Cert. name:	Not reported
Cert. date:	02/07/2005
Date received:	03/24/2005

SECTION 3: DATABASES AND UPDATE DATES

To maintain currency of the following federal, state and local databases, EDR contacts the appropriate government agency on a monthly or quarterly basis as required.

Elapsed ASTM days: Provides confirmation that this report meets or exceeds the 90-day updating requirement of the ASTM standard.

DATABASES FOUND IN THIS REPORT

PADS: PCB Activity Database System
Source: EPA
Telephone: 202-566-0500
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 06/01/2013 — Date of Last EDR Contact: 01/28/2014
Database Release Frequency: Annually — Date of Next Scheduled Update: 04/28/2014

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generator
Source: Environmental Protection Agency
Telephone: 703-308-8895
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/10/2013 — Date of Last EDR Contact: 03/13/2014
Database Release Frequency: Varies — Date of Next Scheduled Update: 04/14/2014

REF-338

MAUI ELECTRIC CO - MIKI BASIN
1001 N MIKI RD
LANAI CITY, HI 96763

Inquiry Number:
March 31, 2014

EDR Site Report™

EDR® Environmental Data Resources Inc

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

The EDR-Site Report™ is a comprehensive presentation of government filings on a facility identified in a search of federal, state and local environmental databases. The report is divided into three sections:

Section 1: Facility Summary ..... **Page 3**

Summary of facility filings including a review of the following areas: waste management, waste disposal, multi-media issues, and Superfund liability.

Section 2: Facility Detail Reports ..... **Page 4**

All available detailed information from databases where sites are identified.

Section 3: Databases and Update Information. ..... **Page 15**

Name, source, update dates, contact phone number and description of each of the databases for this report.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Disclaimer - Copyright and Trademark Notice

This report contains information obtained from a variety of public and other sources reasonably available to Environmental Data Resources , Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. **NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANYSUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OR DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES.ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT.**Purchaser accepts this report "AS IS". Any analyses, estimates, ratings, or risk codes provided in this report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assesment performed by an environmental professional can produce information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2008 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc., or its affiliates, is prohibited without prior written permission.

EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.

REF-339

SECTION 1: FACILITY SUMMARY

FACILITY AREA	FACILITY 1 MAUI ELECTRIC CO - MIKI BASIN 1001 N MIKI RD LANAI CITY, HI 96763 EDR ID #1001024214 EPA #110055402737
WASTE MANAGEMENT Facility generates hazardous waste (RCRA)	NO
Facility treats, stores, or disposes of hazardous waste on-site (RCRA/TSDF)	NO
Facility has received Notices of Violations (RCRA/VIOL)	NO
Facility has been subject to RCRA administrative actions (RAATS)	NO
Facility has been subject to corrective actions (CORRACTS)	NO
Facility handles PCBs (PADS)	NO
Facility uses radioactive materials (MLTS)	NO
Facility manages registered aboveground storage tanks (AST)	NO
Facility manages registered underground storage tanks (UST)	NO
Facility has reported leaking underground storage tank incidents (LUST)	NO
Facility has reported emergency releases to the soil (ERNS)	NO
Facility has reported hazardous material incidents to DOT (HMIRS)	NO
WASTE DISPOSAL Facility is a Superfund Site (NPL)	NO
Facility has a known or suspect abandoned, inactive or uncontrolled hazardous waste site (CERCLIS)	NO
Facility has a reported Superfund Lien on it (LIENS)	NO
Facility is listed as a state hazardous waste site (SHWS)	NO
Facility has disposed of solid waste on-site (SWF/LF)	NO
MULTIMEDIA Facility uses toxic chemicals and has notified EPA under SARA Title III, Section 313 (TRIS)	NO
Facility produces pesticides and has notified EPA under Section 7 of FIFRA (SSTS)	NO
Facility manufactures or imports toxic chemicals on the TSCA list (TSCA)	NO
Facility has inspections under FIFRA, TSCA or EPCRA (FTTS)	NO
Facility is listed in EPA's index system (FINDS)	**YES - p4**
Facility is listed in other database records (OTHER)	**YES - p9**
POTENTIAL SUPERFUND LIABILITY Facility has a list of potentially responsible parties PRP	NO
TOTAL (YES)	2

SECTION 2: FACILITY DETAIL REPORTS

MULTIMEDIA

Facility is listed in EPA's index system

DATABASE: Facility Index System (FINDS)

MAUI ELECTRIC CO - MIKI BASIN
1001 N MIKI RD
LANAI CITY, HI 96763
EDR ID #1001024214

This site is listed in the Federal FINDS database. The FINDS database may contain references to records from government databases included elsewhere in the report.
Please note: the FINDS database may also contain references to out of date records formerly associated with the site.

Registry ID:	110001764029
Facility Name:	MAUI ELECTRIC CO (MECO) - MIKI BASIN GENERATING STATION
Facility Address:	1001 N MIKI RD LANAI CITY, HI
Facility URL:	http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110001764029
FIPS:	15009
Fed Facility:	Not reported
Tribal Land:	Not reported
Tribal Name:	Not reported
Congressional District:	02
Hydrologic Unit Code:	20040000
EPA Region:	09
Site Type:	STATIONARY
Date Created:	01-MAR-00
Date Updated:	29-AUG-13
U.S-Mexico Border:	Not reported
Latitude:	20.790646
Longitude:	-156.93382
Horizontal Collection:	Not reported
Horizontal Accuracy:	Not reported
Reference Point:	FACILITY CENTROID
Horizontal Datum:	NAD83
Coordinates Source:	Not reported

Environmental Interest/Information System

AFS (Aerometric Information Retrieval System (AIRS) Facility Subsystem) replaces the former Compliance Data System (CDS), the National Emission Data System (NEDS), and the Storage and Retrieval of Aerometric Data (SAROAD). AIRS is the national repository for information concerning airborne pollution in the United States. AFS is used to track emissions and compliance data from industrial plants. AFS data are utilized by states to prepare State Implementation Plans to comply with regulatory programs and by EPA as an input for the estimation of total national emissions. AFS is undergoing a major redesign to support facility operating permits required under Title V of the Clean Air Act.

The NEI (National Emissions Inventory) database contains information on stationary and mobile sources that emit criteria air pollutants and their precursors, as well as hazardous air pollutants (HAPs).

US EPA TRIS (Toxics Release Inventory System) contains information from facilities on the amounts of over 300 listed toxic chemicals that these facilities release directly to air, water, land, or that are transported off-site.

US Emissions & Generation Resource Database (EGRID) contains data on emissions and resource mix for virtually every power plant and company that generates electricity in the United States.

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

ELECTRIC GENERATOR

STATE MASTER

CRITERIA AND HAZARDOUS AIR POLLUTANT INVENTORY

US EPA RACT/BACT/LAER Clearinghouse (RBLC) database contains case-specific information on the "Best Available" air pollution technologies that have been required to reduce the emission of air pollutants from stationary sources (e.g., power plants, steel mills, chemical plants, etc.). RACT, or Reasonably Available Control Technology, is required on existing sources in areas that are not meeting national ambient air quality standards. BACT, or Best Available

REF-340

Control Technology, is required on major new or modified sources in clean areas.
LAER, or Lowest Achievable Emission Rate, is required on major new or modified sources in non-attainment areas.

Registry ID:	110055402737
Facility Name:	MIKI BASIN GENERATING STATION
Facility Address:	1001 N MIKI RD LANAI CITY, HI
Facility URL:	http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110055402737
FIPS:	Not reported
Fed Facility:	Not reported
Tribal Land:	Not reported
Tribal Name:	Not reported
Congressional District:	01
Hydrologic Unit Code:	20060000
EPA Region:	09
Site Type:	STATIONARY
Date Created:	23-JUL-13
Date Updated:	Not reported
U.S-Mexico Border:	Not reported
Latitude:	21.338271
Longitude:	-157.89732
Horizontal Collection:	ADDRESS MATCHING-OTHER
Horizontal Accuracy:	149
Reference Point:	UNKNOWN
Horizontal Datum:	NAD83
Coordinates Source:	Not reported

Environmental Interest/Information System

Program System ID:	928711
Program Sys. Name:	EIS
Env. Interest Type:	CRITERIA AND HAZARDOUS AIR POLLUTANT INVENTORY
Env. Interest Start Dt.:	Not reported
Start Date Qualifier:	Not reported
Env. Interest End Dt.:	Not reported
End Date Qualifier:	Not reported
Data Source:	EIS
Active Code:	Yes

Program System ID:	7264
Program Sys. Name:	EIA-860
Env. Interest Type:	ELECTRIC GENERATOR
Env. Interest Start Dt.:	Not reported
Start Date Qualifier:	Not reported
Env. Interest End Dt.:	Not reported
End Date Qualifier:	Not reported
Data Source:	EIA-860
Active Code:	Not reported

Program System ID:	7264
Program Sys. Name:	EGRID
Env. Interest Type:	ELECTRIC POWER GENERATOR (OIL BASED)
Env. Interest Start Dt.:	Not reported
Start Date Qualifier:	Not reported
Env. Interest End Dt.:	Not reported
End Date Qualifier:	Not reported
Data Source:	EGRID
Active Code:	Not reported

Program System ID:	NEIHI12543
Program Sys. Name:	NEI
Env. Interest Type:	CRITERIA AND HAZARDOUS AIR POLLUTANT INVENTORY
Env. Interest Start Dt.:	Not reported
Start Date Qualifier:	Not reported
Env. Interest End Dt.:	Not reported
End Date Qualifier:	Not reported
Data Source:	NEI
Active Code:	Not reported

Program System ID:	3720
Program Sys. Name:	RBLC
Env. Interest Type:	AIR MAJOR
Env. Interest Start Dt.:	04-MAY-96
Start Date Qualifier:	ORIGINAL PERMIT ISSUE DATE
Env. Interest End Dt.:	Not reported
End Date Qualifier:	Not reported
Data Source:	RBLC
Active Code:	Not reported

Program System ID:	HIR000000141
Program Sys. Name:	RCRAINFO
Env. Interest Type:	CESQG
Env. Interest Start Dt.:	24-MAY-95
Start Date Qualifier:	FIRST NOTIFICATION DATE
Env. Interest End Dt.:	Not reported
End Date Qualifier:	Not reported

Data Source:	RCRAINFO
Active Code:	Yes

Program System ID:	1500900035
Program Sys. Name:	AIRS/AFS
Env. Interest Type:	AIR MAJOR
Env. Interest Start Dt.:	Not reported
Start Date Qualifier:	Not reported
Env. Interest End Dt.:	Not reported
End Date Qualifier:	Not reported
Data Source:	AIRS/AFS
Active Code:	Yes

Program System ID:	96763MLCTR1001N
Program Sys. Name:	TRIS
Env. Interest Type:	TRI REPORTER
Env. Interest Start Dt.:	31-DEC-00
Start Date Qualifier:	FIRST REPORTING YEAR
Env. Interest End Dt.:	Not reported
End Date Qualifier:	Not reported
Data Source:	TRI REPORTING FORM
Active Code:	Not reported

Program System ID:	8315
Program Sys. Name:	HI-EHW
Env. Interest Type:	STATE MASTER
Env. Interest Start Dt.:	Not reported
Start Date Qualifier:	Not reported
Env. Interest End Dt.:	Not reported
End Date Qualifier:	Not reported
Data Source:	HI-EHW
Active Code:	Not reported

Alternative Name:	MAUI ELECTRIC CO LTD MIKI BASIN GENERATING STATION
Alternative Name:	MAUI ELECTRIC CO LTD MIKI BASIN POWER PL
Alternative Name:	MAUI ELECTRIC CO LTD, MIKI BASIN
Alternative Name:	MAUI ELECTRIC CO. LTD. MIKI BASIN GENERATING STATION
Alternative Name:	MAUI ELECTRIC COMPANY, LTD.
Alternative Name:	MECO - MIKI BASIN POWER PLANT
Alternative Name:	MIKI BASIN

Contact Name:	DONN FUKADA
Contact Type:	REGULATORY CONTACT
Contact Title:	Not reported
Contact Telephone:	808-543-4525
Contact Fax:	Not reported
Contact email:	Not reported
Contact Address:	1001 N MIKI RD LANAI CITY, HI 96763

Contact Name:	KAUI AWAI-DICKSON
Contact Type:	PUBLIC CONTACT
Contact Title:	Not reported
Contact Telephone:	(808) 872-3263
Contact Fax:	Not reported
Contact email:	Not reported
Contact Address:	Not reported Not reported

Contact Name:	VIRGIL KONG
Contact Type:	TECHNICAL CONTACT
Contact Title:	Not reported
Contact Telephone:	(808) 543-4517
Contact Fax:	Not reported
Contact email:	Not reported
Contact Address:	Not reported Not reported

Contact Name:	Not reported
Contact Type:	PUBLIC CONTACT
Contact Title:	Not reported
Contact Telephone:	Not reported
Contact Fax:	Not reported
Contact email:	Not reported
Contact Address:	MIKI BASIN GENERATING STATION LANAI,

NAICS Code:	221112(FOSSIL FUEL ELECTRIC POWER GENERATION.)
NAICS Code:	221121(ELECTRIC BULK POWER TRANSMISSION AND CONTROL.)
SIC Code:	4911(ELECTRIC SERVICES)
Organization Name:	Not reported
Affiliation Type:	OWNER/OPERATOR
Organization Type:	PRIVATE

REF-341

SECTION 2: FACILITY DETAIL REPORTS

...Continued...

DUNS Number:	006927164
Division Name:	Not reported
Telephone Number:	Not reported
Alternative Number:	Not reported
Fax Number:	Not reported
Email:	Not reported
EIN:	Not reported
State Business ID:	Not reported
Parent Name:	Not reported
Parent DUNS:	Not reported
Mailing Address:	Not reported Not reported

Organization Name:	MAUI ELECTRIC CO LTD
Affiliation Type:	OPERATOR
Organization Type:	Not reported
DUNS Number:	Not reported
Division Name:	Not reported
Telephone Number:	Not reported
Alternative Number:	Not reported
Fax Number:	Not reported
Email:	Not reported
EIN:	Not reported
State Business ID:	Not reported
Parent Name:	Not reported
Parent DUNS:	Not reported
Mailing Address:	Not reported Not reported

Organization Name:	MAUI ELECTRIC CO LTD
Affiliation Type:	OWNER1
Organization Type:	Not reported
DUNS Number:	Not reported
Division Name:	Not reported
Telephone Number:	Not reported
Alternative Number:	Not reported
Fax Number:	Not reported
Email:	Not reported
EIN:	Not reported
State Business ID:	Not reported
Parent Name:	Not reported
Parent DUNS:	Not reported
Mailing Address:	Not reported Not reported

Organization Name:	HAWAIIAN ELECTRIC INDUSTRIES INC
Affiliation Type:	PARENT COMPANY
Organization Type:	PRIVATE
DUNS Number:	103901773
Division Name:	Not reported
Telephone Number:	Not reported
Alternative Number:	Not reported
Fax Number:	Not reported
Email:	Not reported
EIN:	Not reported
State Business ID:	Not reported
Parent Name:	Not reported
Parent DUNS:	Not reported
Mailing Address:	Not reported Not reported

Organization Name:	MAUI ELECTRIC CO LTD
Affiliation Type:	OWNER/OPERATOR
Organization Type:	Not reported
DUNS Number:	Not reported
Division Name:	Not reported
Telephone Number:	Not reported
Alternative Number:	Not reported
Fax Number:	Not reported
Email:	Not reported
EIN:	Not reported
State Business ID:	Not reported
Parent Name:	Not reported
Parent DUNS:	Not reported
Mailing Address:	Not reported P O BOX 398 KAHULUI - MAUI, HI 967320000

Organization Name:	MAUI ELECTRIC COMPANY, LTD.
Affiliation Type:	OPERATOR
Organization Type:	PRIVATE
DUNS Number:	Not reported
Division Name:	Not reported
Telephone Number:	Not reported
Alternative Number:	Not reported

SECTION 2: FACILITY DETAIL REPORTS

...Continued...

Fax Number:	Not reported
Email:	Not reported
EIN:	Not reported
State Business ID:	Not reported
Parent Name:	Not reported
Parent DUNS:	Not reported
Mailing Address:	Not reported Not reported

Organization Name:	MAUI ELECTRIC COMPANY, LTD.
Affiliation Type:	OWNER
Organization Type:	PRIVATE
DUNS Number:	Not reported
Division Name:	Not reported
Telephone Number:	Not reported
Alternative Number:	Not reported
Fax Number:	Not reported
Email:	Not reported
EIN:	Not reported
State Business ID:	Not reported
Parent Name:	Not reported
Parent DUNS:	Not reported
Mailing Address:	Not reported Not reported

REF-342

MULTIMEDIA

Facility is listed in other database records

DATABASE: Other Database Records (OTHER)

MAUI ELECTRIC CO - MIKI BASIN
1001 N MIKI RD
LANAI CITY, HI 96763
EDR ID #1001024214

AIRS (AFS):

Compliance and Violation Data Major Sources:

EPA plant ID:	110001764029
Plant name:	MAUI ELECTRIC CO - MIKI BASIN
Plant address:	1001 N MIKI RD LANAI CITY, HI 96763
County:	MAUI
Region code:	09
Dunn & Bradst #:	Not reported
Air quality cntrl region:	Not reported
Sic code:	4911
Sic code desc:	ELECTRIC SERVICES
North Am. industrial classf:	221112
NAIC code description:	Fossil Fuel Electric Power Generation
Default compliance status:	IN COMPLIANCE - INSPECTION
Default classification:	ACTUAL OR POTENTIAL EMISSIONS ARE ABOVE THE APPLICABLE MAJOR SOURCE THRESHOLDS
Govt facility:	ALL OTHER FACILITIES NOT OWNED OR OPERATED BY A FEDERAL, STATE, OR LOCAL GOVERNMENT
Current HPV:	Not reported

Compliance and Enforcement Major Issues:

Air program:	SIP SOURCE
National action type:	MULTI MEDIA INSPECTION - LEVEL 2 OR GREATER
Date achieved:	000825
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	MULTI MEDIA INSPECTION - LEVEL 2 OR GREATER
Date achieved:	010827
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	MULTI MEDIA INSPECTION - LEVEL 2 OR GREATER
Date achieved:	010827
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	S/L REQ (O/O COND) STACK TEST/NOT OBSV BUT REVWD
Date achieved:	020529
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	020809
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	STATE CONDUCTED FCE / ON-SITE
Date achieved:	020809
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	S/L REQ (O/O COND) STACK TEST/NOT OBSV BUT REVWD
Date achieved:	020816
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	STATE DAY 0
Date achieved:	030530
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	NXXXXX
Date achieved:	030530
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	NXXXXX

Date achieved:	030531
Penalty amount:	000004900
Air program:	TITLE V PERMITS
National action type:	SV RESOLVED
Date achieved:	030707
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	S/L REQ (O/O COND) STACK TEST/NOT OBSV BUT REVWD
Date achieved:	030904
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	030904
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	STATE CONDUCTED FCE / ON-SITE
Date achieved:	030904
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	TITLE V COMPLIANCE CERT DUE/RECEIVED BY
Date achieved:	040402
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	COMPLIANCE CERTIFICATION EPA REVIEW
Date achieved:	040720
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	S/L REQ (O/O COND) STACK TEST/NOT OBSV BUT REVWD
Date achieved:	040722
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	040722
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	STATE CONDUCTED FCE / ON-SITE
Date achieved:	040722
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	S/L REQ (O/O COND) STACK TEST/NOT OBSV BUT REVWD
Date achieved:	050811
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	050811
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	STATE CONDUCTED FCE / ON-SITE
Date achieved:	050811
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	TITLE V COMPLIANCE CERT DUE/RECEIVED BY
Date achieved:	060404
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	060725
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	STATE CONDUCTED FCE / ON-SITE
Date achieved:	060725
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	TITLE V COMPLIANCE CERT DUE/RECEIVED BY
Date achieved:	070403
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	STATE CONDUCTED FCE / ON-SITE

REF-343

Date achieved: 070723
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: S/L REQ (O/O COND) STACK TEST/NOT OBSV BUT REVWD
Date achieved: 070723
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 070723
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: TITLE V COMPLIANCE CERT DUE/RECEIVED BY
Date achieved: 080325
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: S/L REQ (O/O COND) STACK TEST/NOT OBSV BUT REVWD
Date achieved: 080708
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED FCE / ON-SITE
Date achieved: 080708
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 080708
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: TITLE V COMPLIANCE CERT DUE/RECEIVED BY
Date achieved: 090331
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED FCE / ON-SITE
Date achieved: 090813
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: S/L REQ (O/O COND) STACK TEST/NOT OBSV BUT REVWD
Date achieved: 090813
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 090813
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: TITLE V COMPLIANCE CERT DUE/RECEIVED BY
Date achieved: 100518
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 100729
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: S/L REQ (O/O COND) STACK TEST/NOT OBSV BUT REVWD
Date achieved: 100729
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED FCE / ON-SITE
Date achieved: 100729
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 110719
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: S/L REQ (O/O COND) STACK TEST/NOT OBSV BUT REVWD
Date achieved: 110719
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED FCE / ON-SITE

Date achieved: 110719
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 120724
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED FCE / ON-SITE
Date achieved: 120724
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: S/L REQ (O/O COND) STACK TEST/NOT OBSV BUT REVWD
Date achieved: 120724
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: MULTI MEDIA INSPECTION - LEVEL 2 OR GREATER
Date achieved: 970402
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: MULTI MEDIA INSPECTION - LEVEL 2 OR GREATER
Date achieved: 980407
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: NXXXXX
Date achieved: 980810
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: STATE CONSENT AGREEMENT FILED
Date achieved: 980810
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: STATE DAY 0
Date achieved: 980810
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: SV RESOLVED
Date achieved: 980810
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: MULTI MEDIA INSPECTION - LEVEL 2 OR GREATER
Date achieved: 990819
Penalty amount: 000000000

Historical Compliance Minor Sources:
State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1004
Air prog code hist file: SIP SOURCE

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1004
Air prog code hist file: TITLE V PERMITS

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1101
Air prog code hist file: SIP SOURCE

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1101
Air prog code hist file: TITLE V PERMITS

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1102
Air prog code hist file: SIP SOURCE

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1102
Air prog code hist file: TITLE V PERMITS

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1103
Air prog code hist file: SIP SOURCE

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1103

REF-344

Air prog code hist file: TITLE V PERMITS

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1104
Air prog code hist file: SIP SOURCE

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1104
Air prog code hist file: TITLE V PERMITS

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1201
Air prog code hist file: SIP SOURCE

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1201
Air prog code hist file: TITLE V PERMITS

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1202
Air prog code hist file: SIP SOURCE

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1202
Air prog code hist file: TITLE V PERMITS

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1203
Air prog code hist file: SIP SOURCE

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1203
Air prog code hist file: TITLE V PERMITS

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1204
Air prog code hist file: SIP SOURCE

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1204
Air prog code hist file: TITLE V PERMITS

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1301
Air prog code hist file: SIP SOURCE

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1301
Air prog code hist file: TITLE V PERMITS

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1302
Air prog code hist file: SIP SOURCE

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1302
Air prog code hist file: TITLE V PERMITS

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1303
Air prog code hist file: SIP SOURCE

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1303
Air prog code hist file: TITLE V PERMITS

Permit Information:
Compliance plant ID: 00035
Permit number: 0030-06-C
Permit category: V
Permit category desc: TITLE V PERMIT - PLANT SP

Permit Source:
Compliance plant ID: 00035
Plant name: MAUI ELECTRIC CO - MIKI BASIN
Plant address: 1001 N MIKI RD
LANAI CITY, HI 96763

Event Information:
Compliance permit ID: 00035
Permit number: 0030-06-C
Event action type: IF
Event description: *PERMIT AUTHORITY ISSUES FINAL PERMIT

Event action #: 001
Event date: 20021119

REF-345

SECTION 3: DATABASES AND UPDATE DATES

To maintain currency of the following federal, state and local databases, EDR contacts the appropriate government agency on a monthly or quarterly basis as required.

Elapsed ASTM days: Provides confirmation that this report meets or exceeds the 90-day updating requirement of the ASTM standard.

DATABASES FOUND IN THIS REPORT

FINDS: Facility Index System/Facility Registry System
Source: EPA
Telephone: Not reported
Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 11/18/2013 Date of Last EDR Contact: 03/14/2014
Database Release Frequency: Quarterly Date of Next Scheduled Update: 06/23/2014

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)
Source: EPA
Telephone: 202-564-5962
The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/23/2013 Date of Last EDR Contact: 03/31/2014
Database Release Frequency: Annually Date of Next Scheduled Update: 07/14/2014

APPENDIX B

USER QUESTIONNAIRE

REF-346

ASTM E-1527 PHASE I ENVIRONMENTAL SITE ASSESSMENT PRE-SURVEY QUESTIONNAIRE AND DISCLOSURE STATEMENT

Borrower: Please complete this questionnaire before the Consultant's site visit. For those questions that are not applicable to the subject please respond with an "N/A". This document must be signed by the Owner or his/her representative (Item No. 2). If you have any questions about how to answer any of the questions please call. If additional pages for response are necessary please attach them to this form. Clearly mark all references to the appropriate question number(s). This document and your written response to same will be an exhibit in our report.

1. PROPERTY INFORMATION:

Property Name: 200 ACR Industrial Park - Miki Basin		
Property Address: Miki Road		
City: Lanai City	State: HI	Zip: 96763
Assessor's Parcel Number: (2) 4-9-002:001		

2. COMPLETED BY

Signature: [signature]	Date: 3-20-14
Printed Name: Thomas A Horn	Title: Director of Development + Construction

3. ASTM-REQUIRED INQUIRIES

Property Owner: Name: Pulama Lanai Phone: 808-565-3361 Fax:	
Key Site Manager (Site contact): Name: Wayne Ishizaki Phone: 808-565-3953 Fax:	
If not residential Property, please provide list of tenants, including contact names and phone numbers.	
Can you provide a Current Title Abstract for the Property, including a chain of Title? If so, please send documents along with completed questionnaire.	☐ Yes ☒ No
Do you have knowledge of any environmental liens recorded against the Property, or environmentally related Activity and Use Limitations of the Property?	☐ Yes ☒ No
Do you have any specialized knowledge that would be material in identifying recognized environmental conditions in connection with the Property?	☐ Yes ☒ No
Are you aware of a reduction in the property value due to environmental issues?	☐ Yes ☒ No
Please attach explanation of all affirmative answers.	

Please state reason for procuring this Phase 1 ESA:

☐ Qualify for Innocent Landowner defense to CERCLA Liability.

☒ Other: (state below) As part of a study to pursue land use approval to use the land as an industrial park. It is currently zoned ag.

4. PLEASE PROVIDE A GENERAL SITE DESCRIPTION BY COMPLETING THE FOLLOWING TABLE:

Legal description/ boundary survey/ plat available for inspector: Site map provided previously	☐ Yes ☒ No
Total Property Size: 200 Acres	
Total number of buildings: 0	
Total square footage of buildings: 0	
Date of construction: N/A	
Dates of significant renovation: N/A	
Waste water discharge: ☐ Municipal Sanitary Sewer ☐ On-site septic system ☒ Other None currently	
Potable water source: ☐ Community Water Supplier ☐ On-site well ☒ Other None currently	
Please describe prior use of property, if known:	

5. PREVIOUS INVESTIGATIONS:

Have any previous environmental investigations been performed at the site? ☐ Yes ☒ No Not to my knowledge

INVESTIGATION TYPE **If yes, please describe conclusions, and attach copy of report(s)**	
☐ Phase 1 ESA	
☐ Phase 2 ESA	
☐ Tank Tightness Testing	
☐ Asbestos Survey/ O&M	
☐ Radon	
☐ Lead-based Paint	
☐ Lead in Water	
☐ Operations & Maintenance Plan(s)	
☐ Other	

REF-347

6. ON SITE OPERATIONS

Are you aware of any of the following conditions, either past or present, on the site?		
Condition	**Response**	**If yes, please describe**
1. Stored Chemicals	☐ Yes ☒ No	
2. Underground Storage Tanks	☐ Yes ☒ No	
3. Aboveground Storage Tanks	☐ Yes ☒ No	
4. Spills or Releases	☐ Yes ☒ No	
5. Dump Areas/ Landfills	☐ Yes ☒ No	
6. Waste Treatment Systems	☐ Yes ☒ No	
7. Clarifies/ Separators	☐ Yes ☒ No	
8. Air stacks/ Vents/ Odors	☐ Yes ☒ No	
9. Floor Drains/Sumps	☐ Yes ☒ No	
10. Stained Soil/ Impacted Vegetation	☐ Yes ☒ No	
11. On-site OWNED Electrical Transformers	☐ Yes ☒ No	
12. Hydraulic lifts/ Elevators	☐ Yes ☒ No	
13. Dry Cleaning Operations	☐ Yes ☒ No	
14. Wetlands/ Flooding	☐ Yes ☒ No	
15. Oil/ Gas/ Water/ Monitoring Wells	☐ Yes ☒ No	
16. Environmental Cleanups	☐ Yes ☒ No	
17. Environmental Permits	☐ Yes ☒ No	If **yes**, please describe and ATTACH ALL COPIES of permits. Please attach last three waste manifests.
a) Industrial Discharge	☐ Yes ☒ No	
b) POTW (NPDES)	☐ Yes ☒ No	
c) Hazardous Waste Generator	☐ Yes ☒ No	
d) Air Quality	☐ Yes ☒ No	
e) Flammable Materials	☐ Yes ☒ No	
f) AST/UST	☐ Yes ☒ No	
g) Waste Manifest(s)	☐ Yes ☒ No	
h) other	☐ Yes ☒ No	

TRC

APPENDIX C

HISTORICAL RESEARCH DOCUMENTATION

REF-348

Miki Basin - 200 Acre Industrial Site
Miki Road & Kaumalapau Highway
Lanai City, HI 96763

Inquiry Number: 3875991.8
March 12, 2014

The EDR Aerial Photo Decade Package

EDR®

6 Armstrong Road, 4th Floor
Shelton, Connecticut 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

When delivered electronically by EDR, the aerial photo images included with this report are for ONE TIME USE ONLY. Further reproduction of these aerial photo images is prohibited without permission from EDR. For more information contact your EDR Account Executive.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Disclaimer - Copyright and Trademark Notice

This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. **NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OF DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT.** Purchaser accepts this Report AS IS. Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2014 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc., or its affiliates, is prohibited without prior written permission.

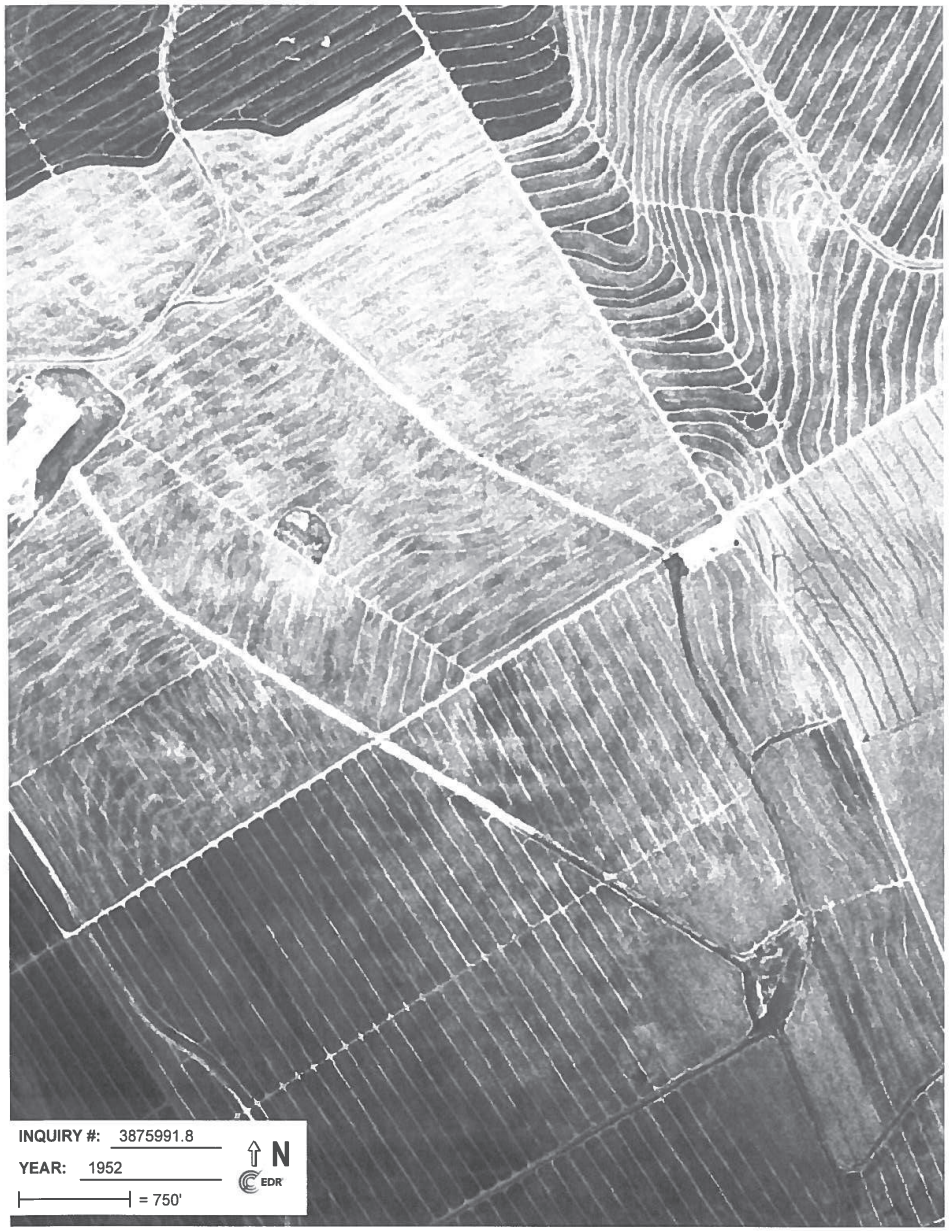
EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.

REF-349

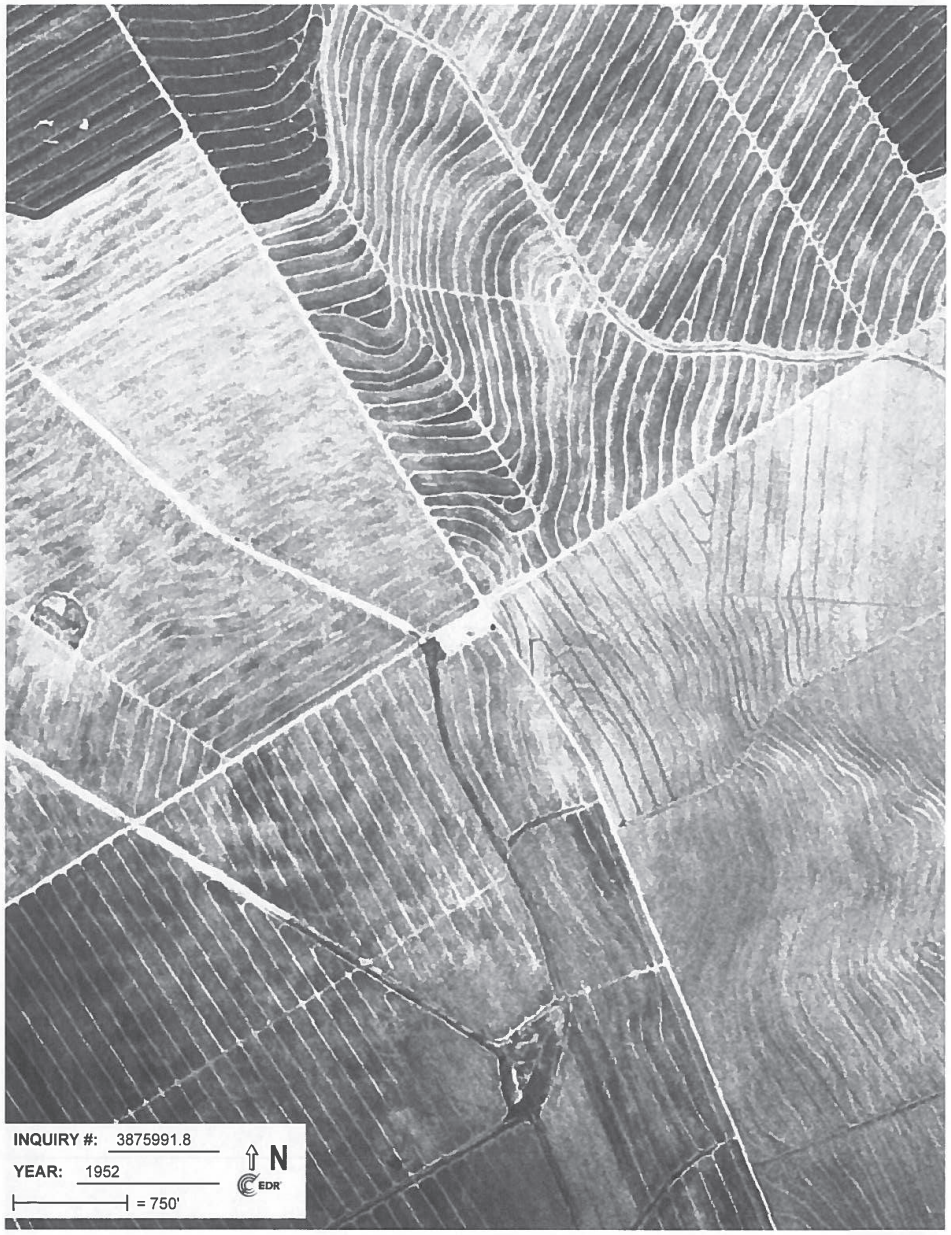
Date EDR Searched Historical Sources:
Aerial Photography March 12, 2014

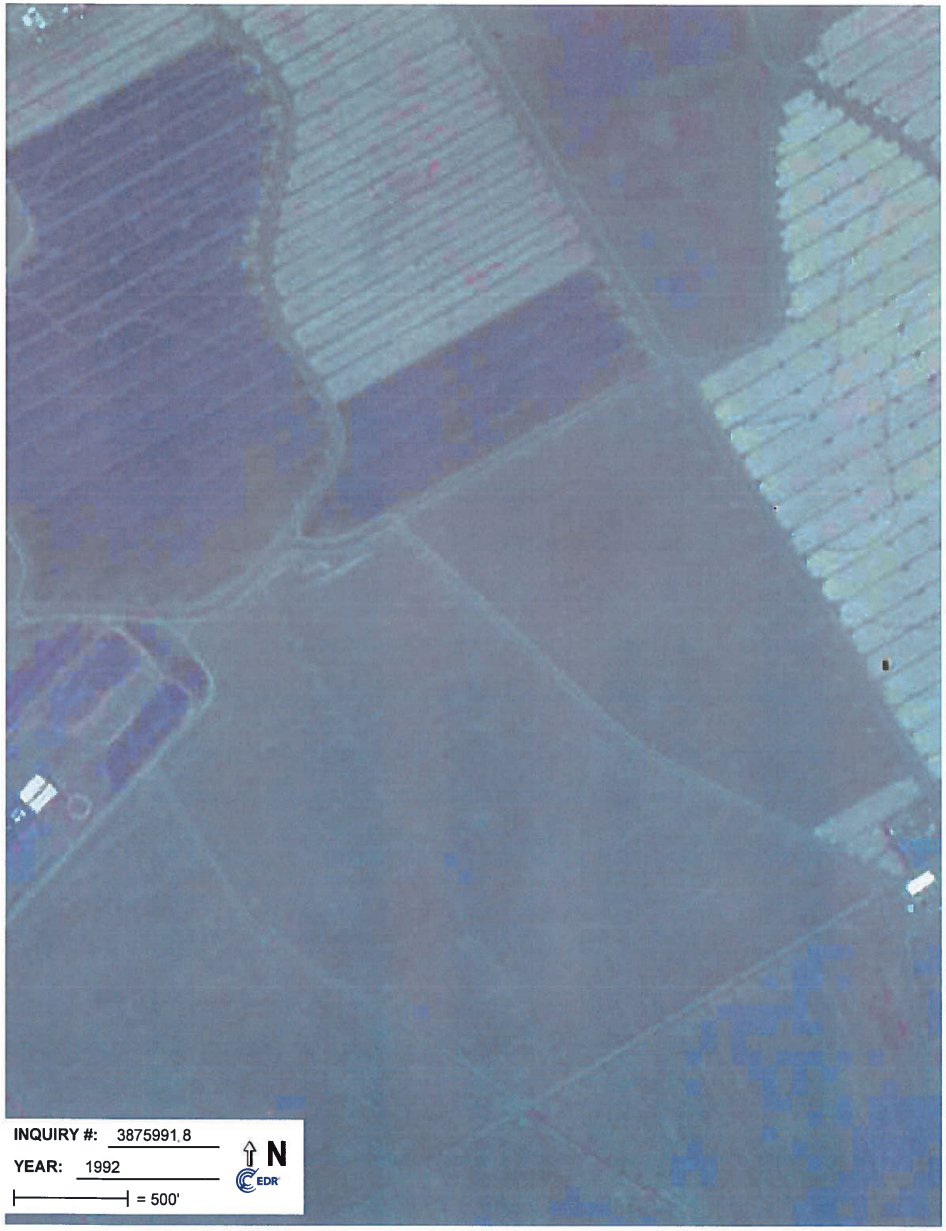
Target Property:
Miki Road & Kaumalapau Highway
Lanai City, HI 96763

Year	*Scale*	*Details*	*Source*
1952	Aerial Photograph. Scale: 1"=750'	Panel #: 20156-G8, ISLAND OF LANAI OE NW, HI,/Flight Date: January 26, 1952	EDR
1952	Aerial Photograph. Scale: 1"=750'	Panel #: 20156-G8, ISLAND OF LANAI OE NW, HI,/Flight Date: January 26, 1952	EDR
1992	Aerial Photograph. Scale: 1"=500'	Panel #: 20156-G8, ISLAND OF LANAI OE NW, HI,/Flight Date: September 23, 1992	EDR
1992	Aerial Photograph. Scale: 1"=500'	Panel #: 20156-G8, ISLAND OF LANAI OE NW, HI,/Flight Date: September 23, 1992	EDR
1992	Aerial Photograph. Scale: 1"=500'	Panel #: 20156-G8, ISLAND OF LANAI OE NW, HI,/Flight Date: September 23, 1992	EDR
1992	Aerial Photograph. Scale: 1"=500'	Panel #: 20156-G8, ISLAND OF LANAI OE NW, HI,/Flight Date: September 23, 1992	EDR
1992	Aerial Photograph. Scale: 1"=500'	Panel #: 20156-G8, ISLAND OF LANAI OE NW, HI,/Flight Date: September 23, 1992	EDR

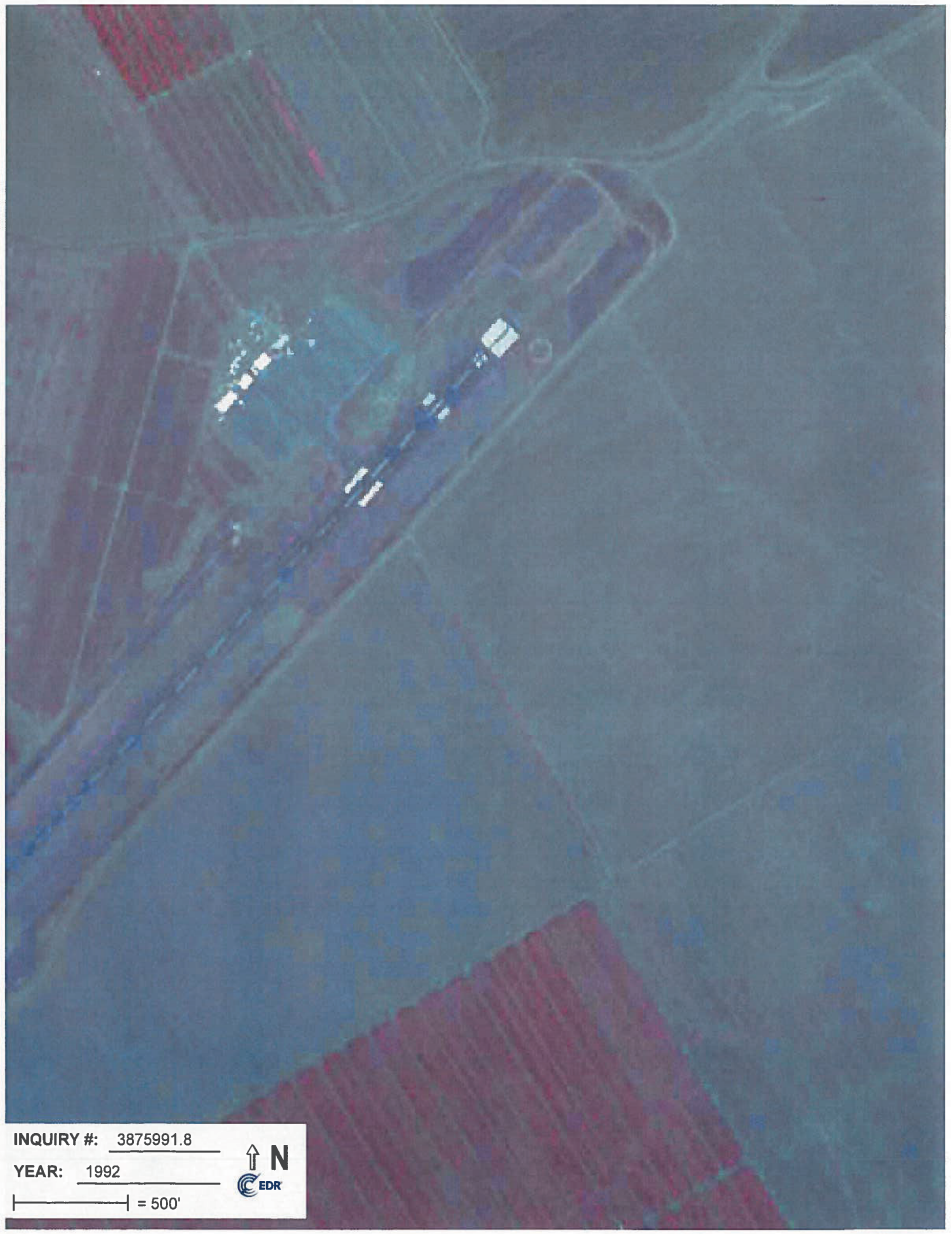


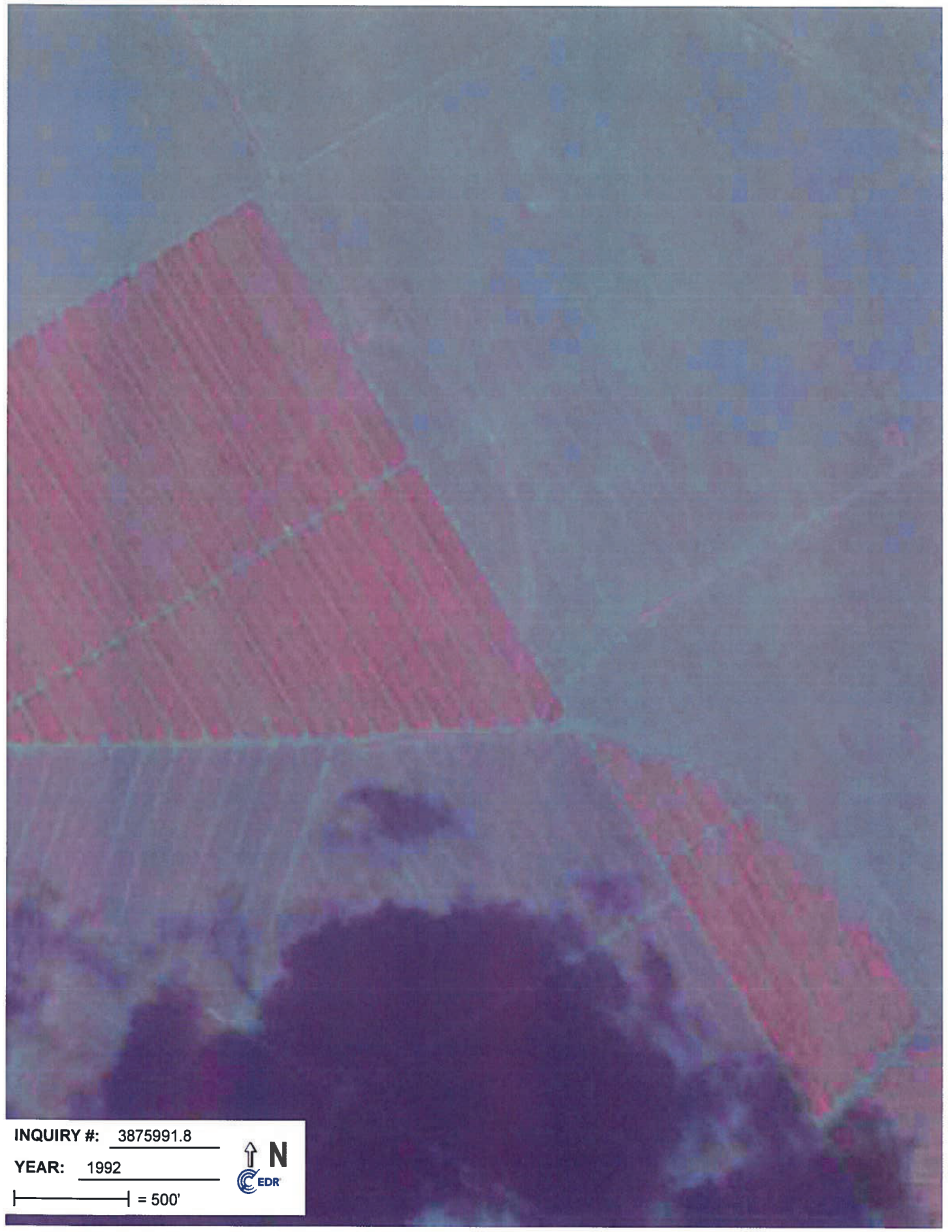
REF-350


INQUIRY #: 3875991.8
YEAR: 1952
= 750'
N
EDR

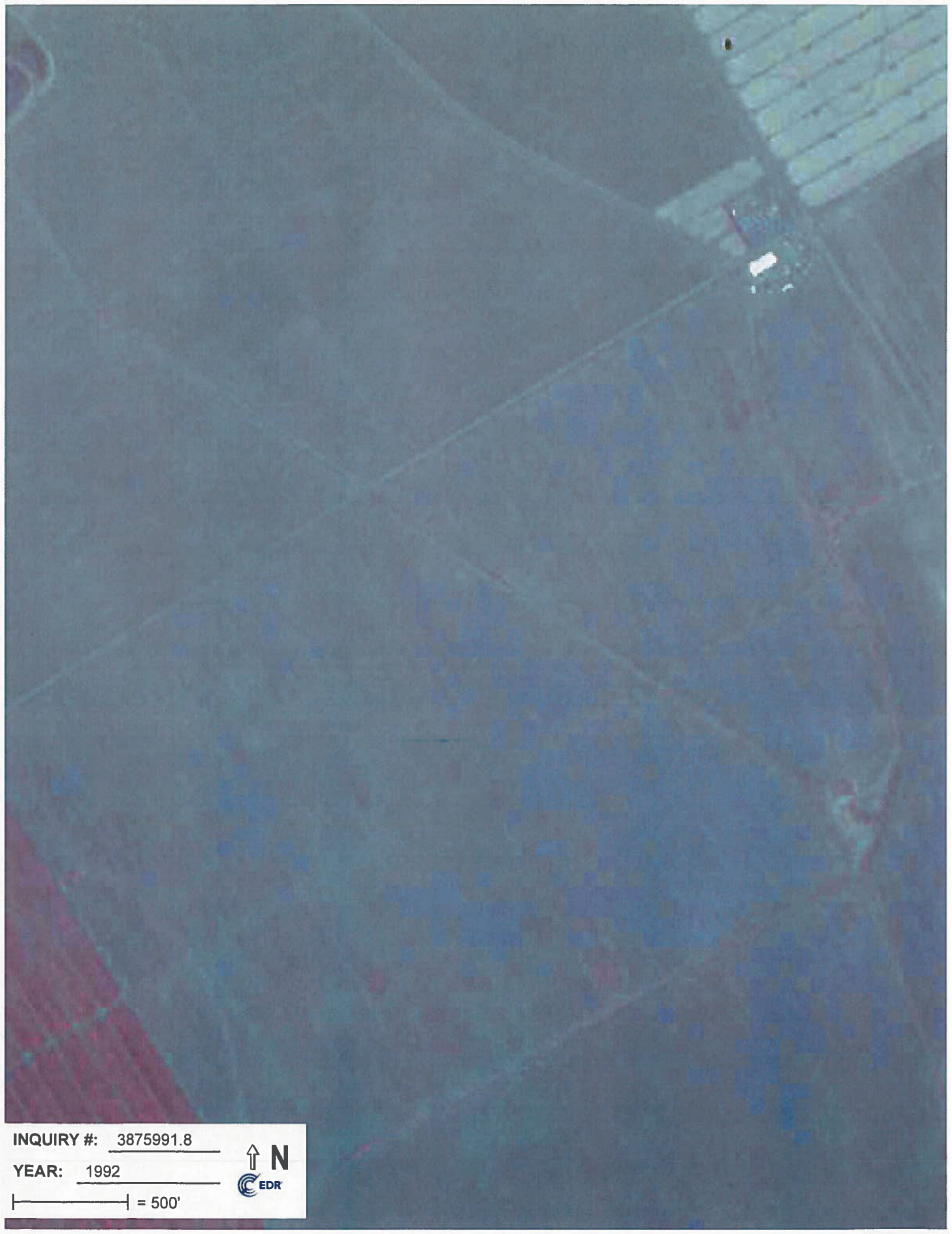

INQUIRY #: 3875991.8
YEAR: 1992
= 500'
N
EDR

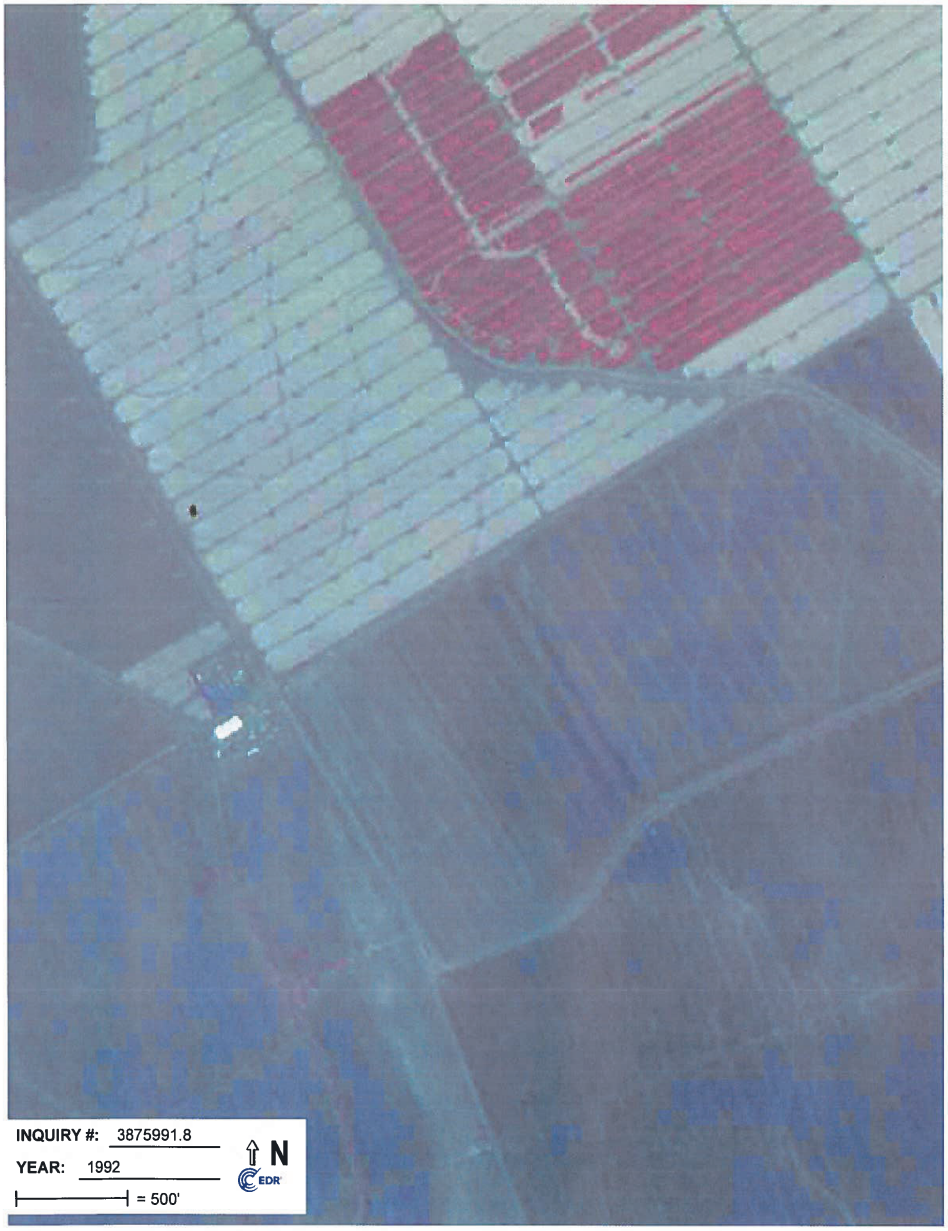
REF-351


INQUIRY #: 3875991.8
YEAR: 1992
= 500'
N
EDR


INQUIRY #: 3875991.8
YEAR: 1992
= 500'
N
EDR

REF-352


INQUIRY #: 3875991.8
YEAR: 1992
= 500'
N
EDR


INQUIRY #: 3875991.8
YEAR: 1992
= 500'
N
EDR

REF-353

Miki Basin - 200 Acre Industrial Site
Miki Road & Kaumalapau Highway
Lanai City, HI 96763

Inquiry Number: 3875991.4
March 10, 2014

EDR Historical Topographic Map Report

6 Armstrong Road, 4th Floor
Shelton, Connecticut 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Historical Topographic Map Report

Environmental Data Resources, Inc.s (EDR) Historical Topographic Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topographic Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the early 1900s.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Disclaimer - Copyright and Trademark Notice

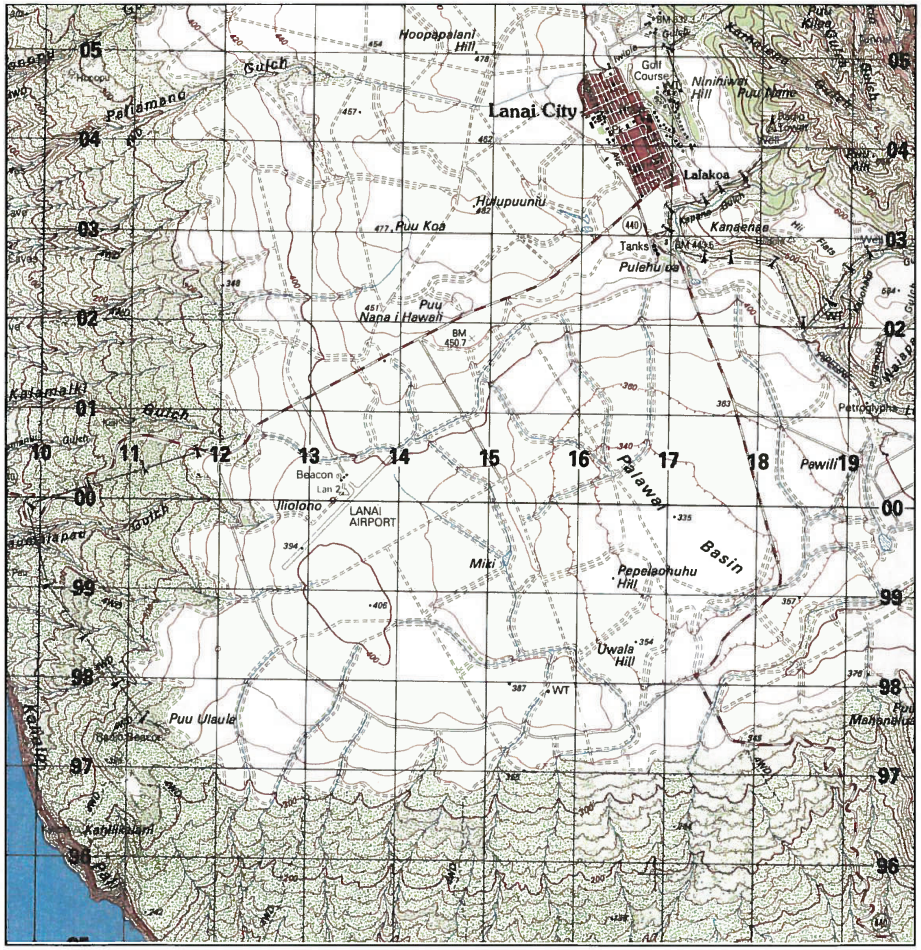
This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. **NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OF DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT.** Purchaser accepts this Report AS IS. Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2014 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc., or its affiliates, is prohibited without prior written permission.

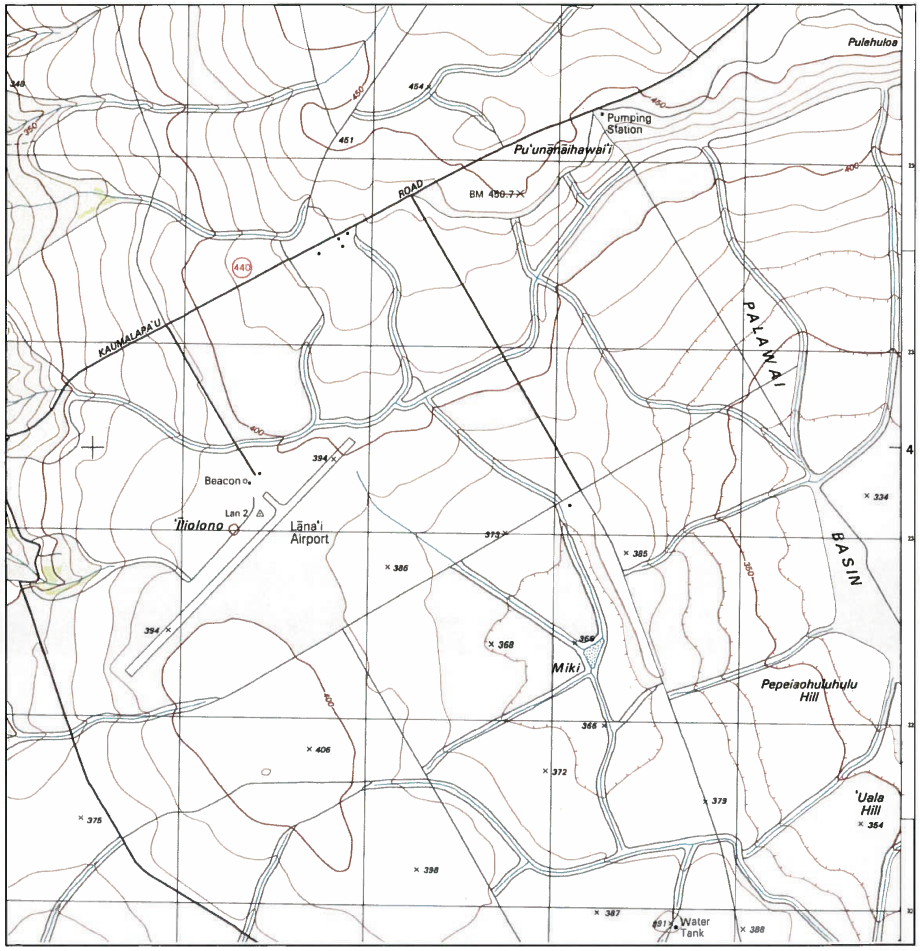
EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.

REF-354

Historical Topographic Map


Lanai City
Hoopapalani Hill
Golf Course
Niniwai Hill
Puu Nene
Lalakoa
Kanaehae
Tanks
Puu Koa
Hulupuuniu
Puu Nana i Hawaii
BM 450
Pulehuloa
Pewill
Beacon
Iliolono
LANAI AIRPORT
Miki
Pepeiaohuhu Hill
Basin
Uwala Hill
Puu Ulaula
Palawai
Kaiamalii Gulch
Kahiliolani
Pallamano Gulch
Kaumalapau Gulch
Petroglyphs
Puu Mahenahua
Kaiu Hill
Kaiu Gulch
Kaiu Beacon
Kaiu Point
Kaiu Pali
Kaiu Ridge
Kaiu Gulch
Kaiu Hill

Historical Topographic Map



N	TARGET QUAD NAME: LANAI CITY MAP YEAR: 1992 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Miki Basin - 200 Acre Industrial Site ADDRESS: Miki Road & Kaumalapau Highway Lanai City, HI 96763 LAT/LONG: 20.7904 / -156.9375	CLIENT: TRC CONTACT: Ron Landolt INQUIRY#: 3875991.4 RESEARCH DATE: 03/10/2014

Miki Basin - 200 Acre Industrial Site
Miki Road & Kaumalapau Highway
Lanai City, HI 96763

Inquiry Number: 3875991.5
March 11, 2014

The EDR-City Directory Image Report

EDR® Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

REF-356

TABLE OF CONTENTS

SECTION

Executive Summary

Findings

City Directory Images

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Disclaimer - Copyright and Trademark Notice

This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. **NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OR DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT.** Purchaser accepts this Report "AS IS". Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction orforecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2013 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc. or its affiliates is prohibited without prior written permission.

EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.

EXECUTIVE SUMMARY

DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Report is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Report includes a search of available city directory data at 5 year intervals.

RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. A check mark indicates where information was identified in the source and provided in this report.

Year	Target Street	Cross Street	Source
2013	☑	☐	Cole Information Services
2008	☐	☐	Cole Information Services
2003	☐	☐	Cole Information Services
1999	☑	☐	Cole Information Services
1997	☑	☐	Polk's City Directory

RECORD SOURCES

EDR is licensed to reproduce certain City Directory works by the copyright holders of those works. The purchaser of this EDR City Directory Report may include it in report(s) delivered to a customer. Reproduction of City Directories without permission of the publisher or licensed vendor may be a violation of copyright.

REF-357

FINDINGS

TARGET PROPERTY STREET

Miki Road & Kaumalapau Highway
Lanai City, HI 96763

Year	CD Image	Source	
KAUMALAPAU HWY			
2013	pg A1	Cole Information Services	
2008	-	Cole Information Services	Target and Adjoining not listed in Source
2003	-	Cole Information Services	Target and Adjoining not listed in Source
1999	pg A2	Cole Information Services	
1997	pg A3	Polk's City Directory	
MIKI RD			
2013	-	Cole Information Services	Street not listed in Source
2008	-	Cole Information Services	Street not listed in Source
2003	-	Cole Information Services	Street not listed in Source
1999	-	Cole Information Services	Street not listed in Source
1997	-	Polk's City Directory	Street not listed in Source

FINDINGS

CROSS STREETS

No Cross Streets Identified

REF-358

City Directory Images

Target Street	Cross Street	Source
✓	-	Cole Information Services

KAUMALAPAU HWY 2013

1	LANAI OIL COMPANY INC
	LANAI TRUCKING INC
	STATE OF HAWAII GOVERNMENT
7008	JOSEPH KAAKUA

REF-359

Target Street	Cross Street	Source
✓	-	Cole Information Services

KAUMALAPAU HWY 1999

7 DANIEL KAOPUIKI
9 TODD CARLOS

Target Street	Cross Street	Source
✓	-	Polk's City Directory

KAUMALAPAU HWY 1997

424 Emberson Coco..... 335-5790
Emberson Ian..... 335-5790
437 Carveiro Charles..... 335-5778
439 Silva Ben G..... 335-5390

HOUSEHOLDS 29

KAUMALAPAU HWY *(LC)* **96763**

Kimokeo Alfred..... 565-6614
7 Kaopuiki Daniel Jr..... 565-6856
9 Carlos Todd..... 565-7644
46 Kaaikala Bruce..... 565-7673
Kaaikala Robin..... 565-7673
Smith Florence..... 565-7673
Smith Roy..... 565-7673

HOUSEHOLDS 7

KAUMALII HWY *(KH)* **96741**

2-2436 DR STANLEY
SCHILLER..... 332-7338
224948 SCOTT
SHIMABUKURO DR 332-7088

REF-360

Miki Basin - 200 Acre Industrial Site
Miki Road & Kaumalapau Highway
Lanai City, HI 96763

Inquiry Number: 3875991.3
March 10, 2014

Certified Sanborn® Map Report

6 Armstrong Road, 4th Floor
Shelton, Connecticut 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

3/10/14

Site Name:	Client Name:
Miki Basin - 200 Acre Industrial	TRC
Miki Road & Kaumalapau	7600 N. 16th Street
Lanai City, HI 96763	Phoenix, AZ 85020
EDR Inquiry # 3875991.3	Contact: Ron Landolt

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by TRC were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Site Name: Miki Basin - 200 Acre Industrial Site
Address: Miki Road & Kaumalapau Highway
City, State, Zip: Lanai City, HI 96763
Cross Street:
P.O. # 215880
Project: Miki Basin - 200 Acre Site
Certification # CF60-4983-A50E

Sanborn® Library search results
Certification # CF60-4983-A50E

UNMAPPED PROPERTY
This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ✔ Library of Congress
- ✔ University Publications of America
- ✔ EDR Private Collection

The Sanborn Library LLC Since 1866™

Limited Permission To Make Copies

TRC (the client) is permitted to make up to FIVE photocopies of this Sanborn Map transmittal and each fire insurance map accompanying this report solely for the limited use of its customer. No one other than the client is authorized to make copies. Upon request made directly to an EDR Account Executive, the client may be permitted to make a limited number of additional photocopies. This permission is conditioned upon compliance by the client, its customer and their agents with EDR's copyright policy; a copy of which is available upon request.

Disclaimer - Copyright and Trademark notice

This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OF DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT. Purchaser accepts this Report "AS IS". Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2014 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc., or its affiliates, is prohibited without prior written permission.

EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.

REF-361

Miki Basin - 200 Acre Industrial Site
Miki Road & Kaumalapau Highway
Lanai City, HI 96763

Inquiry Number: 3875991.10
March 14, 2014

EDR Environmental Lien and AUL Search

EDR® Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

EDR Environmental Lien and AUL Search

The EDR Environmental Lien and AUL Search Report provides results from a search of available current land title records for environmental cleanup liens and other activity and use limitations, such as engineering controls and institutional controls.

A network of professional, trained researchers, following established procedures, uses client supplied address information to:

- search for parcel information and/or legal description;
- search for ownership information;
- research official land title documents recorded at jurisdictional agencies such as recorders' offices, registries of deeds, county clerks' offices, etc.;
- access a copy of the deed;
- search for environmental encumbering instrument(s) associated with the deed;
- provide a copy of any environmental encumbrance(s) based upon a review of key words in the instrument(s) (title, parties involved, and description); and
- provide a copy of the deed or cite documents reviewed.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Disclaimer - Copyright and Trademark Notice

This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. **NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OR DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT.** Purchaser accepts this Report "AS IS". Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction orforecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2013 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc. or its affiliates is prohibited without prior written permission.

EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.

REF-362

EDR Environmental Lien and AUL Search

TARGET PROPERTY INFORMATION

ADDRESS

Miki Road & Kaumalapau Highway
Miki Basin - 200 Acre Industrial Site
Lanai City, HI 96763

RESEARCH SOURCE

Source 1:
Maui County Clerk
Maui, HI

PROPERTY INFORMATION

Deed 1:

Type of Deed:	Limited Warranty Deed
Title is vested in:	Castle & Cooke Resorts, LLC
Title received from:	Castle & Cooke, Inc
Deed Dated	6/22/2012
Deed Recorded:	6/22/2012
Book:	NA
Page:	NA
Volume:	NA
Instrument:	T-8208437
Docket:	NA
Land Record Comments:	see exhibit
Miscellaneous Comments:	see exhibit
Legal Description:	see exhibit
Legal Current Owner:	Castle & Cooke Resorts, LLC
Parcel # / Property Identifier:	4-9-002-001
Comments:	see exhibit

Deed 2:

Type of Deed:	Limited Warranty Deed
Title is vested in:	Castle & Cooke Resorts, LLC
Title received from:	Castle & Cooke, Inc
Deed Dated	6/22/2012
Deed Recorded:	6/22/2012
Book:	NA
Page:	NA
Volume:	NA
Instrument:	T-8208436
Docket:	NA
Land Record Comments:	see exhibit
Miscellaneous Comments:	NA
Legal Description:	see exhibit
Legal Current Owner:	Castle & Cooke Resorts, LLC
Parcel # / Property Identifier:	4-9-002-001
Comments:	see exhibit

EDR Environmental Lien and AUL Search

Deed 3:

Type of Deed:	Limited Warranty Deed
Title is vested in:	Castle & Cooke Resorts, LLC
Title received from:	Castle & Cooke, Inc
Deed Dated	6/22/2012
Deed Recorded:	6/22/2012
Book:	NA
Page:	NA
Volume:	NA
Instrument:	T-8208438
Docket:	NA
Land Record Comments:	see exhibit
Miscellaneous Comments:	NA
Legal Description:	see exhibit
Legal Current Owner:	Castle & Cooke Resorts, LLC
Parcel # / Property Identifier:	4-9-002-001
Comments:	see exhibit

ENVIRONMENTAL LIEN

Environmental Lien: Found ☐ Not Found ☒

OTHER ACTIVITY AND USE LIMITATIONS (AULs)

AULs: Found ☐ Not Found ☒

Deed Exhibit 1

STATE OF HAWAII
OFFICE OF ASSISTANT REGISTRAR
RECORDED
June 22, 2012 3:29 PM
Doc No(s) T-8208437
on Cert(s) 469176
Issuance of Cert(s) 1044094

/s/ NICKI ANN THOMPSON
ASSISTANT REGISTRAR

1 1/1 CHC
B-32082897

Conveyance Tax: $32888.80

LAND COURT SYSTEM | REGULAR SYSTEM

Return by Mail ( ) Pickup (X)To:

Castle & Cooke, Inc.

C. Kurasaki Ph: 548-2909

Total Pages 6

Tax Map Key No.: (2) 4-9-002-001 portion

LIMITED WARRANTY DEED

THIS LIMITED WARRANTY DEED is made as of June 22, 2012, by **CASTLE & COOKE, INC.**, a Hawaii corporation, hereinafter called the "**Grantor,**" in favor of **CASTLE & COOKE RESORTS, LLC**, a Hawaii limited liability company whose address is 680 Iwilei Rd., Suite 510, Honolulu, Hawaii 96817, hereinafter called the "**Grantee.**"

W I T N E S S E T H:

That for Ten Dollars ($10.00) and other good and valuable consideration paid by the Grantee, the receipt of which is hereby acknowledged, the Grantor does hereby grant, bargain, sell and convey unto the Grantee, as tenant in severalty, all of the property more particularly described in **Exhibit A** attached hereto and made a part hereof;

3916637.3
6/22/12

REF-364

And the reversions, remainders, rents, issues and profits thereof and all of the estate, right, title and interest of the Grantor, both at law and in equity, therein and thereto, including but not limited to, if any, water, minerals, metals and geothermal resources;

TO HAVE AND TO HOLD the same, together with all buildings, improvements, rights, easements, privileges and appurtenances thereon and thereto belonging or appertaining or held and enjoyed therewith, unto the Grantee according to the tenancy herein set forth, forever.

AND, in consideration of the premises, the Grantor does hereby covenant with the Grantee that the Grantor is lawfully seised in fee simple of the property herein described (the "Property") and has good right to sell and convey the Property; that the Property is free and clear of all encumbrances made or suffered by the Grantor, except as set forth in **Exhibit A** and except for the lien of real property taxes not yet by law required to be paid; and that the Grantor shall WARRANT AND DEFEND the foregoing against the lawful claims of all persons claiming by, through, or under the Grantor, unto the Grantee and the Grantee's successors and assigns, forever.

AND the Grantor quitclaims to the Grantee all rights, title and interests reserved, granted or acquired by the Grantor or its predecessors in interest with respect to land owned by others on the island of Lanai, including but not limited to, if any, rights and interests with respect to easements, rights of way, access, water, minerals, metals, geothermal resources, and restrictive covenants.

The rights and obligations of the Grantor and the Grantee shall be binding upon and inure to the benefit of their respective estates, heirs, personal representatives, successors, successors in trust, and assigns. The conveyance herein set forth and the warranties of the Grantor concerning the same are expressly declared to be in favor of the Grantee, and the Grantee's heirs, personal representatives, successors, successors in trust and assigns.

The terms **"Grantor"** and **"Grantee,"** as and when used herein, or any pronouns used in place thereof, shall mean and include the masculine or feminine, the singular or plural number, individuals or corporations, limited liability companies or partnerships, and their and each of their respective, heirs, personal representatives, successors, successors in trust, and assigns, according to the context thereof.

This Deed is being made as a part of a larger sale of assets by the Grantor relating to the island of Lanai through which the Grantor is receiving consideration for this Deed by the transfer of assets from the Grantee and additional value from the Grantee and its affiliates.

IN WITNESS WHEREOF, the Grantor has executed these presents as of the day and year first above written.

CASTLE & COOKE, INC., a Hawaii corporation

By: _____
Name: HARRY A. SAUNDERS
Title: Senior Vice President

By: _____
Name: RICHARD K. MIRIKITANI
Title: Vice President & Assistant Secretary

Grantor

REF-365

STATE OF HAWAII)
) SS.
CITY AND COUNTY OF HONOLULU)

On June 21, 2012, before me personally appeared HARRY A. SAUNDERS and RICHARD K. MIRIKITANI, to me personally known, who, being by me duly sworn or affirmed, did say that such persons executed this 6 -page Limited Warranty Deed undated at time of notarization, in the First Circuit of the State of Hawaii, as the free act and deed of such persons, and if applicable in the capacity shown, having been duly authorized to execute such instrument in such capacity.

Rhonda Biffle

Print Name: Rhonda Biffle
Notary Public, State of Hawaii

My commission expires: Aug. 3, 2012

RHONDA BIFFLE NOTARY PUBLIC No. 08-271 STATE OF HAWAII

EXHIBIT A

ALL OF THAT CERTAIN PARCEL OF LAND SITUATE ON THE ISLAND OF LANAI, COUNTY OF MAUI, STATE OF HAWAII, DESCRIBED AS FOLLOWS:

LOT 13-A-1-A, AREA 17,113.987 ACRES, MORE OR LESS, (DEDUCTING THEREFROM THE FOLLOWING LOTS OF LAND COURT APPLICATION 862:

LOT E-2-A-1-A-1-B,
LOT E-2-A-1-A-1-D,
LOT E-2-A-1-A-1-F,
LOT E-2-A-1-A-1-G,
LOT E-2-A-1-A-1-H AND
LOT E-2-A-1-A-1-J, AS SHOWN ON MAP 13;

LOT 35, AS SHOWN ON MAP 19;

LOT 37, AS SHOWN ON MAP 20;

LOT 44 AND 45, AS SHOWN ON MAP 21;

LOTS 724 TO 731, INCLUSIVE AND
LOTS 733 TO 743, INCLUSIVE, AS SHOWN ON MAP 48;

LOTS 746 TO 751, INCLUSIVE, AS SHOWN ON MAP 60;

EXCLUSIONS 13, 17, 18, 26 AND 36 AS SHOWN ON MAP 3;
AND ALL EXISTING GOVERNMENT ROADS
AND ALSO THE FOLLOWING LOTS OF LAND COURT CONSOLIDATION NO. 170; LOTS 12 AS SHOWN ON MAP 5; AND
LOTS 13-B TO 13-G, INCLUSIVE, AS SHOWN ON MAP 6; CONTAINING AN AREA OF 889.799 ACRES, MORE OR LESS),

AND CONTAINING A NET AREA OF 16,224.188 ACRES, MORE OR LESS, AS SHOWN ON MAP 15, FILED WITH LAND COURT CONSOLIDATION NO. 170 OF CASTLE & COOKE, INC.

TOGETHER WITH PERPETUAL RIGHTS AND EASEMENTS AS SET FORTH BY LAND COURT ORDER NO. 132974, FILED OCTOBER 12, 1998, AS FOLLOWS:

(A) PERPETUAL RIGHT AND EASEMENTS TO BUILD, CONSTRUCT, INSTALL, MAINTAIN, OPERATE, REPAIR AND/OR REPLACE POLE AND WIRE LINES OR UNDERGROUND LINES FOR POWER AND COMMUNICATIONS; UNDERGROUND WATER PIPELINES, INCLUDING FIRE HYDRANTS AND VALVES; UNDERGROUND CONCRETE AND/OR CORRUGATED IRON STRUCTURES FOR PURPOSES OF DRAINAGE AND IRRIGATION; AND UNDERGROUND SEWER
LINES;

(B) PERPETUAL RIGHT AND EASEMENTS TO INSTALL, CONSTRUCT, LAY, MAINTAIN, REPAIR, REMOVE AND/OR REPLACE AN UNDERGROUND WATER PIPELINE OR PIPELINES ALONG, ACROSS, THROUGH AND UNDER LOTS 482-B, 553-B, 303-B, 549, 551-C AND 561-A, TOGETHER WITH THE RIGHT OF ACCESS FROM TIME TO TIME FOR THE PURPOSE AFORESAID; PROVIDED, HOWEVER, AND THIS RESERVATION IS ON THE CONDITION THAT, IF SAID EASEMENTS ARE NOT USED FOR THE AFORESAID PURPOSE AT ANY TIME FOR A PERIOD OF TWO (2) CONSECUTIVE YEARS, THEN THE SAME SHALL CEASE AND TERMINATE, AS RESERVED IN DEEDS, DATED DECEMBER 1, 1961, DECEMBER 1, 1961, JANUARY 30, 1962, JULY 27, 1962, APRIL 20, 1964 AND APRIL 20, 1964, FILED AS DOCUMENT NOS. 282714, 282715, 286951, 293717, 329739 AND 329740, RESPECTIVELY; AND

BEING LAND(S) DESCRIBED IN TRANSFER CERTIFICATE OF TITLE NO. 469,176
ISSUED TO: CASTLE & COOKE, INC., A HAWAII CORPORATION.

SUBJECT, HOWEVER, TO:

1. All encumbrances of record. (But no admission is made herein that such encumbrances are valid)

2. All customary and traditional rights, of native Hawaiians as provided for by the law of the State of Hawaii, for subsistence, cultural and religious purposes, which rights may involve access to the subject property.

Deed Exhibit 2

STATE OF HAWAII
OFFICE OF ASSISTANT REGISTRAR
RECORDED
June 22, 2012 3:29 PM
Doc No(s) T-8208436
on Cert(s) 486655
Issuance of Cert(s) 1044093

/s/ NICKI ANN THOMPSON
ASSISTANT REGISTRAR

1 1/1 CHC
B-32082893

Conveyance Tax: $61513.20

LAND COURT SYSTEM | REGULAR SYSTEM

Return by Mail ( ) Pickup (X)To:

Castle & Cooke, Inc.

C. Kurasaki Ph: 548-2909

Total Pages 6

Tax Map Key No.: (2) 4-9-002-001 portion

LIMITED WARRANTY DEED

THIS LIMITED WARRANTY DEED is made as of June 22, 2012, by **CASTLE & COOKE, INC.**, a Hawaii corporation, hereinafter called the "**Grantor**," in favor of **CASTLE & COOKE RESORTS, LLC**, a Hawaii limited liability company whose address is 680 Iwilei Rd., Suite 510, Honolulu, Hawaii 96817, hereinafter called the "**Grantee**."

WITNESSETH:

That for Ten Dollars ($10.00) and other good and valuable consideration paid by the Grantee, the receipt of which is hereby acknowledged, the Grantor does hereby grant, bargain, sell and convey unto the Grantee, as tenant in severalty, all of the property more particularly described in **Exhibit A** attached hereto and made a part hereof;

And the reversions, remainders, rents, issues and profits thereof and all of the estate, right, title and interest of the Grantor, both at law and in equity, therein and thereto, including but not limited to, if any, water, minerals, metals and geothermal resources;

TO HAVE AND TO HOLD the same, together with all buildings, improvements, rights, easements, privileges and appurtenances thereon and thereto belonging or appertaining or held and enjoyed therewith, unto the Grantee according to the tenancy herein set forth, forever.

AND, in consideration of the premises, the Grantor does hereby covenant with the Grantee that the Grantor is lawfully seised in fee simple of the property herein described (the "Property") and has good right to sell and convey the Property; that the Property is free and clear of all encumbrances made or suffered by the Grantor, except as set forth in **Exhibit A** and except for the lien of real property taxes not yet by law required to be paid; and that the Grantor shall WARRANT AND DEFEND the foregoing against the lawful claims of all persons claiming by, through, or under the Grantor, unto the Grantee and the Grantee's successors and assigns, forever.

AND the Grantor quitclaims to the Grantee all rights, title and interests reserved, granted or acquired by the Grantor or its predecessors in interest with respect to land owned by others on the island of Lanai, including but not limited to, if any, rights and interests with respect to easements, rights of way, access, water, minerals, metals, geothermal resources, and restrictive covenants.

The rights and obligations of the Grantor and the Grantee shall be binding upon and inure to the benefit of their respective estates, heirs, personal representatives, successors, successors in trust, and assigns. The conveyance herein set forth and the warranties of the Grantor concerning the same are expressly declared to be in favor of the Grantee, and the Grantee's heirs, personal representatives, successors, successors in trust and assigns.

The terms "**Grantor**" and "**Grantee**," as and when used herein, or any pronouns used in place thereof, shall mean and include the masculine or feminine, the singular or plural number, individuals or corporations, limited liability companies or partnerships, and their and each of their respective, heirs, personal representatives, successors, successors in trust, and assigns, according to the context thereof.

This Deed is being made as a part of a larger sale of assets by the Grantor relating to the island of Lanai through which the Grantor is receiving consideration for this Deed by the transfer of assets from the Grantee and additional value from the Grantee and its affiliates.

REF-368

IN WITNESS WHEREOF, the Grantor has executed these presents as of the day and year first above written.

CASTLE & COOKE, INC., a Hawaii corporation

By: _____
Name: HARRY A. SAUNDERS
Title: Senior Vice President

By: _____
Name: RICHARD K. MIRIKITANI
Title: Vice President & Assistant Secretary

Grantor

STATE OF HAWAII)
) SS.
CITY AND COUNTY OF HONOLULU)

On June 21, 2012, before me personally appeared HARRY A. SAUNDERS and RICHARD K. MIRIKITANI, to me personally known, who, being by me duly sworn or affirmed, did say that such persons executed this 6 -page Limited Warranty Deed undated at time of notarization, in the First Circuit of the State of Hawaii, as the free act and deed of such persons, and if applicable in the capacity shown, having been duly authorized to execute such instrument in such capacity.

_____

Print Name: Rhonda Biffle
Notary Public, State of Hawaii

My commission expires: Aug. 3, 2012

RHONDA BIFFLE NOTARY PUBLIC No. 08-271 STATE OF HAWAII

REF-369

EXHIBIT A

ALL OF THOSE CERTAIN PARCELS OF LAND SITUATE ON THE ISLAND OF LANAI, COUNTY OF MAUI, STATE OF HAWAII, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

LOT 1, NET AREA 69,269.977 ACRES, MORE OR LESS, AS SHOWN ON MAP 1, FILED WITH LAND COURT CONSOLIDATION NO. 189 OF CASTLE & COOKE, INC., EXCEPTING ANY PORTION OF THE LAND CREATED BY ACCRETION AND ALSO ANY PORTION LYING BELOW THE SHORELINE AS DEFINED BY HAWAII LAW AND/OR CERTIFIED BY THE STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES.

TOGETHER WITH:

(A) A PERPETUAL RIGHT AND EASEMENTS TO BUILD, CONSTRUCT, INSTALL, MAINTAIN, OPERATE, REPAIR AND/OR REPLACE POLE AND WIRE LINES OR UNDERGROUND LINES FOR POWER AND COMMUNICATIONS; UNDERGROUND WATER PIPELINES, INCLUDING FIRE HYDRANTS AND VALVES; UNDERGROUND CONCRETE AND/OR CORRUGATED IRON STRUCTURES FOR PURPOSES OF DRAINAGE AND IRRIGATION; AND UNDERGROUND SEWER LINES;

(B) A PERPETUAL RIGHT AND EASEMENTS TO INSTALL, CONSTRUCT, LAY, MAINTAIN, REPAIR, REMOVE AND/OR REPLACE AN UNDERGROUND WATER PIPELINE OR PIPELINES ALONG, ACROSS, THROUGH AND UNDER LOTS 482-B, 553-B, 303-B, 549, 551-C AND 561-A, TOGETHER WITH THE RIGHT OF ACCESS FROM TIME TO TIME FOR THE PURPOSE AFORESAID; PROVIDED, HOWEVER, AND THIS RESERVATION IS ON THE CONDITION THAT, IF SAID EASEMENTS ARE NOT USED FOR THE AFORESAID PURPOSE AT ANY TIME FOR A PERIOD OF TWO (2) CONSECUTIVE YEARS, THEN THE SAME SHALL CEASE AND TERMINATE, AS RESERVED IN DEEDS, DATED DECEMBER 1, 1961, DECEMBER 1, 1961, JANUARY 30, 1962, JULY 27, 1962, APRIL 20, 1964 AND APRIL 20, 1964, FILED AS LAND COURT DOCUMENT NOS. 282714, 282715, 286951, 293717, 329739 AND 329740, RESPECTIVELY; AND

(C) AN ACCESS ACROSS EASEMENT 1, AS SHOWN ON MAP 1 OF LAND COURT CONSOLIDATION NO. 189, AS SET FORTH BY LAND COURT ORDER NO. 126719, FILED JANUARY 22, 1997.

BEING LAND(S) DESCRIBED IN TRANSFER CERTIFICATE OF TITLE NO. 486,655 ISSUED TO CASTLE & COOKE, INC., A HAWAII CORPORATION.

SUBJECT, HOWEVER, TO:

1. All encumbrances of record. (But no admission is made herein that such encumbrances are valid)

2. All customary and traditional rights, of native Hawaiians as provided for by the law of the State of Hawaii, for subsistence, cultural and religious purposes, which rights may involve access to the subject property.

Deed Exhibit 3

STATE OF HAWAII
OFFICE OF ASSISTANT REGISTRAR
RECORDED
June 22, 2012 3:29 PM
Doc No(s) T-8208438
on Cert(s) AS LISTED HEREIN
Issuance of Cert(s) 1044095 - 1044101

/s/ NICKI ANN THOMPSON
ASSISTANT REGISTRAR

1 1/1 CHC
B-32082906

Conveyance Tax: $1860.80

LAND COURT SYSTEM | REGULAR SYSTEM

Return by Mail ( ) Pickup (X)To:

Castle & Cooke, Inc.

C. Kurasaki Ph: 548-2909

Total Pages 12

Tax Map Key No.: (2) 4-9-002-001 portion

LIMITED WARRANTY DEED

THIS LIMITED WARRANTY DEED is made as of June 22, 2012, by **CASTLE & COOKE, INC.**, a Hawaii corporation, hereinafter called **the "Grantor,"** in favor of **CASTLE & COOKE RESORTS, LLC,** a Hawaii limited liability company whose address is 680 Iwilei Rd., Suite 510, Honolulu, Hawaii 96817, hereinafter called the **"Grantee."**

W I T N E S S E T H:

That for Ten Dollars ($10.00) and other good and valuable consideration paid by the Grantee, the receipt of which is hereby acknowledged, the Grantor does hereby grant, bargain, sell and convey unto the Grantee, as tenant in severalty, all of the property more particularly described in **Exhibit A** attached hereto and made a part hereof;

3916637.3
6/22/12

REF-371

And the reversions, remainders, rents, issues and profits thereof and all of the estate, right, title and interest of the Grantor, both at law and in equity, therein and thereto, including but not limited to, if any, water, minerals, metals and geothermal resources;

TO HAVE AND TO HOLD the same, together with all buildings, improvements, rights, easements, privileges and appurtenances thereon and thereto belonging or appertaining or held and enjoyed therewith, unto the Grantee according to the tenancy herein set forth, forever.

AND, in consideration of the premises, the Grantor does hereby covenant with the Grantee that the Grantor is lawfully seised in fee simple of the property herein described (the "Property") and has good right to sell and convey the Property; that the Property is free and clear of all encumbrances made or suffered by the Grantor, except as set forth in **Exhibit A** and except for the lien of real property taxes not yet by law required to be paid; and that the Grantor shall WARRANT AND DEFEND the foregoing against the lawful claims of all persons claiming by, through, or under the Grantor, unto the Grantee and the Grantee's successors and assigns, forever.

AND the Grantor quitclaims to the Grantee all rights, title and interests reserved, granted or acquired by the Grantor or its predecessors in interest with respect to land owned by others on the island of Lanai, including but not limited to, if any, rights and interests with respect to easements, rights of way, access, water, minerals, metals, geothermal resources, and restrictive covenants.

The rights and obligations of the Grantor and the Grantee shall be binding upon and inure to the benefit of their respective estates, heirs, personal representatives, successors, successors in trust, and assigns. The conveyance herein set forth and the warranties of the Grantor concerning the same are expressly declared to be in favor of the Grantee, and the Grantee's heirs, personal representatives, successors, successors in trust and assigns.

The terms "**Grantor**" and "**Grantee**," as and when used herein, or any pronouns used in place thereof, shall mean and include the masculine or feminine, the singular or plural number, individuals or corporations, limited liability companies or partnerships, and their and each of their respective, heirs, personal representatives, successors, successors in trust, and assigns, according to the context thereof.

This Deed is being made as a part of a larger sale of assets by the Grantor relating to the island of Lanai through which the Grantor is receiving consideration for this Deed by the transfer of assets from the Grantee and additional value from the Grantee and its affiliates.

IN WITNESS WHEREOF, the Grantor has executed these presents as of the day and year first above written.

CASTLE & COOKE, INC., a Hawaii corporation

By: _____
Name: HARRY A. SAUNDERS
Title: Senior Vice President

By: _____
Name: RICHARD K. MIRIKITANI
Title: Vice President & Assistant Secretary

Grantor

REF-372

STATE OF HAWAII)
) SS.
CITY AND COUNTY OF HONOLULU)

On June 21, 2012, before me personally appeared HARRY A. SAUNDERS and RICHARD K. MIRIKITANI, to me personally known, who, being by me duly sworn or affirmed, did say that such persons executed this 12 -page Limited Warranty Deed undated at time of notarization, in the First Circuit of the State of Hawaii, as the free act and deed of such persons, and if applicable in the capacity shown, having been duly authorized to execute such instrument in such capacity.

Rhonda Biffle

Print Name: Rhonda Biffle
Notary Public, State of Hawaii

My commission expires: Aug. 3, 2012

RHONDA BIFFLE NOTARY PUBLIC No. 08-271 STATE OF HAWAII

EXHIBIT A

ITEM ONE:

ALL OF THOSE CERTAIN PARCELS OF LAND SITUATE ON THE ISLAND OF LANAI, COUNTY OF MAUI, STATE OF HAWAII, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

LOT 1-A-2, AREA 0.5550 ACRE, MORE OR LESS,

LOT 1-A-3, AREA 0.5530 ACRE, MORE OR LESS, AND

LOT 1-B-1-B, AREA 8.3619 ACRES, MORE OR LESS.

AS SHOWN ON MAP 6, FILED WITH LAND COURT APPLICATION NO. 590 OF HAWAIIAN PINEAPPLE COMPANY, LIMITED.

BEING LAND(S) DESCRIBED IN TRANSFER CERTIFICATE OF TITLE NO. 469,169 ISSUED TO CASTLE & COOKE, INC., A HAWAII CORPORATION.

SUBJECT, HOWEVER, TO:

1. All encumbrances of record. (But no admission is made herein that such encumbrances are valid)

2. All customary and traditional rights, of native Hawaiians as provided for by the law of the State of Hawaii, for subsistence, cultural and religious purposes, which rights may involve access to the subject property.

ITEM TWO:

ALL OF THOSE CERTAIN PARCELS OF LAND SITUATE ON THE ISLAND OF LANAI, COUNTY OF MAUI, STATE OF HAWAII, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

LOT B-1-A, AREA 160.971 ACRES, MORE OR LESS, -

LOT B-1-B, AREA .032 ACRE, MORE OR LESS,

REF-373

LOT B-3-A, AREA 6.059 ACRES, MORE OR LESS, AND

LOT B-3-B, AREA 5.668 ACRES, MORE OR LESS,

AS SHOWN ON MAP 5 FILED WITH LAND COURT APPLICATION NO. 635 OF HAWAIIAN PINEAPPLE COMPANY, LIMITED.

BEING LAND(S) DESCRIBED IN TRANSFER CERTIFICATE OF TITLE NO. 469,170 ISSUED TO CASTLE & COOKE, INC., A HAWAII CORPORATION.

SUBJECT, HOWEVER, TO:

1. All encumbrances of record. (But no admission is made herein that such encumbrances are valid)

2. All customary and traditional rights, of native Hawaiians as provided for by the law of the State of Hawaii, for subsistence, cultural and religious purposes, which rights may involve access to the subject property.

ITEM THREE:

ALL OF THAT CERTAIN PARCEL OF LAND SITUATE ON THE ISLAND OF LANAI, COUNTY OF MAUI, STATE OF HAWAII, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

LOT APANA 1, AREA 133.45 ACRES, MORE OR LESS, AS SHOWN ON MAP 1,

LOT 2, AREA 0.67 ACRES, MORE OR LESS, AS SHOWN ON MAP 3, AND

LOT 1-A, AREA 102.381 ACRES, MORE OR LESS, AS SHOWN ON MAP 4,

FILED WITH LAND COURT APPLICATION NO. 786 OF HAWAIIAN PINEAPPLE COMPANY, LIMITED.

BEING LAND(S) DESCRIBED IN TRANSFER CERTIFICATE OF TITLE NO. 469,171 ISSUED TO CASTLE & COOKE, INC., A HAWAII CORPORATION.

SUBJECT, HOWEVER, TO:

1. All encumbrances of record. (But no admission is made herein that such encumbrances are valid)

2. All customary and traditional rights, of native Hawaiians as provided for by the law of the State of Hawaii, for subsistence, cultural and religious purposes, which rights may involve access to the subject property.

ITEM FOUR:

ALL OF THOSE CERTAIN PARCELS OF LAND SITUATE ON THE ISLAND OF LANAI, COUNTY OF MAUI, STATE OF HAWAII, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

LOT 1, AREA 3.364 ACRES, MORE OR LESS,
LOT 2, AREA 35.02 ACRES, MORE OR LESS,
LOT 3, AREA 4.98 ACRES, MORE OR LESS,
LOT 4, AREA 2.51 ACRES, MORE OR LESS,
LOT 5, AREA 0.497 ACRE, MORE OR LESS,
LOT 7, AREA 0.595 ACRE, MORE OR LESS,
LOT 8, AREA 8.47 ACRE, MORE OR LESS,
LOT 9, AREA 0.285 ACRE, MORE OR LESS,
LOT 10, AREA 0.394 ACRE, MORE OR LESS,
LOT 11, AREA 0.658 ACRE, MORE OR LESS,
LOT 12, AREA 0.284 ACRE, MORE OR LESS,
LOT 14, AREA 0.028 ACRE, MORE OR LESS,
LOT 15, AREA 3.66 ACRES, MORE OR LESS,
LOT 16, AREA 0.612 ACRE, MORE OR LESS,
LOT 17, AREA 0.102 ACRE, MORE OR LESS,
LOT 18, AREA 0.246 ACRE, MORE OR LESS,
LOT 19, AREA 3.13 ACRES, MORE OR LESS,
LOT 20, AREA 30.05 ACRES, MORE OR LESS,
LOT 21, AREA 9.08 ACRES, MORE OR LESS,
LOT 22, AREA 2.08 ACRES, MORE OR LESS,
LOT 23-B, AREA 3.816 ACRES, MORE OR LESS,
LOT 24, AREA 1.00 ACRE, MORE OR LESS,
LOT 25, AREA 1.41 ACRES, MORE OR LESS,
LOT 26, AREA 7.83 ACRES, MORE OR LESS,
LOT 27, AREA 15.70 ACRES, MORE OR LESS,
LOT 28, AREA 46.20 ACRES, MORE OR LESS, AS SHOWN ON MAPS 1 AND 2, AND

LOT 29-A, AREA 1.107 ACRES, MORE OR LESS,
LOT 30-A, AREA 0.175 ACRE, MORE OR LESS, AND

LOT 30-C, AREA 0.254 ACRE, MORE OR LESS, AS SHOWN ON MAP 3,

LOT 31, AREA 0.524 ACRE, AS SHOWN ON MAPS 1 AND 2, AND

LOT 32-B, AREA 0.322 ACRE, MORE OR LESS, AS SHOWN ON MAP 3,

FILED WITH LAND COURT APPLICATION NO. 1590 (AMENDED) OF HAWAIIAN PINEAPPLE COMPANY, LIMITED.

BEING LAND(S) DESCRIBED IN TRANSFER CERTIFICATE OF TITLE NO. 469,172 ISSUED TO CASTLE & COOKE, INC., A HAWAII CORPORATION.

SUBJECT, HOWEVER, TO:

1. All encumbrances of record. (But no admission is made herein that such encumbrances are valid)

2. All customary and traditional rights, of native Hawaiians as provided for by the law of the State of Hawaii, for subsistence, cultural and religious purposes, which rights may involve access to the subject property.

ITEM FIVE:

ALL OF THOSE CERTAIN PARCELS OF LAND SITUATE ON THE ISLAND OF LANAI, COUNTY OF MAUI, STATE OF HAWAII, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

LOT E-2-A-1-A-1-J, AREA 0.166 ACRE, MORE OR LESS, AS SHOWN ON MAP 13, AND

LOT 706, AREA 11,796 SQUARE FEET, MORE OR LESS,
LOT 707, AREA 561,449 SQUARE FEET, MORE OR LESS,
LOT 710, AREA 218,552 SQUARE FEET, MORE OR LESS,
LOT 712, AREA 244,677 SQUARE FEET, MORE OR LESS,
LOT 713, AREA 3,829 SQUARE FEET, MORE OR LESS,
LOT 729, AREA 1,173,239 SQUARE FEET, MORE OR LESS, AND
LOT 733, AREA 117,878 SQUARE FEET, MORE OR LESS,
AS SHOWN ON MAP 48,

FILED WITH LAND COURT APPLICATION NO. 862 (AMENDED) OF HAWAIIAN PINEAPPLE COMPANY, LIMITED.

TOGETHER WITH:

(A) A PERPETUAL RIGHT AND EASEMENTS TO BUILD, CONSTRUCT, INSTALL, MAINTAIN, OPERATE, REPAIR AND/OR REPLACE POLE AND WIRE LINES OR UNDERGROUND LINES FOR POWER AND COMMUNICATIONS; UNDERGROUND WATER PIPELINES, INCLUDING FIRE HYDRANTS AND VALVES; UNDERGROUND CONCRETE AND/OR CORRUGATED IRON STRUCTURES FOR PURPOSES OF DRAINAGE AND IRRIGATION; AND UNDERGROUND SEWER LINES UPON, ALONG, OVER, ACROSS, THROUGH AND/OR UNDER VARIOUS LOTS AND/OR PORTION OR PORTIONS THEREOF; AND

(B) A PERPETUAL RIGHT AND EASEMENTS TO INSTALL, CONSTRUCT, LAY, MAINTAIN, REPAIR, REMOVE AND/OR REPLACE AN UNDERGROUND WATER PIPELINE OR PIPELINES ALONG, ACROSS, THROUGH AND UNDER LOTS 482-B, 553-B, 303-B, 549, 551-C AND 561-A, TOGETHER WITH THE RIGHT OF ACCESS FROM TIME TO TIME FOR THE PURPOSE AFORESAID; PROVIDED, HOWEVER, AND THIS RESERVATION IS ON THE CONDITION THAT, IF SAID EASEMENTS ARE NOT USED FOR THE AFORESAID PURPOSE AT ANY TIME FOR A PERIOD OF TWO (2) CONSECUTIVE YEARS, THEN THE SAME SHALL CEASE AND TERMINATE, AS RESERVED IN DEEDS, DATED DECEMBER 1, 1961, DECEMBER 1, 1961, JANUARY 30, 1962, JULY 27, 1962, APRIL 20, 1964 AND APRIL 20, 1964, FILED AS LAND COURT DOCUMENT NOS. 282714, 282715, 286951, 293717, 329739 AND 329740, RESPECTIVELY.

BEING LAND(S) DESCRIBED IN TRANSFER CERTIFICATE OF TITLE NO. 469,174 ISSUED TO CASTLE & COOKE, INC., A HAWAII CORPORATION.

SUBJECT, HOWEVER, TO:

1. All encumbrances of record. (But no admission is made herein that such encumbrances are valid)

2. All customary and traditional rights, of native Hawaiians as provided for by the law of the State of Hawaii, for subsistence, cultural and religious purposes, which rights may involve access to the subject property.

ITEM SIX:

ALL OF THOSE CERTAIN PARCELS OF LAND SITUATE ON THE ISLAND OF

LANAI, COUNTY OF MAUI, STATE OF HAWAII, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

LOT 1-C-3, AREA 1.5001 ACRES, MORE OR LESS,

AS SHOWN ON MAP 6, FILED WITH LAND COURT APPLICATION NO. 590 OF HAWAIIAN PINEAPPLE COMPANY, LIMITED.

ALL OF THOSE CERTAIN PARCELS OF LAND SITUATE ON THE ISLAND OF LANAI, COUNTY OF MAUI, STATE OF HAWAII, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

LOT 44, AREA 3.816 ACRES, MORE OR LESS, AND
LOT 45, AREA .224 ACRE, MORE OR LESS, AS SHOWN ON MAP 21, AND

LOT 701, AREA .387 ACRE, MORE OR LESS,
LOT 703, AREA .551 ACRE, MORE OR LESS,
LOT 714, AREA .799 ACRE, MORE OR LESS,
LOT 716, AREA 3.132 ACRES, MORE OR LESS,
LOT 730, AREA .521 ACRE, MORE OR LESS, AND
LOT 735, AREA 1.136 ACRES, MORE OR LESS, AS SHOWN ON MAP 48,

FILED WITH LAND COURT APPLICATION NO. 862 (AMENDED) OF HAWAIIAN PINEAPPLE COMPANY, LIMITED.

TOGETHER WITH:

A PERPETUAL RIGHT AND EASEMENTS TO INSTALL, CONSTRUCT, LAY, MAINTAIN, REPAIR, REMOVE AND/OR REPLACE AN UNDERGROUND WATER PIPELINE OR PIPELINES ALONG, ACROSS, THROUGH AND UNDER LOTS 482-B, 553-B, 303-B, 549, 551-C AND 561-A, TOGETHER WITH THE RIGHT OF ACCESS FROM TIME TO TIME FOR THE PURPOSE AFORESAID; PROVIDED, HOWEVER, AND THIS RESERVATION IS ON THE CONDITION THAT, IF SAID EASEMENTS ARE NOT USED FOR THE AFORESAID PURPOSE AT ANY TIME FOR A PERIOD OF TWO (2) CONSECUTIVE YEARS, THEN THE SAME SHALL CEASE AND TERMINATE, AS RESERVED IN DEEDS, DATED DECEMBER 1, 1961, DECEMBER 1, 1961, JANUARY 30, 1962, JULY 27, 1962, APRIL 20, 1964 AND APRIL 20, 1964, FILED AS LAND COURT DOCUMENT NOS. 282714, 282715, 286951, 293717, 329739 AND 329740, RESPECTIVELY.

ALL OF THOSE CERTAIN PARCELS OF LAND SITUATE ON THE ISLAND OF LANAI, COUNTY OF MAUI, STATE OF HAWAII, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

LOT B-2-A, AREA 2.474 ACRES, MORE OR LESS,

LOT B-2-B, AREA .261 ACRE, MORE OR LESS, AND

LOT B-2-C, AREA .027 ACRE, MORE OR LESS,

AS SHOWN ON MAP 5 FILED WITH LAND COURT APPLICATION NO. 635 OF HAWAIIAN PINEAPPLE COMPANY, LIMITED.

BEING LAND(S) DESCRIBED IN TRANSFER CERTIFICATE OF TITLE NO. 469,175 ISSUED TO CASTLE & COOKE, INC., A HAWAII CORPORATION.

SUBJECT, HOWEVER, TO:

1. All encumbrances of record. (But no admission is made herein that such encumbrances are valid)

2. All customary and traditional rights, of native Hawaiians as provided for by the law of the State of Hawaii, for subsistence, cultural and religious purposes, which rights may involve access to the subject property.

ITEM SEVEN:

ALL OF THOSE CERTAIN PARCELS OF LAND SITUATE ON THE ISLAND OF LANAI, COUNTY OF MAUI, STATE OF HAWAII, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

LOT 1, AREA 13.547 ACRES, MORE OR LESS,

LOT 2, AREA 3.346 ACRES, MORE OR LESS,

LOT 3, AREA 3.785 ACRES, MORE OR LESS, AND

LOT 4, AREA 53.175 ACRES, MORE OR LESS,

AS SHOWN ON MAP 1, FILED WITH LAND COURT CONSOLIDATION NO. 190 OF CASTLE & COOKE, INC.

BEING LAND(S) DESCRIBED IN TRANSFER CERTIFICATE OF TITLE NO. 488,592 ISSUED TO CASTLE & COOKE, INC., A HAWAII CORPORATION.

NOTE: FINAL ORDER OF CONDEMNATION FOR A PORTION OF LOT 4, LAND COURT CONSOLIDATION 190, RECORDED AUGUST 28, 2000, LAND COURT DOCUMENT NO. 2646775.

SUBJECT, HOWEVER, TO:

1. All encumbrances of record. (But no admission is made herein that such encumbrances are valid)

2. All customary and traditional rights, of native Hawaiians as provided for by the law of the State of Hawaii, for subsistence, cultural and religious purposes, which rights may involve access to the subject property.

MISCELLANEOUS EXHIBITS

STATE OF HAWAII
OFFICE OF ASSISTANT REGISTRAR
RECORDED
October 2, 2012 1:00 PM
Doc No(s) T-8310375
on Cert(s) AS LISTED HEREIN
Issuance of Cert(s)

/s/ NICKI ANN THOMPSON
ASSISTANT REGISTRAR

1 1/1 SMC
B-32135836

LAND COURT SYSTEM | REGULAR SYSTEM

After Recordation, Return by ☒ Mail or ☐ Pick-up

Mark F. Ito, Esq.
SCHLACK ITO
745 Fort Street, Suite 1500
Honolulu, Hawaii 96813
Telephone: (808) 523-6045

Total Page(s): 8

PETITION FOR ORDER RE CHANGE OF NAME AND ORDER

Petitioner: Lanai Resorts, LLC (formerly known as Castle & Cooke Resorts, LLC)

Affects Certificate of Title Nos.: 468,683; 468,684; 468,685; 468,686; 468,687; 468,688; 468,689; 468,690; 468,691; 468,692; 468,693; 468,694; 468,695; 468,696; 468,697; 468,698; 468,700; 468,702; 506,384; 583,970; 633,767; 799,954; 812,328; 852,675; 987,393; 1,044,092; 1,044,093; 1,044,094; 1,044,095; 1,044,096; 1,044,097; 1,044,098; 1,044,099; 1,044,100 and 1,044,101

IN THE LAND COURT OF THE STATE OF HAWAII

1 L. D. CASE NO.12-1-3296

In the Matter of the Application

of

Various Applicants,

to register title to land situate at various locations in the State of Hawaii

Land Court Application Nos. 590, 635, 786, 862 and 1590 Consolidation Nos. 170, 189 and 190

2012 SEP 27 PM 2:14
FILED
KATHLEEN HANAWAHINE
REGISTRAR

PETITION FOR ORDER RE CHANGE OF NAME AND ORDER

Attorneys for Petitioner

MARK F. ITO 3692-0
SCHLACK ITO
A Limited Liability Law Company
745 Fort Street, Suite 1500
Honolulu, HI 96813
Telephone No.: (808) 523-6045

A TRUE COPY, ATTEST WITH THE SEAL OF SAID COURT.

JANNIS SHIROMA
Clerk

REF-378

IN THE LAND COURT OF THE STATE OF HAWAII

In the Matter of the Application of Various Applicants, to register title to land situate at various locations in the State of Hawaii	Land Court Application Nos. 590, 635, 786, 862 and 1590 Consolidation Nos. 170, 189 and 190

PETITION FOR ORDER RE CHANGE OF NAME AND ORDER

TO: THE HONORABLE PRESIDING JUDGE OF THE LAND COURT OF THE STATE OF HAWAII:

The undersigned Petitioner respectfully shows unto this Court as follows:

1. The name of Petitioner has been legally changed on September 14, 2012 from CASTLE & COOKE RESORTS, LLC to LANAI RESORTS, LLC as evidenced by the certified copy of Articles of Amendment to Change Limited Liability Company Name filed in the Department of Commerce and Consumer Affairs of the State of Hawaii attached hereto and made a part hereof.

2. Petitioner desires that the change of name from CASTLE & COOKE RESORTS, LLC to LANAI RESORTS, LLC be appropriately endorsed on the following Certificates of Title describing land owned by Petitioner:

CERTIFICATE OF TITLE NO.	LAND COURT APPLICATION NO.	LAND COURT CONSOLIDATION NO.
468,683	862	
468,684	862	
468,685	862	
468,686	862	
468,687	862	
468,688	862	
468,689	862	
468,690	862	
468,691	862	
468,692	862	
468,693		170
468,694	862	
468,695		170
468,696	862	
468,697	862	
468,698		170
468,700		170
468,702	590	
506,384	862	
583,970	862	
633,767	862	
799,954	862	
812,328		170
852,675		170
987,393		170
1,044,092		170
1,044,093		189
1,044,094		170
1,044,095	590	
1,044,096	635	
1,044,097	786	
1,044,098	1590	
1,044,099	862	
1,044,100	590, 635 & 862	
1,044,101		190

REF-379

WHEREFORE, Petitioner respectfully prays that the Assistant Registrar of this Court be authorized and directed to endorse upon said Certificates of Title listed above the change of name of Petitioner from CASTLE & COOKE RESORTS, LLC to LANAI RESORTS, LLC.

DATED: Honolulu, Hawaii, September 25, 2012.

Petitioner: LANAI RESORTS, LLC

By _____
Mark F. Ito
Its Attorney

STATE OF HAWAII)
) ss.
CITY AND COUNTY OF HONOLULU)

On this 25th day of September, 2012, in the State of Hawaii, before me personally appeared **MARK F. ITO**, to me personally known or proved to me on the basis of satisfactory evidence of her signature and identity to be the aforesaid persons, who, being by me duly sworn or affirmed, did say that such persons executed the foregoing instrument as the free act and deed of such persons, and if applicable, in the capacities shown, having been duly authorized to execute such instrument in such capacities.

I hereby certify that the instrument to which this notary acknowledgment is attached is entitled **PETITION FOR ORDER RE CHANGE OF NAME AND ORDER**, and ☒ dated September 25, 2012 or ☐ undated at the time of notarization. The entire instrument, including the notary acknowledgment page(s) and attachment(s), if any, consists of 7-pages.

MICHELE P. MAKAINAI NOTARY PUBLIC 12-119 STATE OF HAWAII

Michele P. Makainai
Print Name: Michele P. Makainai
Notary Public, State of Hawaii

My commission expires: 04/08/2016

ORDER

Upon the record herein and good cause appearing, the prayer of Petitioner in the foregoing Petition for Order re Change of Name is hereby granted, and the Assistant Registrar of this Court is authorized and directed to comply herewith.

DATED: Honolulu, Hawaii, this ____ day of SEP 27 2012, 201

KATHLEEN HANAWAHINE
for _____ REGISTRAR
JUDGE OF THE LAND COURT OF THE STATE OF HAWAII

LAND COURT STATE OF HAWAII

REF-380

09/17/2012220062

www.BusinessRegistrations.com

FORM LLC-2
7/2008

FILED 09/14/2012 11:19 AM
Business Registration Division
DEPT. OF COMMERCE AND
CONSUMER AFFAIRS
State of Hawaii

STATE OF HAWAII
DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS
Business Registration Division
335 Merchant Street
Mailing Address: P.O. Box 40, Honolulu, Hawaii 96810
Phone No. (808) 586-2727

ARTICLES OF AMENDMENT TO CHANGE LIMITED LIABILITY COMPANY NAME

(Section 428-204, Hawaii Revised Statutes)

6495 C5

PLEASE TYPE OR PRINT LEGIBLY IN BLACK INK

The undersigned, for the purpose of amending the Articles of Organization, do hereby certify as follows:

1. The present name of the limited liability company is:
   CASTLE & COOKE RESORTS, LLC

2. The name of the limited liability company is changed to:
   LANAI RESORTS, LLC

3. The amendment was adopted with the consent of all, or a lesser number of, the members of the limited liability company as authorized by the operating agreement.

We certify, under the penalties set forth in the Hawaii Uniform Limited Liability Company Act, that we have read the above statements, we are authorized to make this change, and that the statements are true and correct.

Signed this 14th day of September 2012

Lanai Island Holdings, LLC, Its Member
LIH Corporation, Its Manager

PAUL T. MARINELLI, Vice President,
(Typed/Print Name & Title)

(Signature) (Signature)

Instructions: Articles must be typewritten or printed in *black ink*, and must be *legible*. The articles must be signed and certified by at least one manager of a manager-managed company or by at least one member of a member-managed company. All signatures must be in *black ink*. *Submit original articles* together with the appropriate fee.

Line 1. State the full name of the limited liability company prior to the change.

Line 2. State the new name of the limited liability company. The company name must contain the words *Limited Liability Company*, or the abbreviation, *L.L.C.* or *LLC*.

Filing Fee: *Filing fee ($25.00) is not refundable.* Make checks payable to DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS. Dishonored Check Fee $25.00.

For any questions call (808) 586-2727. Neighbor islands may call the following numbers followed by 6-2727 and the # sign: Kauai 274-3141; Maui 984-2400; Hawaii 974-4000, Lanai & Molokai 1-800-468-4644 (toll free).
Fax. (808) 586-2733 Email Address: breg@dcca.hawaii.gov

NOTICE: THIS MATERIAL CAN BE MADE AVAILABLE FOR INDIVIDUALS WITH SPECIAL NEEDS. PLEASE CALL THE DIVISION SECRETARY, BUSINESS REGISTRATION DIVISION, DCCA, AT 586-2744, TO SUBMIT YOUR REQUEST.

ALL BUSINESS REGISTRATION FILINGS ARE OPEN TO PUBLIC INSPECTION. (SECTION 92F-11, HRS)

09/17/2012220062

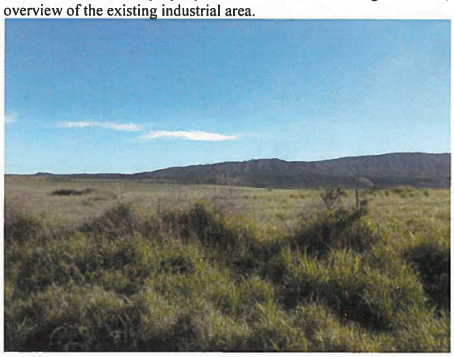
APPENDIX D

PHOTOGRAPH LOG

1. Site from south property border facing west, overview of the existing industrial area.

2. Site from the south property border at Miki Road facing northwest, overview of the existing industrial area.

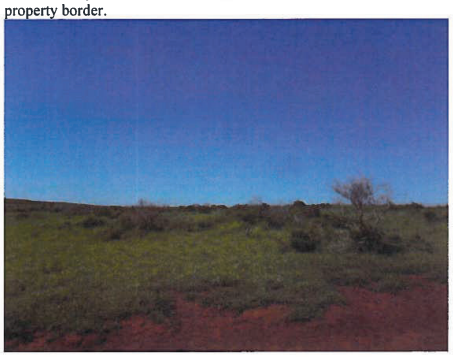
3. Site from the south property border at Miki Road facing north.



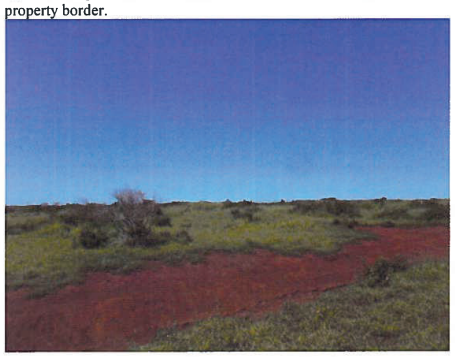
4. Site from the south property border facing east.

5. Undeveloped land to the east beyond the Site from the east property border.

6. Undeveloped land to the north beyond the Site from the north property border.



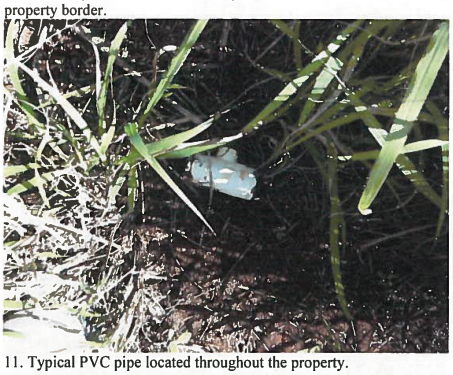
7. Undeveloped land to the west beyond the Site from the west property border.



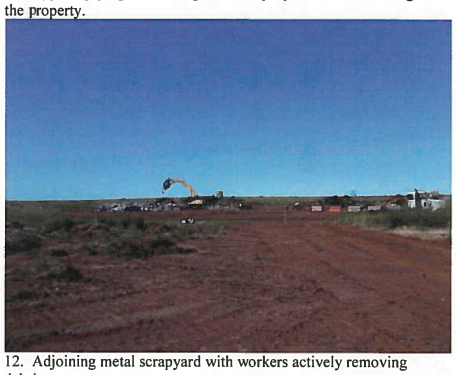
8. Undeveloped land to the northwest of the Site with the Lanai Airport beyond from the West property boundary.

9. Undeveloped land to the south beyond the Site from the southwest property border.

10. Typical piping used for agricultural purposes located throughout the property.



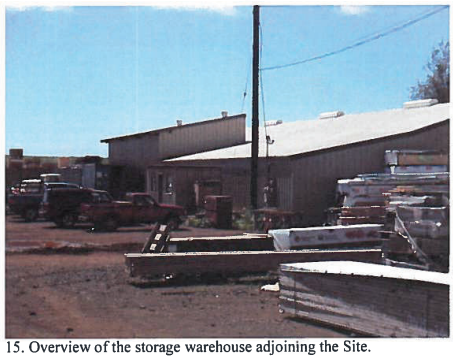
11. Typical PVC pipe located throughout the property.



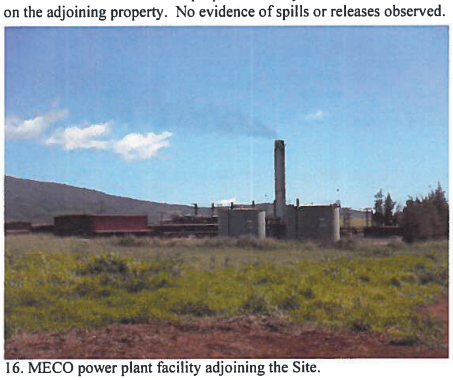
12. Adjoining metal scrapyard with workers actively removing debris.

13. Segregated waste materials including batteries, tires and propane tanks located on the adjoining property.

14. Gasoline and oil without proper secondary containment located on the adjoining property. No evidence of spills or releases observed.



15. Overview of the storage warehouse adjoining the Site.



16. MECO power plant facility adjoining the Site.

APPENDIX E

OTHER REFERENCE INFORMATION

APPENDIX F

TRC STAFF AND ENVIRONMENTAL PROFESSIONAL QUALIFICATIONS/RESUMES

RONALD A. LANDOLT, CAC

EDUCATION
B.A., Biology/Environmental Management, Concordia University, 2002

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS
- State of California, Department of Occupational Safety and Health, Certified Asbestos Consultant, #10-4597
- State of California, Department of Public Health, Certified Lead Inspector/Assessor, #24276.
- State of Hawaii, Department of Health, Certified Asbestos Inspector, #HIASB-2677.

AREAS OF EXPERTISE
Mr. Ronald A. Landolt, CAC, has project management and technical experience in the following general areas:
- Client Development, Management and Interaction
- Write and Edit Technical Reports for Clients and Regulatory Agencies
- Soil and Groundwater Sampling and Remediation System Implementation
- Spill Prevention Control and Countermeasure (SPCC) Plan Management
- Stormwater Pollution Control Plan (SWPCP) Development & Management
- Indoor Air Quality and Microbial Assessments and Remediation Design
- Asbestos Surveys and Abatement Project Design
- AHERA Management Plan Review and Development
- Poly-Chlorinated Biphenyl and Mercury Investigations
- Stormwater Regulatory Compliance and Plan Development
- Phase I and Phase II Environmental Site Assessments and Audits
- Property Condition Assessments
- 3rd Party QAQC Inspections
- Construction Management and Loan Reviews

REPRESENTATIVE EXPERIENCE
Mr. Landolt has over 10 years of experience and progressive responsibility in environmental and engineering consulting. His qualifications include extensive hands-on planning, field investigation, design, permitting, cost estimating, project management, and client management. Mr. Landolt's background includes extensive service to public and private-sector clientele including Target, Rite Aid, Shorenstein Realty Services, Deering Property Management, Beaverton School District, North Wasco County School District, Salem-Keizer School District, University of New Mexico, Clackamas Community College, Clatsop Community College, Columbia Gorge Community College, NW Natural Gas, Bank of America, Bechtel Corporation, CB Richard Ellis, FedEx Ground and UPS. He currently serves in the capacity of Project Manager for TRC with responsibility for the business development, proposal and contract document writing and review to initiate projects, track project status and input critical data associated with each project, monitor the work performed by field staff and subcontractors and analyze the data acquired to determine further action with respect to regulatory compliance or industry standards while maintaining strict deadlines.

Mr. Landolt is also responsible for management of financial budgets set forth in the specific contract documents from initial development, tracking labor and additional costs through the project until contract completion and final invoicing.

Millennium Bulk Terminals, Hazardous Materials Assessments – Longview, Washington (Project Manager: Present).
Lead project manager and client manager responsible for the hazardous materials inspection (asbestos, lead, PCB's, PAH's, Fluoride and Mercury), abatement oversight and regulatory compliance for the re-development of the Millennium Bulk Terminals facility. Responsibilities included initial cost proposals and contracts, scope of work development, organization with the Client and contractors as well as sample collection, staff management and oversight.

Holly Street Power Plant, Pre-Demolition Asbestos Abatement Management – Austin, Texas (Asbestos Abatement Manager: March – August 2012)
On-site abatement organization and oversight of the asbestos abatement activities associated with the demolition of the Holly Street Power Plant in Austin, TX. Mr. Landolt was responsible for the management of the abatement activities being conducted in conjunction with the active demolition of the plant as well as providing direct project updates and other correspondence to the client and their representatives on a daily basis.

Target Distribution Center, SPCC Plan Development and Audits – Albany, Oregon (Project Manager: 2008 – 2011).
Project Manager responsible for the development of the facilities revised SPCC plan in order to ensure regulatory conformance as well as the subsequent facility audits to confirm compliance with the SPCC plan. Responsibilities included development of the SPCC plan for regulatory compliance and annual Audit of the facility. Mr. Landolt was also involved in client management and communication throughout the duration of the project.

FedEx Ground, SPCC Audits – Portland, Oregon (Project Manager: 2007 – 2010).
Project Manager responsible for the audit of the FedEx Ground facilities SPCC plan and conformance to the regulatory requirements. Responsibilities included review of the SPCC plan for regulatory compliance and annual Audit of the facility. Mr. Landolt was also involved in client management and communication throughout the duration of the project.

FedEx Ground, Environmental Site Investigation – Troutdale, Oregon (Project Manager: 2009 – 2010).
Development and implementation of a large scale contract and scope of work on a 78-acre site to be used as a shipping facility. The site was previously occupied by an aluminum factory and is listed as a former Superfund site. Responsibilities included developing the scope of work, working with a team to perform the initial Phase I Environmental Site Assessment, management of surveying and excavating subcontractors, performing a detailed subsurface investigation and associated report. Mr. Landolt was also involved in client management and communication throughout the duration of the project.

TRC Ronald A. Landolt, CAC

Coca-Cola Bottling Company, Due Diligence Environmental Investigations – Omak, Washington (Project Scientist and Project Manager: 2004 – 2011)
Subsurface investigation where responsibilities included scheduling, ordering drilling supplies, supervision of outside contractors, collect and field screen soil samples, log soil borings according to the Unified Soils Classification System, monitoring well re-development, groundwater monitoring, data interpretation and report preparation as well as remediation system design, implementation and submittal of Voluntary Cleanup Program Application to Washington DOE, and regulatory compliance discussions with Washington DOE.

Conoco Phillips, Soil and Groundwater Sampling – Oregon, Washington and Arizona (Project Geologist: 2004-2008 and Project Manager: 2008 – 2011)
Project Geologist and Project Manager responsible for conducting soil and groundwater sampling activities for various retail fueling stations throughout Oregon, Washington and Arizona. Mr. Landolt has also been responsible for the on-site safety compliance associated with soil and groundwater sampling activities for Conoco Phillips as well as collaborating with other consultants, contractors and laboratories to ensure proper sample collection and procedures were followed in accordance with all applicable regulations.

Tersoro Golden Eagle Oil Refining Terminal, Groundwater Remediation Well System Sampling – Concord, California (Project Manager: 2008 – 2010)
Lead on-site Project Manager for bi-annual sampling of over 300 monitoring wells located throughout a 1,000-acre oil refining terminal. Responsibilities included daily scheduling, permit acquisition, staff coordination, data compilation and management. Mr. Landolt was also responsible for collaborating with other consultants, contractors and laboratories to ensure proper sample collection and procedures were followed.

Various Clients, Phase I Environmental Site Assessments – Oregon, Washington, California, Idaho, Arizona and New Mexico (Project Manager: 2001 – Present)
Performs, reviews and manages ASTM Phase I ESAs as an Environmental Professional for various clients including industrial properties, commercial/retail properties, residential properties, and vacant parcels of land. Responsibilities included proposal and budget preparation, proposal review, client interaction, record review, site reconnaissance, interviews, report preparation, limited sampling, report review and submittals.

Various Clients, Property Condition Assessments – Oregon, Washington, California, Idaho, Colorado, Wyoming, Utah, Nevada, Arizona, New Mexico and Massachusetts (Project Manager: 2005 – Present)
Performs and manages ASTM PCA's for various clients including high-rise buildings, hotel properties, industrial properties, commercial properties, retail properties and multi-family residential facilities. Responsibilities included proposal and budget preparation, proposal review, client interaction, record review, site reconnaissance, interviews, report preparation, report review and submittals.

Various Clients, Indoor Air Quality Assessments and Microbial Sampling – Oregon, Washington, California, Idaho and New Mexico (Project Scientist and Project Manager: 2001 – Present)
Conducted pre- and post-remediation sampling for viable and non-viable spores in commercial, retail and residential properties. Responsibilities include budget and proposal preparation, project coordination, collection of both viable and non-viable spore sampling, bulk sampling, swab sampling, data interpretation, report preparation, and client interaction.

Clatsop Community College, Hazardous Materials Inspection and Management – Astoria, Oregon (Project Manager and Client Manager: 2009 – Present)
Lead project manager and client manager responsible for the hazardous materials inspection (asbestos, lead, PCB's and Mercury), abatement oversight and regulatory compliance for the Jerome Campus Redevelopment Project. Responsibilities included initial cost proposals and contracts, scope of work development, organization with the Project Manager, general contractor and abatement contractors as well as staff management and oversight.

Beaverton School District, Building Science Services – Beaverton, Oregon (Project Manager: 2002-2007, Client Manager: 2007 – Present)
Project Manager responsible for the oversight of bond and non-bond related asbestos services including: asbestos surveys, development of abatement project designs, abatement oversight, clearance sampling, project completion reports as well as 6-month surveillances, 3-year re-inspections and other AHERA management activities. Lead client manager for ensuring proper investigation, remediation and best management practices compliance during District wide indoor air quality and microbial projects. Responsibilities included initial cost proposals and contracts, scope of work development, organization with District Facilities Specialist and remediation contractors as well as staff management and oversight. Mr. Landolt is also responsible for conducting direct client management and review in conjunction with each project.

Salem-Keizer School District, Asbestos Management – Salem, Oregon (Client Manager: 2009 – 2011)
Lead client manager for ensuring regulatory compliance during substantial asbestos abatement projects in conjunction with a District wide 252-million dollar redevelopment bond. Responsibilities included initial cost proposals and contracts, scope of work development, organization with project management teams and general contractors as well as staff management and oversight. Mr. Landolt was also responsible for conducting direct client management and regulatory review in conjunction with each project.

Falls City School District, Asbestos Program Management – Falls City, Oregon (Client Manager: 2011 – Present)
Lead client manager for updating the District's AHREA program, ensuring regulatory compliance. Responsibilities included initial cost proposals and contracts, scope of work development, as well as AHERA sampling, report writing and Management Plan development. Mr. Landolt is also responsible for conducting direct client management and training to ensure proper regulatory compliance needs are implemented.

TRC Ronald A. Landolt, CAC

North Wasco County School District, Asbestos Program Management – The Dalles, Oregon (Client Manager: 2009 – Present)
Lead client manager for assisting the District with the management of their AHREA program, ensuring regulatory compliance. Responsibilities included initial cost proposals and contracts, scope of work development, as well as AHERA sampling, report writing, abatement project design, abatement oversight and re-inspections.

Bank of America, Asbestos Inspections and Program Development – Western United States (Project Manager: 2005 – 2010)
Assistant project manager for the development of standardized sampling methods and report templates for an asbestos survey portfolio consisting of full interior and exterior surveys of over 350 banks throughout California. Mr. Landolt was also the primary project manager for this client in Oregon, with experience managing over 100 local asbestos and indoor air quality projects.

Rite Aid Corporation, Asbestos & Concrete Vapor Emissions – Western United States (Client Manager: 2007 – Present)
Primary Client manager for Rite Aid Corporation. The scope of work consists of providing standardized asbestos surveys with concrete moisture testing of the floors as well. Responsibilities included proposal and budget development, project management, distribution of projects to various other offices as well as client management and communication.

Confidential Luxury Hotel/Resort, Asbestos and Microbial Assessment – Kapalua, Maui, Hawaii (Assistant Project Manager: March – September 2007)
On-site inspection and remediation oversight of a large scale renovation project in Maui, Hawaii. The resort property consisted of a 550-room hotel, and two unattached restaurant buildings that were scheduled for complete renovation. Responsibilities included assisting with the initial asbestos and microbial inspection, as well as being the lead on-site Project Manager overseeing the microbial remediation. Mr. Landolt was also responsible for providing direct project updates and other correspondence to the client on a regular basis.

Beaverton School District, Storm Water System Management – Beaverton, Oregon (Project Manager: 2006 – Present)
Project Manager responsible for the District's Storm Water Pollution Control Program. Conducted sampling events, site inspections and updated facility storm water pollution control plans (SWPCP) in coordination with applicable regulations. Responsible for working with regulators to ensure compliance with proper storage and handling of hazardous materials.

Milgard Windows and Doors, Storm Water System Management – Tualatin, Oregon (Project Manager: 2010 – Present)
Project Manager responsible for the development of the industrial facilities Storm Water Pollution Control Plan. Conducted sampling events, site inspections and issued action plans in coordination with applicable regulations and the facilities 1200-Z industrial stormwater permit. Also responsible for working with regulators to ensure compliance with proper sampling strategies, as well as the storage and handling of hazardous materials.

SPECIALIZED TRAINING

- EPA AHERA-Accredited Building Inspector, Management Planner, Project Designer, and Contractor Supervisor
- OSHA 10-Hour Construction Safety Training
- 40-Hour Hazardous Waste Operations and Emergency Response (HAZWOPER)
- OSHA Confined Space Training
- NIOSH 582 Trained Microscopist
- First Aid/CPR Certified (Not current)
- DOT & IATA Department of Transportation's Hazardous Materials' Regulations Certification
- Washington Department of Ecology Dangerous Waste Management Training
- Hazardous/Toxic Waste Management Training
- 16-Hour Microbial Investigations, Assessments and Remediation Training

Kacey N. Swindle

EDUCATION

B.A., Biology, Hendrix College, 2006
A.A., Education, Central Baptist College, 2003

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

EPA/AHERA (HIASB-3378) Accredited Asbestos Inspector - Hawaii
EPA/AHERA (HIASB-3378) Accredited Asbestos Contractor/Supervisor - Hawaii
EPA/AHERA (HIASB-3378) Accredited Asbestos Project Monitor – Hawaii
EPA (PB-0509) Certified Lead Inspector – Hawaii
NIOSH 582 Equivalent Sampling and Evaluating Airborne Asbestos Dust

AREAS OF EXPERTISE

Ms. Kacey N. Swindle has technical experience in the following general areas:

- Environmental Assessments and Audits
- Site Remediation Design and Implementation
- Asbestos Surveys
- Microbial Investigations
- Lead Based Paint Inspections
- OSHA Compliance

REPRESENTATIVE EXPERIENCE

Ms. Swindle's responsibilities include large and small scale asbestos and lead (Pb) inspections for private, public, commercial and governmental agencies, air monitoring and compliance certification. Ms. Swindle is a certified lead inspector, AHERA inspector, contractor / supervisor, and project monitor.

In addition to asbestos and lead consulting, Ms. Swindle is also proficient in industrial hygiene air monitoring exposure and evaluations, including OSHA compliance and safety program development, as well as indoor air quality studies. Ms. Swindle has performed microbial investigations on multi-family residential and commercial structures. The investigations have encompassed microbial sampling, moisture mapping, project design, and coordination with company senior-level scientists (Ph.D.s, C.I.H.s). Ms. Swindle also performs microbial remediation oversight and post-remediation sampling. She is knowledgeable of construction practices, means, and methods. Ms. Swindle has performed Phase I Environmental Site Assessments including conducting site visits and generating reports.

ASBESTOS ASSESSMENTS

Kyo-Ya, Ltd., Princess Kaiulani Hotel and Retail Spaces Asbestos Surveys - Honolulu, Hawaii (2013 - 2014)
Performed asbestos inspections prior to proposed renovation activities. The investigation included sample collection, analysis, square footage estimates and friability status to determine if the materials pose a health risk to workers and the general public. Written reports were issued to the client detailing laboratory findings with regulatory recommendations including health risk assessment.

Hawaii Pacific University, Aloha Tower Marketplace Asbestos/Lead Paint Surveys - Honolulu, Hawaii (2013 - 2014)
Performed asbestos/lead paint inspections prior to proposed renovation activities. The investigation included sample collection, analysis, square footage estimates and friability status to determine if the materials pose a health risk to workers and the general public. Written reports were issued to the client detailing laboratory findings with regulatory recommendations including health risk assessment.

General Growth Properties, Sears Asbestos/Lead Paint Surveys and Abatement Oversight - Honolulu, Hawaii (2012 - 2013)
Performed asbestos/lead paint inspections and asbestos abatement oversight during demolition activities. The investigation included sample collection, analysis, square footage estimates and friability status to determine if the materials pose a health risk to workers and the general public. Written reports were issued to the client detailing laboratory findings with regulatory recommendations including health risk assessment. Oversight activities included daily asbestos air monitoring, clearance inspections and waste disposal characterizations and laboratory data interpretation to ensure that human health was protected.

Kyo-Ya, Ltd., Moana Surfrider Hotel Asbestos Surveys - Honolulu, Hawaii (2012 - 2013)
Performed asbestos inspections and asbestos remediation oversight of during renovation activities. The investigation included sample collection, analysis, square footage estimates and friability status to determine if the materials pose a health risk to workers and the general public. Written reports were issued to the client detailing laboratory findings with regulatory recommendations including health risk assessment. Oversight activities included daily asbestos air monitoring, clearance inspections and waste disposal characterizations and laboratory data interpretation to ensure that human health was protected.

TRC Kacey N. Swindle

Kyo-Ya, Ltd., Sheraton Waikiki Hotel Asbestos/Lead Paint Surveys - Honolulu, Hawaii (2011 - 2013)
Performed asbestos/lead paint inspections and asbestos remediation oversight during renovation activities. The investigation included sample collection, analysis, square footage estimates and friability status to determine if the materials pose a health risk to workers and the general public. Written reports were issued to the client detailing laboratory findings with regulatory recommendations including health risk assessment. Oversight activities included daily asbestos air monitoring, clearance inspections and waste disposal characterizations and laboratory data interpretation to ensure that human health was protected.

Hilton Hawaiian Village, LLC., Hilton Hawaiian Village Asbestos/Lead Paint Surveys - Honolulu, Hawaii (2011 - 2013)
Performed asbestos/lead paint inspections and asbestos remediation oversight during renovation activities. The investigation included sample collection, analysis, square footage estimates and friability status to determine if the materials pose a health risk to workers and the general public. Written reports were issued to the client detailing laboratory findings with regulatory recommendations including health risk assessment. Oversight activities included daily asbestos air monitoring, clearance inspections and waste disposal characterizations and laboratory data interpretation to ensure that human health was protected.

LEAD BASED PAINT ASSESSMENTS

Ala Wai Townhouse AOAO, Ala Wai Townhouse Lead Based Paint Inspection - Honolulu, Hawaii (2012)
Performed a lead based paint inspection of the above referenced residential building consisting of one hundred (100) similar dwellings as defined by the State of Hawaii, Environmental Protection Agency (EPA) and United States Department of Housing and Urban Development. A written report was issued to the client detailing findings with regulatory recommendations.

PHASE I ENVIRONMENTAL SITE ASSESSMENTS

Lanai Resorts, LLC, Phase I Environmental Site Assessments – Lanai City, Hawaii (Present).
Performed Phase I Environmental Site Assessments for the development of various properties within Lanai City, HI. Responsibilities included assisting in the site investigations and report generation.

APPENDIX G

ENVIRONMENTAL PROFESSIONAL STATEMENT

DEFINITION OF ENVIRONMENTAL PROFESSIONAL AND RELEVANT EXPERIENCE THERETO PURSUANT TO 40 CFR 312

(1) a person who possesses sufficient specific education, training, and experience necessary to exercise professional judgment to develop opinions and conclusions regarding conditions indicative of releases or threatened releases (see §312.1(c)) on, at, in, or to a property, sufficient to meet the objectives and performance factors in §312.20(e) and (f).

(2) Such a person must: (i) hold a current Professional Engineer's or Professional Geologist's license or registration from a state, tribe, or U.S. territory (or the Commonwealth of Puerto Rico) and have the equivalent of three (3) years of full-time relevant experience; or (ii) be licensed or certified by the federal government, a state, tribe, or U.S. territory (or the Commonwealth of Puerto Rico) to perform environmental inquiries as defined in §312.21 and have the equivalent of three (3) years of full-time *relevant experience*; or (iii) have a Baccalaureate or higher degree from an accredited institution of higher education in a discipline of engineering or science and the equivalent of five (5) years of full-time relevant experience; or (iv) have the equivalent of ten (10) years of full-time relevant experience.

(3) An environmental professional should remain current in his or her field through participation in continuing education or other activities.

(4) The definition of environmental professional provided above does not preempt state professional licensing or registration requirements such as those for a professional geologist, engineer, or site remediation professional. Before commencing work, a person should determine the applicability of state professional licensing or registration laws to the activities to be undertaken as part of the inquiry identified in §312.21(b).

(5) A person who does not qualify as an environmental professional under the foregoing definition may assist in the conduct of all appropriate inquiries in accordance with this part if such person is under the supervision or responsible charge of a person meeting the definition of an environmental professional provided above when conducting such activities.

Relevant experience, as used in the definition of environmental professional in this section, means: participation in the performance of all appropriate inquiries investigations, environmental site assessments, or other site investigations that may include environmental analyses, investigations, and remediation which involve the understanding of surface and subsurface environmental conditions and the processes used to evaluate these conditions and for which professional judgment was used to develop opinions regarding conditions indicative of releases or threatened releases (see §312.1(c)) to the Site. TRC personnel resume(s) are included in **Appendix F**.

I declare that, to the best of my professional knowledge and belief, I meet the definition of environmental professional as defined in §312.10 of 40 CFR 312.

I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Signature of Environmental Professional: _____ Date: 04/03/14

REF-390

ECONOMIC, POPULATION AND FISCAL IMPACTS REPORT

APPENDIX F

REF-391

Miki Basin Industrial Park:
• Socio-Economic Conditions
• Economic, Population and Fiscal Impacts

Miki Basin Industrial Park:
• Socio-Economic Conditions
• Economic, Population and Fiscal Impacts

PREPARED FOR:

Pūlama Lānaʻi

PREPARED BY:

Plasch Econ Pacific LLC

September 2021

REF-392

Contents

Executive Summary ..... ES- 1

Part I: Introduction and Proposed Project ..... I- 1

1. **Introduction** ..... I- 1
   - a. Content and Purpose ..... I- 1
   - b. Methodology ..... I- 1
   - c. Organization of the Report ..... I- 3
   - d. Economic Consultant ..... I- 3
2. **Project Overview** ..... I- 3
   - a. Project Location ..... I- 3
   - b. Project Description ..... I- 3
   - c. Development Period ..... I- 4
   - d. Land Classifications and Required Approvals ..... I- 4

Part II: Lānaʻi's Economy and Socio-Economic Conditions ..... II- 1

1. **Economic Overview** ..... II- 1
2. **Socio-Economic Conditions** ..... II- 1
   - a. Population ..... II- 1
   - b. Households ..... II- 2
   - c. Housing ..... II- 2
   - d. Income and Education ..... II- 3
3. **Economic Role of Shipping** ..... II- 3
4. **Implications to the Demand for Industrial Land** ..... II- 3

Part III: Economic, Population and Fiscal Impacts ..... III- 1

1. **Planned Development** ..... III- 1
   - a. Zoning and Land Use ..... III- 1
   - b. Building Space ..... III- 3
2. **Economic Impacts of Development Activities** ..... III- 4
   - a. Development Period ..... III- 4
   - b. Construction Expenditures and Related Sales ..... III- 4
   - c. Profits ..... III- 5
   - d. Employment ..... III- 5

   - e. Payroll ..... III- 6
   - f. Sources of Construction Workers ..... III- 6
3. **Economic Impacts of Operations, 2030** ..... III- 6
   - a. Economic Activities ..... III- 6
   - b. Revenues ..... III- 7
   - c. Rental Income ..... III- 7
   - d. Profits ..... III- 7
   - e. Employment ..... III- 7
   - f. Payroll ..... III- 7
   - g. Sources of Skilled Workers ..... III- 7
   - h. Supported Population and Housing ..... III- 7
4. **Impacts on County Revenues and Expenditures** ..... III- 8
   - a. Development Activities ..... III- 8
   - b. Operations, 2030 ..... III- 8
5. **Impacts on State Revenues and Expenditures** ..... III- 8
   - a. Development Activities ..... III- 8
   - b. Operations, 2030 ..... III- 9

References ..... R- 1

Figures

I-1. Project Location, Lānaʻi ..... I- 5
I-2. Project Location, Miki Basin ..... I- 6
I-3. Site Plan ..... I- 7

Part II Tables: Socio-Economic Conditions

II-1. Demographic Characteristics, County of Maui and Island of Lānaʻi: 2010 and 2015–2019 Estimates
II-2. Income and Education, County of Maui and Island of Lānaʻi: : 2010–2014 and 2015–2019 Estimates

Part III Tables: Economic, Population and Fiscal Impacts

III-1. Planned Development
III-2. Economic Impacts of Development Activities
III-3. Economic Impacts of Operations, 2030
III-4. Economic Impacts County Revenues and Expenditures
III-5. Economic Impacts State Revenues and Expenditures

REF-393

Executive Summary

1. Planned Development

Miki Basin Industrial Park (the **Project** or **Miki 200**) is a proposed master-planned development on a 200-acre site located in the Miki Basin area on the island of Lāna‘i, Hawai‘i. The project will include approximately 100 acres of light industrial and 100 acres of heavy industrial zoned lands.

Following approval, most Project development is expected to occur over a period of about 10 years, but development could require more or less time, depending on the pace of future economic and population growth, market conditions and lot leases.

By 2030, the use of industrial land at Miki 200 is projected to be as follows:

	Acres
— Committed	
• Infrastructure	20.0
• Renewable energy	127.0
• Concrete/rock-crushing facility	14.5
• Asphalt plant	12.5
— Typical industrial activities	7.6
— Vacant (projected development after 2030)	18.4
— Total	**200.0**

As indicated, about 18.4 acres will accommodate the demand for industrial land beyond 2030. More importantly, this acreage will provide land approved for development and may have major infrastructure in order to take immediate advantage of any new economic opportunities which may arise, thereby diversifying Lāna‘i’s economy.

2. Employment Benefits

a. Construction and Related Employment

During the Project’s initial 10-year development period, construction employment is expected to average about 19 jobs per year. Indirect employment related to Project development is expected to average about 29 jobs per year. Thus, total direct-plus-indirect employment associated with Project development activities will average about 48 jobs per year. The actual job count will fluctuate over time, depending on the pace of construction.

b. Operating Employment, 2030

Onsite operating employment is expected to grow to about 60 new jobs by 2030. These jobs will include entry-level positions to highly skilled professionals.

3. Fiscal Benefits

a. County

Project development activity is expected to have a negligible impact on County finances inasmuch as the developer will provide or pay its fair-share of support infrastructure (interior roads, water distribution, sewers, drainage, etc.).

At full development, the Project is expected to generate net income to the County of approximately $380,000 per year. Net revenues are positive largely because of the property taxes.

Inasmuch as the Miki 200 is expected to be developed in conjunction with forecasted population growth for Lāna‘i, the County is not expected to realize significant additional increases in expenditures as a direct result of the Project.

b. State

Unlike the County, the State derives substantial net revenues from development activity. Over the initial 10-year construction period, the State will net about $5.6 million from construction and related economic activities associated with the Project, or an average of about $560,000 million per year.

At full development, the Project is expected to generate net income to the State of about $670,000 per year. The positive return to the State reflects the various taxes on economic activities associated with Miki 200. As with County services, additional State expenditures are not anticipated to be required to support operations of the Project.

REF-394

Miki Basin Industrial Park:
• Socio-Economic Conditions
• Economic, Population, and Fiscal Impacts

Part I: Introduction and Proposed Project

1. Introduction

a. Content and Purpose

Miki Basin Industrial Park (the **Project** or **Miki 200**) is a proposed master-planned development on a 200-acre site located in the Miki Basin area on the island of Lānaʻi, Hawaiʻi.

This report addresses (1) the socio-economic conditions on Lānaʻi, and (2) the economic, population and fiscal impacts of the Project. The purpose is to provide the community, State of Hawaiʻi (**State**) officials and County of Maui (**County**) officials with relevant information about planned development and operations.

Socio-economic conditions includes information about the population, housing, incomes, education, economic activities, employment and labor force on Lānaʻi.

Economic impacts cover expenditures and sales, profits, employment and payroll related to (1) construction and related activities, and (2) operations of the Project.

Population impacts cover the number of residents supported by jobs created by the development and operations, and the number of homes required to house these residents.

Fiscal impacts address the impact of the Project on State and County revenues and expenditures.

b. Methodology

Socio-Economic Conditions

Demographic, social, household and economic characteristics of the population were obtained from the 2010 census by the U.S. Census Bureau, and from the American Community Survey ("**ACS**"). The ACS is an ongoing survey that provides up-to-date information about the nation's population. The ACS includes questions that were not included in the 2010 decennial census (but, historically, were included in the 2000 census). The most up-to-date available data from the ACS are five-year estimates from 2015-2019.

Economic and Fiscal Impacts

Multipliers

The proposed development and operations are translated into economic and fiscal impacts based on a number of multipliers (for example, indirect sales as a percentage of direct sales, construction jobs per $1 million in expenditures, indirect jobs per direct jobs, and tax rates). These multipliers reflect the professional judgment of the consultant, and were based on information from the following sources: U.S. Census data; the *State of Hawaiʻi Data Book; The Hawaiʻi State Input-Output Study: 2012 Benchmark Report* (I-O Model); employment and labor rates from the Hawaiʻi Department of Labor and Industrial Relations (**DLIR**); State and County tax rates.

Direct and Indirect Impacts

"**Direct**" economic impacts (gross sales, employment, payroll, etc.) are the immediate effects of a change in a particular sector of the economy (e.g., construction activity). Traditionally, "indirect" impacts are changes in other sectors of the economy that are caused by the direct impacts (e.g., transportation of building supplies), but exclude impacts related to the purchase of goods and services by employees and their families (**household spending**). Traditionally, "induced" impacts are changes in the economy that are caused by the household spending by those who are affected by the direct and indirect changes in the economy. In this report, "**indirect**" economic impacts are redefined broadly to include both the traditional indirect economic impacts and the induced economic impacts.

2019 Dollars

For the economic and fiscal impacts (Part III), dollar amounts are expressed in terms of 2019 purchasing power and market conditions. The year 2019 was used because it is the last year of "normal" economic conditions before COVID-19. Values, prices, costs and dollar amounts for prior years are adjusted for inflation to 2019 dollars based on the Honolulu Consumer Price Index (CPI) for Urban Consumers. Dollar amounts after 2019 are not increased to account for inflation, appreciation in property values, changes in labor rates, changes in building costs, or other changes in market conditions. However, fiscal impacts are based on current tax rates (i.e., August 2021 rates).

Accuracy of Estimates

Much of the analysis contained in this report is quantitative in nature, where numbers are used to help communicate anticipated impacts. However, these numbers should not be interpreted as precise predictions. Rather, they represent the best estimates of what is

REF-395

expected to occur based on available information about planned development and operations, market conditions, and tax rates.

c. Organization of the Report

The report is divided into three Parts:

— Part I: Introduction and Proposed Project

— Part II: Socio-Economic Conditions

— Part III: Economic, Population and Fiscal Impacts

All Figures in this report are embedded in the text, while all tables are at the end. Socio-economic conditions for Lānaʻi and the County are presented in Tables II-1 and II-2. Economic, population and fiscal impacts are presented in Tables III-1 to III-5. In these tables, the quantities appearing in **bold** highlight the more significant impacts.

d. Economic Consultant

The analysis was conducted by Plasch Econ Pacific LLC (**PEP**), a Hawai'i-based economic-consulting firm specializing in economic development, land and housing economics, feasibility studies, valuations, market analysis, public policy analysis, and the economic and fiscal impacts of projects.

2. PROJECT OVERVIEW

a. Project Location

The Miki 200 will be centrally located on a 200-acre site in Miki Basin on the island of Lānaʻi, about 1 mile east of the Lānaʻi Airport terminal, 2.7 miles southwest of Lānaʻi City, and 3.7 miles east of Kaumalapau Harbor (Figures I-1 and I-2). The Tax Map Key (TMK) for the Project area is (2)4-9-002:061(por.).

As shown in Figure I-3, the Project will abut (1) the Hawaiian Electric Company/Maui Electric Co. (**HECO**) power plant, and (2) the "Existing Industrial Condominium" (referred to as **Miki 20** since it is a 20-acre project in the Miki Basin).

b. Project Description

Consistent with the Lānaʻi Community Plan, Miki 200 will include 100 acres designated Light Industrial and 100 acres designated Heavy Industrial. It will be Lānaʻi's first large-scale industrial park. Lot sizes may range from less than a half-acre to 20 acres or more. Also, rental space may be available in industrial buildings if built. Infrastructure may include internal roads, water, power, sewers, drainage, etc.

Miki 200 will provide space for the relocation and/or expansion of existing industrial activities on Lānaʻi, land and warehouses for storing goods and equipment, and land and buildings to accommodate industrial activities new to Lānaʻi. Regarding the last point, it is important to have industrial land readily available and approved for development in order to take immediate advantage of any new economic opportunities which may arise.

c. Development Period

Following approval, most Project development is expected to occur over a period of about 10 years, but development could require more time, depending on the pace of future economic and population growth, market conditions and lot leases. About 9% of the land is expected to be developed after 2030.

d. Land Classifications and Required Approvals

Current land classifications of the Project Area and proposed changes are as follows:

— State Districts
- Current: Agricultural
- Proposed: Urban

— County Designations
- Lānaʻi Community Plan
  + Current: Light and Heavy Industrial
  + Proposed: No change
- Maui County Zoning
  + Current: Agricultural
  + Proposed: Light and Heavy Industrial

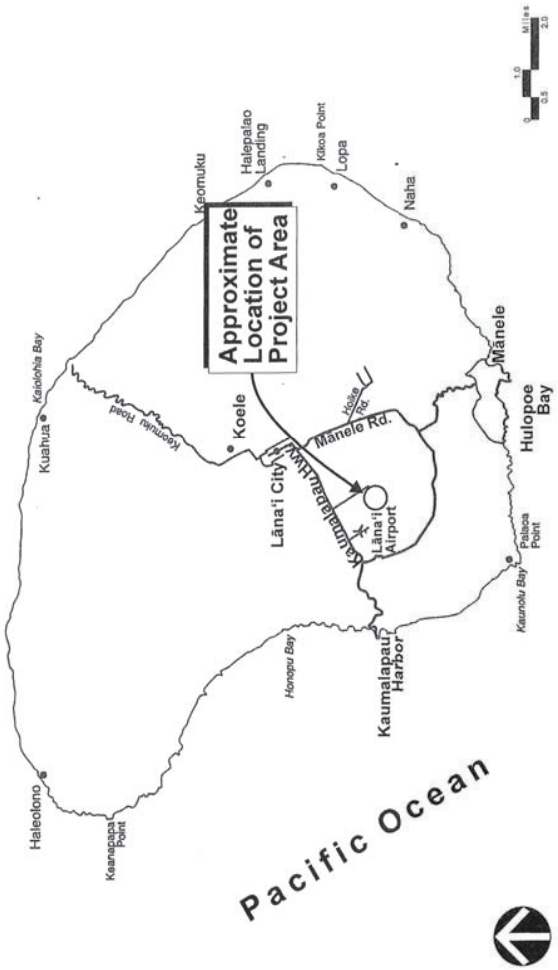


Figure I-1. Project Location, Lāna‘i

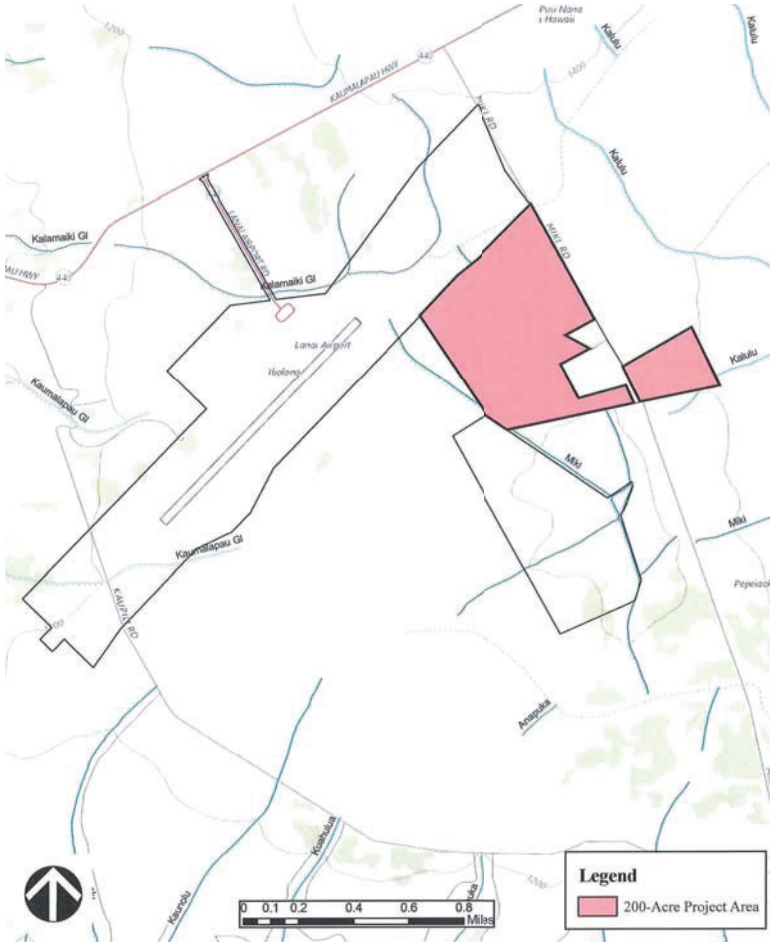


Figure I-2. Project Location, Miki Basin

REF-397

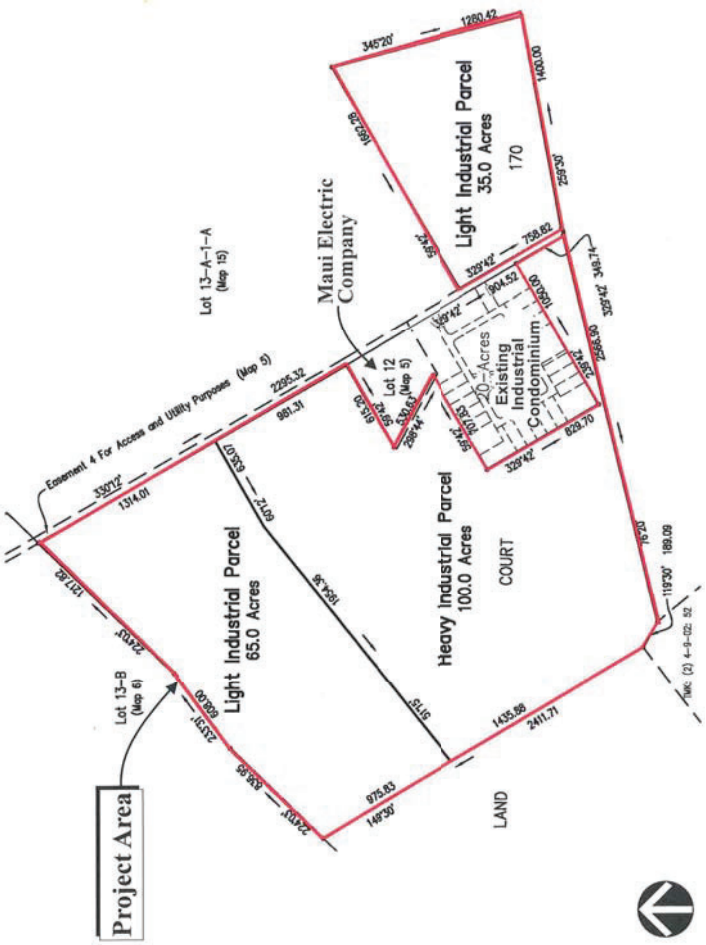


Figure I-3. Site Plan

PART II: LANAI'S ECONOMY AND SOCIO-ECONOMIC CONDITIONS

1. ECONOMIC OVERVIEW

From the 1920s to 1992, the primary economic activity on Lānaʻi was growing pineapple for the mainland canned-pineapple market.

Since the 1990s, the two resorts on Lānaʻi (Manele and Kōʻele) have been the primary driving forces for the economy. Manele and Kōʻele feature 213 and 96 luxury rooms and suites, respectively. In addition, both resorts include single-family homes and multi-family homes for retirees, part-time residents, visitors and managers. The purchase of goods and services by visitors, retirees, part-time residents, the hotel, and hotel employees generate most of the jobs on Lānaʻi.

Other economic driving forces on Lānaʻi's include:

- Sensei Farms, a new hydroponic farm which exports fresh vegetables to markets throughout the Hawaiian Islands, and which employs about 50 workers.
- Government operations (schools, the airport, the harbors, police, fire, post office, etc.)
- Social security and retirement income paid to residents.
- Government income-support payments.
- Occasional construction activity for the building or renovation of hotels, homes, commercial and industrial buildings, government facilities, etc.

Except for the hotel at Manele, most commercial activities on the island are located in Lānaʻi City, including grocery stores, drug stores, restaurants, service stations, beauty salons, building suppliers, etc.

2. SOCIO-ECONOMIC CONDITIONS

Tables II-1 and II-2 summarize socio-economic conditions for County of Maui and Lānaʻi. The County consists of the islands of Maui, Lānaʻi, Molokaʻi, Kahoʻolawe, and Molokini. Except where stated otherwise, the estimates below were reported by the American Community Survey.

a. Population

Between 2015 and 2019, Lānaʻi had a resident population of approximately 2,730, or 1.64% of the County population of 165,979 residents. Residents include those who live full-

REF-398

time or permanently in the County, and exclude visitors and part-time residents (i.e., those who live most of the time in a primary home located elsewhere).

Throughout most of the decade, the U.S. Census Bureau's five-year population estimate for Lānaʻi ranged from approximately 3,100 to 3,500 residents. However, in 2018 and 2019, the five-year estimate dipped below 3,000 residents. As noted above, the 2015-2019 five-year estimate was 2,730 people, which represents a 12.9% decrease from the 2010 population of 3,135 residents. Meanwhile, the population for the County as a whole has increased by 7.2% since 2010 (Table II-1).

The Lānaʻi Community Plan, which was updated and approved by the Maui County Council in 2016, originally projected that an additional 885 residents will live on the island by the year 2030, for a total population of 4,020 (based on the County's Land Use Forecast produced in December 2012). The Lānaʻi Community Plan did note that increased economic activity and development plans on the island may result in the population growing beyond the original forecast of up to 6,000 residents.

Between 2015 and 2019, Asian residents comprised a higher proportion of the Lānaʻi population compared to the County as a whole: 53.4% of residents were estimated to be Asians compared to 29.3% for the County (Table II-1).

The resident profile of Lānaʻi is older than that of the County as a whole. The median age on Lānaʻi was about 49.0 years old between 2015 and 2019 compared to 41.2 years for the County.

b. Households

The average household size on Lānaʻi is estimated to be 2.31 people per household between 2015 and 2019—a decrease from 2.71 people per household in 2010 (Table II-1). On average, households on Lānaʻi are smaller than households for the County —3.00 people per household.

Approximately 59.8% of the households were estimated to be homeowners. Also, an estimated 63.1% of the households were family households.

c. Housing

Between 2015 and 2019, Lānaʻi had an estimated 1,549 housing units (Table II-1). This figure includes resort/residential units that were used as second homes, or were available for visitors, or were vacant. Approximately 23.8% of housing units were vacant, compared to 25.5% for the County.

Most residents live in Lānaʻi City in single family homes of less than 1,500 square feet on lots of about 6,000 square feet or less (Google Maps). According to the County tax records, many of the homes on Lānaʻi were built before 1940.

d. Income and Education

The mean household income on Lānaʻi between 2015 and 2019 was estimated at $73,484, 39.8% lower than the County as a whole (Table II-2). Correspondingly, Lānaʻi had a lower per-capita income.

A slightly lower proportion of residents on Lānaʻi completed some secondary education compared to the County as a whole. An estimated 50.7% of Lānaʻi residents attended some college or received a higher education degree, compared to 60.8% of the residents for the County. About 67.2% of the households spoke only English at home, while 31.5% spoke Asian and Pacific Island languages.

3. ECONOMIC ROLE OF SHIPPING

Inasmuch as Lānaʻi is a small island with a small population and a small economy, few consumer and business goods are produced on the island. Instead, most goods must be imported by barge or airfreight from Honolulu. Barge service is weekly, but the service is canceled occasionally due to kona storms. Airfreight is available daily, but the capacity is low and the shipping rates are higher than the barge rates.

4. IMPLICATIONS FOR INDUSTRIAL ACTIVITIES ON LĀNAʻI

Economic development is needed on Lānaʻi in order to provide jobs and increase incomes for the residents. As mentioned above, the average household income on Lānaʻi is 39.8% lower than the County-wide average.

For both residents and businesses, Lānaʻi needs more storage space than other communities of similar size because most goods must be imported, and shipping is infrequent and occasionally unreliable. And for most residents, home storage is limited by the relatively small lots and homes.

PART III: ECONOMIC, POPULATION AND FISCAL IMPACTS

1. PLANNED DEVELOPMENT

The development plans for Miki 200 are summarized in Table III-1.

a. Zoning and Land Use

Zoning (proposed)

As indicated previously, Miki 200 will include 100 acres designated Light Industrial and 100 acres designated Heavy Industrial, which is consistent with the Lānaʻi Community Plan (Table III, Section 1.a).

Land Use, 2030

As mentioned in Subsection I.2.b, Miki 200 will be Lānaʻi's first large-scale industrial park. Lot sizes may range from less than a half-acre to 20 acres or more. Also, rental space may be available in industrial buildings, if built.

Committed Industrial Uses

About 174 acres are committed for infrastructure and industrial activities, including:

— Infrastructure: about 20 acres

Internal roads, drainage areas and common areas are expected to require about 20 acres (10%) of the Project area.

— Renewable Energy: about 127 acres

HECO has requested proposals for a 17.5 megawatt (**MW**) photo voltaic system on Lānaʻi plus a 70 MW-hour (**MWh**) battery energy storage system (**PV+BESS**). To help meet the need for renewable energy on Lānaʻi, Pūlama Lānaʻi plans to allocate 127 acres at Miki 200 for renewable energy. The acreage is based on the energy facility being developed at the Pacific Missile Range Facility (**PMRF**) on Kauaʻi (14 MW/70MWh PV+BESS).

— Concrete/Rock Crushing Facility: about 14.5 acres

Pūlama Lānaʻi's concrete recycling and rock- crushing facility uses equipment to crush concrete and rocks into various sizes and types of aggregate to construct roadways, sidewalks, etc., and for backfill throughout the island for construction projects.

The facility and equipment are mobile, and are temporarily located on 1.6 acres at Miki 20. Miki 200 will provide a permanent base for the operation, water for washing equipment and controlling dust, and a central location for serving the island. Most of the acreage for the relocated operation will be used for stockpiling (1) various types of material to be crushed and (2) various grades of aggregate. These stockpiles will provide an ample and ready supply of aggregate when needed.

After the relocation of operations to Miki 200, the 1.6 acres now used at Miki 20 will come available for other industrial activities.

— Asphalt Plant: about 12.5 acres

Pūlama Lānaʻi's asphalt plant is a hot-mix batch plant that services both the community and Pūlama Lānaʻi. The asphaltic concrete produced from this plant supplies material required to pave new roads, and to repair and repave existing ones.

This mobile facility will be relocated from its current temporary site near Kaumalapau Harbor to Miki 200 in order to provide a permanent base of operations in a central location for serving the island. The current location near the harbor will be used for stockpiling supplies.

Typical Industrial Activities by 2030

"Typical industrial activities" are defined to include those industrial activities typically found in Hawaiʻi (such as manufacturing, warehouses, base yards, etc.), but excluding those activities listed in the previous section (i.e., PV+BESS, concrete/rock-crushing facilities, and asphalt plants).

A partial list of industrial activities that could or are likely to develop at Miki 200 include the following:

— Vehicle rentals (cars, 4-wheel drive vehicles, trucks, etc.)
— Vehicle maintenance and repair (engines, transmissions, tires, body, etc.)
— Car wash
— All-terrain vehicle sales, maintenance, repair, etc.
— Small-boat supplies, maintenance and repair (including fishing gear)
— Commercial laundry services for residents
— Base yards and storage for construction trucks, equipment and supplies (lumber, bricks, cement, pipes, roofing, sheetrock, etc.)
— A base of operations for home maintenance, repairs and services (roofing, electrical, plumbing, appliances, cleaning services, pools, etc.)

— A base of operations for maintaining and repairing office equipment (computers, printers, wifi networks, etc.)

— Self-storage space for household goods, records, business supplies, etc.

— Shops and crafts (metal, woodcrafts, taxidermy, lei hulu, etc.)

— Fruit and vegetable processing, possibly with a shared commercial kitchen

— Veterinarian services and pet supplies at a fixed location

— A gym featuring exercise and therapy equipment

— A fixed location for a slaughtering facility and cold storage for hunted animals (i.e., axis deer and mouflon sheep)

— Laboratories (medical, environmental, etc.)

— Shared office facilities for business at Miki 200

The market assessment for Miki 200 forecasts that about 7.6 acres will be used for "typical industrial activities" by 2030.

Industrial Activities After 2030

About 18.4 acres at Miki 200 will accommodate the demand for industrial land beyond 2030. More importantly, this acreage will provide industrial land approved for development and may have major infrastructure in order to take immediate advantage of any new economic opportunities which may arise, thereby diversifying Lānaʻi's economy. This acreage will also be available to accommodate "typical industrial activities" before 2030 in the event that the pent-up demand is greater than estimated.

Fully Improved and Partially Improved Lots

Improved lots will be offered for lease, with the lots having access to internal roads, water, power, sewers, the drainage system, etc. However, the lots planned for renewable energy, the concrete/rock crushing facilities and the asphalt plant will be partially improved given the nature of these activities. These lots, which will cover about 154 acres, will require less road development, less water or no water, less power or no power, less waste-water disposal or no disposal, etc.

b. Building Space

As mentioned above, estimated 7.6 acres will be used for "typical industrial activities" by 2030. This acreage may accommodate about 114,000 sq. ft. of building space (Table III-1, Section 1.b). It is anticipated that some of this space may be occupied by businesses relocating from home operations in Lānaʻi City.

2. ECONOMIC IMPACTS OF DEVELOPMENT ACTIVITIES

The development of the Project may involve the following activities: (1) grading and other work to prepare the site for development; (2) construction of internal roads, a water delivery system, a sewer system, drainage systems, utilities systems, etc.; (3) rental of lots to component developers; and (4) construction of buildings. Table III-2 summarizes the direct and indirect economic impacts of these development activities. The material in this table gives the development period, construction expenditures, indirect sales generated by the construction activity, profits, and employment and payroll.

a. Development Period

As mentioned previously, most Project development is expected to occur over a period of about 10 years (Table III-2, Section 4.a). Given the current economy and population, along with projected growth, significant demand for industrial space is expected during this period. However, development could require more time, depending on future market conditions, lot leases, and the construction of buildings.

b. Construction Expenditures and Related Sales

Over the 10-year development period, total construction expenditures for the Project are estimated at about $78.8 million (Table III-2, Section 2.b). This translates into average construction expenditures of about $7.9 million per year. In practice, construction expenditures will vary from year to year. Infrastructure costs normally occur in the early years of development as the backbone infrastructure is installed. Construction expenditures associated with possible buildings and other improvements will be made over time as the lots are leased and developed.

In addition to construction, other development expenditures will be incurred for planning, permitting, design, financing, marketing, and sales commissions.

In addition to construction expenditures, development activities will generate indirect sales associated with supplying goods and services to construction companies and to the families of construction workers. In turn, the companies supplying goods and services, and the families of their employees, will purchase goods and services from other companies, and so on. These indirect sales will include sales by companies supplying building materials (cement, steel, lumber, roofing materials, plumbing equipment, electrical equipment, hardware supplies, lighting, flooring, etc.); rent out construction equipment; repair equipment; provide warehousing services; provide shipping and trucking services; etc. Indirect sales also include sales by grocery stores, drug stores, restaurants, service stations, beauty salons, medical providers, accountants, attorneys, insurance agents, etc.

Based on State economic multipliers, these indirect sales are expected to average about $5.0 million per year, of which about $3.0 million per year will be on the island of Lānaʻi and about $2.0 million on O`ahu (Table III-2, Section 2.b).

REF-401

Construction expenditures plus indirect sales related to construction are expected to average about $12.9 million per year. About $9.6 million per year will be subject to the State 4% excise tax on final sales, while about $3.3 million per year will be subject to the 0.5% excise tax on intermediate sales. Depending upon market conditions, development and sales in some years may be much higher or lower than the average.

c. Profits

Profits on construction expenditures and related sales are estimated to average about $1.7 million per year (Table III-2, Section 2.c). These profits will accrue to the various construction companies and subcontractors, and to the various companies that sell goods and services to those companies and the families deriving income from the construction activity.

d. Employment

During the Project's 10-year development period, construction employment is expected to average about 19 jobs per year (Table III-2, Section 2.e). These jobs will include supervisors, heavy-equipment operators (grading, roads, water mains, sewer lines, etc.), cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, glass and window installers, cabinet makers, carpet and tile layers, painters, equipment installers, interior decorators, landscapers, etc. Other jobs related to construction will include architects, civil engineers, draftsmen, government inspectors, etc. These jobs will range over a variety of skill levels, including entry-level, semi-skilled, skilled, management, and professional positions.

As with indirect sales, development activities will generate indirect jobs associated with supplying goods and services to construction companies and to the families of construction workers. In turn, the companies supplying goods and services, and the families of their employees, will purchase goods and services from other companies, and so on. Indirect jobs will include those at companies supplying building materials (cement, steel, lumber, roofing materials, plumbing equipment, electrical equipment, hardware supplies, lighting, flooring, etc.); rent construction equipment; repair equipment; provide warehousing services; provide shipping and trucking services; etc. Other indirect jobs will include those involved with supplying goods and services to employees and their families: grocery workers, store clerks, restaurant workers, service-station workers, beauty technicians, barbers, bankers, pharmacists, veterinarians, computer technicians, medical workers, accountant attorneys, etc. The jobs will range over a variety of skill levels, including entry-level, semi-skilled, skilled, and management positions.

Based on State employment multipliers, indirect employment related to Project development is expected to average about 29 jobs per year.

Thus, total direct-plus-indirect employment associated with Project development activities will average about 48 jobs per year.

e. Payroll

Development activities are expected to generate a total payroll of about $3.0 million per year for the Project, of which nearly $1.7 million will be for construction workers, and nearly $1.4 million for indirect employment (Table III-2, Section 2.f). These estimates are based on the average number of direct and indirect jobs multiplied by average wages as reported by the DLIR.

Wages are expected to average about $87,800 per year for construction jobs and about $47,000 for indirect jobs.

f. Sources of Construction Workers

The construction labor force on the island of Lānaʻi is limited. As such, it is assumed that a mix of on-island and off-island construction workers will fill the various jobs generated by the proposed development. In the past, construction workers have commuted to Lānaʻi to fill the labor requirements of building projects.

3. ECONOMIC IMPACTS OF OPERATIONS, 2030

Table III-3 summarizes economic impacts of operations at Miki 200 in 2030.

a. Economic Activities

As mentioned previously, industrial activities at Miki 200 by 2030 will include the renewable energy facility (ie., PV+BESS), the concrete/rock-crushing facility, the asphalt plant, and "typical industrial activities."

The PV system is expected to generate about 35,800 MWh per year of energy, which is based on HECO's request for proposals.

The concrete/rock-crushing facility and the asphalt plant will be relocated from elsewhere on Lānaʻi, so are not new activities to the island. These operations are owned by Palama Lānaʻi, and generate little or no revenues.

"Typical industrial activities" are expected to use about 114,000 sq. ft. of space at Miki 200 by 2030. About about 23,700 sq. ft. of this space may be used for self-storage facilities (based on the market assessment for Miki 200).

Some of the companies at Miki 200 are expected to be businesses that will relocate from home operations in Lānaʻi City. The space required to accommodate these existing business is estimated at 17,700 sq. ft. based on 5% of the households on Lānaʻi × an average of 300 sq. ft. per household. Thus, the net increase in "typical industrial activities" is projected to be about 96,300 sq. ft., including about 23,700 sq. ft. used for self-storage facilities.

REF-402

b. Revenues

By 2030, new economic activities at Miki 200 are expected to generate about $17.1 million per year in revenues (Table III-3, Section 3.b).

c. Rental Income

Rental income is expected to reach nearly $1.7 million per year, including (1) rent from the renewable energy facility and (2) rents from the industrial space within buildings (Table III-3, Section 3.c). However, the rental income does not include land rents for those lots having buildings.

d. Profits

Corresponding new profits will amount to about $1.6 million per year by 2030 (Table III, Section 3.d).

e. Employment

The industrial activities at Miki 200 will generate about 60 new jobs by 2030 (Table III-3, Section 3.e). Most of these new jobs will be provided by "typical industrial activities." Also, about 8 additional employees will be hired for concrete/rock-crushing and asphalt operations.

The industrial jobs at Miki 200 will range over a variety of skill levels, including entry-level, semi-skilled, skilled, highly skilled professionals, and management positions.

f. Payroll

By 2030, total payroll for the new jobs is estimated at about $2.8 million per year (Table III-3, Section 3.f).

g. Sources of Skilled Workers

As Miki 200 will be developed over a number of years, skilled workers will be recruited from various schools, companies, and other organizations in Hawai‘i and on the mainland. The jobs will appeal to skilled workers who want to apply their training and skills in order to remain in Hawai‘i or return to Hawai‘i.

Programs to increase the supply of professionals and skilled workers are the responsibility of the various universities, colleges, and technical schools.

h. Supported Population and Housing

New jobs at Miki 200 will support approximately 120 residents in 50 homes by 2030 (Table III, Section 3.g).

4. IMPACTS ON COUNTY REVENUES AND EXPENDITURES

The impact of the Project on County finances is shown in Table III-4. This table summarizes: (1) revenues and expenditures related to development activities, and (2) revenues and expenditures related to operations in 2030.

a. Development Activities

The County derives negligible tax revenues from development activity.

Regarding County expenditures to support the Project, they also are expected to be negligible. As with other major projects in the County, the developer and builders will provide or finance their fair shares of infrastructure and facilities to support the Project. This may include interior roads, interior water distribution, sewers, drainage systems, etc. Also, construction activities require few onsite services from the County. Furthermore, construction companies will provide their own security, sanitation, transportation, etc.

As a result, Project development activity will result in a negligible impact on County finances during the development period.

b. Operations, 2030

By 2030, Miki 200 will generate additional property tax revenues to the County of about $380,000 per year (Table III-4, Section 4.b). Nominal revenues from other taxes and user fees will be generated but are not estimated.

Inasmuch as the Miki 200 is expected to be developed in conjunction with forecasted population growth for Lāna‘i, the County is not expected to realize significant additional increases in expenditures as a direct result of the project. Thus, the Project is projected to generate about $380,000 per year in net revenues to the County.

5. IMPACTS ON STATE REVENUES AND EXPENDITURES

The impact of the Project on State finances is shown in Table III-5. This table summarizes: (1) revenues and expenditures related to development activities, and (2) revenues and expenditures related to operations in 2030.

a. Development Activities

Unlike the County, the State derives substantial revenues from development activity. Over the initial 10-year development period, Project development activities are expected to generate about $5.6 million in revenues for the State, for an average of about $560,000 per year (Table III-5, Section 5.a). Most of the revenues will be derived from (1) excise taxes and (2) corporate and personal income taxes.

REF-403

State expenditures to support Project development activities are expected to be negligible. Infrastructure and facilities to support the Project are primarily a County responsibility, with most of the fair share provided or financed by the developer. Also, Construction activities will require few onsite services from the State. Furthermore, most required services will be provided by construction companies.

Over the initial 10-year development period, the State will net about $5.6 million from development activities associated with the Project, for an average of about $560,000 per year.

b. Operations, 2030

By 2030, Miki 200 will generate increased revenues to the State of about $670,000 per year (Table III-5, Section 5.b). State revenues will include excise taxes, corporate and personal income taxes. Nominal revenues from other taxes and user fees will be generated but are not estimated.

Additional State expenditures are not anticipated to be required to support operations of the Project.

Thus, the Project is projected to generate about $670,000 per year in net revenues to the State by 2030.

REFERENCES

Colliers International. "O‘ahu, Hawai‘i, Research & Forecast Report, Industrial Market." Fourth Quarter 2019.

County of Maui, Office of Economic Development. Maui County Data Book. 2019.

County of Maui, Real Property Assessment Division. 2021.

Department of Business, Economic Development & Tourism, State of Hawai‘i. *The Hawai‘i Inter-County Input-Output Study: 2017 Benchmark Report.* June 2021.

Department of Business, Economic Development & Tourism, State of Hawai‘i. *The Hawai‘i State Input-Output Study: 2017 Benchmark Report.* December 20210.

Department of Business, Economic Development & Tourism, State of Hawai‘i. *The State of Hawai'i Data Book.* Annual.

Department of Labor and Industrial Relations, State of Hawai'i. *Employment and Payroll in Hawai'i.* Annual.

Google Maps. 2021.

Hawai‘i Energy Projects Directory. 2021.

Plasch Econ Pacific LLC. "Miki Basin Industrial Park: Market Assessment." September 2021.

Plasch Econ Pacific LLC. 2021.

Pūlama Lāna‘i. 2021.

Tax Foundation of Hawai’i. "Taxes in Hawai’i." Annual.

U.S. Census Bureau. American Community Survey 5 Year Estimates.

U.S. Census Bureau. Decennial Census, 2010.

Part II Tables:
Socio-Economic Conditions

Table II-1. Demographic Characteristics, County of Maui and Island of Lana'i: 2010 and 2015–2019 Estimates

Item	County of Maui			Lana 'i		
	2010	2015-2019	Change	2010	2015-2019	Change
Population (residents)	154,834	165,979	7.2%	3,135	2,730	-12.9%
Male	77,587	82,633	6.5%	1,600	1,396	-12.8%
Female	77,247	83,346	7.9%	1,535	1,334	-13.1%
Distribution						
Male	50.1%	49.8%		51.0%	51.1%	
Female	49.9%	50.2%		49.0%	48.9%	
Population by Age						
Pre-school Age, 4 and Under	10,020	9,907	-1.1%	235	124	-47.2%
School Age, 5 to 19	29,117	29,706	2.0%	621	366	-41.1%
Working Age, 20 to 64	95,894	97,271	1.4%	1,805	1,546	-14.3%
Retirement Age, 65 and Over	19,803	29,095	46.9%	474	694	46.4%
Distribution						
Pre-school Age, 4 and Under	6.5%	6.0%		7.5%	4.5%	
School Age, 5 to 17	18.8%	17.9%		19.8%	13.4%	
Working Age, 18 to 64	61.9%	58.6%		57.6%	56.6%	
Retirement Age, 65 and Over	12.8%	17.5%		15.1%	25.4%	
Median Age	39.6	41.20	4.0%	38.6	49.00	26.9%
Ethnicity						
White alone	53,336	58,891	10.4%	460	488	6.1%
Black or African American alone	870	845	-2.9%	5	0	-100.0%
American Indian and Alaska Native alone	603	424	-29.7%	2	0	-100.0%
Asian alone	44,595	48,579	8.9%	1,745	1,459	-16.4%
Native Hawaiian and Other Pacific Islander alone	16,051	18,093	12.7%	205	186	-9.3%
Some Other Race alone	3,051	2,865	-6.1%	5	52	940.0%
Two or More Races	36,328	36,282	-0.1%	713	545	-23.6%
Distribution						
White alone	34.4%	35.5%		14.7%	17.9%	
Black or African American alone	0.6%	0.5%		0.2%	0.0%	
American Indian and Alaska Native alone	0.4%	0.3%		0.1%	0.0%	
Asian alone	28.8%	29.3%		55.7%	53.4%	
Native Hawaiian and Other Pacific Islander alone	10.4%	10.9%		6.5%	6.8%	
Some Other Race alone	2.0%	1.7%		0.2%	1.9%	
Two or More Races	23.5%	21.9%		22.7%	20.0%	

REF-405

Table II-1. Demographic Characteristics, County of Maui and Island of Lanaʻi: 2010 and 2015–2019 Estimates

(continued)

Item	County of Maui			Lana 'i		
	2010	2015-2019	Change	2010	2015-2019	Change
Households	53,886	54,479	1.1%	1,158	1,181	2.0%
Average Size	2.82	3.00	6.4%	2.71	2.31	-14.8%
Tenure						
Homeowners	30,055	33,232	10.6%	591	706	19.5%
Renters	23,831	21,247	-10.8%	567	475	-16.2%
Distribution						
Homeowners	55.8%	61.0%		51.0%	59.8%	
Renters	44.2%	39.0%		49.0%	40.2%	
Household Type						
Family Household	35,498	38,249	7.7%	788	745	-5.5%
Non-family Household	18,388	16,230	-11.7%	370	436	17.8%
Distribution						
Family Household	65.9%	70.2%		68.0%	63.1%	
Non-family Household	34.1%	29.8%		32.0%	36.9%	
Housing Units	70,379	73,169	4.0%	1,545	1,549	0.3%
Occupied	53,886	54,479	1.1%	1,158	1,181	2.0%
Vacant	16,493	18,690	13.3%	387	368	-4.9%
For seasonal, recreational, or occasional use	9,956	n/a		108	n/a	
Distribution						
Occupied	76.6%	74.5%		75.0%	76.2%	
Vacant	23.4%	25.5%		25.0%	23.8%	
For seasonal, recreational, or occasional use	14.1%	n/a		7.0%	n/a	

Sources:

U.S. Censusu Bureau. Decennial Census. 2010.

U.S. Census Bureau. American Community Survey 5 Year Estimate, 2015-2019.

Table II-2. Income and Education, County of Maui and Island of Lanaʻi: 2010–2014 and 2015–2019 Estimates

Item	County of Maui			Lana 'i		
	2010-2014	2015-2019	Change	2010-2014	2015-2019	Change
Income						
Mean Household Income	$84,035	$102,759	22.3%	$67,475	$73,484	8.9%
Per Capita Income	$29,499	$35,241	19.5%	$23,262	$33,052	42.1%
Educational Attainment, 25 Years and Older						
Less than 9th Grade	4,393	4,416	0.5%	146	219	50.0%
Grades 9 to 12, No Diploma	6,007	5,057	-15.8%	158	128	-19.0%
High School Graduate, No College	34,941	36,912	5.6%	896	723	-19.3%
Some College, No Degree	27,200	27,584	1.4%	505	408	-19.2%
Associate Degree	9,854	12,029	22.1%	170	229	34.7%
College, Bachelor's Degree	19,374	21,366	10.3%	367	334	-9.0%
Graduate or Professional Degree	9,000	10,753	19.5%	170	136	-20.0%
Total Population, Age 25 and Older	110,769	118,117	6.6%	2,412	2,177	-9.7%
Distrbution						
Less than 9th Grade	4.0%	3.7%		6.1%	10.1%	
Grades 9 to 12, No Diploma	5.4%	4.3%		6.6%	5.9%	
High School Graduate, No College	31.5%	31.3%		37.1%	33.2%	
Some College, No Degree	24.6%	23.4%		20.9%	18.7%	
Associate Degree	8.9%	10.2%		7.0%	10.5%	
College, Bachelor's Degree	17.5%	18.1%		15.2%	15.3%	
Graduate or Professional Degree	8.1%	9.1%		7.0%	6.2%	
Language Spoken at Home (Household)						
English Only	117,369	120,418	2.6%	2,299	1,751	-23.8%
Spanish	2,768	5,896	113.0%	-	33	0.0%
Other Indo-European	2,483	1,647	-33.7%	1	1	0.0%
Asian and Pacific Island languages	25,882	27,466	6.1%	967	821	-15.1%
Others	234	645	175.6%	-	-	0.0%
Distribution						
English Only	78.9%	77.2%		70.4%	67.2%	
Spanish	1.9%	3.8%		0.0%	1.3%	
Other Indo-European	1.7%	1.1%		0.0%	0.0%	
Asian and Pacific Island languages	17.4%	17.6%		29.6%	31.5%	
Others	0.2%	0.4%		0.0%	0.0%	

Sources:

U.S. Census Bureau. American Community Survey 5 Year Estimate, 2010-2014.

Part III Tables:
Economic, Population and Fiscal Impacts

Table III-1. Planned Development
(Values in 2019 dollars)

Item	Source or Multiplier	Amount	Units
1.a. ZONING AND LAND USE			
Zoning (proposed)			
Light Industrial	Pulama Lanai	100.0	acres
Heavy Industrial		100.0	acres
Total Industrial		**200.0**	**acres**
Land Use, 2030			
Infrastructure	Pulama Lanai	20.0	acres
Renewable Energy	Pulama Lanai	127.0	acres
Concrete/Rock-Crushing Facility	Pulama Lanai	14.5	acres
Asphalt Plant	Pulama Lanai	12.5	acres
Typical Industrial Activities	Market Assessment	7.6	acres
Vacant (to be developed after 2030)	Market Assessment	18.4	acres
Total Use		200.0	acres
Fully Improved and Partially Improved Areas			
Full Improvements	residual	46.0	acres
Partial Improvements	Renewable energy, concrete/rock-crushing facility and asphalt plant	154.0	acres
Total		200.0	acres
1.b. BUILDING SQUARE FOOTAGE			
Typical Industrial Activities	15,000 sq ft per acre	**114,000**	**sq. ft.**

REF-407

Table III-2. Economic Impacts of Development Activities

(Values in 2019 dollars)

Item	Source or Multiplier	Amount	Units
2.a. DEVELOPMENT PERIOD			
Duration of Construction (for most development)		**10**	**years**
2.b. CONSTRUCTION AND RELATED EXPENDITURES			
Construction Costs			
Sitework, Infrastructure and Utilities			
Full Improvements	$ 200,000 per acre	$ 9,200,000	
Partial Improvements	$ 20,000 per acre	$ 3,080,000	
Renewable Energy	17.5 MW $ 2.5 million/MW	$ 43,750,000	
Relocation Costs, Crushing Facilities		n.e.	
Relocation Costs, Asphalt Plant		n.e.	
Buildings	$200 per sq. ft.	$ 22,800,000	
Total Construction and Related Expenditures		**$ 78,830,000**	
Construction Expenditures, Annual Average		**$ 7,883,000**	per year
Hawaii	55%	$ 4,335,700	per year
Imports	45%	$ 3,547,400	per year
Indirect Sales, Annual Average	1.15 of Hawaii exp.	**$ 4,986,055**	**per year**
Lanai	60%	$ 2,991,600	per year
Oahu	40%	$ 1,994,455	per year
Total Direct and Indirect Sales, Annual Average		**$ 12,869,055**	**per year**
Other Development Costs [1]		**n.e.**	
Final Sales (taxed at 4%)			
Construction Expenditures	above	$ 7,883,000	per year
Consumption	55% of payroll	$ 1,667,160	per year
Total Final Sales		**$ 9,550,160**	**per year**
Intermediate Sales (taxed at 0.5%)			
Indirect Sales Related to Construction	Section 4.c	$ 4,986,055	per year
Less Consumption	above	$ (1,667,160)	
Total Intermediate Sales		**$ 3,318,895**	**per year**
2.c. PROFITS			
Profits on Total Expenditures & Sales	10.0%	$ 1,286,906	per year
Risk Premium for Construction	5.0%	$ 394,200	per year
Total Profit from Construction & Related Activity		**$ 1,681,106**	**per year**
2.d. EMPLOYMENT (on-site & off-site)			
Construction Jobs	4.31 x sales/$1 mil	19	jobs/year
Indirect Jobs Generated by Construction	1.55 x direct jobs x	29	jobs/year
Total Employment		**48**	**jobs/year**
2.e. PAYROLL			
Construction Payroll	$ 87,800 per job	$ 1,668,200	per year
Payroll for Indirect Employment	$ 47,000 per job	$ 1,363,000	per year
Total Payroll		**$ 3,031,200**	**per year**

[1] Before realizing profits, developers must pay a number of development-related costs in addition to construction costs. These "Other Development Costs" include planning, permitting, design, financing, marketing, and sales commissions.

Table III-3. Economic Impacts of Operations, 2030

(Values in 2019 dollars)

Item	Source or Multiplier	Amount	Units
3.a. ECONOMIC ACTIVITIES			
On Site			
Renewable Energy	HECO	35,800	MWh/yr
Concrete/Rock-Crushing Facility	Table III-1, Section 1.a	14.5	acres
Asphalt Plant	Table III-1, Section 1.a	12.5	acres
Typical Industrial Activities	Table III-1, Section 1.b	114,000	sq. ft.
Typical Industrial Activities, Excluding Self-Storage	derived	90,300	sq. ft.
Self-Storage	Market Assessment	23,700	sq. ft.
Relocated Activities			
Concrete/Rock-Crushing Facility	Pulama Lanai	14.5	acres
Asphalt Plant	Pulama Lanai	12.5	acres
Typical Industrial Activities, Excluding Self-Storage	5% of households 1,181 households 300 sq. ft per household	17,700	sq. ft.
New To Lanai			
Renewable Energy		35,800	MWh/yr
Typical Industrial Activities		96,300	sq. ft.
Typical Industrial Activities, Excluding Self-Storage	residual	72,600	sq. ft.
Self-Storage	Market Assessment	23,700	sq. ft.
3.b. REVENUES			
Revenues, On-Site Activities			
Renewable Energy	$ 0.10 per kWh	$ 3,580,000	per year
Concrete/Rock-Crushing Facility	Pulama Lanai	$ -	per year
Asphalt Plant	Pulama Lanai	$ -	per year
Typical Industrial Activities, Excluding Self-Storage	$ 150 per sq. ft.	$ 13,545,000	per year
Self-Storage	(included with rents)	$ -	per year
Total Revenues, On-Site Activities		**$ 17,125,000**	**per year**
New Revenues			
Renewable Energy	$ 0.10 per kWh	$ 3,580,000	per year
Concrete/Rock-Crushing Facility		$ -	per year
Asphalt Plant		$ -	per year
Typical Industrial Activities, Excluding Self-Storage	$ 150 per sq. ft.	$ 10,890,000	per year
Self-Storage	included with rents	$ -	per year
Total New Revenues		**$ 14,470,000**	**per year**
3.c. RENTAL INCOME			
Renewable Energy	$ 3,000 per acre	$ 381,000	per year
Concrete/Rock-Crushing Facility	Pulama Lanai	$ -	per year
Asphalt Plant	Pulama Lanai	$ -	per year
Typical Industrial Activities			
Land Rent		n.e.	per year
Space Rent			
Typical Industrial Activities, Excluding Self-Storage	$ 10 per sq. ft. 50% rented	$ 451,500	per year
Self-Storage	$ 35 per sq. ft.	$ 829,500	per year
Total Rents		**$ 1,662,000**	**per year**

REF-408

Table III-3. Economic Impacts of Operations, 2030

(Values in 2019 dollars)
(continued)

Item	Source or Multiplier	Amount	Units
3.d. PROFITS			
Profits, On-site Activities			
From Operations	10% of revenues	$ 1,712,500	per year
From Rents	10% of rents	$ 166,200	per year
Total Profits, On-Site Activities		**$ 1,878,700**	**per year**
New Profits			
From Operations	10% of revenues	$ 1,447,000	per year
From Rents	10% of rents	$ 166,200	per year
Total New Profits		**$ 1,613,200**	**per year**
3.e. EMPLOYMENT			
Employment, On Site			
Renewable Energy	PEP	2	jobs
Concrete/Rock-Crushing Facility + Asphalt Plant	Pulama Lanai	25	jobs
Typical Industrial Activities	1,500 sf per job	60	jobs
Self-Storage	PEP	2	jobs
Total Jobs, On Site		**89**	**jobs**
New Employment			
Renewable Energy	PEP	2	jobs
Concrete/Rock-Crushing Facility + Asphalt Plant	Pulama Lanai	8	jobs
Typical Industrial Activities	1,500 sf per job	48	jobs
Self-Storage	PEP	2	jobs
Total New Jobs		**60**	**jobs**
3. f. PAYROLL			
Payroll for On-site Jobs			
Renewable Energy	$ 60,000 per job	$ 120,000	per year
Concrete/Rock-Crushing Facility+ Asphalt Plant	$ 56,000 per job	$ 1,400,000	per year
Typical Industrial Activities	$ 45,000 per job	$ 2,700,000	per year
Self-Storage	$ 35,000 per job	$ 70,000	per year
Total Payroll, On Site		**$ 4,290,000**	**per year**
Payroll for New Jobs			
Renewable Energy	$ 60,000 per job	$ 120,000	per year
Concrete/Rock-Crushing Facility+ Asphalt Plant	$ 56,000 per job	$ 448,000	per year
Typical Industrial Activities	$ 45,000 per job	$ 2,160,000	per year
Self-Storage	$ 35,000 per job	$ 70,000	per year
Total Payroll for New Jobs		**$ 2,798,000**	**per year**
3.g. SUPPORTED POPULATION AND HOUSING			
Total New Employment	Section 3.e	60	jobs
Supported Population	1.97 residents per new job	120	residents
Housing for Supported Population	2.31 resident per home	50	homes

Table III-4. Impacts on County Revenues and Expenditures

(Values in 2019 dollars)

Item	Source or Multiplier	Amount	Units
4.a. DEVELOPMENT ACTIVITIES			
Revenues, Cumulative		n.e.	see text
Expenditures, Cumulative [1]		n.e.	see text
Net Revenues, Cumulative		n.e.	see text
4.b. OPERATIONS, 2030			
Tax and Expenditure Base			
Taxable Property Value			
Land	$ 150,000 per acre	$ 30,000,000	
Buildings	Table III-2, Section 2.b	$ 22,800,000	
Total Property Value		**$ 52,800,000**	
Revenues, Annual			
Property Taxes			
Property Tax Revenue	$ 7.20 per $1,000	$ 380,160	per year
Less Current Taxes	County of Maui	$ (490)	per year
New Property Taxes		**$ 379,670**	**per year**
Expenditures, Annual		n.e.	see text
Net Revenues, Annual		**$ 379,670**	**per year**

[1] Infrastructure will be built by Pulama Lanai.

REF-409

Table III-5. Impacts on State Revenues and Expenditures

(Values in 2019 dollars)

Item	Source or Multiplier	Amount	Units
5.a. DEVELOPMENT ACTIVITIES			
Tax and Expenditure Base			
Duration (for most development)	Table III-2, Section 2.a	10	years
Final Sales	Table III-2, Section 2.b	$ 9,550,160	per year
Intermediate Sales	Table III-2, Section 2.b	$ 3,318,895	per year
Profits	Table III-2, Section 2.c	$ 1,681,106	per year
Payroll	Table III-2, Section 2.e	$ 3,031,200	per year
Revenues, Average Annual			
Excise Tax on:			
Final Sales	4.0% of sales and property sales	$ 382,000	per year
Intermediate Sales	0.5% of sales	$ 16,600	per year
Corporate Income Taxes	1.0% of profits	$ 16,800	per year
Personal Income Taxes	4.8% of income	$ 145,500	per year
Total Revenues		**$ 560,900**	**per year**
Revenues, Cumulative		**$ 5,609,000**	
Expenditures, Cumulative		n.e.	see text
Net Revenues, Cumulative		**$ 5,609,000**	
5.b. OPERATIONS, 2030			
Tax and Expenditure Base			
Sales Revenues, New			
Final Sales (Typical industrial activities)	Table III-3, Section 3.b	$ 10,890,000	per year
Intermediate Sales (energy)	Table III-3, Section 3.b	$ 3,580,000	per year
Rental Income	Table III-3, Section 3.c	$ 1,662,000	per year
Profits, New	Table III-3, Section 3.d	$ 1,613,200	per year
Payroll, New	Table III-3, Section 3.f	$ 2,798,000	per year
New Revenues, Annual			
Excise Tax on:			
Final Sales	4.0% of sales final sales	$ 435,600	per year
Intermediate Sales	0.5% of sales intermediate sales	$ 17,900	per year
Rents	4.0% of rents	$ 66,480	per year
Corporate Income Tax	1.0% of profit	$ 16,130	per year
Personal Income Tax	4.8% of income	$ 134,300	per year
Total New Revenues		**$ 670,410**	**per year**
Expenditures, Annual		n.e.	see text
Net Revenues, Annual		**$ 670,410**	**per year**

REF-410

TRAFFIC IMPACT ANALYSIS REPORT

APPENDIX

G

REF-411

TRAFFIC IMPACT ANALYSIS REPORT
MIKI BASIN INDUSTRIAL PARK
LANAI CITY, LANAI, HAWAII

DRAFT FINAL

June 3, 2021

Prepared for:
Pulama Lanai
1311 Fraser Avenue
Lanai City, HI 96763

Austin, Tsutsumi & Associates, Inc.
Civil Engineers • Surveyors
501 Sumner Street, Suite 521
Honolulu, Hawaii 96817-5031
Telephone: (808) 533-3646
Facsimile: (808) 526-1267
E-mail: atahnl@atahawaii.com
Honolulu • Wailuku • Hilo, Hawaii

TRAFFIC IMPACT ANALYSIS REPORT
MIKI BASIN INDUSTRIAL PARK
Lanai City, Lanai, Hawaii

DRAFT FINAL

Prepared for

Pulama Lanai
1311 Fraser Avenue
Lanai City, HI 96763

Prepared by
Austin, Tsutsumi & Associates, Inc.
Civil Engineers • Surveyors
Honolulu • Wailuku • Hilo, Hawaii

June 3, 2021

REF-412

TABLE OF CONTENTS

		Page
1.	INTRODUCTION	1 - 4
1.1	Project Description	1
1.2	Study Methodology	1
1.3	Analysis Methodology	2
2.	EXISTING CONDITIONS	5-7
2.1	Roadway System	5
2.2	Existing Traffic Volumes	5
2.2.1	Kaumalapau Highway/Miki Road Count Data	5
2.2.2	Traffic Count Adjustments	5
2.3	Existing Observations and Analysis	6
2.3.1	Intersection Analysis	6
3.	BASE YEAR 2040 TRAFFIC CONDITIONS	8-10
3.1	Growth Rate	8
3.2	Background Projects	8
3.3	Planned Roadway Projects	8
3.4	Base Year 2040 Analysis	8
4	FUTURE YEAR 2040 TRAFFIC CONDITIONS	11-16
4.1	Project Description	11
4.2	Travel Demand Estimations	11
4.2.1	Trip Generation	11
4.2.2	Trip Distribution & Assignment	12
4.3	Future Year 2040 Analysis	12
4.3.1	Signal Warrant Analysis	12

AUSTIN, TSUTSUMI & ASSOCIATES, INC.
CIVIL ENGINEERS • SURVEYORS

TABLE OF CONTENTS
Cont'd

4.3.2	Left-turn Lane Warrant	13
4.3.3	Intersection Geometry	13
5	CONCLUSIONS AND RECOMMENDATIONS	17
6	REFERENCES	18

TABLES

2.1	HDOT AADT TRAFFIC VOLUMES	6
4.1	PROJECT TRIP GENERATION	12
4.2	EXISTING, BASE YEAR 2040, AND FUTURE YEAR 2040 LOS	13

FIGURES

1.1	LOCATION MAP	3
1.2	SITE PLAN	4
2.1	EXISTING LANE CONFIGURATION, VOLUMES, AND LOS	7
3.1	BACKGROUND PROJECTS	9
3.2	BASE YEAR 2040 LANE CONFIGURATION, VOLUMES, AND LOS	10
4.1	PROJECT GENERATED TRIPS	14
4.2	FUTURE YEAR 2040 LANE CONFIGURATION, VOLUMES, AND LOS	15
4.3	LEFT-TURN WARRANT (NCHRP 279)	16

TABLE OF CONTENTS
Cont'd

APPENDICES

A. LEVEL OF SERVICE CRITERIA

B. TRAFFIC COUNT DATA

C. LEVEL OF SERVICE CALCULATIONS

D. TRAFFIC SIGNAL WARRANT

AUSTIN, TSUTSUMI & ASSOCIATES, INC. CIVIL ENGINEERS • SURVEYORS
CONTINUING THE ENGINEERING PRACTICE FOUNDED BY H. A. R. AUSTIN IN 1934

TERRANCE S. ARASHIRO, P.E.
ADRIENNE W.L.H. WONG, P.E., LEED AP
DEANNA M.R. HAYASHI, P.E.
PAUL K. ARITA, P.E.
ERIK S. KANESHIRO, L.P.L.S., LEED AP
MATT K. NAKAMOTO, P.E.
GARRETT K. TOKUOKA, P.E.

TRAFFIC IMPACT ANALYSIS REPORT

Miki Basin Industrial Park

Lanai City, Lanai, Hawaii

1. INTRODUCTION

This report documents the findings of a traffic study conducted by Austin, Tsutsumi, and Associates, Inc. (ATA) to evaluate the traffic impacts resulting from the proposed Miki Basin Industrial Park (hereinafter referred to as the "Project") located in Lanai, Hawaii.

1.1 Project Description

The Project proposes to construct a 200-acre industrial park located south of Lanai Airport within a portion of a large parcel (TMK No. (2) 4-9-002:061). The current site plan proposes to include the following:

- Relocated Concrete Crushing Facility and Asphalt Plant (27 acres)
- Renewable Energy Projects (127 acres)
- New Industrial Uses (26 acres)
- Infrastructure (20 acres)

Access to the Project will be provided via Miki Road. It is our understanding that if approved, the 200-acre industrial park will develop over a 20-year period with the concrete crushing facility, asphalt plant and renewable energy projects completed in the first 10 years and the remaining industrial uses completed in the following 10 years. Thus, full build-out of the Project is anticipated by year 2040.

See Figure 1.1 for Project Location. See Figure 1.2 for the Project site plan.

1.2 Study Methodology

This study will address the following:

- Assess existing traffic operating conditions during the weekday AM and PM peak hours of traffic within the study area.
- Traffic Projections for Base Year 2040 (without the Project).

REF-414

- Estimate the vehicular trips that will be generated by the Project.
- Traffic projections for the Project for Future Year 2040 (with Project).
- Recommendations for roadway improvements or other mitigative measures, as appropriate, to reduce or eliminate the adverse impacts resulting from traffic generated by the Project.

1.3 Analysis Methodology

Level of Service (LOS) is a qualitative measure used to describe the conditions of traffic flow at intersections, with values ranging from free-flow conditions at LOS A to congested conditions at LOS F. The Highway Capacity Manual (HCM), 6th Edition, includes methods for calculating volume to capacity ratios, delays, and corresponding LOS that were used in this study. See Appendix A for LOS Criteria.

Analyses for the study intersections were performed using the traffic analysis software Synchro, which is able to prepare reports based on the methodologies described in the HCM. These reports contain control delay results as based on intersection lane geometry, signal timing, and hourly traffic volumes. Based on the vehicular delay at each intersection, a LOS is assigned to each approach and intersection movement as a qualitative measure of performance. These results, as confirmed or refined by field observations, constitute the technical analysis that will form the basis of the recommendations outlined in this report.

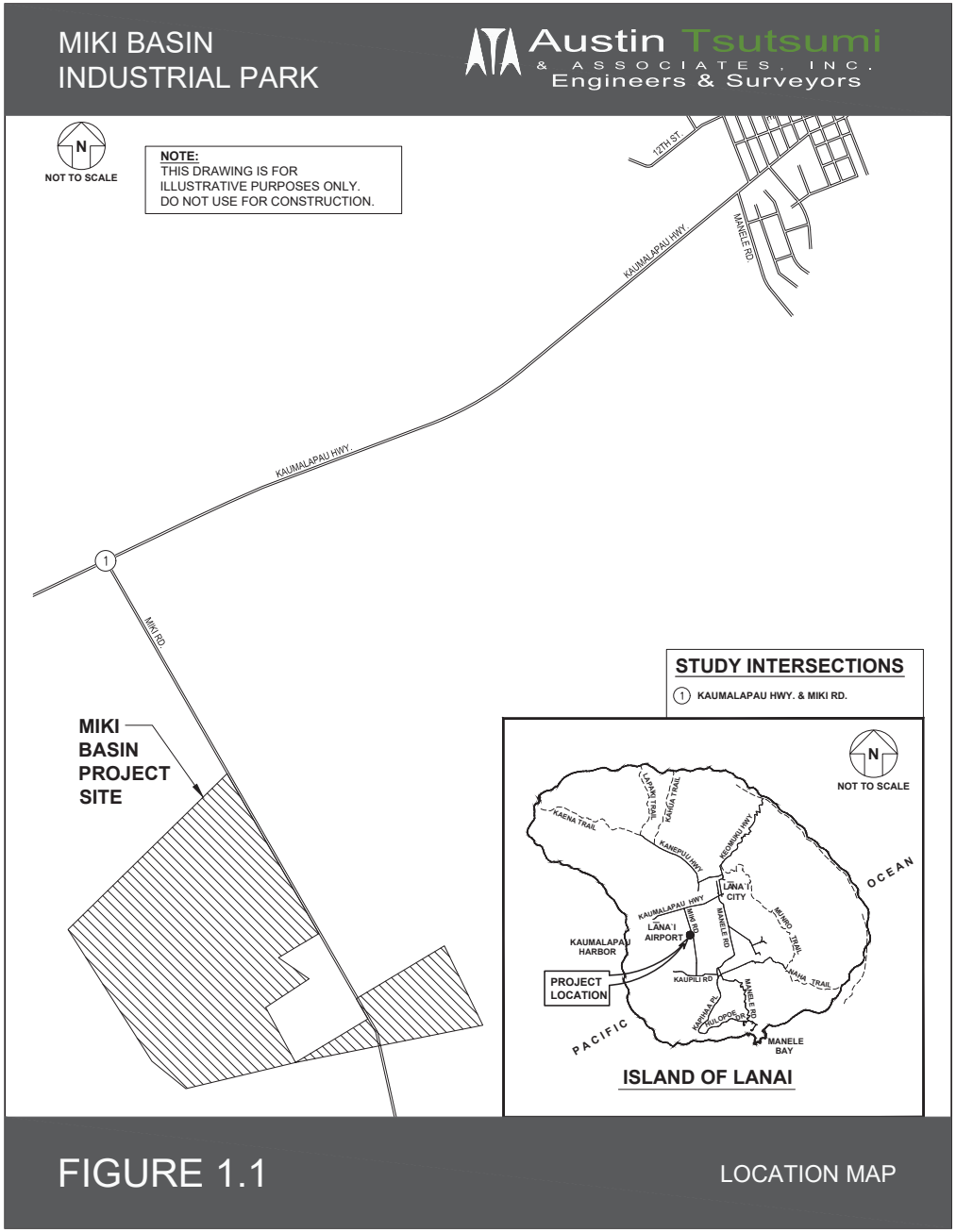


FIGURE 1.1 LOCATION MAP

REF-415

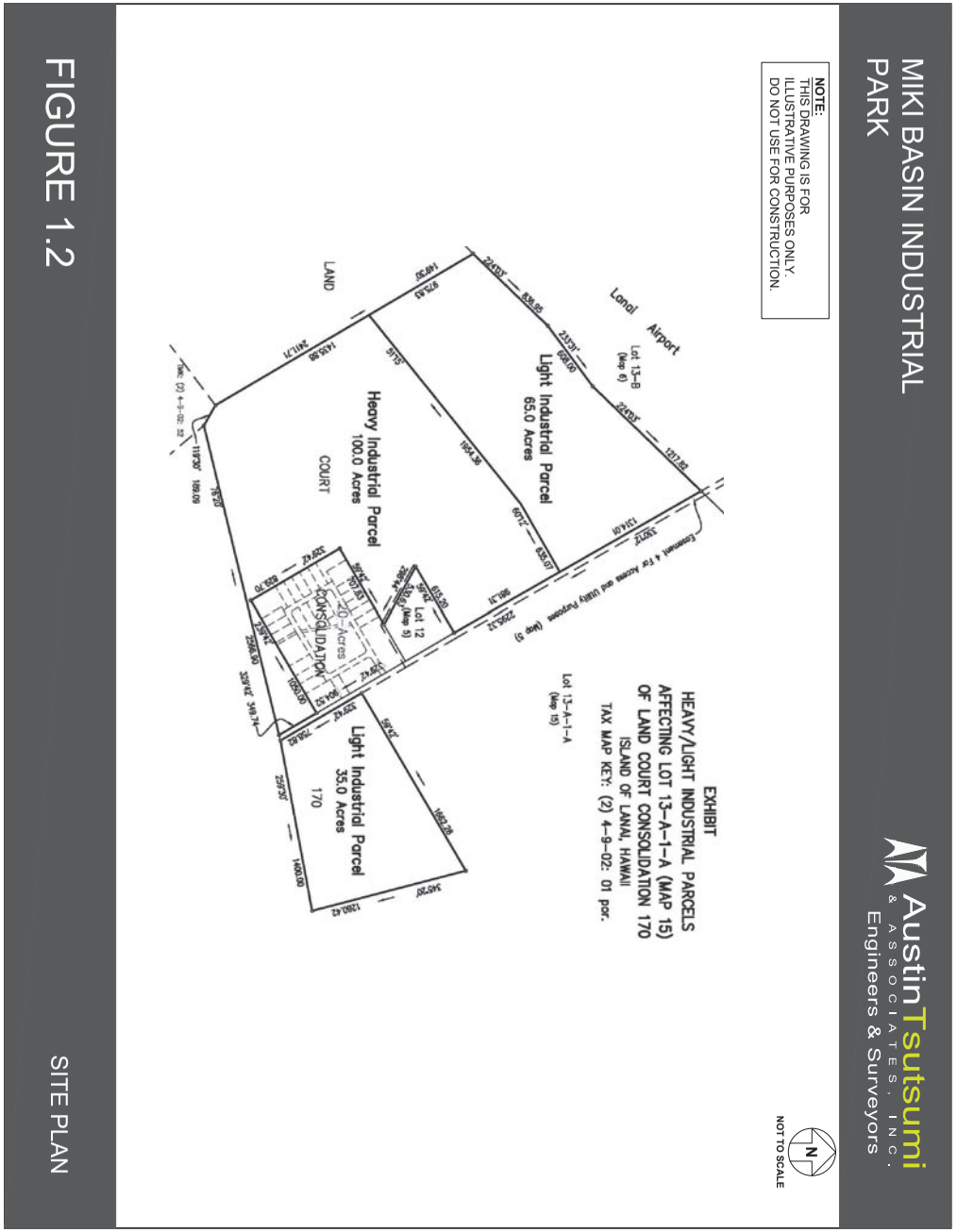


FIGURE 1.2

SITE PLAN

2. EXISTING CONDITIONS

2.1 Roadway System

The following are brief descriptions of the existing roadways studied within the vicinity of the Project:

Kaumalapau Highway is generally an east-west, two-way, two-lane state-owned roadway that runs perpendicular to Miki Road. This roadway begins to the west at the Fuel Depot and terminates to the east at its intersection with Lanai Avenue/Queens Street. The speed limit along Kaumalapau Highway is 45 miles per hour (mph) near Miki Road.

Miki Road is generally a north-south, two-way privately owned roadway that begins to the north at its intersection with Kaumalapau Highway and extends approximately 2.95 miles to the south – primarily through undeveloped land. The roadway is only approximately 13-15 feet wide, and therefore requires vehicles to pull off to the unpaved shoulder when encountering approaching vehicles traveling in the opposite direction.

2.2 Existing Traffic Volumes

Due to the prolonged disruptions to both residential and visitor traffic in the Hawaii region as a result of the impacts of the COVID-19 pandemic, collecting new traffic count data at this time would be atypical. Previously collected data in conjunction with available traffic volume data from the Hawaii Department of Transportation (HDOT) were instead used to estimate the existing 2020 traffic volumes at the study intersections. Observations of existing conditions in the study area were also not conducted as part of this study as a result of the atypical traffic conditions. Available traffic count data and adjustments made to estimate existing 2020 traffic volumes are described in the following sections.

2.2.1 Kaumalapau Highway/Miki Road Count Data

12-hour traffic count data was taken between 6:00 AM and 6:00 PM at the Kaumalapau Highway/Miki Road intersection between Wednesday, October 24, 2018 and Friday, October 26, 2018. The Wednesday AM and PM peak hours were the heaviest days in terms of traffic generation, and were therefore used as the basis for the intersection analyses contained within this report. The AM and PM hours of traffic were determined to be 6:30-7:30 AM and 1:00-2:00 PM, respectively. Traffic count data is provided in Appendix A.

2.2.2 Traffic Count Adjustments

Because Kaumalapau Highway serves as the major east-west arterial on Lanai connecting Kaumalapau Harbor, Lanai Airport and Lanai City, the 2018 traffic counts along the highway were adjusted to reflect growth between 2018 and 2020. HDOT traffic volume data collected between 2016 and 2019 along Kaumalapau Highway between Lanai Airport Road and Miki Road were used to determine historical growth along the roadway. The HDOT annual average daily traffic (AADT) are included in Appendix A and summarized in Table 2.1 below.

Based on the HDOT traffic counts, volumes have increased every year along Kaumalapau Highway between 2016 and 2019. However, the annual growth has varied from year to year. Therefore, the average annual growth of 9.7% between 2016 and 2019 was applied to 2018 volumes to estimate existing 2020 volumes.

REF-416

Table 2.1: HDOT AADT Traffic Volumes

Kaumalapau Highway - West of Miki Road				
Year	EB	WB	Total	Growth
2019	541	543	1084	8.0%
2018	502	502	1004	18.0%
2017	426	425	851	3.2%
2016	413	412	825	
Average	**471**	**471**	**941**	**9.7%**

2.3 Existing Observations and Analysis

2.3.1 Intersection Analysis

The Kaumalapau Highway/Miki Road intersection currently operates with all movements at LOS B or better during the AM and PM peak hours of traffic. No significant delays or queuing were previously observed during the 2018 data collection at the intersection during either peak hour of traffic. See Figure 2.1 and Table 4.2 for traffic volumes and levels of service. LOS worksheets are provided in Appendix C.

MIKI BASIN
INDUSTRIAL PARK

Austin Tsutsumi & ASSOCIATES, INC.
Engineers & Surveyors

DATE OF COUNTS:
WEDNESDAY, OCTOBER 24, 2018 TO
FRIDAY, OCTOBER 26, 2018

AM PEAK HOUR:
6:30 AM - 7:30 AM

PM PEAK HOUR:
1:00 PM - 2:00 PM

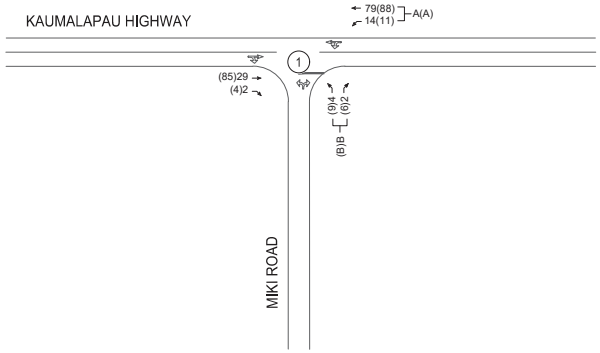
N
NOT TO SCALE

LEGEND

##(##) - AM(PM) VEHICLE VOLUMES

X(X) - AM(PM) LOS

(X) - UNSIGNALIZED INTERSECTION X



NOTES:
1. THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY. DO NOT USE FOR CONSTRUCTION.
2. THE WEDNESDAY, OCTOBER 24, 2018 AM PEAK HOUR AND THE FRIDAY, OCTOBER 26, 2018 PM PEAK HOUR WERE THE HEAVIEST IN TERMS OF TRAFFIC GENERATION AND REFLECT THE AM PEAK HOUR AND PM PEAK HOUR, RESPECTIVELY.
3. KAUMALAPAU HIGHWAY VOLUMES WERE ADJUSTED BASED ON HISTORIC HDOT TRAFFIC VOLUMES TO REFLECT 2020 CONDITIONS.

FIGURE 2.1

EXISTING LANE CONFIGURATION, VOLUMES AND LOS

REF-417

3. BASE YEAR 2040 TRAFFIC CONDITIONS

The Year 2040 was selected to reflect the Project completion year. The Base Year 2040 scenario represents the traffic conditions within the study area without the Project. Traffic projections were formulated by applying a defacto growth rate to the existing 2020 traffic count volumes as well as trips generated by known future developments in the vicinity of the Project.

3.1 Growth Rate

As of 2010, the population on the island of Lanai was about 3,100 residents. According to the Lanai Community Plan Update published by the County of Maui Planning Department in December 2013, the anticipated growth of Lanai's economy may require its population to nearly double in size to about 6,000 residents. This planning document was published as a guide for decision making and implementation through 2030. In order for Lanai's population to reach 6,000 by year 2030, the island would experience an average growth rate of approximately 4.7 percent per year. Therefore, this growth rate was applied along Kaumalapau Highway to represent the anticipated growth by year 2030.

The Population and Economic Projections for the State of Hawaii to 2045, published by the Hawaii Department of Business, Economic Development, and Tourism (DBEDT) in June 2018, was used to estimate the anticipated growth of Lanai's population between year 2030 and year 2040. According to DBEDT population forecasts, the population growth rate will decrease to less than 1.0 percent per year between 2025 and 2045. To be conservative, an average growth rate of 1.0 percent per year was applied along Kaumalapau Highway to represent the anticipated growth between year 2030 and year 2040.

3.2 Background Projects

The following background project was added to Base Year 2040 projections.

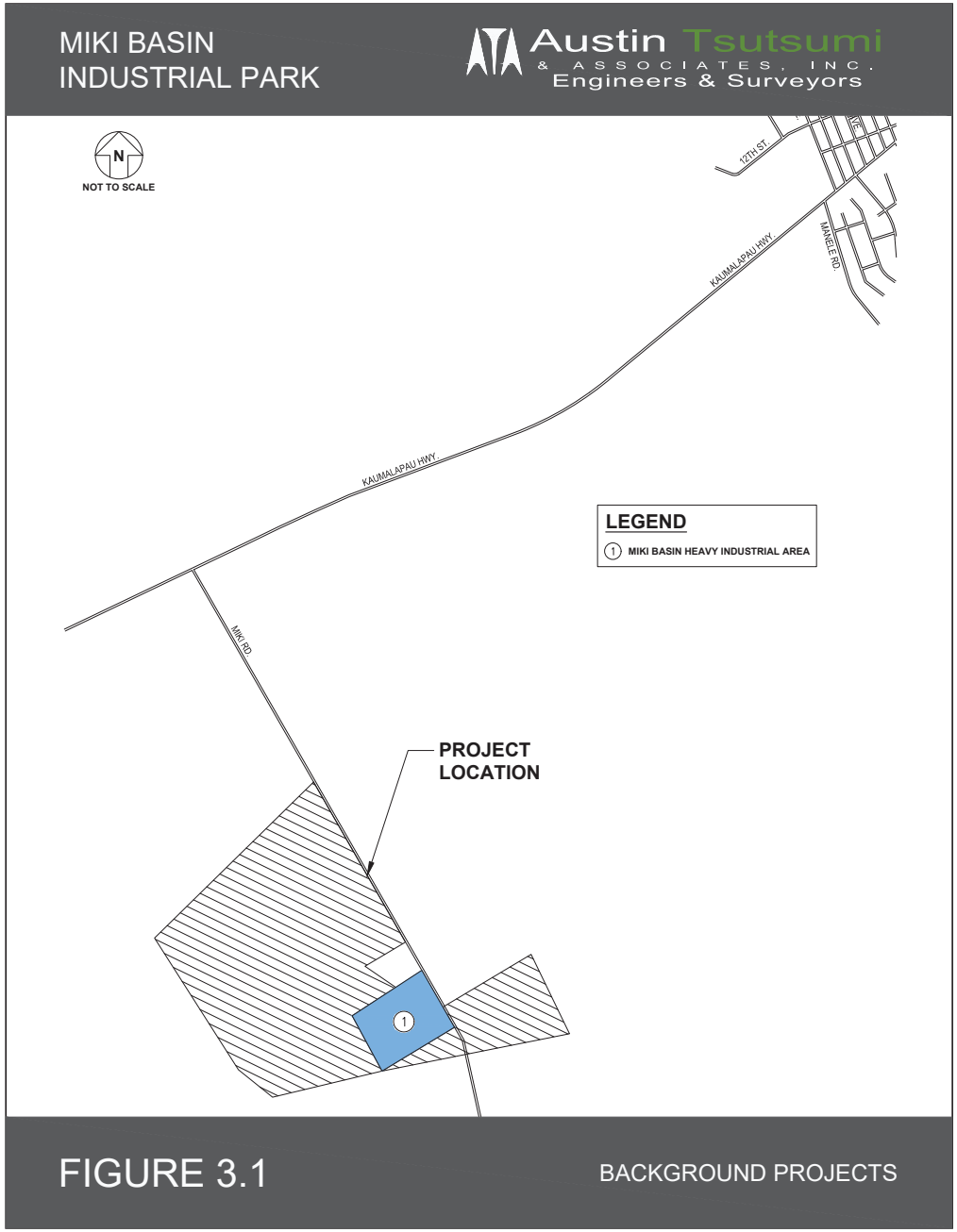
1. Miki Basin Heavy Industrial Area – 14-acre expansion to the existing 6 acres of the Miki Industrial Complex. The project is anticipated to generate a total of 43(43) trips per hour during the AM and PM peak hours of traffic, respectively. All trips are expected to pass through the Kaumalapau Highway/Miki Road intersection. The background project is shown in Figure 3.1.

3.3 Planned Roadway Projects

The Lanai Community Plan Update identified two proposed private roadway connections near the Project site. One roadway will travel parallel to Miki Road, east of the Project site connecting Kaumalapau Highway and Manele Road. The other roadway will travel between Miki Road and the proposed road, described in the previous sentence. To be conservative, it is assumed that these proposed private roadways will not provide access to the Project site, which would require all Project traffic to travel along Miki Road.

3.4 Base Year 2040 Analysis

Under Base Year 2040 conditions, the study intersection is forecast to operate similarly to existing conditions with all intersection movements expected to operate at LOS B or better during the AM and PM peak hours of traffic. See Figure 3.2 and Table 4.2 for traffic volumes and LOS. LOS worksheets are provided in Appendix C.



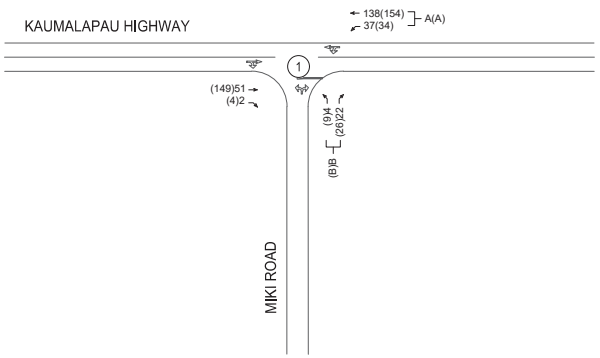
REF-418

MIKI BASIN
INDUSTRIAL PARK

Austin Tsutsumi & ASSOCIATES, INC.
Engineers & Surveyors

NOTE:
THIS DRAWING IS FOR
ILLUSTRATIVE PURPOSES ONLY.
DO NOT USE FOR CONSTRUCTION.

N
NOT TO SCALE



LEGEND

##(##)	- AM(PM) VEHICLE VOLUMES
X(X)	- AM(PM) LOS
(X)	- UNSIGNALIZED INTERSECTION X

FIGURE 3.2

BASE YEAR 2040 LANE CONFIGURATION, VOLUMES AND LOS

4. FUTURE YEAR 2040 TRAFFIC CONDITIONS

The Future Year 2040 scenario represents the traffic conditions within the Project study area with the full build-out of the Project.

4.1 Project Description

The Project proposes to construct a 200-acre industrial park located south of Lanai Airport within a portion of a large parcel (TMK No. (2) 4-9-002:061). The current site plan proposes to include the following:

- Relocated Concrete Crushing Facility and Asphalt Plant (27 acres)
- Renewable Energy Projects (127 acres)
- New Industrial Uses (26 acres)
- Infrastructure (20 acres)

It is assumed that at least two driveway access points to the Project site will be provided along Miki Road. As shown in Figure 4.1, Project Driveway 1 provides access to the light and heavy industrial areas west of Miki Road and Project Driveway 2 provides access to the light industrial area east of Miki Road. For the purposes of this analysis Project Driveway 2 was assumed to align with the existing driveway west of Miki Road. However, it is important to note that a final decision on the location or number of Project driveways has not been made.

4.2 Travel Demand Estimations

4.2.1 Trip Generation

Trip generation for the proposed Project was estimated based on the anticipated land uses planned for the site. Currently, the known land uses include a concrete crushing facility, asphalt plant and a photovoltaic plus battery energy storage system. The remainder of the Project will be allocated for new industrial uses, which may include, but not be limited to, a slaughter house, warehouse space for cold storage, laboratory/testing facilities, product development, automotive services, a multi-media facility and an animal hospital.

The concrete crushing facility and asphalt plant are existing land uses that will be relocated to the Project site. Based on the current employment and operations at the facilities, it is anticipated that the uses will conservatively generate a total of 35(35) trips during the AM and PM peak hours of traffic. The photovoltaic plus battery energy storage system will be a new land use. Trips generated by the site will be primarily from employees performing normal operation and maintenance activities. It is anticipated that the photovoltaic plus battery energy storage system will have a maximum of 10 employees and is estimated to generate 10(10) trips during the AM and PM peak hours during operation.

Because the new industrial uses have not been finalized yet, general trip generation rates were applied to the remaining 26 acres. The Institute of Transportation Engineers (ITE) publishes trip rates, Trip Generation Manual, 10th Edition, based upon historical data from similar land uses. These trip rates/formulae and their associated directional distributions were used to estimate the increase in the number of vehicular trips generated by the new industrial uses. The rate selected was based on the potential facilities that may be constructed within the 26-acre new

REF-419

industrial uses portion of the Project site. Table 4.1 shows the projected traffic generated by the Project during the AM and PM peak hours.

Table 4.1: Project Trip Generation

Land Use	Independent Variable	Weekday AM Peak Hour			Weekday PM Peak Hour		
		Enter (vph)	Exit (vph)	Total (vph)	Enter (vph)	Exit (vph)	Total (vph)
Concrete Crushing Facility & Asphalt Plant	27 Acres	35	0	35	0	35	35
Photovoltaic + Battery Energy Storage System	127 Acres	10	0	10	0	10	10
New Industrial Uses (ITE Code 140 - Manufacturing)	26 Acres	104	12	116	51	67	118
Total		**149**	**12**	**161**	**51**	**112**	**163**

The Project is anticipated to generate 161 trips during the AM peak hour of traffic and 163 trips during the PM peak hour of traffic.

4.2.2 Trip Distribution & Assignment

Approximately 75 percent of the trips were assumed to originate from and be destined towards the east and the remaining 25 percent of the trips were assumed to originate from and be destined towards the west. Figure 4.1 illustrates the Project-generated trip distribution.

As mentioned above, it was assumed that two driveways to the Project site would be provided – one east and one west of Miki Road. The trips were distributed between the two driveways based on the proportion of Project area located on each side of Miki Road.

4.3 Future Year 2040 Analysis

Upon completion of the Project, all intersection movements are forecast to operate at LOS B or better during the AM and PM peak hours of traffic. Miki Road is privately-owned; the levels of service for the proposed uses on such are acceptable and not significant. A westbound left-turn deceleration lane is recommended and is discussed further in section 4.3.2.

See Figure 4.2 and Table 4.2 for traffic volumes and LOS. LOS worksheets are provided in Appendix C.

4.3.1 Signal Warrant Analysis

Although a full traffic signal warrant analysis was not performed as part of this report, the Kaumalapau Highway/Miki Road intersection is not anticipated to warrant a traffic signal by Year 2040 with the Project. Refer to Appendix D for signal warrant analysis.

4.3.2 Left-turn Lane Warrant

Westbound Left-Turn Lane

At the time of this writing, the A Policy on Geometric Design of Highways and Streets ("Green Book", 2011) was the most recent version adopted by the Hawaii Department of Transportation. Based upon the following chart from NCHRP Report 279, which is referenced by the Green Book, a westbound left-turn lane is not warranted but is close to warranting at this intersection for Future Year 2040 with the Project. The westbound left-turn percentages are roughly 52 and 32 percent, respectively for the AM and PM peak hours of traffic as plotted below in Figure 4.3.

Although not warranted, given the proximity of the left-turn lane warranting as well as the understanding that the industrial park will serve a large number of heavy vehicles, a left-turn lane is recommended at the intersection.

4.3.3 Intersection Geometry

The current intersection geometry provides a single, approximately 13-foot wide bi-directional lane at its southern Miki Road approach, which is inadequate to accommodate vehicles traveling side-by-side. As a result of the significant anticipated increase in travel demand, large design vehicle (lowboy with crane), and the 45 mph posted speed along Kaumalapau Highway in the vicinity of Miki Road, widening to two lanes is recommended between the Project site and Kaumalapau Highway with intersection geometries capable of accommodating turning movements by the design vehicle.

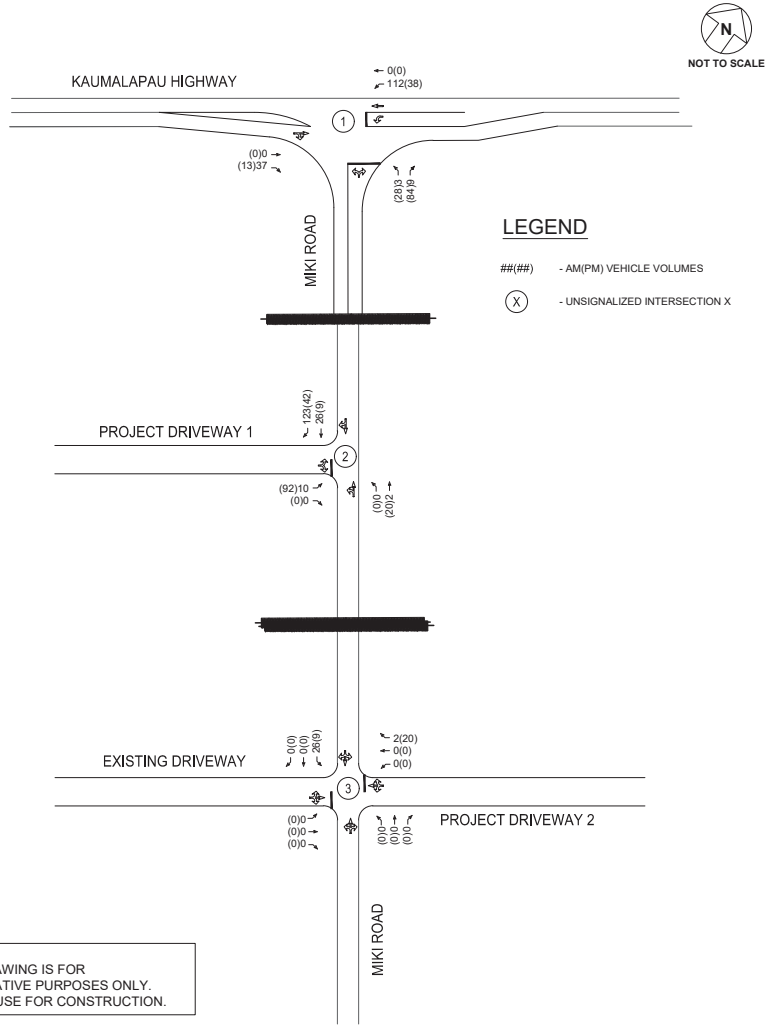
Table 4.2: Existing, Base Year 2040, and Future Year 2040 LOS

	Existing Conditions						Base Year 2040						Future Year 2040					
	AM			PM			AM			PM			AM			PM		
	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS
Kaumalapau Highway/Miki Road																		
NB LT/RT	10.3	0.01	B	10.4	0.01	B	11.2	0.01	B	12.2	0.02	B	10.2	0.06	B	11.8	0.23	B
WB LT	7.3	0.01	A	7.5	0.01	A	7.4	0.03	A	7.7	0.03	A	7.7	0.11	A	7.8	0.06	A
Miki Road/Project Driveway 1																		
NB LT/TH	n/a						n/a						0.0	0.00	A	0.0	0.00	A
EB LT/TH													10.1	0.02	B	10.5	0.13	B
Miki Road/Project Driveway 2																		
EB LT/TH/RT	n/a						n/a						0.0	0.00	A	0.0	0.00	A
WB LT/TH/RT													0.0	0.00	A	0.0	0.00	A

REF-420

MIKI BASIN
INDUSTRIAL PARK

Austin Tsutsumi & ASSOCIATES, INC.
Engineers & Surveyors



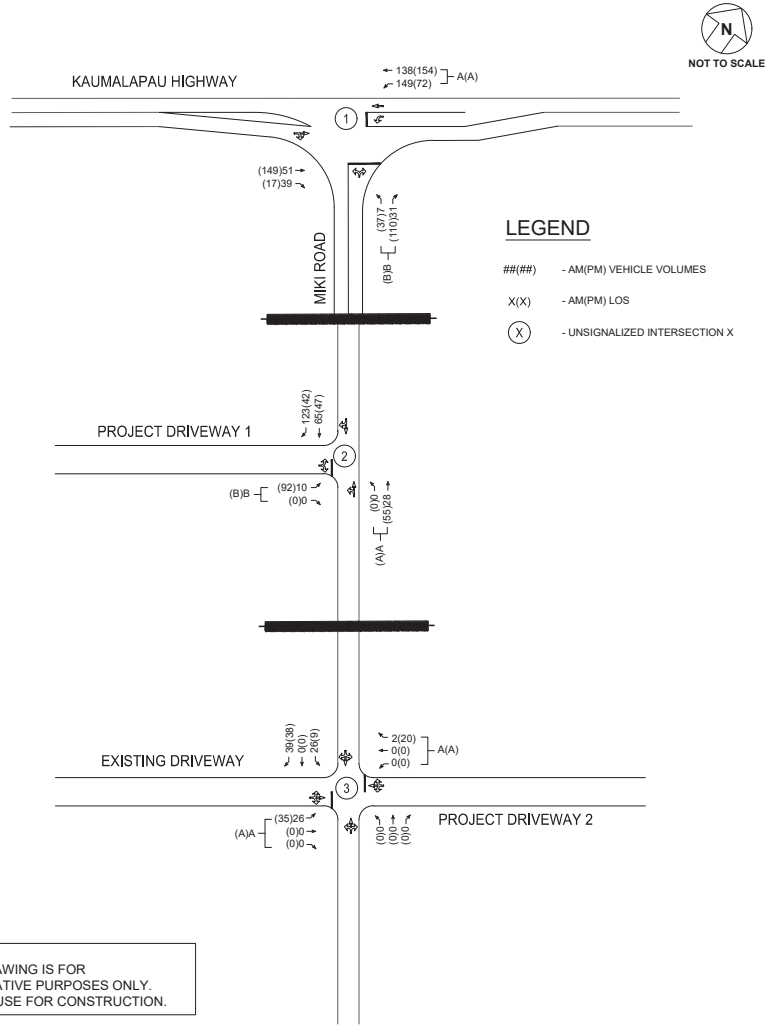
NOTE:
THIS DRAWING IS FOR
ILLUSTRATIVE PURPOSES ONLY.
DO NOT USE FOR CONSTRUCTION.

FIGURE 4.1

PROJECT-GENERATED TRIPS

MIKI BASIN
INDUSTRIAL PARK

Austin Tsutsumi & ASSOCIATES, INC.
Engineers & Surveyors



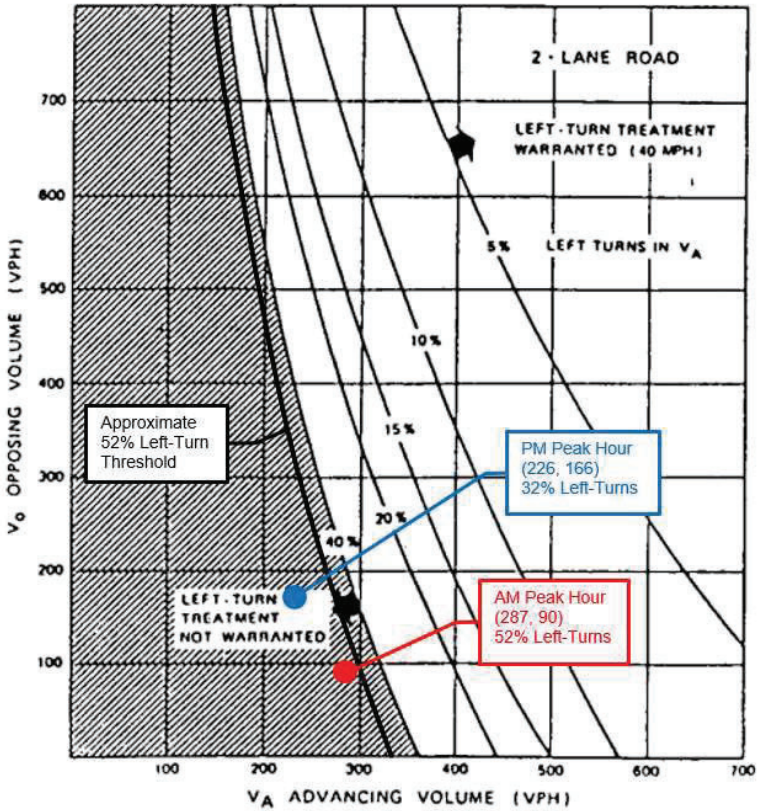
NOTE:
THIS DRAWING IS FOR
ILLUSTRATIVE PURPOSES ONLY.
DO NOT USE FOR CONSTRUCTION.

FIGURE 4.2

FUTURE YEAR 2040 LANE CONFIGURATION, VOLUMES AND LOS

REF-421

Figure 4.3: Left-Turn Warrant (NCHRP 279)



5. CONCLUSIONS AND RECOMMENDATIONS

The Project proposes to construct a 200-acre industrial park along Miki Road, south of Lanai Airport. The Project is anticipated to generate approximately 161(163) trips during the AM(PM) peak hours of traffic by its 2040 estimated completion.

Upon completion of the Project, all intersection movements are forecast to operate at LOS B or better during the AM and PM peak hours of traffic.

The following geometric modifications are recommended when warranted:

- Widen Miki Road between its intersection with Kaumalapau Highway to the Project Driveway(s). Miki Road is currently estimated to be 13 feet wide, and should be widened to accommodate the design vehicle (lowboy with crane) and full side-by-side bidirectional travel with intersection geometries capable of accommodating turning movements.
- Provide an exclusive westbound left-turn deceleration lane.

REF-422

6. REFERENCES

1. American Association of State Highway and Transportation Officials, A Policy on Geometric Design of Highways and Streets, 2011.
2. Austin, Tsutsumi and Associates, Inc., Traffic Assessment for Miki Basin Heavy Industrial Area, 2013.
3. County of Maui Planning Department, Lanai Community Plan Update, 2013.
4. Institute of Transportation Engineers, Trip Generation, 10th Edition, 2017.
5. Neuman, Timothy R., NCHRP 279 – Intersection Channelization Design Guide, 1985.
6. State of Hawaii Department of Business, Economic Development and Tourism, Population and Economic Projections for the State of Hawaii to 2045, 2018.
7. Transportation Research Board, Highway Capacity Manual, 6th Edition.

APPENDICES

REF-423

AUSTIN, TSUTSUMI & ASSOCIATES, INC.
CIVIL ENGINEERS • SURVEYORS

APPENDIX A

LEVEL OF SERVICE CRITERIA

APPENDIX A – LEVEL OF SERVICE (LOS) CRITERIA

VEHICULAR LEVEL OF SERVICE FOR SIGNALIZED INTERSECTIONS (HCM 6th Edition)

Level of service for vehicles at signalized intersections is directly related to delay values and is assigned on that basis. Level of Service is a measure of the acceptability of delay values to motorists at a given intersection. The criteria are given in the table below.

Level-of Service Criteria for Signalized Intersections

Level of Service	Control Delay per Vehicle (sec./veh.)
A	< 10.0
B	>10.0 and ≤ 20.0
C	>20.0 and ≤ 35.0
D	>35.0 and ≤ 55.0
E	>55.0 and ≤ 80.0
F	> 80.0

Delay is a complex measure, and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group or approach in question.

VEHICULAR LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS (HCM 6th Edition)

The level of service criteria for vehicles at unsignalized intersections is defined as the average control delay, in seconds per vehicle.

LOS delay threshold values are lower for two-way stop-controlled (TWSC) and all-way stop-controlled (AWSC) intersections than those of signalized intersections. This is because more vehicles pass through signalized intersections, and therefore, drivers expect and tolerate greater delays. While the criteria for level of service for TWSC and AWSC intersections are the same, procedures to calculate the average total delay may differ.

Level of Service Criteria for Two-Way Stop-Controlled Intersections

Level of Service	Average Control Delay (sec/veh)
A	≤ 10
B	>10 and ≤15
C	>15 and ≤25
D	>25 and ≤35
E	>35 and ≤50
F	> 50

REF-424

AUSTIN, TSUTSUMI & ASSOCIATES, INC.
CIVIL ENGINEERS • SURVEYORS

APPENDIX B

TRAFFIC COUNT DATA

Miki Road_Kaumalapau Highway

	KAUMALAPAU HWY EASTBOUND		KAUMALAPAU HWY WESTBOUND		MIKI RD NORTHBOUND			
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total	
6:00	1	0	3	15	0	0	19	100
6:15	3	2	3	12	0	0	20	104
6:30	1	0	5	18	0	0	24	112
6:45	11	1	3	22	0	0	37	108
7:00	8	1	3	9	2	0	23	93
7:15	4	0	3	17	2	2	28	93
7:30	4	1	1	13	0	1	20	89
7:45	6	2	1	9	1	3	22	98
8:00	3	0	3	15	2	0	23	100
8:15	9	0	1	10	2	2	24	107
8:30	11	2	1	13	0	2	29	105
8:45	5	2	3	12	2	0	24	103
9:00	18	2	2	6	2	0	30	103
9:15	9	1	0	9	1	2	22	110
9:30	10	0	2	9	1	5	27	127
9:45	13	0	0	11	0	0	24	135
10:00	13	0	4	18	1	1	37	154
10:15	16	0	0	19	0	4	39	161
10:30	7	2	3	22	0	1	35	156
10:45	20	1	2	14	1	5	43	158
11:00	25	1	2	14	2	0	44	154
11:15	17	1	1	9	1	5	34	149
11:30	29	1	0	5	0	2	37	146
11:45	14	2	2	18	1	2	39	138
12:00	12	1	4	17	1	4	39	138
12:15	11	0	4	14	1	1	31	146
12:30	9	1	2	10	3	4	29	160
12:45	11	3	2	20	0	3	39	169
13:00	17	0	4	22	1	3	47	174
13:15	21	0	4	17	2	1	45	174
13:30	14	1	0	18	4	1	38	168
13:45	19	3	3	16	2	1	44	168
14:00	20	2	3	19	1	2	47	161
14:15	16	2	3	14	1	3	39	158
14:30	17	2	3	12	2	2	38	138
14:45	21	2	2	9	2	1	37	134
15:00	25	2	1	11	3	2	44	119
15:15	7	3	0	4	1	4	19	102
15:30	24	1	2	3	0	4	34	110
15:45	8	0	2	8	1	3	22	91
16:00	14	1	1	9	0	2	27	84
16:15	10	1	6	5	1	4	27	73
16:30	7	0	0	5	0	3	15	56
16:45	9	0	0	2	1	3	15	53
17:00	7	0	0	5	3	1	16	49
17:15	6	0	0	3	0	1	10	
17:30	3	0	0	8	0	1	12	
17:45	2	1	0	8	0	0	11	
24-Oct	**567**	**48**	**94**	**578**	**51**	**91**	**1429**	

AM Peak Hour

PM Peak Hour

REF-425

Miki Road_Kaumalapau Highway								
	KAUMALAPAU HWY EASTBOUND		KAUMALAPAU HWY WESTBOUND		MIKI RD NORTHBOUND			
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total	
6:00	0	0	2	6	0	0	8	80
6:15	5	0	2	10	0	0	17	85
6:30	2	0	5	23	0	0	30	91
6:45	4	0	6	15	0	0	25	85
7:00	2	0	3	3	1	4	13	90
7:15	5	0	2	14	1	1	23	103
7:30	3	1	4	15	0	1	24	108
7:45	5	0	5	15	1	4	30	126
8:00	10	0	2	10	1	3	26	125
8:15	6	1	2	13	2	4	28	134
8:30	15	1	2	21	0	3	42	143
8:45	8	2	2	14	0	3	29	143
9:00	15	1	0	17	1	1	35	144
9:15	8	1	5	21	0	2	37	145
9:30	22	1	1	15	0	3	42	135
9:45	10	2	4	11	0	3	30	126
10:00	15	0	2	12	2	5	36	120
10:15	12	1	2	9	1	2	27	107
10:30	12	1	2	13	0	5	33	119
10:45	7	2	1	11	1	2	24	125
11:00	8	1	2	10	0	2	23	132
11:15	20	1	4	11	2	1	39	141
11:30	19	0	2	14	0	4	39	130
11:45	17	0	1	10	0	3	31	123
12:00	12	0	6	11	0	3	32	124
12:15	12	0	3	9	0	4	28	117
12:30	10	0	3	15	1	3	32	124
12:45	8	0	2	17	0	5	32	123
13:00	8	0	3	12	0	2	25	117
13:15	14	1	1	19	0	0	35	137
13:30	11	1	3	11	2	3	31	138
13:45	7	1	3	11	0	4	26	132
14:00	19	1	3	18	0	4	45	151
14:15	17	0	5	9	1	4	36	144
14:30	8	0	0	14	0	3	25	139
14:45	22	1	5	15	2	0	45	155
15:00	22	2	1	9	0	4	38	143
15:15	13	1	2	14	0	1	31	127
15:30	20	2	1	9	1	8	41	111
15:45	20	0	1	11	0	1	33	90
16:00	9	0	2	5	1	5	22	77
16:15	10	0	1	3	0	1	15	70
16:30	6	1	2	10	0	1	20	64
16:45	11	0	0	4	0	5	20	54
17:00	7	0	0	5	1	2	15	44
17:15	3	0	0	5	1	0	9	
17:30	4	1	0	5	0	0	10	
17:45	4	0	2	4	0	0	10	
25-Oct	507	28	112	558	23	119	1347	

Miki Road_Kaumalapau Highway								
	KAUMALAPAU HWY EASTBOUND		KAUMALAPAU HWY WESTBOUND		MIKI RD NORTHBOUND			
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total	
6:00	1	0	0	3	0	0	4	63
6:15	0	0	0	15	0	0	15	76
6:30	1	0	3	20	0	0	24	79
6:45	2	0	5	10	0	3	20	84
7:00	6	0	2	9	0	0	17	87
7:15	2	1	3	11	1	0	18	97
7:30	9	3	1	11	4	1	29	106
7:45	4	0	4	12	0	3	23	105
8:00	10	1	1	9	0	6	27	125
8:15	9	1	2	10	3	2	27	132
8:30	5	1	2	20	0	0	28	141
8:45	11	2	3	21	2	4	43	146
9:00	8	0	2	20	1	3	34	145
9:15	13	0	4	17	0	2	36	148
9:30	14	1	4	12	0	2	33	139
9:45	27	2	2	7	1	3	42	141
10:00	17	1	1	13	2	3	37	136
10:15	10	0	2	12	1	2	27	130
10:30	13	0	0	15	0	7	35	141
10:45	15	1	4	16	0	1	37	134
11:00	12	3	1	13	0	2	31	125
11:15	22	0	2	9	1	4	38	122
11:30	16	0	0	7	0	5	28	111
11:45	10	0	2	12	1	3	28	113
12:00	9	0	2	15	0	2	28	114
12:15	16	0	2	7	0	2	27	127
12:30	10	0	4	15	0	1	30	123
12:45	8	0	3	12	5	1	29	113
13:00	13	3	3	20	0	2	41	113
13:15	10	1	2	9	0	1	23	107
13:30	5	0	2	12	0	1	20	106
13:45	14	0	1	10	2	2	29	115
14:00	13	2	5	13	0	2	35	114
14:15	10	1	0	7	0	4	22	108
14:30	16	0	3	7	1	2	29	123
14:45	8	0	11	8	0	1	28	154
15:00	14	0	4	8	0	3	29	147
15:15	14	0	1	18	0	4	37	136
15:30	30	0	1	20	0	9	60	118
15:45	7	1	1	9	0	3	21	68
16:00	10	0	0	5	1	2	18	56
16:15	8	0	0	10	1	0	19	44
16:30	5	1	1	3	0	0	10	39
16:45	3	0	3	3	0	0	9	43
17:00	1	1	0	2	0	2	6	44
17:15	4	0	0	4	0	6	14	
17:30	7	0	0	5	1	1	14	
17:45	7	0	0	3	0	0	10	
26-Oct	479	27	99	529	28	107	1269	

REF-426

APPENDIX C

LEVEL OF SERVICE CALCULATIONS

AUSTIN, TSUTSUMI & ASSOCIATES, INC.
CIVIL ENGINEERS • SURVEYORS

APPENDIX C

LEVEL OF SERVICE CALCULATIONS

- Existing Conditions

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	29	2	14	79	4	2
Future Vol, veh/h	29	2	14	79	4	2
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	10	55	4	8	55	20
Mvmt Flow	39	3	19	107	5	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	43	0	187	-
Stage 1	-	-	-	-	42	-
Stage 2	-	-	-	-	145	-
Critical Hdwy	-	-	4.14	-	6.95	-
Critical Hdwy Stg 1	-	-	-	-	5.95	-
Critical Hdwy Stg 2	-	-	-	-	5.95	-
Follow-up Hdwy	-	-	2.236	-	3.995	-
Pot Cap-1 Maneuver	-	-	1553	-	695	0
Stage 1	-	-	-	-	860	0
Stage 2	-	-	-	-	768	0
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1552	-	685	-
Mov Cap-2 Maneuver	-	-	-	-	685	-
Stage 1	-	-	-	-	859	-
Stage 2	-	-	-	-	758	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	685	-	-	1552	-
HCM Lane V/C Ratio	0.008	-	-	0.012	-
HCM Control Delay (s)	10.3	-	-	7.3	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	85	4	11	88	9	6
Future Vol, veh/h	85	4	11	88	9	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	11	56	7	10	46	11
Mvmt Flow	91	4	12	95	10	6

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	95	0	212	-
Stage 1	-	-	-	-	93	-
Stage 2	-	-	-	-	119	-
Critical Hdwy	-	-	4.17	-	6.86	-
Critical Hdwy Stg 1	-	-	-	-	5.86	-
Critical Hdwy Stg 2	-	-	-	-	5.86	-
Follow-up Hdwy	-	-	2.263	-	3.914	-
Pot Cap-1 Maneuver	-	-	1468	-	688	0
Stage 1	-	-	-	-	831	0
Stage 2	-	-	-	-	808	0
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1468	-	682	-
Mov Cap-2 Maneuver	-	-	-	-	682	-
Stage 1	-	-	-	-	831	-
Stage 2	-	-	-	-	801	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	10.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	682	-	-	1468	-
HCM Lane V/C Ratio	0.014	-	-	0.008	-
HCM Control Delay (s)	10.4	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

REF-428

AUSTIN, TSUTSUMI & ASSOCIATES, INC.
CIVIL ENGINEERS • SURVEYORS

APPENDIX C

LEVEL OF SERVICE CALCULATIONS

- Base Year 2040 without Project Conditions

Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	51	2	37	138	4	22
Future Vol, veh/h	51	2	37	138	4	22
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	55	4	8	55	20
Mvmt Flow	55	2	40	150	4	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	58	0	287	-
Stage 1	-	-	-	-	57	-
Stage 2	-	-	-	-	230	-
Critical Hdwy	-	-	4.14	-	6.95	-
Critical Hdwy Stg 1	-	-	-	-	5.95	-
Critical Hdwy Stg 2	-	-	-	-	5.95	-
Follow-up Hdwy	-	-	2.236	-	3.995	-
Pot Cap-1 Maneuver	-	-	1533	-	605	0
Stage 1	-	-	-	-	846	0
Stage 2	-	-	-	-	698	0
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1532	-	587	-
Mov Cap-2 Maneuver	-	-	-	-	587	-
Stage 1	-	-	-	-	845	-
Stage 2	-	-	-	-	678	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	11.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	587	-	-	1532	-
HCM Lane V/C Ratio	0.007	-	-	0.026	-
HCM Control Delay (s)	11.2	-	-	7.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0.1	-

REF-429

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	149	4	34	154	9	26
Future Vol, veh/h	149	4	34	154	9	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	11	56	7	10	46	11
Mvmt Flow	160	4	37	166	10	28

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	164	0	402	-
Stage 1	-	-	-	-	162	-
Stage 2	-	-	-	-	240	-
Critical Hdwy	-	-	4.17	-	6.86	-
Critical Hdwy Stg 1	-	-	-	-	5.86	-
Critical Hdwy Stg 2	-	-	-	-	5.86	-
Follow-up Hdwy	-	-	2.263	-	3.914	-
Pot Cap-1 Maneuver	-	-	1385	-	528	0
Stage 1	-	-	-	-	771	0
Stage 2	-	-	-	-	707	0
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1385	-	513	-
Mov Cap-2 Maneuver	-	-	-	-	513	-
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	686	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.4	12.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	513	-	-	1385	-
HCM Lane V/C Ratio	0.019	-	-	0.026	-
HCM Control Delay (s)	12.2	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

AUSTIN, TSUTSUMI & ASSOCIATES, INC.
CIVIL ENGINEERS • SURVEYORS

APPENDIX C

LEVEL OF SERVICE CALCULATIONS

- Future Year 2040 with Project Conditions

REF-430

Intersection	
Int Delay, s/veh	3.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	51	39	149	138	7	31
Future Vol, veh/h	51	39	149	138	7	31
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	900	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	55	4	8	55	20
Mvmt Flow	55	42	162	150	8	34

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	98	0	551	77
Stage 1	-	-	-	-	77	-
Stage 2	-	-	-	-	474	-
Critical Hdwy	-	-	4.14	-	6.95	6.4
Critical Hdwy Stg 1	-	-	-	-	5.95	-
Critical Hdwy Stg 2	-	-	-	-	5.95	-
Follow-up Hdwy	-	-	2.236	-	3.995	3.48
Pot Cap-1 Maneuver	-	-	1483	-	416	936
Stage 1	-	-	-	-	828	-
Stage 2	-	-	-	-	529	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1482	-	370	935
Mov Cap-2 Maneuver	-	-	-	-	370	-
Stage 1	-	-	-	-	827	-
Stage 2	-	-	-	-	471	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4	10.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	730	-	-	1482	-
HCM Lane V/C Ratio	0.057	-	-	0.109	-
HCM Control Delay (s)	10.2	-	-	7.7	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.4	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	0	0	28	65	123
Future Vol, veh/h	10	0	0	28	65	123
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	50	50	50	50	50	50
Mvmt Flow	11	0	0	30	71	134

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	168	138	205	0	-	0
Stage 1	138	-	-	-	-	-
Stage 2	30	-	-	-	-	-
Critical Hdwy	6.9	6.7	4.6	-	-	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	2.65	-	-	-
Pot Cap-1 Maneuver	723	797	1126	-	-	-
Stage 1	783	-	-	-	-	-
Stage 2	882	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	723	797	1126	-	-	-
Mov Cap-2 Maneuver	723	-	-	-	-	-
Stage 1	783	-	-	-	-	-
Stage 2	882	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1126	-	723	-	-
HCM Lane V/C Ratio	-	-	0.015	-	-
HCM Control Delay (s)	0	-	10.1	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

REF-431

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	0	0	0	0	2	0	0	0	26	0	39
Future Vol, veh/h	26	0	0	0	0	2	0	0	0	26	0	39
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	50	50	50	50	50	50	50	50	50	50	50	50
Mvmt Flow	28	0	0	0	0	2	0	0	0	28	0	42

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	78	77	21	77	98	0	42	0	0	0	0	0
Stage 1	77	77	-	0	0	-	-	-	-	-	-	-
Stage 2	1	0	-	77	98	-	-	-	-	-	-	-
Critical Hdwy	7.6	7	6.7	7.6	7	6.7	4.6	-	-	4.6	-	-
Critical Hdwy Stg 1	6.6	6	-	6.6	6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	6	-	6.6	6	-	-	-	-	-	-	-
Follow-up Hdwy	3.95	4.45	3.75	3.95	4.45	3.75	2.65	-	-	2.65	-	-
Pot Cap-1 Maneuver	807	730	933	808	710	-	1308	-	-	-	-	-
Stage 1	825	746	-	-	-	-	-	-	-	-	-	-
Stage 2	910	-	-	825	730	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	730	933	808	710	-	1308	-	-	-	-	-
Mov Cap-2 Maneuver	-	730	-	808	710	-	-	-	-	-	-	-
Stage 1	825	746	-	-	-	-	-	-	-	-	-	-
Stage 2	910	-	-	825	730	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			0	
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1308	-	-	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	-	-	-	-
HCM Lane LOS	A	-	-	-	-	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-	-	-	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	149	17	72	154	37	110
Future Vol, veh/h	149	17	72	154	37	110
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	900	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	11	56	7	10	46	11
Mvmt Flow	160	18	77	166	40	118

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	178	0	489	169
Stage 1	-	-	-	-	169	-
Stage 2	-	-	-	-	320	-
Critical Hdwy	-	-	4.17	-	6.86	6.31
Critical Hdwy Stg 1	-	-	-	-	5.86	-
Critical Hdwy Stg 2	-	-	-	-	5.86	-
Follow-up Hdwy	-	-	2.263	-	3.914	3.399
Pot Cap-1 Maneuver	-	-	1368	-	467	852
Stage 1	-	-	-	-	765	-
Stage 2	-	-	-	-	647	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1368	-	441	852
Mov Cap-2 Maneuver	-	-	-	-	441	-
Stage 1	-	-	-	-	765	-
Stage 2	-	-	-	-	611	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.5	11.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	690	-	-	1368	-
HCM Lane V/C Ratio	0.229	-	-	0.057	-
HCM Control Delay (s)	11.8	-	-	7.8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.9	-	-	0.2	-

REF-432

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	92	0	0	55	47	42
Future Vol, veh/h	92	0	0	55	47	42
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	50	50	50	50	50	50
Mvmt Flow	100	0	0	60	51	46

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	134	74	97	0	-	0
Stage 1	74	-	-	-	-	-
Stage 2	60	-	-	-	-	-
Critical Hdwy	6.9	6.7	4.6	-	-	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	2.65	-	-	-
Pot Cap-1 Maneuver	758	869	1243	-	-	-
Stage 1	841	-	-	-	-	-
Stage 2	854	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	758	869	1243	-	-	-
Mov Cap-2 Maneuver	758	-	-	-	-	-
Stage 1	841	-	-	-	-	-
Stage 2	854	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1243	-	758	-	-
HCM Lane V/C Ratio	-	-	0.132	-	-
HCM Control Delay (s)	0	-	10.5	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	35	0	0	0	0	20	0	0	0	9	0	38
Future Vol, veh/h	35	0	0	0	0	20	0	0	0	9	0	38
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	50	50	50	50	50	50	50	50	50	50	50	50
Mvmt Flow	38	0	0	0	0	22	0	0	0	10	0	41

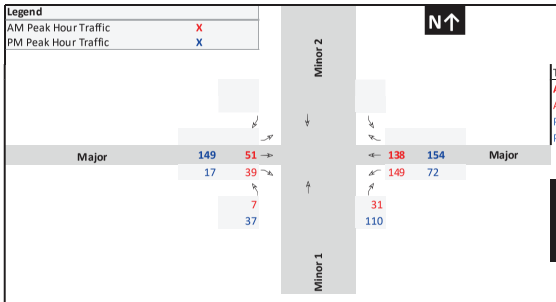
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	52	41	21	41	61	0	41	0	0	0	0	0
Stage 1	41	41	-	0	0	-	-	-	-	-	-	-
Stage 2	11	0	-	41	61	-	-	-	-	-	-	-
Critical Hdwy	7.6	7	6.7	7.6	7	6.7	4.6	-	-	4.6	-	-
Critical Hdwy Stg 1	6.6	6	-	6.6	6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	6	-	6.6	6	-	-	-	-	-	-	-
Follow-up Hdwy	3.95	4.45	3.75	3.95	4.45	3.75	2.65	-	-	2.65	-	-
Pot Cap-1 Maneuver	840	766	933	855	746	-	1309	-	-	-	-	-
Stage 1	865	775	-	-	-	-	-	-	-	-	-	-
Stage 2	899	-	-	865	759	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	766	933	855	746	-	1309	-	-	-	-	-
Mov Cap-2 Maneuver	-	766	-	855	746	-	-	-	-	-	-	-
Stage 1	865	775	-	-	-	-	-	-	-	-	-	-
Stage 2	899	-	-	865	759	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			0	
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1309	-	-	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	-	-	-	-
HCM Lane LOS	A	-	-	-	-	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-	-	-	-

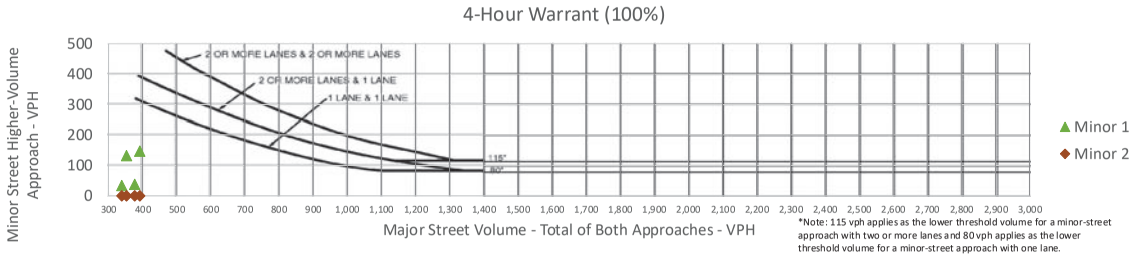
REF-433

Legend	
AM Peak Hour Traffic	X
PM Peak Hour Traffic	X

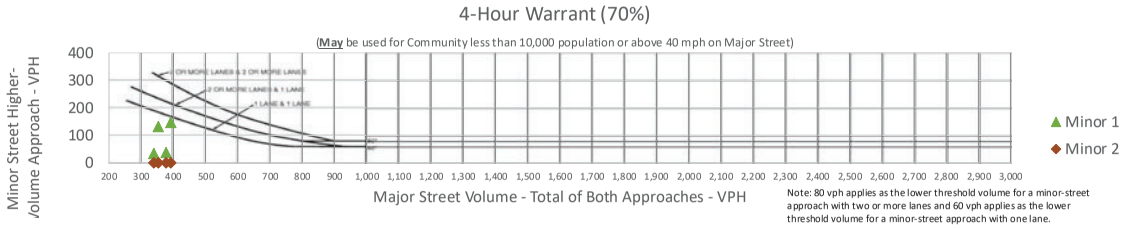


	Major						Minor 1			Minor 2			
					Lanes:	1		Lanes:	1		Lanes:	1	
								RT Reduction:	0%		RT Reduction:	0%	
Time	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Factor
AM Peak	0	51	39	149	138	0	7	0	31	0	0	0	
AM Peak 2 (est.)	0	46	35	134	124	0	6	0	28	0	0	0	90%
PM Peak	0	149	17	72	154	0	37	0	110	0	0	0	
PM Peak 2 (est.)	0	134	15	65	139	0	33	0	99	0	0	0	90%

Major	Minor 1	Minor 2
377	38	0
339	34	0
392	147	0
353	132	0



*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.



Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

Kaumalapau Highway & Miki Road	Austin, Tsutsumi, and Associates, Inc.	FIGURE
	Future Year 2040 4-Hour Signal Warrant Approximation	D.1

REF-434

APPENDIX D
SIGNAL WARRANT

AUSTIN, TSUTSUMI & ASSOCIATES, INC.
CIVIL ENGINEERS • SURVEYORS

WATER MASTER PLAN

APPENDIX H-1

REF-435

PŪLAMA LĀNAʻI MIKI BASIN

200 ACRE INDUSTRIAL PARK

TMK: 4-9-002:061
(Portion)

Lānaʻi, Hawaiʻi

WATER MASTER PLAN

Prepared By: Akinaka & Associates, Ltd.
1100 Alakea Street, Suite 1800
Honolulu, Hawaii 96813

Date: October 2021

TABLE OF CONTENTS

I. INTRODUCTION

II. EXECUTIVE SUMMARY

III. EXISTING WATER SUPPLY AND DISTRIBUTION SYSTEM
1. **Source**
2. **Storage**
3. **Transmission**
4. **Connection to Other Water Systems**

IV. LAND USE

V. SAFE DRINKING WATER SYSTEM DESIGN CRITERIA
1. **Consumption Guidelines**
2. **Demand Factors**
3. **Fire Flow Requirements**
4. **Pipeline Sizing**
5. **Reservoir Capacity**
6. **Pump Capacity**

VI. INDUSTRIAL PARK WATER DEMAND

VII. PROPOSED SAFE DRINKING WATER SYSTEM (BASED ON LAND USE/ZONING)
1. **Water Source**
2. **Reservoir Capacity**
3. **Transmission/Distribution Mains**

VIII. COST CONSIDERATIONS

IX. EXHIBITS
1. **Exhibit 1: Location Map**
2. **Exhibit 2: Existing Mānele Bay Water System (Public Water System 238)**
3. **Exhibit 3: Existing and Projected Water Flow Summation**
4. **Exhibit 4: Water Demand Map**
5. **Exhibit 5: Existing Mānele Bay Water System (Public Water System 238) Nodal Map**
6. **Exhibit 6: Proposed Mānele Bay Water System (Public Water System 238) Improvements Nodal Map**

X. APPENDICES

REF-436

1. **Appendix A1: Water Calculations**
2. **Appendix A2: Water Calculations – Adjusted PRV**
3. **Appendix B: 0% Design Construction Costs**

X. REFERENCES (Not attached)

1. County of Water Supply, Department of Water Supply, Water System Standards, dated 2002.
2. County of Water Supply, Department of Water Supply, Lānaʻi Island Water Use and Development Plan, dated 2011.

I. INTRODUCTION

The Water Master Plan for Pūlama Lānaʻi Miki Basin 200-Acre Industrial Park provides the basic information for the design of the water distribution system for the Miki Basin 200-Acre Industrial Park (Industrial Park) based on zoning requirements. The purpose of this master plan is to analyze the condition of the existing water distribution system and provide a plan for the new projected water demands as part of the Environmental Assessment (EA) submission required to complete the Land Use Commission (LUC) rezoning process.

The Industrial Park consists of approximately 200 acres of agricultural zoned lands. Pūlama Lānaʻi is in the process of rezoning the area for light and heavy industrial lands. The project area (Industrial Park) is located directly south of Lānaʻi Airport within the Pālāwai Irrigation Grid (See **Exhibit 1: Location Map**). The majority of Miki Basin is currently undeveloped with the exception of the Maui Electric Company (MECO) Miki Basin diesel generating facility and substation and a portion of the 20-acre approved subdivision which is currently used by Pūlama Lānaʻi for mobile concrete batch plant (CBP), Pūlama Lānaʻi warehouses and by other commercial industrial tenants uses (e.g., Hawaii Gas, Maui Disposal, etc.). Pūlama Lānaʻi has submitted a Special Use Permit to the County of Maui Planning Department for the relocation of the interim industrial uses. The 200-acres of the proposed Industrial Park do not include the MECO facility and the 20-acre subdivision.

II. EXECUTIVE SUMMARY

Water for Miki Basin is currently provided by the Mānele Bay Water System (Public Water System 238) which is owned, operated, and maintained by the Lānaʻi Water Company. The system, sourced by Wells No. 2 (State Well No. 5-4953-001) and 4 (State Well No. 5-4952-002), currently services Mānele, Hulopoʻe and the Pālāwai Irrigation Grid. Water from the wells is either stored in the existing 0.5 million gallon (MG) Hiʻi Tank or 1.0 MG concrete Hiʻi Reservoir or fed directly into the distribution system depending on need. The existing Mānele Bay Water System (PWS 238) consists of 10-inch, 12-inch and 16-inch transmission mains. The Mānele Bay Water System (PWS 238) is interconnected with the Lānaʻi City Water System (Public Water System 237). During emergencies, the Lānaʻi City Water System (PWS 237) can be connected to the Mānele Bay Water System (PWS 238) by opening a valve.

The existing average daily water usage of the Mānele Bay Water System (PWS 238) is currently estimated at 433,000 gallons per day (gpd).

REF-437

In accordance with the Water System Standards (WSS), available source capacity is governed by the well with the smallest pumping unit. Well No. 2 has an existing maximum pump capacity of 500 gallons per minute (gpm). Well No. 4 has a maximum pump capacity of 900 gpm. Since Well No. 2 currently has the smaller pump capacity, available source capacity for the Mānele Bay Water System (PWS 238) is governed by Well No. 2, which has a maximum day pumping capacity of 480,000 gpd and is equivalent to an average day pumping capacity of 320,000 gpd. Once this capacity is used/committed, the construction of a new well will be required. According to the 2011 Lānaʻi Water Use and Development Plan, Well No. 2 can be outfitted with a pump with a capacity of up to 1,200 gpm. However, based upon analysis of a pump test of the well in October 2015, we do not recommend increasing the current pump capacity.

Proposed water use for the full buildout of the Industrial Park is based on the existing demands on the Mānele Bay Water System (PWS 238) and potential development plans. The potential development plans that are contemplated in the Industrial Park include an asphalt plant, CBP, renewable energy projects, infrastructure, and new industrial uses.

The Industrial Parkʻs incremental or new estimated water demand on Mānele Bay Water System (PWS 238) is 159,625 gpd. The estimated water demand on Mānele Bay Water System (PWS 238) for the full buildout of the Industrial Park is 163,125 gpd.

The projected average day demand for the Mānele Bay Water System (PWS 238), including full buildout of the Industrial Park and existing demands serviced by the Mānele Bay Water System (PWS 238), is 592,625 gpd. The pie chart in Section 4 (**Figure B)** provides a visual summary of the percentages of existing, new or incremental water demands on the Mānele Bay Water System (PWS 238). After evaluating the full buildout of the project, the Mānele Bay Water System (PWS 238), does not have adequate well-pump capacity (source). There is enough storage to support the full buildout with the existing tank and reservoir. Although the transmission mains do meet WSS for fire flow protection, the existing Mānele Bay Water System (PWS 238) does not meet the WSS in other aspects. There is an existing pressure reducing valve (PRV) that has an outflow limit that could be lowered. If a booster pump could be added to the system, the PRV can be set lower, and the booster could pump the water from nodes J-4 to J-5 through pipe P-6 so that there can be enough pressure to distribute water uphill (See **Exhibit 6: Proposed Mānele Bay Water System (Public Water System 238) Improvements Nodal Map**).

The following improvements will be required to support full buildout of the Industrial Park (See **Exhibit 5: Existing Mānele Bay Water System (Public Water System 238)**):

- The existing water PRV could be lowered to at least acquire an outflow of 55 pounds per square inch (psi) to reach the best possible pressures for the distribution main. If there are cavitation issues, a new PRV should be installed that has an anti-cavitation trim.
- Drilling a new source or multiple sources to obtain an additional total minimum pump capacity of 426 gpm.
- While Lānaʻi Water Company has replaced and has abandoned sections of the Pālāwai Irrigation Grid, there remains sections that are in need of repair, replacement or possible abandonment. Since the condition and use of these pipes are unknown, those pipes were excluded from this evaluation. A conditional assessment and analysis for those pipes should be conducted separately, but from the water calculations in this water master plan (See **Appendix A1 & A2**), existing pipes will need to be assessed and potentially replaced at high pressures.
- Construction costs of offsite improvements can be revised based off of the condition assessment for the existing pipes and the existing PRV.

III. EXISTING WATER SUPPLY AND DISTRIBUTION SYSTEM

Water for Miki Basin is currently serviced by the Mānele Bay Water System (PWS 238) which is owned, operated and maintained by Lānaʻi Water Company (See **Exhibit 2: Existing Mānele Bay Water System (Public Water System 238)**). Mānele Bay Water System (PWS 238) services Mānele, Hulopoʻe and the Pālāwai Irrigation Grid.

1. SOURCE

Water is provided by Wells No. 2 (State Well No. 5-4953-001) and 4 (State Well No. 5-4952-002) and either stored in the existing 0.5 MG Hiʻi Tank or 1.0 MG concrete Hiʻi Reservoir or fed into the tank, then into the distribution system depending on need.

a. Well No. 2 has a pump capacity of 500 gpm or an average day

REF-438

capacity of 320,000 gpd based on an operating time of 16 hours. According to the 2011 Lānaʻi Water Use and Development Plan, Well No. 2 can be outfitted with a pump with a capacity of up to 1,200 gpm. However, based upon analysis of a pump test of the well in October 2015, we do not recommend increasing the current pump capacity.

b. Well No. 4 has a pump capacity of 900 gpm or an average day capacity of 576,000 gpd.

c. The existing average daily water usage from Mānele Bay Water System (PWS 238) is currently estimated at 433,000 gpd.

d. WSS requires sources to be able to meet maximum day demand with an operating time of 16 hours, assuming that the largest pumping unit is down. Since Well No. 4 has the larger pump capacity of the two wells, available source capacity for the system is governed by Well No. 2. The incremental estimated water demand for the full buildout of the Miki 200 project (excluding existing water use) is 159,625 gpd.

e. Lānaʻi has a sustainable yield of 6 million gallons per day (MGD), with 3 MGD allocated to both the Leeward and Windward aquifer sector areas. The majority of the pumping wells are located in the Leeward Aquifer. According to the Lānaʻi Water Company Periodic Water Report, the current moving average pumping is 1.53 MGD.

2. STORAGE

a. 500,000 gallon Hiʻi Tank (Spillway Elevation = 1823')
Serves as the water distribution storage tank for Mānele, Hulopoʻe and the Pālāwai Irrigation Grid.

b. 1,000,000 gallon Hiʻi Reservoir (Spillway Elevation = 1823')
Primarily serves as storage for the two well water sources to supply water into the distribution system

3. TRANSMISSION

a. A 12-inch transmission main transports water from the 1,000,000 gallon Hiʻi Reservoir to the 500,000 gallon Hiʻi Tank and into the

Mānele Bay Water System (PWS 238). The 12-inch main splits at a junction to serve both Mānele and Pālāwai Irrigation Grid.

b. To Mānele and Hulopoʻe – From the junction, the 12-inch line feeds into three pressure breaker storage tanks that service Mānele.

c. To Pālāwai Irrigation Grid – From the junction, the waterline upsizes to a 16-inch main that delivers water to the Pālāwai Irrigation Grid area. The existing 12-inch Pālāwai PRV downstream of the junction reduces the pressure in the waterline to 95 psi.

4. CONNECTION TO OTHER WATER SYSTEMS

a. The Mānele Bay Water System (PWS 238) is interconnected with the Lānaʻi City Water System (PWS 237). During emergencies, the Lānaʻi City System (PWS 237) can be connected to the Mānele Bay Water System (PWS 238) by opening a valve.

IV. LAND USE

Pūlama Lānaʻi is in the process of rezoning approximately 200 acres of land from LUC agricultural to urban, which will include both light and heavy industrial uses.

The Industrial Park project is in the entitlement phase. Proposed water use for the full build out of the Industrial Park is based on the existing demands on the Mānele Bay Water System (PWS 238) and potential development plans. The potential development plans that are contemplated in the Industrial Park include an asphalt plant, CBP, renewable energy projects, infrastructure, and new industrial uses.

The asphalt plant and the CBP are being relocated to the Industrial Park. Although the relocation of the asphalt plant is not anticipated to create any additional water demand on for the entire island, the relocation will shift the existing demand from Lānaʻi City (PWS 237) to Mānele Bay Water System (PWS 238).

The renewable energy projects and infrastructure do not consider any new or incremental water demands on Mānele Bay Water System (PWS 238). The only "new" or "incremental" water demands for the Industrial Park include the new industrial uses and a minor increase for the CBP. The estimated water demand for new industrial uses is determined by the guidelines set in the WSS, which contemplates 6,000 gpd, per acre.

REF-439

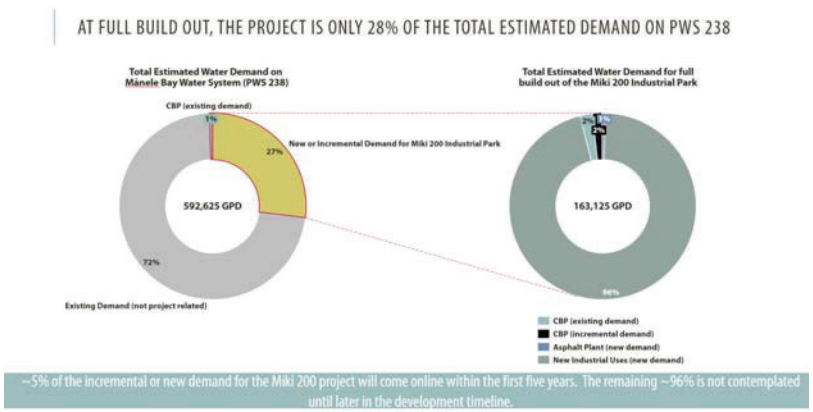
The Industrial Park's incremental or new estimated water demand on Mānele Bay Water System (PWS 238) is 159,625 gpd. The estimated water demand on Mānele Bay Water System (PWS 238) for the full build out of the Industrial Park is 163,125 gpd. The table below (**Figure A**) provides a summary for convenience.

Figure A

Description	Acres	Existing water demand on Mānele Bay Water System (PWS 238) (GPD)	New or incremental water demand on Mānele Bay Water System (PWS 238) (GPD)	Full Build Out of Industrial Park water demand on Mānele Bay Water System (PWS 238) (GPD)
CBP	14.5	3,500	2,625	6,125
Asphalt Plant	12.5	-	1,000	1,000
Renewable Energy Projects	127.0	-	-	-
New Industrial Uses	26.0	-	156,000	156,000
Infrastructure	20.0	-	-	-
Total	**200.0**	**3,500**	**159,625**	**163,125**

The projected average day demand for the Mānele Bay Water System (PWS 238), including full build out of the Industrial Park and existing demands serviced by the Mānele Bay Water System (PWS 238), is 592,625 gpd. The pie chart (**Figure B**) below provides a visual summary of the percentages of existing, new or incremental water demands on the Mānele Bay Water System (PWS 238).

Figure B



V. SAFE DRINKING WATER SYSTEM DESIGN CRITERIA

As outlined in the County of Maui WSS, the following criteria are used in determining the minimum requirements for the safe drinking water system.

1. CONSUMPTION GUIDELINES

a. The average demand for industrial land uses for planning purposes is 6,000 gpd / acre.

2. DEMAND FACTORS

a. Maximum Daily Demand = 1.5 x Average Day

b. Peak Hour Demand = 3.0 x Average Day

3. FIRE FLOW REQUIREMENTS

a. Light Industrial = 2,000 gpm for 2 hour duration

b. Heavy Industrial = 2,500 gpm for 2 hour duration

4. PIPELINE SIZING

a. Maximum daily flow plus fire flow with a residual pressure of 20 psi at critical fire hydrant.

b. Peak hour flow with a minimum residual pressure of 40 psi.

c. In determining the carrying capacity of the mains, the "C" values to be applied are:

Size	"C"
4" & 6"	100
8" & 12"	110
16" & 20"	120

d. The maximum velocity in transmission mains (without fire flow) is 20 feet per second. The maximum velocity in distribution mains with fire flow shall be 10 feet per second.

REF-440

e. Maximum static or pumping pressure, whichever is greater, shall not exceed 125 psi.

f. Ductile iron pipe is required by County of Maui WSS and is recommended for this project. The design pressures for ductile iron pipe are as follows:

i .	Maximum design working pressure	=	250 psi
ii.	Maximum desirable working pressure	=	125 psi
iii.	Maximum expected working pressure	=	150 psi

g. The working pressure for distribution mains servicing residences:

i.	Maximum	=	125 psi
ii.	Minimum	=	40 psi

h. In-line Pālāwai's for distribution mains are required where pressure exceeds 125 psi.

i. Cleanouts are required at the end of all transmission and distribution waterlines.

j. Sampling spigots: For collection of water samples to determine water quality at dead ends of pipeline.

5. RESERVOIR CAPACITY

a. Meet maximum day consumption. Reservoir fills at the beginning of the 24-hour period with no source input to the reservoir.

b. Meet maximum day consumption plus fire flow for duration of fire. Reservoir ¾-full, with credit for incoming flow from pumps.

c. Minimum reservoir size shall be 100,000 gallons.

d. Where there are two or more reservoir serving the same system, the design shall be made on the basis of combined protection by all facilities available.

6. PUMP CAPACITY

a. Meet maximum day demand with an operating time of 16 hours simultaneously with maximum fire flow required independent of the reservoir. The standby unit may be used to determine the total flow required.

b. Meet maximum day demand during the duration of the fire plus fire demand less ¾ of reservoir storage.

c. Meet maximum day demand with an operating time of 16 hours with the largest pumping unit considered out of service.

VI. INDUSTRIAL PARK WATER DEMAND

1. The Industrial Park's incremental or new estimated water demand on Mānele Bay Water System (PWS 238) is 159,625 gpd.

2. The estimated water demand on Mānele Bay Water System (PWS 238) for the full build out of the Industrial Park is 163,125 gpd.

3. The projected average day demand for the Mānele Bay Water System (PWS 238), including full build out of the Industrial Park and existing demands serviced by the Mānele Bay Water System (PWS 238), is 592,625 gpd. (See **Exhibit 3: Existing and Projected Water Flow Summation**, **Exhibit 4: Water Demand Map for Mānele Bay Water System (PWS 238)**).

4. The existing system does not meet the WSS criteria for pipe sizing based on the maximum static pressure shall not exceed 125 psi. The system does meet the WSS criteria to have a maximum of 2,000 gpm for Fire Flow plus Maximum Daily flow for Light Industry and 2,500 gpm for Fire Flow plus Maximum Daily flow for Heavy Industry with a maximum velocity of 10 feet per second for Light and Heavy Industrial Uses. The system also meets the criteria for the Peak Hour flow with a minimum residual pressure of 20 psi.

5. **Exhibit 5: Existing Mānele Bay Water System (PWS 238) Nodal Map** shows the overall water system facilities and nodal map.

VII. PROPOSED SAFE DRINKING WATER SYSTEM (BASED ON LAND USE/ZONING)

1. **WATER SOURCE**

REF-441

a. In accordance with the WSS, available source capacity is governed by the well with the smallest pumping unit. Well No. 2 has an existing pump capacity of 500 gpm. Well No. 4 has a pump capacity of 900 gpm. Since Well No. 2 has the smaller pump capacity, available source capacity for the Mānele Bay Water System (PWS 238) is governed by Well No. 2, which has an average day pumping capacity of 320,000 gpd, which is equivalent to a maximum day pumping capacity of 480,000 gpd. The current average daily water usage of the Mānele Bay Water System (PWS 238) is 433,000 gpd. The full build out of the Industrial Park is anticipated to add an incremental demand of 159,625 gpd to the Mānele Bay Water System (PWS 238), resulting in a total demand of 163,125 gpd for the Industrial Park on the Mānele Bay Water System (PWS 238). Since there are no definite plans to utilize the full amount of water in these estimations, the actual water use may be lower than anticipated.

b. Well Pump Sizing - Mānele Bay Water System (PWS 238)

i. Existing PWS 238 average day capacity = 320,000 gpd
Existing PWS 238 maximum day capacity = 480,000 gpd

ii. PWS 238 with Full Buildout of Industrial Park average day demand = 592,625 gpd
PWS 238 with Full Buildout of Industrial Park maximum day demand = 888,937 gpd

iii. Additional average day capacity required = 272,625 gpd
Additional maximum day capacity required = 408,937 gpd

408,937 gallons / 16 hours / 60 min	=	426 gpm
Additional required pump capacity	=	426 gpm

Full Buildout of the Industrial Park will require increasing the existing well pump, the development of a new well, or multiple wells with an additional total minimum total capacity of 426 gpm.

b. Source Options

The Lānaʻi Water Use and Development Plan (WUDP) discusses the following options for development of to meet future water demand requirements:

i. Drilling a new source or multiple sources to obtain a total minimum pump capacity of 426 gpm.

ii. Installing a permanent interconnection with the Lānaʻi City System. This will require a separate analysis for possible interconnection.

iii. Well 7 is currently in the permitting process for another project in Lānaʻi City to bring online (See **Exhibit 2: Existing Mānele Bay Water System (PWS 238)**). Recommissioning the well will provide reliability for both the Lānaʻi City system and the Irrigation Grid.

2. **RESERVOIR CAPACITY**

a. Case A: Meet maximum day demand in 24-hours
Capacity required = 888,937 gallons

Case B: Meet maximum day + fire flow, reservoir ¾ full
Max day rate = 888,937 gpd
Fire flow = 2,500 gpm
Smallest pump capacity = 500 gpm

Max day rate + fire flow – smallest pump for 120 minutes
= 888,937 gpd + 2,500 gpm x 120 min
= 1,188,937 gallons

Size required = 1,188,937 gallons * 1.25 = 1,486,171 gallons

Case B governs:

Minimum Reservoir Capacity = 1,486,171 gallons

Existing Reservoir Capacity = 1,500,000 gallons

Therefore, existing reservoir capacity is adequate for full buildout.

3. **TRANSMISSION/DISTRIBUTION MAINS**

a. Offsite Improvements

i. Option 1. The existing water PRV could be lowered to at least acquire an outflow of 55 psi to reach the best possible pressures for the distribution main. If there are

REF-442

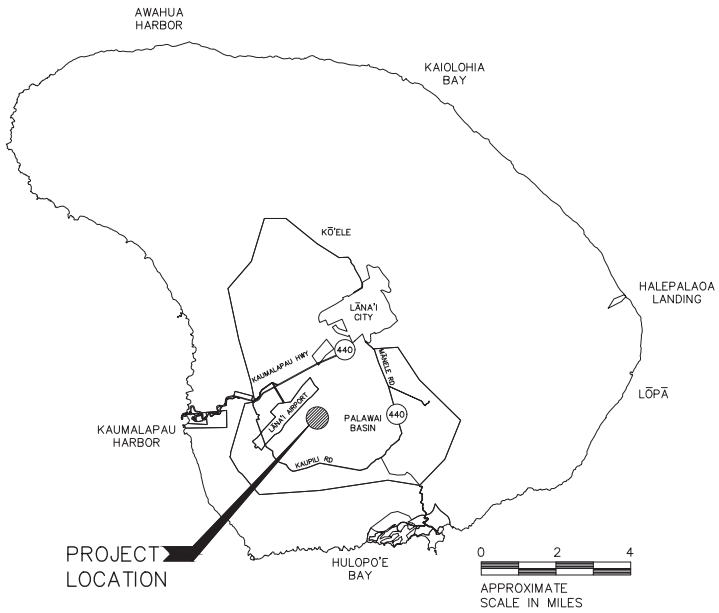
cavitation issues, a new PRV should be installed that has an anti-cavitation trim.

ii. Option 2. While Lāna'i Water Company has replaced and has abandoned sections of the Pālāwai Irrigation Grid, there remains sections that are potentially in need of repair, replacement, or possible abandonment. Since the condition and use of these pipes are unknown, those pipes were excluded from this evaluation. A conditional assessment and analysis for those pipes should be conducted separately, but from the water calculations in this water master plan (see **Appendix A1 & A2**), existing pipes will need to be assessed and potentially replaced at high pressures.

VII. COST CONSIDERATIONS

Budgetary cost for the water improvements is provided in Appendix B.

EXHIBITS



ISLAND OF LĀNA'I

EXHIBIT 1

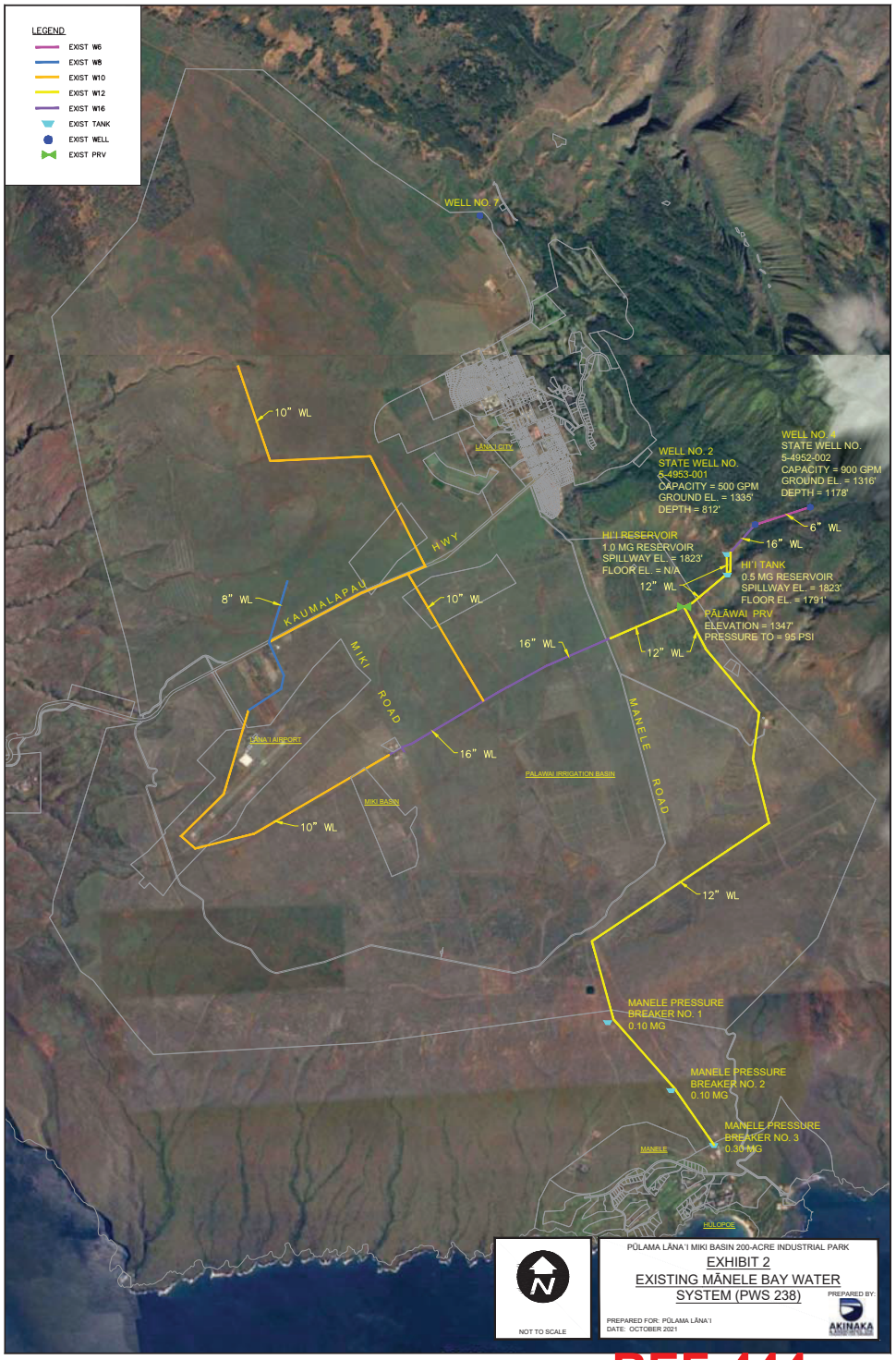
NORTH

PŪLAMA LĀNA'I MIKI BASIN
200–ACRE INDUSTRIAL PARK

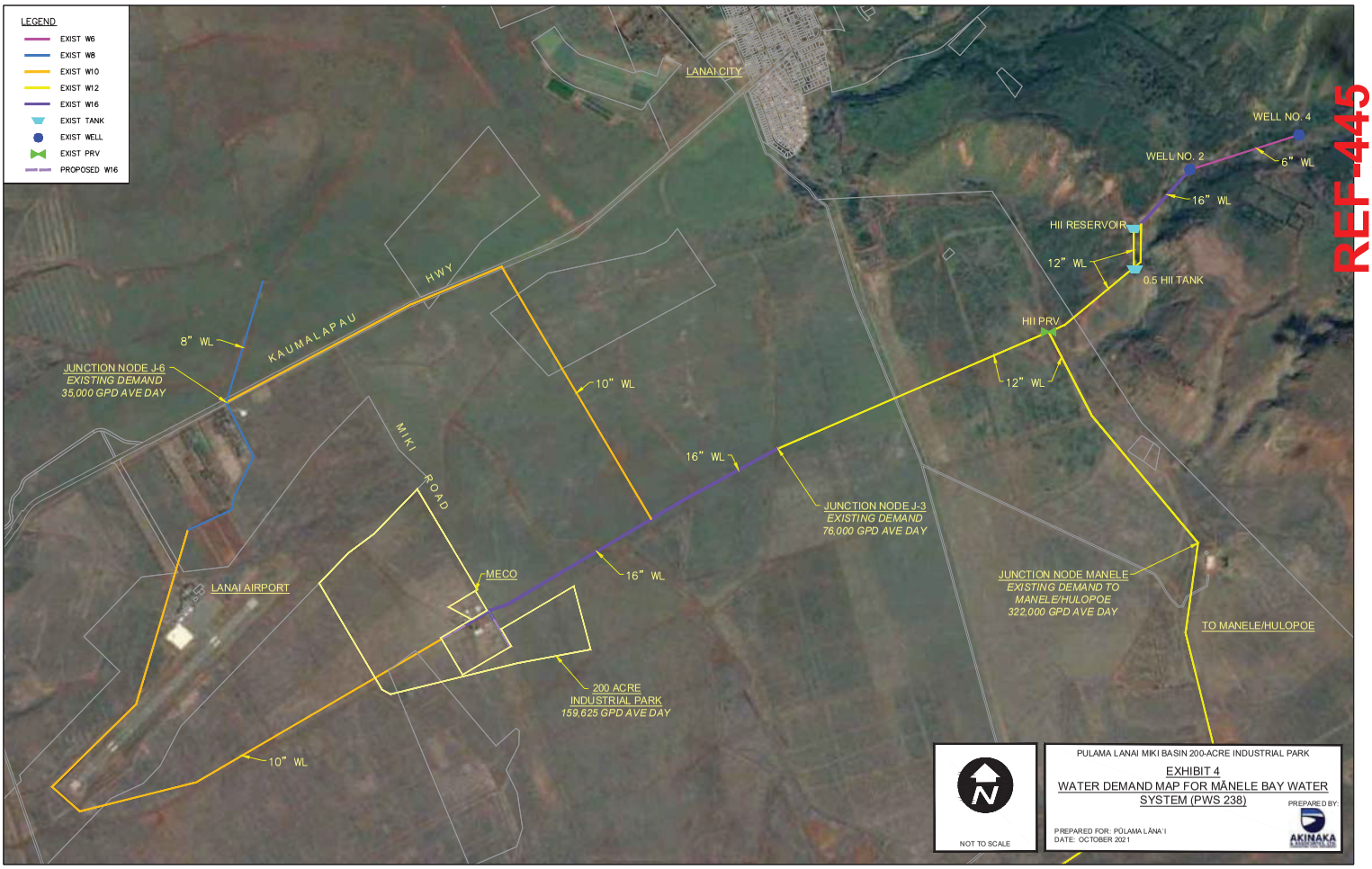
LOCATION MAP

AKINAKA & ASSOCIATES, LTD.

SCALE: AS SHOWN DATE: OCTOBER 2021



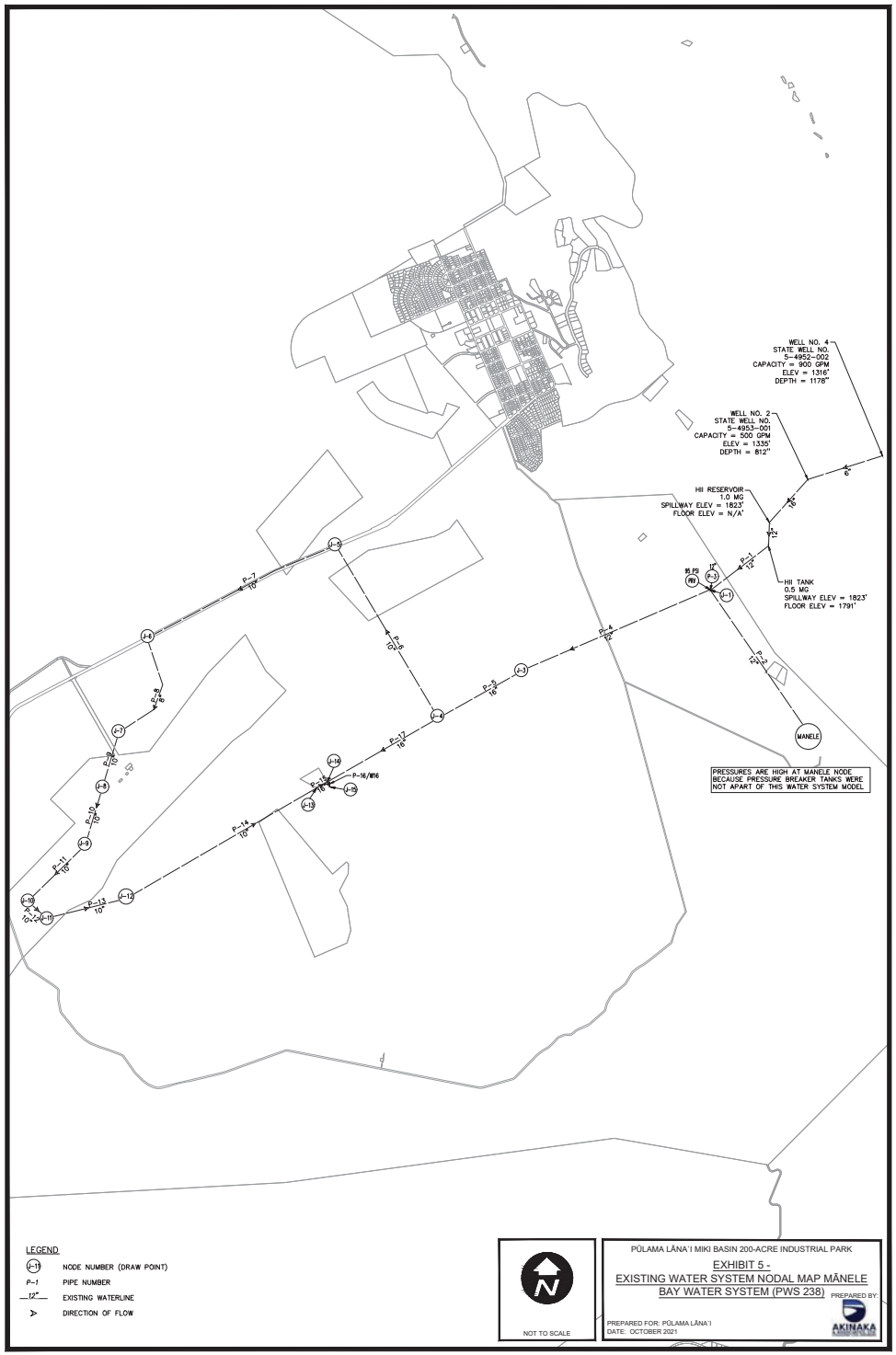
REF-444

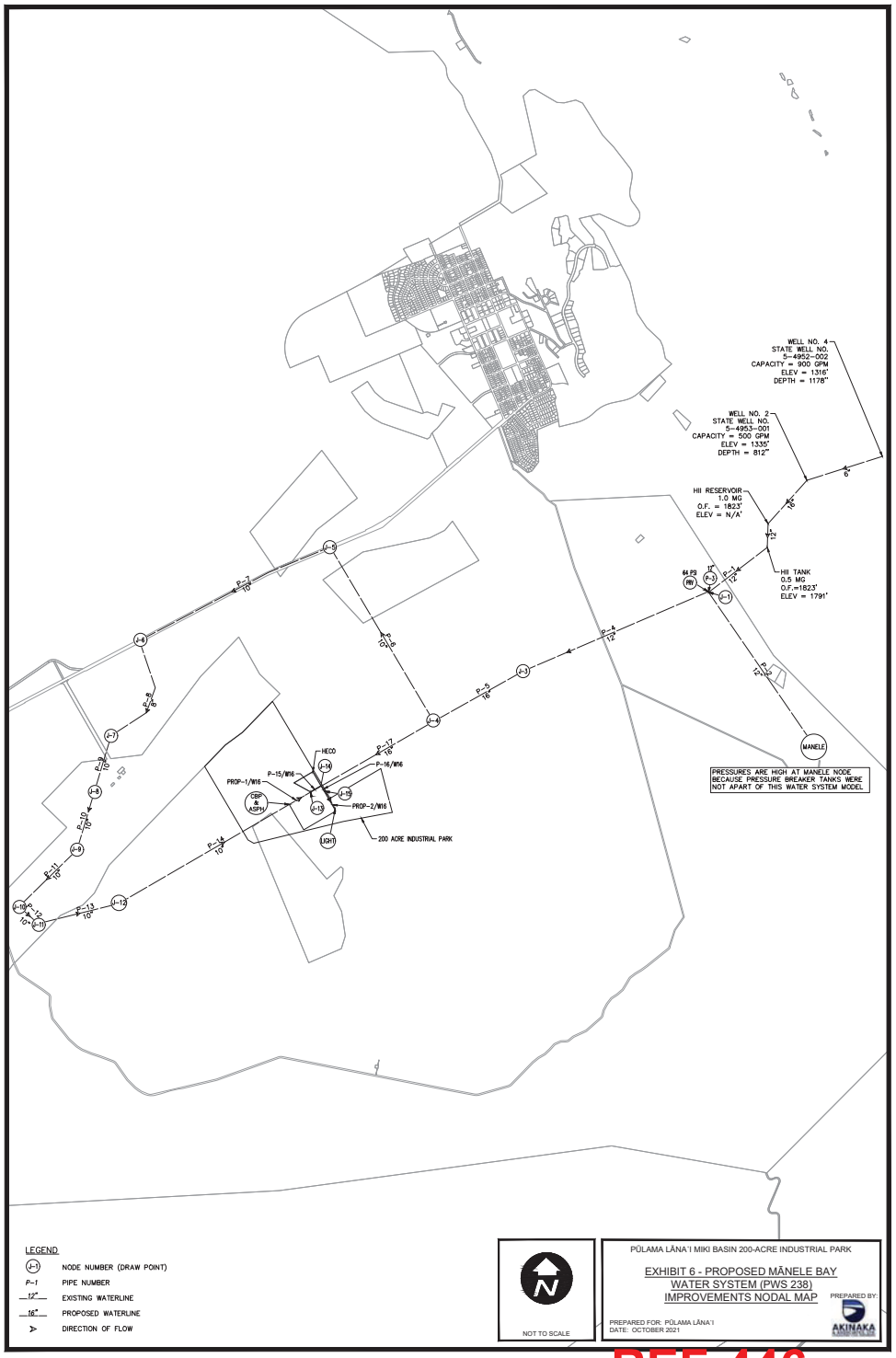


REF-445

EXHIBIT 3: EXISTING AND PROJECTED WATER FLOW SUMMATION
PŪLAMA LĀNA'I MIKI BASIN 200 ACRE INDUSTRIAL PARK
OCTOBER 2021

Point No	Description	Land Use	Proposed Area (ac)	Avg Daily Demand (gal/ac)	Avg Day Rate (GPD)	Max Day Rate (GPD)	Peak Hour Rate (GPD)	Avg Day Rate (GPM)	Max Day Rate (GPM)	Peak Hour Rate (GPM)
MANELE	*Exist Demand*		-	-	*322,000.00*	*483,000.00*	*966,000.00*	*223.61*	*335.42*	*670.83*
J-3	*Exist Demand*		-	-	*76,000.00*	*114,000.00*	*228,000.00*	*52.78*	*79.17*	*158.33*
J-6	*Exist Demand*		-	-	*35,000.00*	*52,500.00*	*105,000.00*	*24.00*	*36.00*	*72.00*
CBP & ASPH	Concrete Crushing Facility	CBP & Toilet Facility	14.50	-	2,625.00	3,937.50	7,875.00	1.82	2.73	5.47
LIGHT	Other Industrial Uses	Light Industrial	26.00	6,000.00	156,000.00	234,000.00	468,000.00	108.33	162.50	325.00
CBP & ASPH	Asphalt Plant	Emission Process	12.50	-	1,000.00	1,500.00	3,000.00	0.69	1.04	2.08
	Renewable Energy Projects		127.00	-	-	-	-	-	-	-
	Infrastructure		20.00	-	-	-	-	-	-	-
			200.00	**Total**	592,625.00	888,937.50	1,777,875.00	411.24	616.86	1,233.72


WELL NO. 4
STATE WELL NO.
5-4952-002
CAPACITY = 900 GPM
ELEV = 1316'
DEPTH = 1178"
WELL NO. 2
STATE WELL NO.
5-4953-001
CAPACITY = 500 GPM
ELEV = 1335'
DEPTH = 812"
HII RESERVOIR
1.0 MG
SPILLWAY ELEV = 1823'
FLOOR ELEV = N/A'
HII TANK
0.5 MG
SPILLWAY ELEV = 1823'
FLOOR ELEV = 1791'
MANELE
P-16/W16
PRESSURES ARE HIGH AT MANELE NODE BECAUSE PRESSURE BREAKER TANKS WERE NOT APART OF THIS WATER SYSTEM MODEL
LEGEND
NODE NUMBER (DRAW POINT)
P-1 PIPE NUMBER
12" EXISTING WATERLINE
DIRECTION OF FLOW
NOT TO SCALE
PŪLAMA LĀNA'I MIKI BASIN 200-ACRE INDUSTRIAL PARK
EXHIBIT 5 -
EXISTING WATER SYSTEM NODAL MAP MĀNELE BAY WATER SYSTEM (PWS 238)
PREPARED BY:
AKINAKA
PREPARED FOR: PŪLAMA LĀNA'I
DATE: OCTOBER 2021


WELL NO. 4
STATE WELL NO.
5-4952-002
CAPACITY = 900 GPM
ELEV = 1316'
DEPTH = 1178"
WELL NO. 2
STATE WELL NO.
5-4953-001
CAPACITY = 500 GPM
ELEV = 1335'
DEPTH = 812"
HII RESERVOIR
1.0 MG
O.F. = 1823'
ELEV = N/A'
HII TANK
0.5 MG
O.F.=1823'
ELEV = 1791'
MANELE
HECO
P-15/W16
P-16/W16
PROP-1/W16
PROP-2/W16
CBP & ASPH
ASPH
200 ACRE INDUSTRIAL PARK
PRESSURES ARE HIGH AT MANELE NODE BECAUSE PRESSURE BREAKER TANKS WERE NOT APART OF THIS WATER SYSTEM MODEL
LEGEND
NODE NUMBER (DRAW POINT)
P-1 PIPE NUMBER
12" EXISTING WATERLINE
16" PROPOSED WATERLINE
DIRECTION OF FLOW
NOT TO SCALE
PŪLAMA LĀNA'I MIKI BASIN 200-ACRE INDUSTRIAL PARK
EXHIBIT 6 - PROPOSED MĀNELE BAY WATER SYSTEM (PWS 238) IMPROVEMENTS NODAL MAP
PREPARED BY:
AKINAKA
PREPARED FOR: PŪLAMA LĀNA'I
DATE: OCTOBER 2021

REF-446

PŪLAMA LĀNA'I MIKI BASIN
200 ACRE INDUSTRIAL PARK
EXISTING PIPES & PRV @ 95 PSI : STATIC

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	2088.00	T-1	J-1	12.00	Ductile Iron	110.00	0.00	0.00	0.00
P-2	5145.00	J-1	MANELE	12.00	Ductile Iron	110.00	0.00	0.00	0.00
P-3	11.00	J-1	PRV	12.00	Ductile Iron	110.00	0.00	0.00	0.00
P-4	5931.00	PRV	J-3	12.00	Ductile Iron	110.00	0.00	0.00	0.00
P-5	2675.00	J-3	J-4	16.00	Ductile Iron	120.00	0.00	0.00	0.00
P-6	5732.00	J-4	J-5	10.00	Ductile Iron	110.00	0.00	0.00	0.00
P-7	6012.00	J-5	J-6	10.00	Ductile Iron	110.00	0.00	0.00	0.00
P-8	3194.00	J-7	J-6	8.00	Ductile Iron	110.00	0.00	0.00	0.00
P-9	1561.00	J-8	J-7	10.00	Ductile Iron	110.00	0.00	0.00	0.00
P-10	1989.00	J-9	J-8	10.00	Ductile Iron	110.00	0.00	0.00	0.00
P-11	2294.00	J-10	J-9	10.00	Ductile Iron	110.00	0.00	0.00	0.00
P-12	723.00	J-11	J-10	10.00	Ductile Iron	110.00	0.00	0.00	0.00
P-13	2338.00	J-12	J-11	10.00	Ductile Iron	110.00	0.00	0.00	0.00
P-14	6275.00	J-12	J-13	10.00	Ductile Iron	110.00	0.00	0.00	0.00
P-15	361.00	J-13	J-14	16.00	Ductile Iron	120.00	0.00	0.00	0.00
P-16	170.00	J-14	J-15	16.00	Ductile Iron	120.00	0.00	0.00	0.00
P-17	3654.00	J-4	J-14	16.00	Ductile Iron	120.00	0.00	0.00	0.00

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Demand (gpm)
J-1	1347.17	1818.00	204.00	0.00
J-3	1345.73	1566.82	96.00	0.00
J-4	1134.61	1566.82	187.00	0.00
J-5	1350.00	1566.82	94.00	0.00
J-6	1339.00	1566.82	99.00	0.00
J-7	1301.00	1566.82	115.00	0.00
J-8	1287.75	1566.82	121.00	0.00
J-9	1249.00	1566.82	138.00	0.00
J-10	1207.00	1566.82	156.00	0.00
J-11	1223.00	1566.82	149.00	0.00
J-12	1281.00	1566.82	124.00	0.00
J-13	1224.41	1566.82	148.00	0.00
J-14	1221.15	1566.82	150.00	0.00
J-15	1221.91	1566.82	149.00	0.00
MANELE	1128.00	1818.00	299.00	0.00

Label	Elevation (Base) (ft)	Elevation (Min) (ft)	Hydraulic Grade (ft)	Elevation (Max) (ft)	Volume (MG)	Diameter (ft)	Flow (Out) (gpm)	Percent Full (%)
Hi'i Tank	1791.00	1812.00	1818.00	1823.00	0.50	26.00	0.00	54.50

REF-447

APPENDIX A1

Water Calculations

PŪLAMA LĀNA'I MIKI BASIN
200 ACRE INDUSTRIAL PARK
EXISTING PIPES & PRV @ 95 PSI : MAX DAY

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	2088.00	T-1	J-1	12.00	Ductile Iron	110.00	616.86	1.75	0.00
P-2	5145.00	J-1	MANELE	12.00	Ductile Iron	110.00	335.42	0.95	0.00
P-3	11.00	J-1	PRV	12.00	Ductile Iron	110.00	281.44	0.80	0.00
P-4	5931.00	PRV	J-3	12.00	Ductile Iron	110.00	281.44	0.80	0.00
P-5	2675.00	J-3	J-4	16.00	Ductile Iron	120.00	202.27	0.32	0.00
P-6	5732.00	J-4	J-5	10.00	Ductile Iron	110.00	27.95	0.11	0.00
P-7	6012.00	J-5	J-6	10.00	Ductile Iron	110.00	27.95	0.11	0.00
P-8	3194.00	J-7	J-6	8.00	Ductile Iron	110.00	8.05	0.05	0.00
P-9	1561.00	J-8	J-7	10.00	Ductile Iron	110.00	8.05	0.03	0.00
P-10	1989.00	J-9	J-8	10.00	Ductile Iron	110.00	8.05	0.03	0.00
P-11	2294.00	J-10	J-9	10.00	Ductile Iron	110.00	8.05	0.03	0.00
P-12	723.00	J-11	J-10	10.00	Ductile Iron	110.00	8.05	0.03	0.00
P-13	2338.00	J-12	J-11	10.00	Ductile Iron	110.00	8.05	0.03	0.00
P-14	5359.00	CBP & ASPH	J-12	10.00	Ductile Iron	110.00	8.05	0.03	0.00
P-15	361.00	J-14	J-13	16.00	Ductile Iron	120.00	11.82	0.02	0.00
P-16	170.00	J-14	J-15	16.00	Ductile Iron	120.00	162.50	0.26	0.00
P-17	3654.00	J-4	J-14	16.00	Ductile Iron	120.00	174.32	0.28	0.00
PROP-1	916.00	J-13	CBP & ASPH	16.00	Ductile Iron	120.00	11.82	0.02	0.00
PROP-2	461.00	J-15	LIGHT	16.00	Ductile Iron	120.00	162.50	0.26	0.00

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Demand (gpm)
CBP & ASPH	1230.00	1564.46	145.00	3.77
J-1	1347.17	1809.47	200.00	0.00
J-3	1345.73	1564.87	95.00	79.17
J-4	1134.61	1564.57	186.00	0.00
J-5	1350.00	1564.50	93.00	0.00
J-6	1339.00	1564.44	98.00	36.00
J-7	1301.00	1564.45	114.00	0.00
J-8	1287.75	1564.45	120.00	0.00
J-9	1249.00	1564.45	136.00	0.00
J-10	1207.00	1564.45	155.00	0.00
J-11	1223.00	1564.45	148.00	0.00
J-12	1281.00	1564.46	123.00	0.00
J-13	1236.46	1564.46	142.00	0.00
J-14	1239.00	1564.46	141.00	0.00
J-15	1250.00	1564.46	136.00	0.00
LIGHT	1255.00	1564.45	134.00	162.50
MANELE	1128.00	1799.62	291.00	335.42

Label	Elevation (Base) (ft)	Elevation (Min) (ft)	Hydraulic Grade (ft)	Elevation (Max) (ft)	Volume (MG)	Diameter (ft)	Flow (Out) (gpm)	Percent Full (%)
Hi'i Tank	1791.00	1812.00	1818.00	1823.00	0.50	26.00	616.86	54.50

PŪLAMA LĀNA'I MIKI BASIN
200 ACRE INDUSTRIAL PARK
EXISTING PIPES & PRV @ 95 PSI : PEAK HOUR

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	2088.00	T-1	J-1	12.00	Ductile Iron	110.00	1233.71	3.50	0.01
P-2	5145.00	J-1	MANELE	12.00	Ductile Iron	110.00	670.83	1.90	0.00
P-3	11.00	J-1	PRV	12.00	Ductile Iron	110.00	562.88	1.60	0.00
P-4	5931.00	PRV	J-3	12.00	Ductile Iron	110.00	562.88	1.60	0.00
P-5	2675.00	J-3	J-4	16.00	Ductile Iron	120.00	404.55	0.65	0.00
P-6	5732.00	J-4	J-5	10.00	Ductile Iron	110.00	55.89	0.23	0.00
P-7	6012.00	J-5	J-6	10.00	Ductile Iron	110.00	55.89	0.23	0.00
P-8	3194.00	J-7	J-6	8.00	Ductile Iron	110.00	16.11	0.10	0.00
P-9	1561.00	J-8	J-7	10.00	Ductile Iron	110.00	16.11	0.07	0.00
P-10	1989.00	J-9	J-8	10.00	Ductile Iron	110.00	16.11	0.07	0.00
P-11	2294.00	J-10	J-9	10.00	Ductile Iron	110.00	16.11	0.07	0.00
P-12	723.00	J-11	J-10	10.00	Ductile Iron	110.00	16.11	0.07	0.00
P-13	2338.00	J-12	J-11	10.00	Ductile Iron	110.00	16.11	0.07	0.00
P-14	5359.00	CBP & ASPH	J-12	10.00	Ductile Iron	110.00	16.11	0.07	0.00
P-15	361.00	J-14	J-13	16.00	Ductile Iron	120.00	23.66	0.04	0.00
P-16	170.00	J-14	J-15	16.00	Ductile Iron	120.00	325.00	0.52	0.00
P-17	3654.00	J-4	J-14	16.00	Ductile Iron	120.00	348.66	0.56	0.00
PROP-1	916.00	J-13	CBP & ASPH	16.00	Ductile Iron	120.00	23.66	0.04	0.00
PROP-2	461.00	J-15	LIGHT	16.00	Ductile Iron	120.00	325.00	0.52	0.00

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Demand (gpm)
CBP & ASPH	1230.00	1558.30	142.00	7.55
J-1	1347.17	1787.22	190.00	0.00
J-3	1345.73	1559.76	93.00	158.33
J-4	1134.61	1558.67	183.00	0.00
J-5	1350.00	1558.44	90.00	0.00
J-6	1339.00	1558.20	95.00	72.00
J-7	1301.00	1558.24	111.00	0.00
J-8	1287.75	1558.25	117.00	0.00
J-9	1249.00	1558.25	134.00	0.00
J-10	1207.00	1558.26	152.00	0.00
J-11	1223.00	1558.27	145.00	0.00
J-12	1281.00	1558.28	120.00	0.00
J-13	1236.46	1558.30	139.00	0.00
J-14	1239.00	1558.30	138.00	0.00
J-15	1250.00	1558.28	133.00	0.00
LIGHT	1255.00	1558.24	131.00	325.00
MANELE	1128.00	1751.64	270.00	670.83

Label	Elevation (Base) (ft)	Elevation (Min) (ft)	Hydraulic Grade (ft)	Elevation (Max) (ft)	Volume (MG)	Diameter (ft)	Flow (Out) (gpm)	Percent Full (%)
Hi'i Tank	1791.00	1812.00	1818.00	1823.00	0.50	26.00	1233.71	54.50

REF-448

PŪLAMA LĀNA'I MIKI BASIN
200 ACRE INDUSTRIAL PARK
EXISTING PIPES & PRV @ 95 PSI : MAX DAY FLOW + FIRE FLOW @ CONCRETE CRUSHING FACILITY & ASPHALT PLANT

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	2088.00	T-1	J-1	12.00	Ductile Iron	110.00	3116.86	8.84	0.03
P-2	5145.00	J-1	MANELE	12.00	Ductile Iron	110.00	335.42	0.95	0.00
P-3	11.00	J-1	PRV	12.00	Ductile Iron	110.00	2781.44	7.89	0.02
P-4	5931.00	PRV	J-3	12.00	Ductile Iron	110.00	2781.44	7.89	0.02
P-5	2675.00	J-3	J-4	16.00	Ductile Iron	120.00	2702.27	4.31	0.01
P-6	5732.00	J-4	J-5	10.00	Ductile Iron	110.00	245.17	1.00	0.00
P-7	6012.00	J-5	J-6	10.00	Ductile Iron	110.00	245.17	1.00	0.00
P-8	3194.00	J-7	J-6	8.00	Ductile Iron	110.00	-209.17	1.34	0.00
P-9	1561.00	J-8	J-7	10.00	Ductile Iron	110.00	-209.17	0.85	0.00
P-10	1989.00	J-9	J-8	10.00	Ductile Iron	110.00	-209.17	0.85	0.00
P-11	2294.00	J-10	J-9	10.00	Ductile Iron	110.00	-209.17	0.85	0.00
P-12	723.00	J-11	J-10	10.00	Ductile Iron	110.00	-209.17	0.85	0.00
P-13	2338.00	J-12	J-11	10.00	Ductile Iron	110.00	-209.17	0.85	0.00
P-14	5359.00	CBP & ASPH	J-12	10.00	Ductile Iron	110.00	-209.17	0.85	0.00
P-15	361.00	J-14	J-13	16.00	Ductile Iron	120.00	2294.60	3.66	0.00
P-16	170.00	J-14	J-15	16.00	Ductile Iron	120.00	162.50	0.26	0.00
P-17	3654.00	J-4	J-14	16.00	Ductile Iron	120.00	2457.10	3.92	0.00
PROP-1	916.00	J-13	CBP & ASPH	16.00	Ductile Iron	120.00	2294.60	3.66	0.00
PROP-2	461.00	J-15	LIGHT	16.00	Ductile Iron	120.00	162.50	0.26	0.00

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Demand (gpm)
CBP & ASPH	1230.00	1375.82	63.00	2503.77
J-1	1347.17	1646.73	130.00	0.00
J-3	1345.73	1430.61	37.00	79.17
J-4	1134.61	1394.11	112.00	0.00
J-5	1350.00	1390.55	18.00	0.00
J-6	1339.00	1386.81	21.00	36.00
J-7	1301.00	1382.43	35.00	0.00
J-8	1287.75	1381.70	41.00	0.00
J-9	1249.00	1380.78	57.00	0.00
J-10	1207.00	1379.72	75.00	0.00
J-11	1223.00	1379.39	68.00	0.00
J-12	1281.00	1378.30	42.00	0.00
J-13	1236.46	1378.91	62.00	0.00
J-14	1239.00	1380.13	61.00	0.00
J-15	1250.00	1380.12	56.00	0.00
LIGHT	1255.00	1380.11	54.00	162.50
MANELE	1128.00	1636.88	220.00	335.42

Label	Elevation (Base) (ft)	Elevation (Min) (ft)	Hydraulic Grade (ft)	Elevation (Max) (ft)	Volume (MG)	Diameter (ft)	Flow (Out) (gpm)	Percent Full (%)
Hi'i Tank	1791.00	1812.00	1818.00	1823.00	0.50	26.00	3116.86	54.50

PŪLAMA LĀNA'I MIKI BASIN
200 ACRE INDUSTRIAL PARK
EXISTING PIPES & PRV @ 95 PSI : MAX DAY FLOW + FIRE FLOW @ LIGHT INDUSTRIAL PARCEL

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	2088.00	T-1	J-1	12.00	Ductile Iron	110.00	2616.86	7.42	0.02
P-2	5145.00	J-1	MANELE	12.00	Ductile Iron	110.00	335.42	0.95	0.00
P-3	11.00	J-1	PRV	12.00	Ductile Iron	110.00	2281.44	6.47	0.02
P-4	5931.00	PRV	J-3	12.00	Ductile Iron	110.00	2281.44	6.47	0.02
P-5	2675.00	J-3	J-4	16.00	Ductile Iron	120.00	2202.27	3.51	0.00
P-6	5732.00	J-4	J-5	10.00	Ductile Iron	110.00	180.84	0.74	0.00
P-7	6012.00	J-5	J-6	10.00	Ductile Iron	110.00	180.84	0.74	0.00
P-8	3194.00	J-7	J-6	8.00	Ductile Iron	110.00	-144.84	0.92	0.00
P-9	1561.00	J-8	J-7	10.00	Ductile Iron	110.00	-144.84	0.59	0.00
P-10	1989.00	J-9	J-8	10.00	Ductile Iron	110.00	-144.84	0.59	0.00
P-11	2294.00	J-10	J-9	10.00	Ductile Iron	110.00	-144.84	0.59	0.00
P-12	723.00	J-11	J-10	10.00	Ductile Iron	110.00	-144.84	0.59	0.00
P-13	2338.00	J-12	J-11	10.00	Ductile Iron	110.00	-144.84	0.59	0.00
P-14	5359.00	CBP & ASPH	J-12	10.00	Ductile Iron	110.00	-144.84	0.59	0.00
P-15	361.00	J-14	J-13	16.00	Ductile Iron	120.00	-141.07	0.23	0.00
P-16	170.00	J-14	J-15	16.00	Ductile Iron	120.00	2162.50	3.45	0.00
P-17	3654.00	J-4	J-14	16.00	Ductile Iron	120.00	2021.43	3.23	0.00
PROP-1	916.00	J-13	CBP & ASPH	16.00	Ductile Iron	120.00	-141.07	0.23	0.00
PROP-2	461.00	J-15	LIGHT	16.00	Ductile Iron	120.00	2162.50	3.45	0.00

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Demand (gpm)
CBP & ASPH	1230.00	1437.75	90.00	3.77
J-1	1347.17	1694.11	150.00	0.00
J-3	1345.73	1472.46	55.00	79.17
J-4	1134.61	1447.46	135.00	0.00
J-5	1350.00	1445.44	41.00	0.00
J-6	1339.00	1443.31	45.00	36.00
J-7	1301.00	1441.09	61.00	0.00
J-8	1287.75	1440.73	66.00	0.00
J-9	1249.00	1440.26	83.00	0.00
J-10	1207.00	1439.72	101.00	0.00
J-11	1223.00	1439.55	94.00	0.00
J-12	1281.00	1439.00	68.00	0.00
J-13	1236.46	1437.73	87.00	0.00
J-14	1239.00	1437.72	86.00	0.00
J-15	1250.00	1437.21	81.00	0.00
LIGHT	1255.00	1435.82	78.00	2162.50
MANELE	1128.00	1684.25	241.00	335.42

Label	Elevation (Base) (ft)	Elevation (Min) (ft)	Hydraulic Grade (ft)	Elevation (Max) (ft)	Volume (MG)	Diameter (ft)	Flow (Out) (gpm)	Percent Full (%)
Hi'i Tank	1791.00	1812.00	1818.00	1823.00	0.50	26.00	2616.86	54.50

REF-449

PŪLAMA LĀNA'I MIKI BASIN
200 ACRE INDUSTRIAL PARK
PROPOSED PRV @ 55 PSI : STATIC

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	2088.00	T-1	J-1	12.00	Ductile Iron	110.00	0.00	0.00	0.00
P-2	5145.00	J-1	MANELE	12.00	Ductile Iron	110.00	0.00	0.00	0.00
P-3	11.00	J-1	PRV	12.00	Ductile Iron	110.00	0.00	0.00	0.00
P-4	5931.00	PRV	J-3	12.00	Ductile Iron	110.00	0.00	0.00	0.00
P-5	2675.00	J-3	J-4	16.00	Ductile Iron	120.00	0.00	0.00	0.00
P-6	5732.00	J-4	J-5	10.00	Ductile Iron	110.00	0.00	0.00	0.00
P-7	6012.00	J-5	J-6	10.00	Ductile Iron	110.00	0.00	0.00	0.00
P-8	3194.00	J-7	J-6	8.00	Ductile Iron	110.00	0.00	0.00	0.00
P-9	1561.00	J-8	J-7	10.00	Ductile Iron	110.00	0.00	0.00	0.00
P-10	1989.00	J-9	J-8	10.00	Ductile Iron	110.00	0.00	0.00	0.00
P-11	2294.00	J-10	J-9	10.00	Ductile Iron	110.00	0.00	0.00	0.00
P-12	723.00	J-11	J-10	10.00	Ductile Iron	110.00	0.00	0.00	0.00
P-13	2338.00	J-12	J-11	10.00	Ductile Iron	110.00	0.00	0.00	0.00
P-14	5359.00	CBP	J-12	10.00	Ductile Iron	110.00	0.00	0.00	0.00
P-15	361.00	J-14	J-13	16.00	Ductile Iron	120.00	0.00	0.00	0.00
P-16	170.00	J-14	J-15	16.00	Ductile Iron	120.00	0.00	0.00	0.00
P-17	3654.00	J-4	J-14	16.00	Ductile Iron	120.00	0.00	0.00	0.00
PROP-1	916.00	J-13	CBP	16.00	Ductile Iron	120.00	0.00	0.00	0.00
PROP-2	461.00	J-15	LIGHT	16.00	Ductile Iron	120.00	0.00	0.00	0.00

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Demand (gpm)
CBP	1230.00	1474.34	106.00	0.00
J-1	1347.17	1818.00	204.00	0.00
J-3	1345.73	1474.34	56.00	0.00
J-4	1134.61	1474.34	147.00	0.00
J-5	1350.00	1474.34	54.00	0.00
J-6	1339.00	1474.34	59.00	0.00
J-7	1301.00	1474.34	75.00	0.00
J-8	1287.75	1474.34	81.00	0.00
J-9	1249.00	1474.34	97.00	0.00
J-10	1207.00	1474.34	116.00	0.00
J-11	1223.00	1474.34	109.00	0.00
J-12	1281.00	1474.34	84.00	0.00
J-13	1236.46	1474.34	103.00	0.00
J-14	1239.00	1474.34	102.00	0.00
J-15	1250.00	1474.34	97.00	0.00
LIGHT	1255.00	1474.34	95.00	0.00
MANELE	1128.00	1818.00	299.00	0.00

Label	Elevation (Base) (ft)	Elevation (Min) (ft)	Hydraulic Grade (ft)	Elevation (Max) (ft)	Volume (MG)	Diameter (ft)	Flow (Out) (gpm)	Percent Full (%)
Hi'i Tank	1791.00	1812.00	1818.00	1823.00	0.50	26.00	0.00	54.50

REF-450

APPENDIX A2

Water Calculations – Adjusted PRV

PŪLAMA LĀNA'I MIKI BASIN
200 ACRE INDUSTRIAL PARK
PROPOSED PRV @ 55 PSI : MAX DAY

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	2088.00	T-1	J-1	12.00	Ductile Iron	110.00	616.86	1.75	0.00
P-2	5145.00	J-1	MANELE	12.00	Ductile Iron	110.00	335.42	0.95	0.00
P-3	11.00	J-1	PRV	12.00	Ductile Iron	110.00	281.44	0.80	0.00
P-4	5931.00	PRV	J-3	12.00	Ductile Iron	110.00	281.44	0.80	0.00
P-5	2675.00	J-3	J-4	16.00	Ductile Iron	120.00	202.27	0.32	0.00
P-6	5732.00	J-4	J-5	10.00	Ductile Iron	110.00	27.95	0.11	0.00
P-7	6012.00	J-5	J-6	10.00	Ductile Iron	110.00	27.95	0.11	0.00
P-8	3194.00	J-7	J-6	8.00	Ductile Iron	110.00	8.05	0.05	0.00
P-9	1561.00	J-8	J-7	10.00	Ductile Iron	110.00	8.05	0.03	0.00
P-10	1989.00	J-9	J-8	10.00	Ductile Iron	110.00	8.05	0.03	0.00
P-11	2294.00	J-10	J-9	10.00	Ductile Iron	110.00	8.05	0.03	0.00
P-12	723.00	J-11	J-10	10.00	Ductile Iron	110.00	8.05	0.03	0.00
P-13	2338.00	J-12	J-11	10.00	Ductile Iron	110.00	8.05	0.03	0.00
P-14	5359.00	CBP & ASPH	J-12	10.00	Ductile Iron	110.00	8.05	0.03	0.00
P-15	361.00	J-14	J-13	16.00	Ductile Iron	120.00	11.82	0.02	0.00
P-16	170.00	J-14	J-15	16.00	Ductile Iron	120.00	162.50	0.26	0.00
P-17	3654.00	J-4	J-14	16.00	Ductile Iron	120.00	174.32	0.28	0.00
PROP-1	916.00	J-13	CBP & ASPH	16.00	Ductile Iron	120.00	11.82	0.02	0.00
PROP-2	461.00	J-15	LIGHT	16.00	Ductile Iron	120.00	162.50	0.26	0.00

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Demand (gpm)
CBP & ASPH	1230.00	1471.98	105.00	3.77
J-1	1347.17	1809.47	200.00	0.00
J-3	1345.73	1472.38	55.00	79.17
J-4	1134.61	1472.08	146.00	0.00
J-5	1350.00	1472.02	53.00	0.00
J-6	1339.00	1471.95	58.00	36.00
J-7	1301.00	1471.96	74.00	0.00
J-8	1287.75	1471.96	80.00	0.00
J-9	1249.00	1471.96	96.00	0.00
J-10	1207.00	1471.97	115.00	0.00
J-11	1223.00	1471.97	108.00	0.00
J-12	1281.00	1471.97	83.00	0.00
J-13	1236.46	1471.98	102.00	0.00
J-14	1239.00	1471.98	101.00	0.00
J-15	1250.00	1471.97	96.00	0.00
LIGHT	1255.00	1471.96	94.00	162.50
MANELE	1128.00	1799.62	291.00	335.42

Label	Elevation (Base) (ft)	Elevation (Min) (ft)	Hydraulic Grade (ft)	Elevation (Max) (ft)	Volume (MG)	Diameter (ft)	Flow (Out) (gpm)	Percent Full (%)
Hi'i Tank	1791.00	1812.00	1818.00	1823.00	0.50	26.00	616.86	54.50

PŪLAMA LĀNA'I MIKI BASIN
200 ACRE INDUSTRIAL PARK
PROPOSED PRV @ 55 PSI : PEAK HOUR

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	2088.00	T-1	J-1	12.00	Ductile Iron	110.00	1233.71	3.50	0.01
P-2	5145.00	J-1	MANELE	12.00	Ductile Iron	110.00	670.83	1.90	0.00
P-3	11.00	J-1	PRV	12.00	Ductile Iron	110.00	562.88	1.60	0.00
P-4	5931.00	PRV	J-3	12.00	Ductile Iron	110.00	562.88	1.60	0.00
P-5	2675.00	J-3	J-4	16.00	Ductile Iron	120.00	404.55	0.65	0.00
P-6	5732.00	J-4	J-5	10.00	Ductile Iron	110.00	55.89	0.23	0.00
P-7	6012.00	J-5	J-6	10.00	Ductile Iron	110.00	55.89	0.23	0.00
P-8	3194.00	J-7	J-6	8.00	Ductile Iron	110.00	16.11	0.10	0.00
P-9	1561.00	J-8	J-7	10.00	Ductile Iron	110.00	16.11	0.07	0.00
P-10	1989.00	J-9	J-8	10.00	Ductile Iron	110.00	16.11	0.07	0.00
P-11	2294.00	J-10	J-9	10.00	Ductile Iron	110.00	16.11	0.07	0.00
P-12	723.00	J-11	J-10	10.00	Ductile Iron	110.00	16.11	0.07	0.00
P-13	2338.00	J-12	J-11	10.00	Ductile Iron	110.00	16.11	0.07	0.00
P-14	5359.00	CBP & ASPH	J-12	10.00	Ductile Iron	110.00	16.11	0.07	0.00
P-15	361.00	J-14	J-13	16.00	Ductile Iron	120.00	23.66	0.04	0.00
P-16	170.00	J-14	J-15	16.00	Ductile Iron	120.00	325.00	0.52	0.00
P-17	3654.00	J-4	J-14	16.00	Ductile Iron	120.00	348.66	0.56	0.00
PROP-1	916.00	J-13	CBP & ASPH	16.00	Ductile Iron	120.00	23.66	0.04	0.00
PROP-2	461.00	J-15	LIGHT	16.00	Ductile Iron	120.00	325.00	0.52	0.00

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Demand (gpm)
CBP & ASPH	1230.00	1465.81	102.00	7.55
J-1	1347.17	1787.22	190.00	0.00
J-3	1345.73	1467.27	53.00	158.33
J-4	1134.61	1466.19	143.00	0.00
J-5	1350.00	1465.96	50.00	0.00
J-6	1339.00	1465.72	55.00	72.00
J-7	1301.00	1465.75	71.00	0.00
J-8	1287.75	1465.76	77.00	0.00
J-9	1249.00	1465.77	94.00	0.00
J-10	1207.00	1465.78	112.00	0.00
J-11	1223.00	1465.78	105.00	0.00
J-12	1281.00	1465.79	80.00	0.00
J-13	1236.46	1465.81	99.00	0.00
J-14	1239.00	1465.81	98.00	0.00
J-15	1250.00	1465.80	93.00	0.00
LIGHT	1255.00	1465.76	91.00	325.00
MANELE	1128.00	1751.64	270.00	670.83

Label	Elevation (Base) (ft)	Elevation (Min) (ft)	Hydraulic Grade (ft)	Elevation (Max) (ft)	Volume (MG)	Diameter (ft)	Flow (Out) (gpm)	Percent Full (%)
Hi'i Tank	1791.00	1812.00	1818.00	1823.00	0.50	26.00	1233.71	54.50

REF-451

PŪLAMA LĀNA'I MIKI BASIN
200 ACRE INDUSTRIAL PARK
PROPOSED PRV @ 55 PSI : MAX DAY FLOW + FIRE FLOW @ CONCRETE CRUSHING FACILITY & ASPHALT PLANT

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	2088.00	T-1	J-1	12.00	Ductile Iron	110.00	3116.86	8.84	0.03
P-2	5145.00	J-1	MANELE	12.00	Ductile Iron	110.00	335.42	0.95	0.00
P-3	11.00	J-1	PRV	12.00	Ductile Iron	110.00	2781.44	7.89	0.02
P-4	5931.00	PRV	J-3	12.00	Ductile Iron	110.00	2781.44	7.89	0.02
P-5	2675.00	J-3	J-4	16.00	Ductile Iron	120.00	2702.27	4.31	0.01
P-6	5732.00	J-4	J-5	10.00	Ductile Iron	110.00	245.17	1.00	0.00
P-7	6012.00	J-5	J-6	10.00	Ductile Iron	110.00	245.17	1.00	0.00
P-8	3194.00	J-7	J-6	8.00	Ductile Iron	110.00	-209.17	1.34	0.00
P-9	1561.00	J-8	J-7	10.00	Ductile Iron	110.00	-209.17	0.85	0.00
P-10	1989.00	J-9	J-8	10.00	Ductile Iron	110.00	-209.17	0.85	0.00
P-11	2294.00	J-10	J-9	10.00	Ductile Iron	110.00	-209.17	0.85	0.00
P-12	723.00	J-11	J-10	10.00	Ductile Iron	110.00	-209.17	0.85	0.00
P-13	2338.00	J-12	J-11	10.00	Ductile Iron	110.00	-209.17	0.85	0.00
P-14	5359.00	CBP & ASPH	J-12	10.00	Ductile Iron	110.00	-209.17	0.85	0.00
P-15	361.00	J-14	J-13	16.00	Ductile Iron	120.00	2294.60	3.66	0.00
P-16	170.00	J-14	J-15	16.00	Ductile Iron	120.00	162.50	0.26	0.00
P-17	3654.00	J-4	J-14	16.00	Ductile Iron	120.00	2457.10	3.92	0.00
PROP-1	916.00	J-13	CBP & ASPH	16.00	Ductile Iron	120.00	2294.60	3.66	0.00
PROP-2	461.00	J-15	LIGHT	16.00	Ductile Iron	120.00	162.50	0.26	0.00

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Demand (gpm)
CBP & ASPH	1230.00	1283.34	23.00	2503.77
J-1	1347.17	1646.73	130.00	0.00
J-3	1345.73	1338.13	-3.00	79.17
J-4	1134.61	1301.62	72.00	0.00
J-5	1350.00	1298.06	-22.00	0.00
J-6	1339.00	1294.32	-19.00	36.00
J-7	1301.00	1289.94	-5.00	0.00
J-8	1287.75	1289.22	1.00	0.00
J-9	1249.00	1288.30	17.00	0.00
J-10	1207.00	1287.23	35.00	0.00
J-11	1223.00	1286.90	28.00	0.00
J-12	1281.00	1285.82	2.00	0.00
J-13	1236.46	1286.42	22.00	0.00
J-14	1239.00	1287.64	21.00	0.00
J-15	1250.00	1287.64	16.00	0.00
LIGHT	1255.00	1287.62	14.00	162.50
MANELE	1128.00	1636.88	220.00	335.42

Label	Elevation (Base) (ft)	Elevation (Min) (ft)	Hydraulic Grade (ft)	Elevation (Max) (ft)	Volume (MG)	Diameter (ft)	Flow (Out) (gpm)	Percent Full (%)
Hi'i Tank	1791.00	1812.00	1818.00	1823.00	0.50	26.00	3143.50	54.50

PŪLAMA LĀNA'I MIKI BASIN
200 ACRE INDUSTRIAL PARK
PROPOSED PRV @ 55 PSI : MAX DAY FLOW + FIRE FLOW @ LIGHT INDUSTRIAL PARCEL

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	2088.00	T-1	J-1	12.00	Ductile Iron	110.00	2616.86	7.42	0.02
P-2	5145.00	J-1	MANELE	12.00	Ductile Iron	110.00	335.42	0.95	0.00
P-3	11.00	J-1	PRV	12.00	Ductile Iron	110.00	2281.44	6.47	0.02
P-4	5931.00	PRV	J-3	12.00	Ductile Iron	110.00	2281.44	6.47	0.02
P-5	2675.00	J-3	J-4	16.00	Ductile Iron	120.00	2202.27	3.51	0.00
P-6	5732.00	J-4	J-5	10.00	Ductile Iron	110.00	180.84	0.74	0.00
P-7	6012.00	J-5	J-6	10.00	Ductile Iron	110.00	180.84	0.74	0.00
P-8	3194.00	J-7	J-6	8.00	Ductile Iron	110.00	-144.84	0.92	0.00
P-9	1561.00	J-8	J-7	10.00	Ductile Iron	110.00	-144.84	0.59	0.00
P-10	1989.00	J-9	J-8	10.00	Ductile Iron	110.00	-144.84	0.59	0.00
P-11	2294.00	J-10	J-9	10.00	Ductile Iron	110.00	-144.84	0.59	0.00
P-12	723.00	J-11	J-10	10.00	Ductile Iron	110.00	-144.84	0.59	0.00
P-13	2338.00	J-12	J-11	10.00	Ductile Iron	110.00	-144.84	0.59	0.00
P-14	5359.00	CBP & ASPH	J-12	10.00	Ductile Iron	110.00	-144.84	0.59	0.00
P-15	361.00	J-14	J-13	16.00	Ductile Iron	120.00	-141.07	0.23	0.00
P-16	170.00	J-14	J-15	16.00	Ductile Iron	120.00	2162.50	3.45	0.00
P-17	3654.00	J-4	J-14	16.00	Ductile Iron	120.00	2021.43	3.23	0.00
PROP-1	916.00	J-13	CBP & ASPH	16.00	Ductile Iron	120.00	-141.07	0.23	0.00
PROP-2	461.00	J-15	LIGHT	16.00	Ductile Iron	120.00	2162.50	3.45	0.00

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Demand (gpm)
CBP & ASPH	1230.00	1345.26	50.00	3.77
J-1	1347.17	1694.11	150.00	0.00
J-3	1345.73	1379.97	15.00	79.17
J-4	1134.61	1354.98	95.00	0.00
J-5	1350.00	1352.95	1.00	0.00
J-6	1339.00	1350.83	5.00	36.00
J-7	1301.00	1348.61	21.00	0.00
J-8	1287.75	1348.24	26.00	0.00
J-9	1249.00	1347.77	43.00	0.00
J-10	1207.00	1347.24	61.00	0.00
J-11	1223.00	1347.07	54.00	0.00
J-12	1281.00	1346.52	28.00	0.00
J-13	1236.46	1345.24	47.00	0.00
J-14	1239.00	1345.24	46.00	0.00
J-15	1250.00	1344.73	41.00	0.00
LIGHT	1255.00	1343.33	38.00	2162.50
MANELE	1128.00	1684.25	241.00	335.42

Label	Elevation (Base) (ft)	Elevation (Min) (ft)	Hydraulic Grade (ft)	Elevation (Max) (ft)	Volume (MG)	Diameter (ft)	Flow (Out) (gpm)	Percent Full (%)
Hi'i Tank	1791.00	1812.00	1818.00	1823.00	0.50	26.00	2643.50	54.50

REF-452

APPENDIX B

0% Design Construction Costs

PULAMA LANAI MIKI BASIN - OCTOBER 2021
200 ACRE INDUSTRIAL PARK
0% DESIGN CONSTRUCTION COSTS FOR PROPOSED WATER IMPROVEMENTS

ITEM	APPROX QTY	UNIT	UNIT PRICE	AMOUNT
OFFSITE IMPROVEMENTS				
New Well:				
Well Studies, including environmental and hydrologic studies for siting exploratory well		Lump Sum	Lump Sum	$ 250,000.00
Exploratory Well, including siting, drilling and testing	1	Each	Each	$ 1,000,000.00
Well Construction, including reaming of exploratory well, drilling, installation of casing and pump installation	1	Each	Each	$ 2,300,000.00
PRV Replacement:				
Replacement and installation of 12" Cla-val Model 90-01 Pressure Reducing Valve with Anti-Cavitation SST Trim and 150lb Flanged End connections, epoxy coated, opening speed control, valve position indicator and gauges	1	Each	Each	$ 55,000.00
*TOTAL OFFSITE IMPROVEMENTS AND CONTINGENCY (20%)				**$ 4,326,000.00**
*Not included in this estimate is the piping cost from a new well to the existing piping and/or exisiting tank or reservoir. Once the new well is sited, an estimate can be provided based on the distance.				
ONSITE IMPROVEMENTS				
16-inch water line along Miki Road within the parcel, including trench excavation, cushion and backfill, fittings and connections to existing water lines	450	LF	$ 200.00	$ 90,000.00
16-inch water line along Road A, including trench excavation, cushion and backfill, fittings and connections to existing water lines	1,050	LF	$ 200.00	$ 210,000.00
CONTINGENCY (20%)		Lump Sum	Lump Sum	$ 60,000.00
TOTAL ONSITE IMPROVEMENTS				**$ 360,000.00**

REF-453

NEW WELL SUPPLY ALTERNATIVES FOR THE MANELE BAY WATER SYSTEM, PUBLIC WATER SYSTEM NO. 238

APPENDIX

H-2

REF-454

New Well Supply Alternatives for the Manele Bay Water System, Public Water System No. 238

Prepared for:

Lanai Resorts, LLC
733 Bishop Street – Suite 1500
Honolulu, Hawaii 96813

Prepared by:

Tom Nance Water Resource Engineering
560 N. Nimitz Hwy. - Suite 213
Honolulu, Hawaii 96817

Revised October 2021
August 2021

Table of Contents

	Page
Introduction	1
Basic Considerations in the Selection of Well Development Alternatives	1
Available supply in the Leeward Aquifer System	1
Well Installed Pumping Capacity Versus its Long-Term Sustainable Supply	1
Sustainable Supplies of Wells 2 and 4, the Current Sources of Supply for PWS No. 238	1
Evaluation of Alternatives for New Well Development for Public Water System No. 238	3
A New Well at the Site of Well 5	9
A New Well Upgradient of Well 2 and Drawing Water from the Groundwater Compartment Tapped by Shaft 3	9
A New Well About 2000 Feet to the Northwest of Well 2	18
Recommended Well Site	18
References	20

List of Figures

No.	Title	Page
1	Pumpage from the Leeward High Level Aquifer (No. 50102) Since January 2000	2
2	Drawdown as a Function of Duration of Pumping During the October 21 to 24, 2015 Pump Test of Lanai Well 2 (Log Scale of Time)	4
3	Pumpage and Water Level Response in Well 2 Since December 2017	5
4	Pumpage and Water Level Response in Well 4 in the Post-Plantation Period	6
5	Combined Pumpage of Wells 2 and 4 Since December 2017	7
6	Possible Locations for New Well Development for Public Water System No. 238	8
7	Comparison of the Water Level in Well 5 with that in Well 4 from April 2008 to March 2018	10
8	Annual Average Pumpage of Lanai Well 5 and its Year End Water Levels from 1950 through 1984	11
9	Pumpage and Water Levels of Well 5 from January 1971 to December 1994	12
10	Pumpage and Water Levels of Shaft 3 from January 1971 to December 1994	13
11	Pumpage and Water Levels of Well 2 from January 1971 to December 1994	14
12	Response in Shaft 3 During the October 21 to 24, 2015 Pump Test of Lanai Well 2	15
13	Response in Shaft 3 During the October 21 to 24, 2015 Pump Test of Lanai Well 2 (Expanded Water Level Scale for Shaft 3)	16
14	Response in Shaft 3 to the Pumping of Well 2 (Log Time Scale)	17
15	Combined Pumpage Shaft 3 and Well 2 from January 1971 to December 1994	19

REF-455

Introduction

Pulama Lanai proposes to develop a 200-acre industrial subdivision in Miki Basin. The subdivision site is next to the airport and in the service area of the Manele Bay System, identified as Public Water System (PWS) No. 238. At present, PWS No. 238 is supplied by Well 2 (State No. 4953-001) and by Well 4 (State No. 4952-002). The October 2021 Water Master Plan prepared by Akinaka & Associates, Ltd. determined that the pumping capacities of these two wells are not sufficient to supply current users and the proposed industrial subdivision. Although there is connection between the Lanai City (PWS No. 237) and Manele Bay systems, it is just a back-up for emergencies. The Akinaka report concluded that new well supply for the Manele Bay System of at least 426 gallons per minute (GPM) capacity will be required. This report evaluates alternatives to provide this new well supply.

Basic Considerations in the Identification of Well Development Alternatives

Available Supply in the Leeward Aquifer System. As a practical matter of geography, a new well for PWS No. 238 would be located in the Leeward Aquifer System (No. 50102). The Commission on Water Resource Management (CWRM) has set the sustainable yield for this Aquifer at 3.0 million gallons per day (MGD). All of the presently active wells, with the single exception of Well 6 (State No. 5054-002), are located in and are pumping from the Leeward Aquifer system. Figure 1 depicts the combined pumpage of these wells over the last 20 years in comparison to the 3.0 MGD sustainable yield limit. The sustainable yield is expressed as the moving annual average. That average is shown as the bold red line on Figure 1. It reached a peak of 1.9 MGD in December 2008 and again in March 2015 and has been less than 1.5 MGD since early 2017. Based on this data, it can be concluded that the planned addition of Well 7 (State No. 5055-001) in PWS No. 237 and a new well in PWS No. 238 to supply the Miki industrial subdivision can both be readily accommodated within the Leeward Aquifer System's 3.0 MGD sustainable yield.

Well Installed Pumping Capacity Versus its Long-Term Sustainable Supply. Without exception, the following aspects of well performance apply to all presently active and planned pumping wells. First, all of these wells tap into separate high-level groundwater compartments. No two wells draw from the same groundwater compartment. Second, the long-term sustainable supply of each of these compartments is less than the well's installed pump capacity if the pump were to be operated continuously. Third, based on the available storage in each of these groundwater compartments, the well pumps can be operated for extended periods in excess of the compartment's long-term sustainable supply as long as the pumping is then cut back to allow recharge to recover the depletion in storage. Fourth and finally, the long-term sustainable supply of a compartment can only be accurately determined by the response of its water level to pumping over an extended period. As such, determination of the long-term sustainable supply of any well must rely on the available pumping and water level data in Anderson & Kelly (1985) from the start of use of the wells in the 1950s through 1984 and on the Lanai Water Company's Periodic Water Reports for the pumping and water level data since that time. Up through December 1988, pumpage and water levels were reported as monthly amounts. Starting in January 1988, reporting has been at 28-day intervals.

Sustainable Supplies of Wells 2 and 4, the Current Sources of Supply for PWS No. 238. Wells 2 and 4 were drilled in 1946 and 1950, respectively. Anderson & Kelly (1985) provides pumpage and water level data starting in 1948 for Well 2 and in 1950 for Well 4. For Well 2 up to July 2012, the pump was located on the floor of the inclined access tunnel to Shaft 3 at an elevation of about 1505 feet. A decision was then made to shut down use of Shaft 3 and the cart used for access up and down the inclined shaft

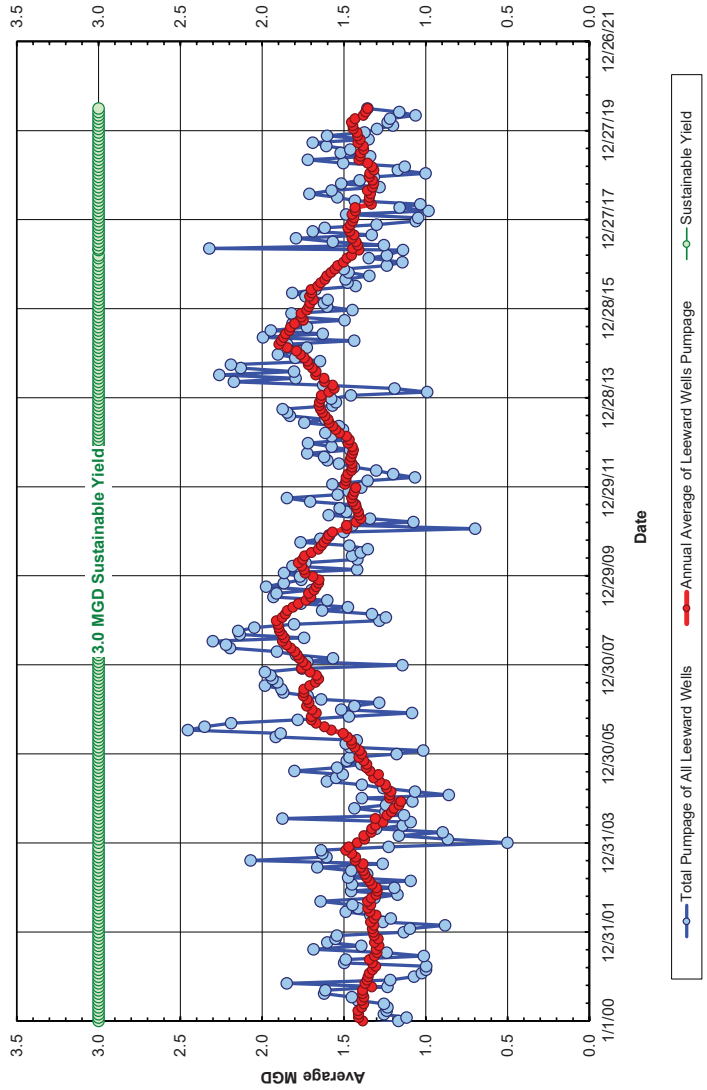


Figure 1. Combined Pumpage of Wells in the Leeward High Level Aquifer from Janauary 2000 to June 2020

REF-456

and move the pump for Well 2 to the ground surface at the location where the well was originally drilled at an elevation of 1905 feet.

As a new pump for Well 2 would be required for this change, a pump test of the well was run in October 2015 to determine the appropriate capacity of the new pump. At an average pumping rate of 904 GPM, the drawdown was substantial and did not stabilize by the end of the 61-hour test (Figure 2). Based on the results of this test, a 500 GPM capacity pump was selected and installed. The well was put back into service in December 2017. Its use since then has averaged about 0.20 MGD with only a modest impact on its water level (Figure 3). Based on this record, the well's long-term sustainable supply appears to be about 0.3 MGD. It should be noted that the 2011 Water Use and Development Plan for Lanai states that Well 2 could be outfitted with a pump of up to 1200 GPM capacity. If this was actually the case, the lease expensive alternative for new supply would simply be to remove the 500 GPM pump now in the well and replace it with one of at least 426 GPM capacity. Very clearly based on the October 2015 pump test results, this is not a viable option. However, some discussion of pump capacity to provide some perspective is warranted:

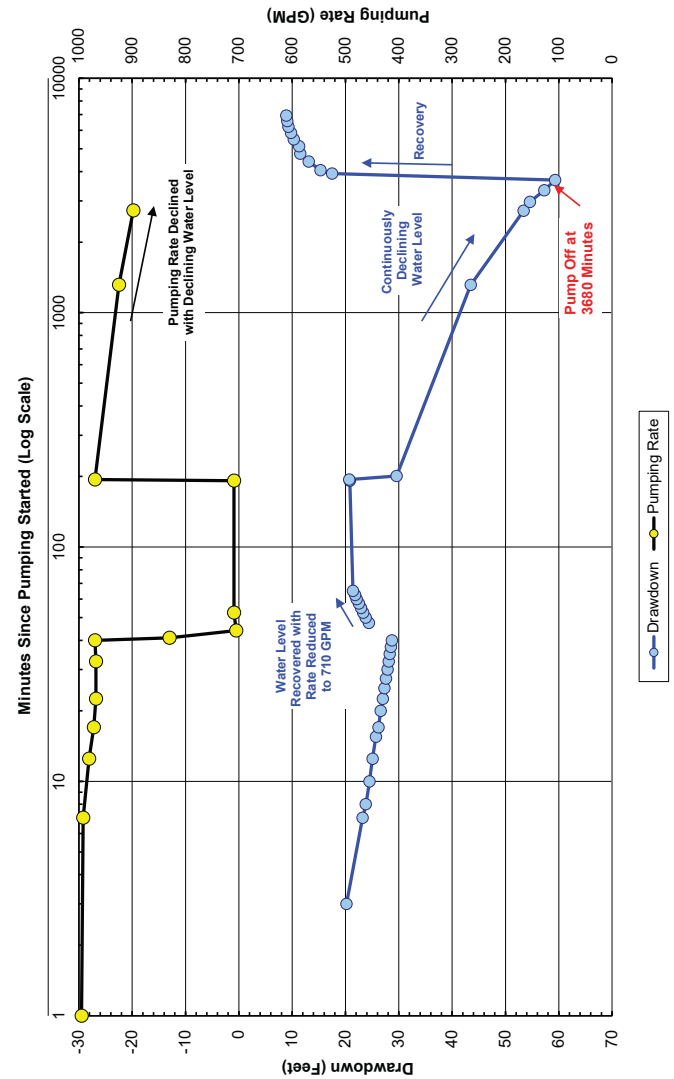
- The basis for the reported capacity of up to 1200 GPM in the Water Use and Development Plant is not known.
- CWRM records prior to the conversion of the well to a 500 GPM pump listed its pump capacity as 1400 GPM.
- There is no way the well itself could sustain a 1400 GPM rate. It would drop the water level precipitously and begin sucking air in a matter of minutes.
- The 1400 GPM listed pump capacity in the CWRM records is likely to be the capacity of the booster pump in the pump room of Shaft 3. It pumped the combined delivery from Well 2 and Shaft 3 up the inclined shaft and on to the Hii storage tank.

Well 4 is outfitted with a 900 GPM (1.3 MGD) pump. Particularly in the post-plantation period, this well has been far and away the most productive of any on Lanai. Based on its performance in this period, its long-term sustainable supply is estimated to be about 0.7 MGD (Figure 4). That puts the combined long-term sustainable supply of Wells 2 and 4 at approximately 1.0 MGD. In contrast, their combined use since Well 2 was put back into service in December 2017 has typically been between 0.4 and 0.5 MGD (Figure 5).

Evaluation of Alternatives for New Well Development for Public Water System No. 238

The October 2021 Water Master Plan by Akinaka & Associates, Ltd. determined that new well pumping capacity of at least 426 GPM would need to be installed to supply the full build out and occupancy of the proposed industrial subdivision as well as ongoing uses and commitments. Three alternative well sites have been evaluated to provide that supply. They are: a new well at the site of Lanai Well 5; a new well directly inland of Well 2 and drilled into the groundwater compartment tapped by Shaft 3; and a new well to the northwest of Well 2 and above Hii Flats. Figure 6 shows these three locations. The site for a new well at Well 5 would be about 25 feet from the existing well. The site for a new well drilled into the groundwater tapped by Shaft 3 would be about 400 feet upgradient from Well 2. The third alternative, labeled "Possible Well Site" on Figure 6, is about 2000 feet northwest of Well 2 and at the upper end of a former pineapple field.

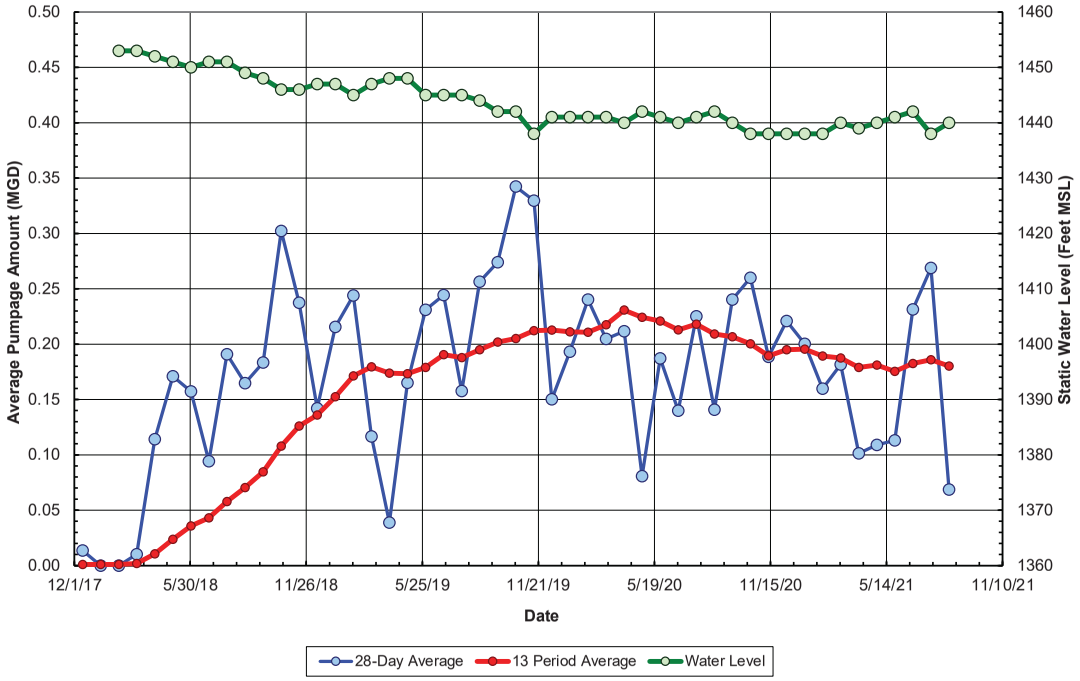
Figure 2
Drawdown as a Function of Duration of Pumping
During the October 21 to 24, 2015 Pump Test of Lanai Well 2 (Log Scale of Time)



o_20-64

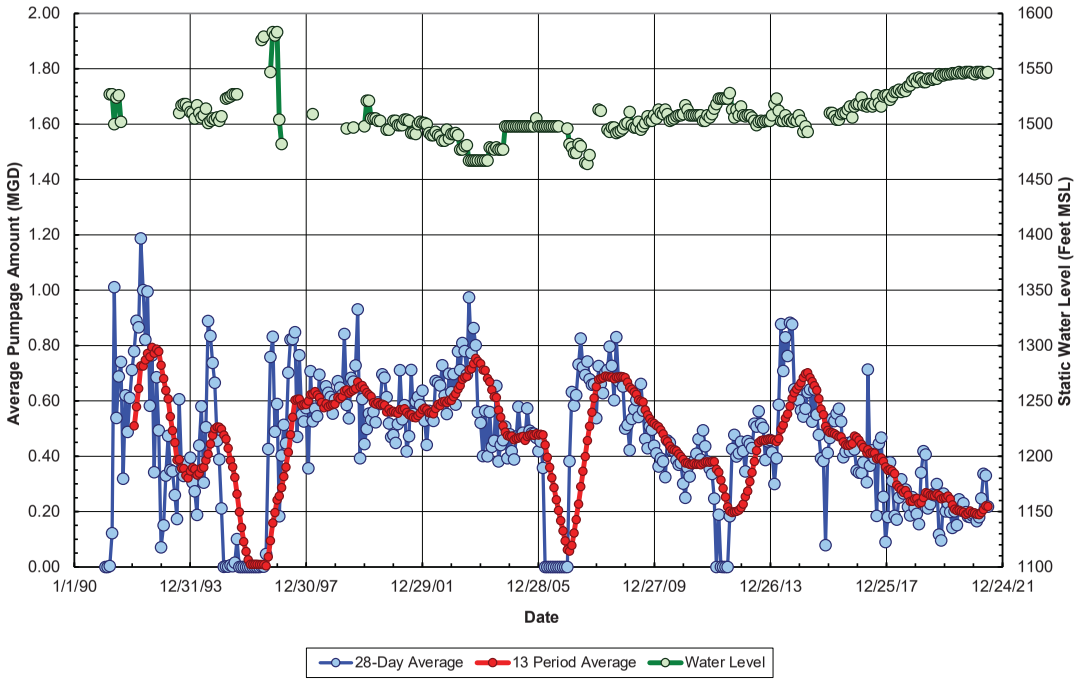
REF-457

Figure 3
Pumpage and Water Level Response in Well 2 from December 2017 through August 2021



o_20-64

Figure 4
Pumpage and Water Level Response in Well 4 in the Post-Plantation Period



o_20-64

REF-458

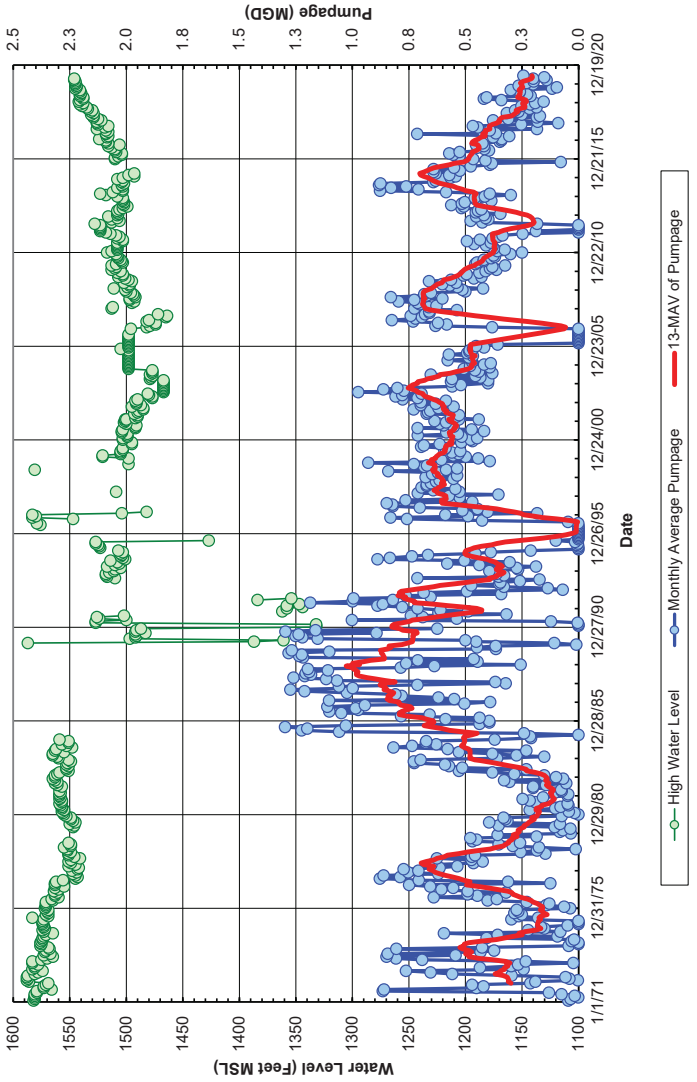
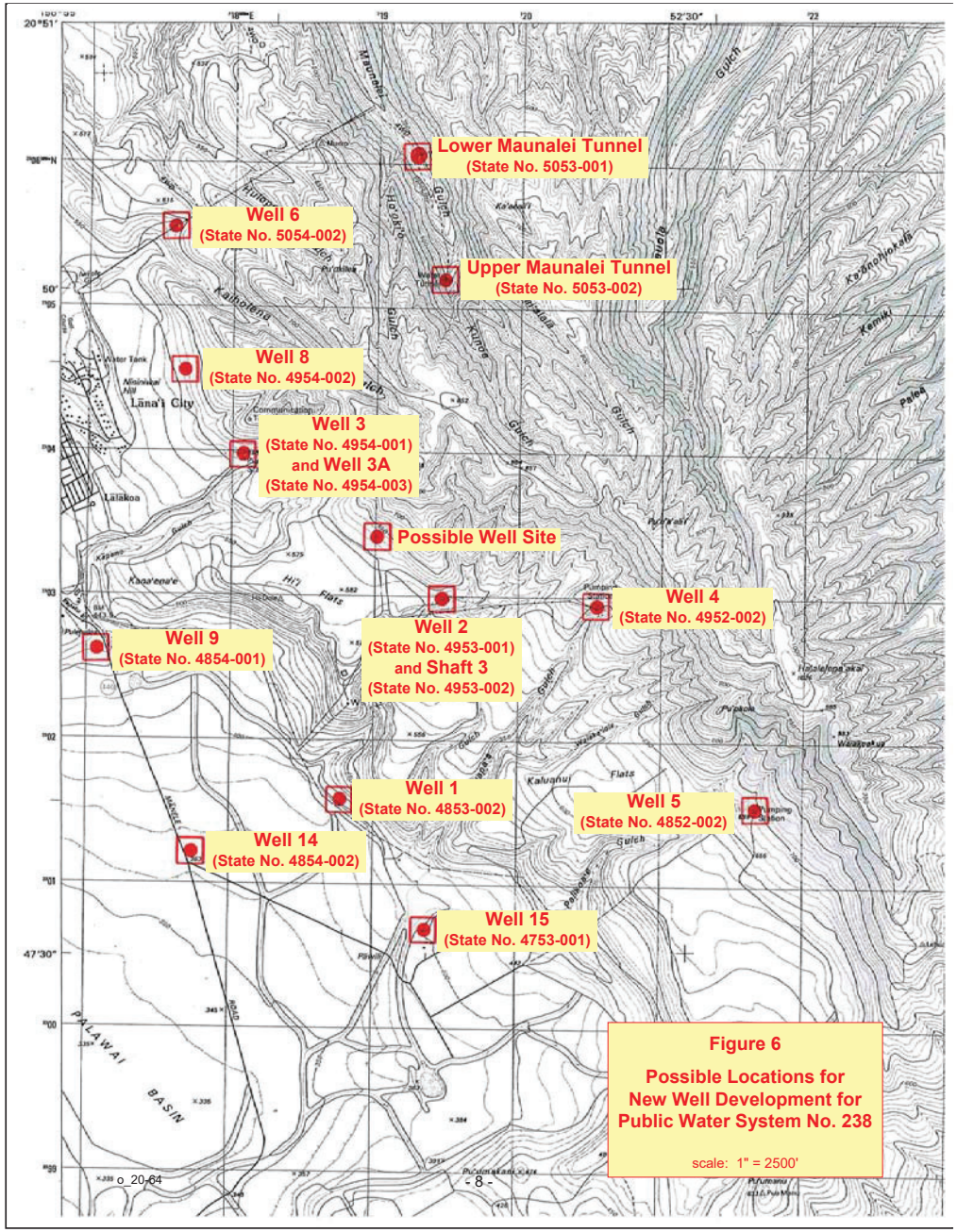


Figure 5
Water Levels and Pumpage of Lanai Well 4 Since Janaury 1971

o_20-64



o_20-64

REF-459

A New Well at the Site of Well 5. The use of existing Well 5, State No. 4852-002, was terminated in 1995 due to a collapsing casing and heaving cinders. Since then, it was converted to a permanent monitoring well and cannot be converted back to a production well. Its record as a production well prior to the end of its use in 1995 provides the best way to evaluate the potential sustainable supply of a new well at this location. Well 5 was completed in 1950 and was drilled from an elevation of 2296 feet to a depth of 1122 feet (1174 feet above sea level). It was cased to its full depth with 18-inch diameter solid casing for 630 feet and 490 feet of perforated casing below that. Its initial water level was generally of similar elevation as Well 4, but there is no data to indicate that pumping of either well has had an impact on the water level of the other. After Well 5 was converted to a monitoring well, its water level was recorded over the 10-year period from April 2008 through March 2018. Figure 7 compares this water level recording to the water levels in Well 4 as reported in the Lanai Water Company's Periodic Reports. The trends were reasonably similar but the water levels in Well 4 were, for the most part, 10 to 30 feet higher than in Well 5, despite the ongoing use of Well 4.

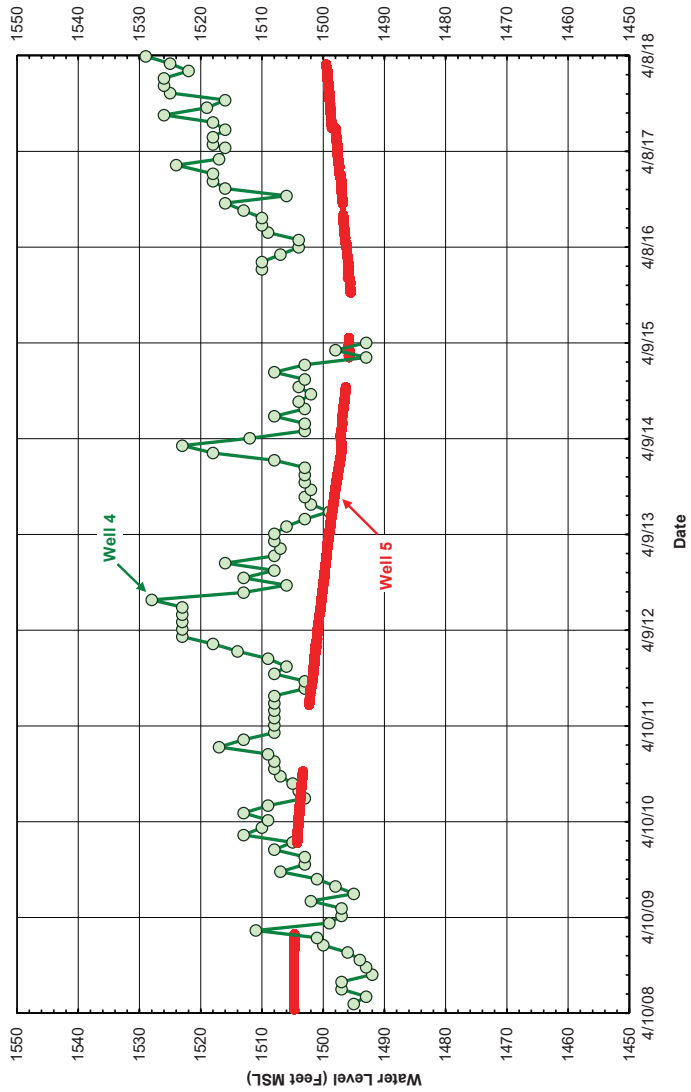
Well 5 was outfitted with a 900 GPM pump. Anderson & Kelly (1985) provides pumpage and water level data for Well 5 from 1950 through December 1984. Annual average pumpage of Well 5 over that period is presented on Figure 8. Its use varied widely over that period. During the peak use period from 1973 through 1984, pumpage average 0.25 MGD and the water level declined 100 feet. More recent data in the early 1990s showed a substantial rise in the water level during an average pumpage of 0.19 MGD (Figure 9). These pumping rates likely bracket the long-term sustainable supply for a new well at this location.

Collapse of the well's casing and a buildup of cinders in the bottom of the well ultimately led to the termination of its use in 1995. In drilling a new well at this site, the heaving cinders could be handled by an experienced driller during construction and by the use of an appropriately sized filter pack in completing the well, both at only a modest cost increase in the cost of the construction contract.

A New Well Upgradient of Well 2 and Drawing Water from the Groundwater Compartment Tapped by Shaft 3. The horizontal development tunnel known as Shaft 3 and identified as State No. 4953-002 was completed in 1954, eight years after the completion of the adjacent Well 2. There is a concrete bulkheaded at a nearly vertical dike which separates the groundwater compartment tapped by Well 2 from the one tapped by the Shaft 3. The lateral distance from Well 2 to the Shaft 3 bulkhead is less than 200 feet. Historically, water levels in Shaft 3 were 60 to 100 feet higher than in Well 2 (compare the water levels in Figures 10 and 11). However, extending all the way back to 1954 when concurrent use of both wells started, there has never been a period of sufficient duration when one or the other pump was out of service to determine if pumping either Well 2 or Shaft 3 impacted the water level in the adjacent groundwater compartment tapped by the other well.

The October 2015 pump test of Well 2 provided an opportunity to document the possible impact of pumping Well 2 on the water level in Shaft 3. Figure 12 shows the respective water levels during and following the pump test. At the start of the test, the water in Well 2 was 59.3 feet lower than in Shaft 3. After 61.3 hours of pumping Well 2 at an average of 904 GPM, its water level was then 118.5 feet below that in Shaft 3. At the elevation scale plotted on Figure 12, no response in the Shaft's water level is visually obvious. However, when the scale of the water level in Shaft 3 is expanded, it is clear that a drawdown did actually occur, but it was less than 0.10 feet in response to a drawdown of 60 feet in Well 2 (Figures 13 and 14). In other words, there is a hydraulic connection between the adjacent groundwater compartments, but it is obviously a very modest one. So, with this modest hydraulic connection established, it appears that the sustainable supply of Shaft 3 is about 0.35 MGD (refer back to Figure 10),

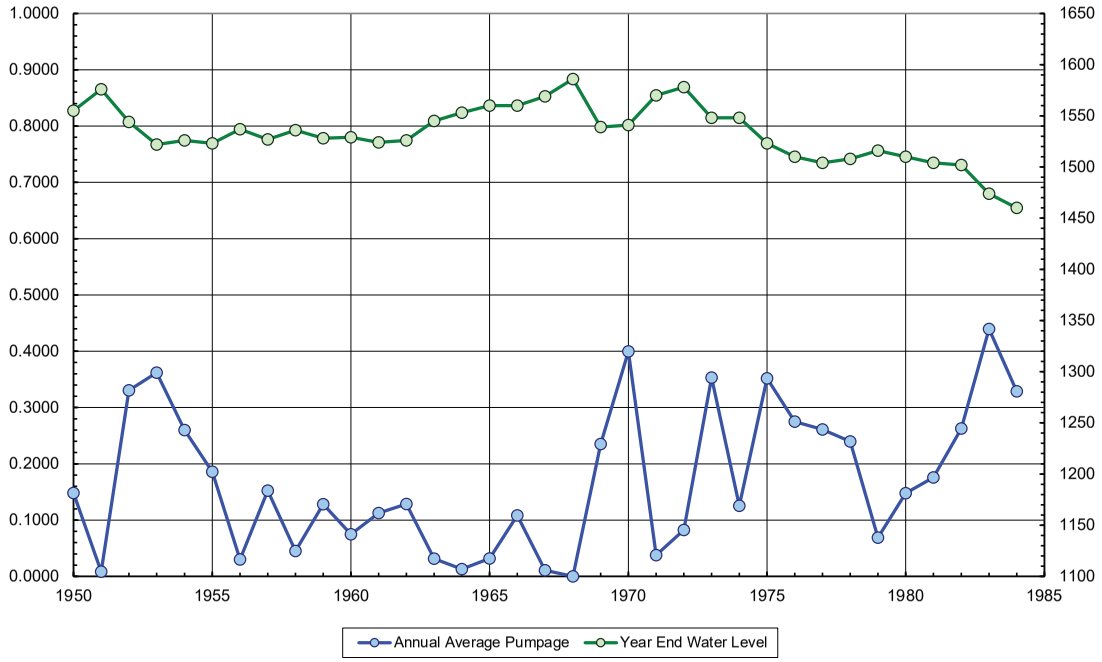
Figure 7
Comparison of the Water Level in Well 5 with that in Well 4 from April 2008 to March 2018



o_20-64

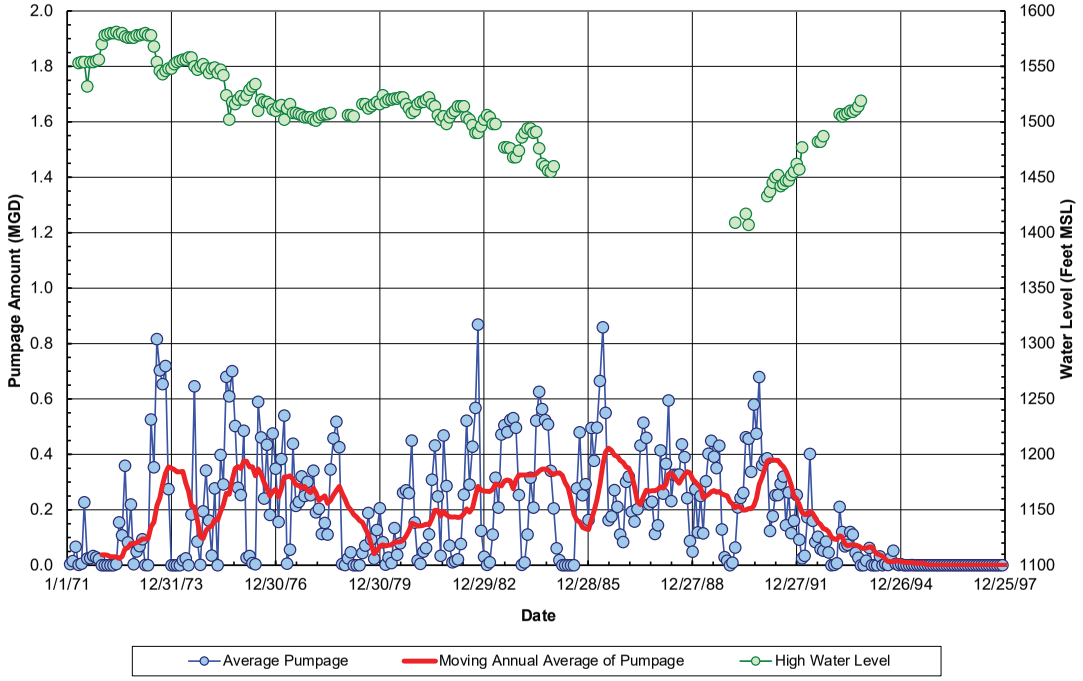
REF-460

Figure 8
Annual Average Pumpage of Lanai Well 5 and its Year End Water Levels from 1950 through 1984



o_20-64

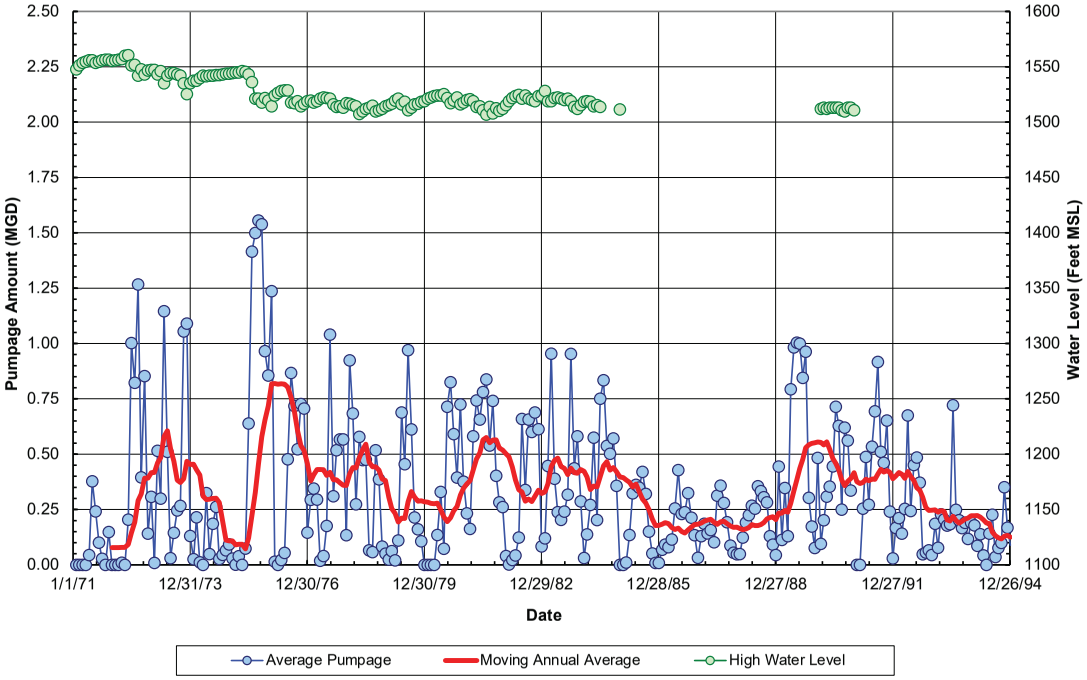
Figure 9
Pumpage and Water Levels of Well 5 from Janauary 1971 to December 1994



o_20-64

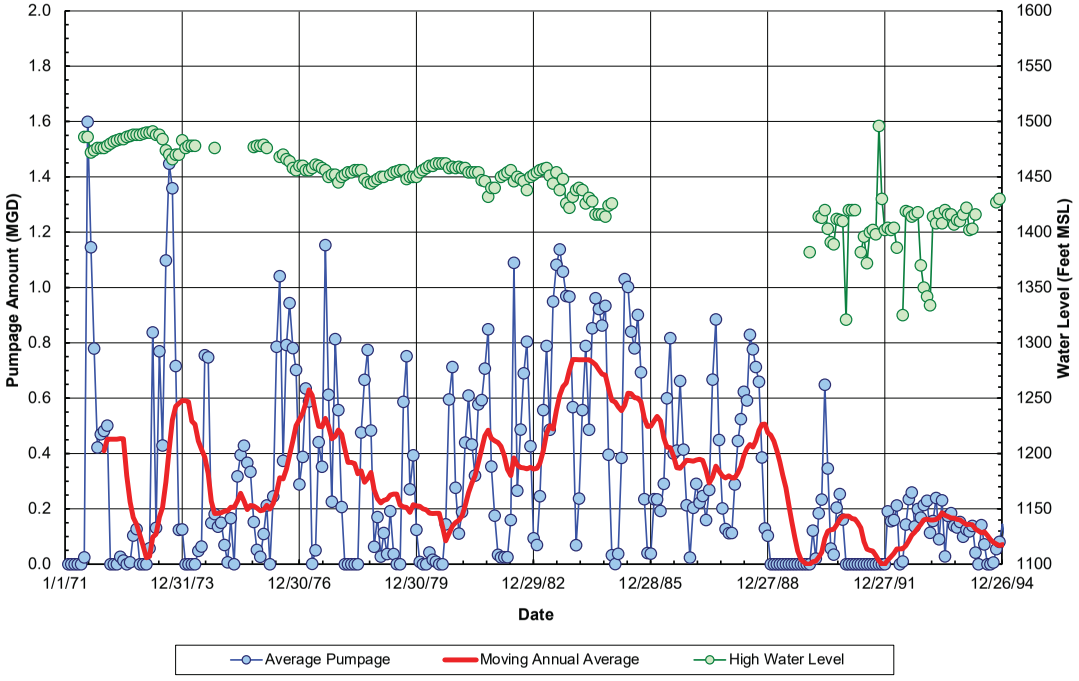
REF-461

Figure 10
Pumpage and Water Levels of Shaft 3 from Janauary 1971 to December 1994



o_20-64

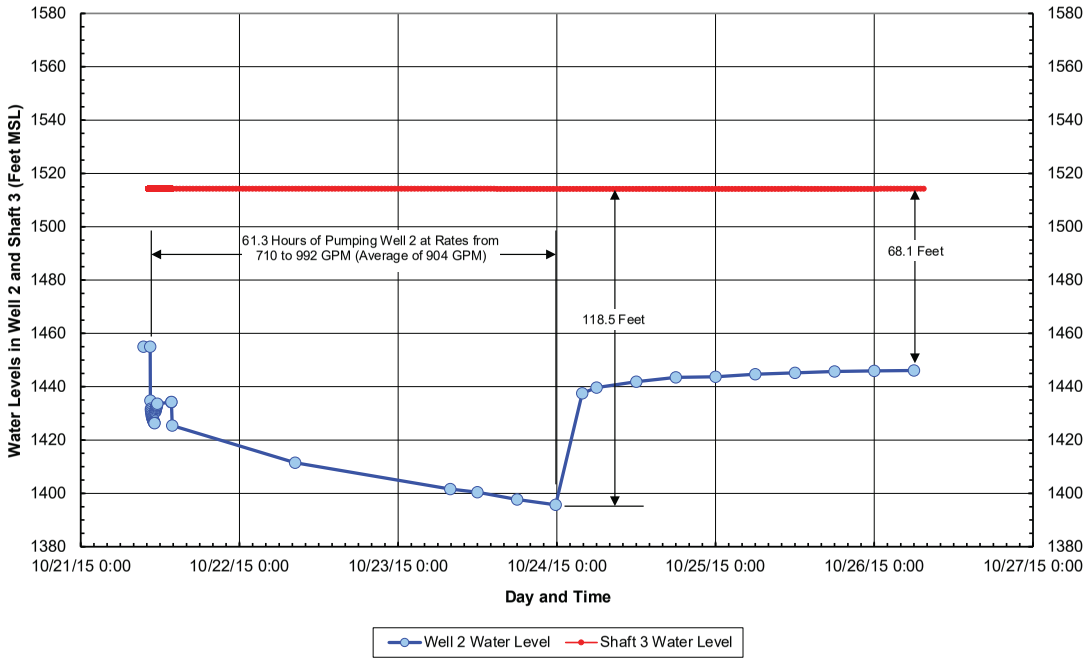
Figure 11
Pumpage and Water Levels of Well 2 from Janauary 1971 to Decemebr 1994



o_20-64

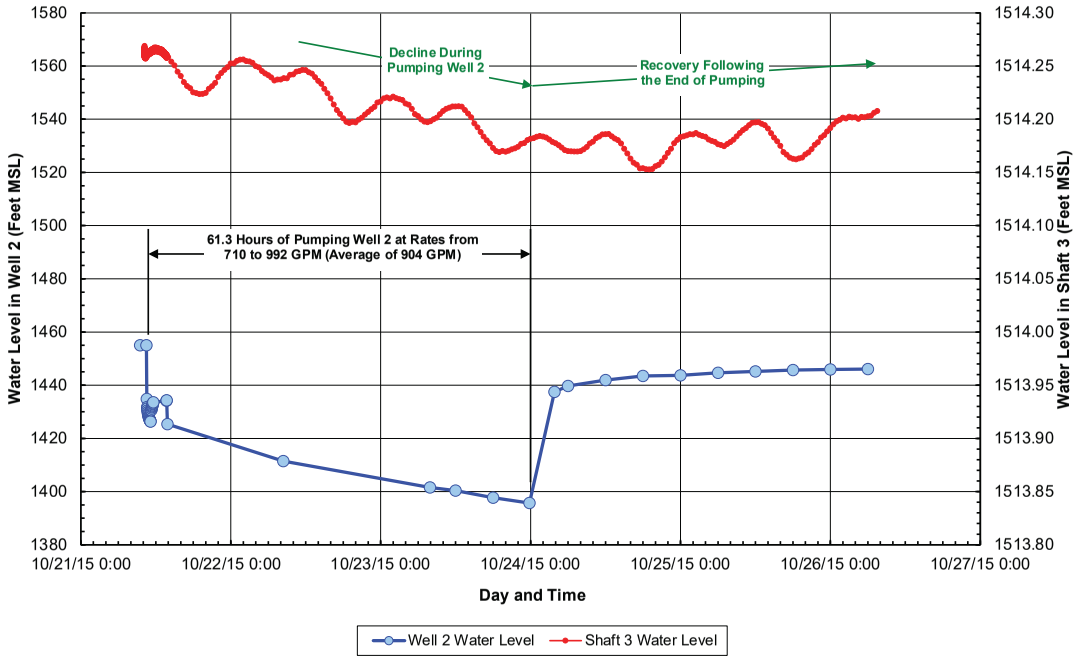
REF-462

Figure 12
Response in Shaft 3 During the October 21 to 24, 2015 Pump Test of Lanai Well 2



o_20-64

Figure 13
Response in Shaft 3 During the October 21 to 24, 2015 Pump Test of Lanai Well 2
(Expanded Water Level Scale for Shaft 3)



o_20-64

REF-463

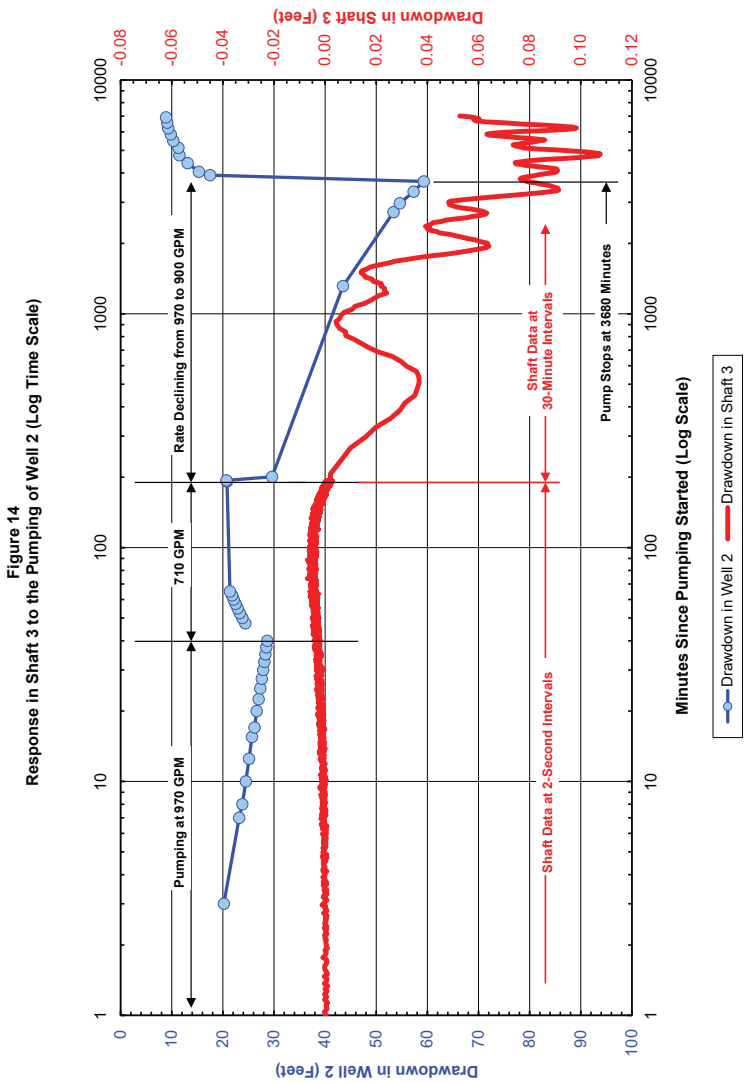


Figure 14
Response in Shaft 3 to the Pumping of Well 2 (Log Time Scale)

o_20-64

an estimate derived from a period when the combined pumpage of both sources was 0.70 MGD (Figure 15).

A New Well About 2000 Feet to the Northwest of Well 2. A third possible site would be at about 2000-foot elevation, about 2000 feet to the northwest of Well 2, and at the top of a former pineapple field (its location is shown on Figure 6). The site could be accessed by old plantation roads, the present condition of which are unknown. The site is far enough away from Wells 2 and 3 so as not to impact their sustainable supplies. A well at this site would definitely encounter high level, drinking water quality groundwater. With sufficient depth into groundwater, a pump of sufficient capacity to meet or exceed the necessary 426 GPM capacity to ensure adequate supply for the industrial subdivision could be developed.

Recommended Well Site

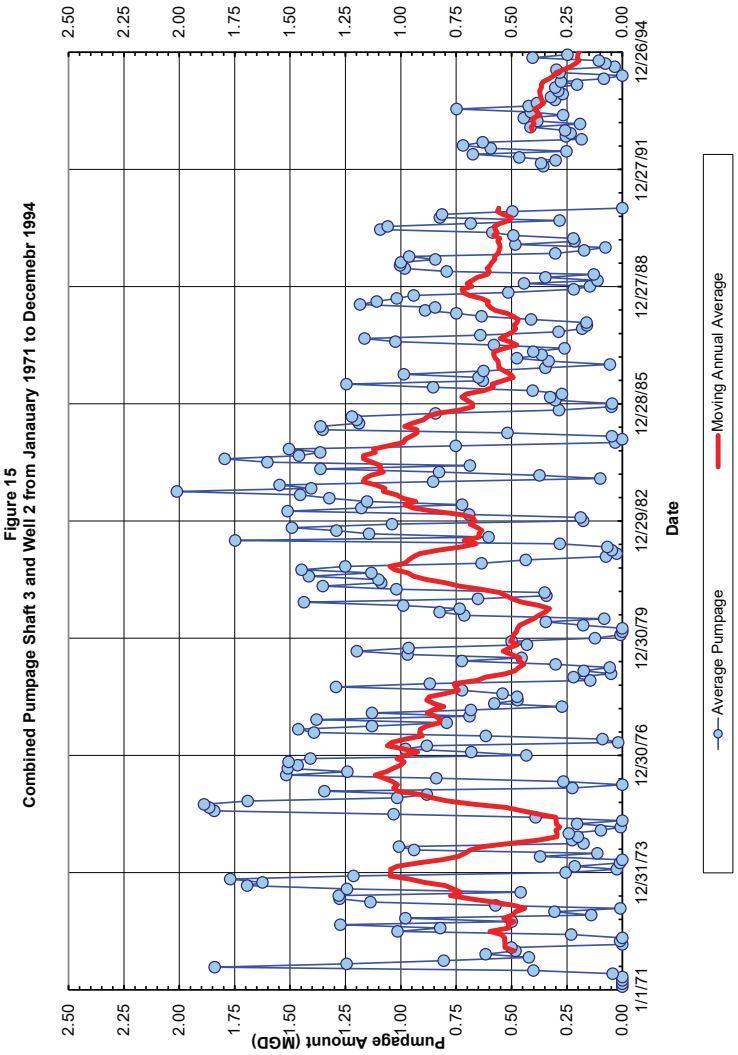
1. Existing Well 5 has been converted to a permanent monitoring well. A new well at this site is not recommended for the following reasons: it would have a relatively modest long term sustainable yield; there are issues with cinder zones in the water bearing strata that would need to be overcome; its transmission pipeline which connects directly to the distribution system has not been used since 1995 and is almost certainly not usable; and its water would not go into one of the system's storage reservoirs to augment fire protection as well as to provide chlorine contact time.

2. A new drilled well to tap into the groundwater compartment which supplied Shaft 3 could, based on the Shaft's past performance, have significant yield. However, there is some risk concerning its successful development:

   - As there are no known construction plans, the orientation of the Shaft is not known and a well drilled to intercept it may not encounter it; and
   - On a long-term basis, it may reduce the sustainable yield of Well 2.

3. The site about 2000 feet northwest of Well 2 is the recommended choice. It has sufficient lateral spacing between existing Wells 2 and 3 to almost certainly be in a groundwater compartment not tapped by either of these wells, has relatively easy access, and could be positioned to be outside the Conservation District to avoid the permitting process that the other two sites would necessarily be required to do. Its connection to the PWS No. 238 system would be at the Hii storage tank, providing chlorine contact time and augmenting fire protection.

REF-464



o_20-64

References

Akinaka & Associates, Ltd. 2021. Pulama Lanai Miki Basin 200 Acre Industrial Park Water Master Plan. Consultant Report Prepared for Pulama Lanai

Anderson & Kelly. 1983. Lanai Water Supply Review. April 21-22, 1983. Consultant Report Prepared for Dole Corporation, Lanai City.

Anderson & Kelly. 1985. Dole Company, Lanai Plantation, Lanai Water Supply Review. Consultant Report Prepared for Dole Company – Lanai Plantation.

George A. L. Yuen and Associates, Inc. 1990. Water Resources Protection Plan, Volumes I and II. Consultant Report Prepared for the Commission on Water Resource Management, DLNR, State of Hawaii.

Mink, J. F. 1983. Lanai Water Supply. Consultant Report Prepared for the Lanai Company.

Munro, James. 1958. Record of Water Supply on Lanai. 20 Page Manuscript Report.

Sherrod, D. R., J. M. Sinton, S. E. Watkins, and K. M. Brust. 2007. Geologic Map of the State of Hawaii. Open File Report 2007-1089, U. S. Geological Survey.

Stearns, H. T. 1940. Geology and Ground-Water Resources of the Islands of Lanai and Kahoolawe, Hawaii. Bulletin 6, Division of Hydrography, Territory of Hawaii.

Townscape, Inc. 2019. Water Resources Protection Plan 2019 Update. Consultant Report Prepared for the Commission on Water Resource Management, DLNR, State of Hawaii.

Wilson Okamoto Corporation. 2008. Water Resource Protection Plan. Consultant Report Prepared for the Commission on Water Resource Management, DLNR, State of Hawaii

o_20-64

REF-465

WASTEWATER MASTER PLAN

APPENDIX

I

REF-466

PŪLAMA LĀNAʻI MIKI BASIN

200 ACRE INDUSTRIAL PARK

Lānaʻi, Hawaiʻi

WASTEWATER MASTER PLAN

Prepared By: Akinaka & Associates, Ltd.
1100 Alakea Street, Suite 1800
Honolulu, Hawaii 96813

Date: August 2021

TABLE OF CONTENTS

I. INTRODUCTION

II. EXECUTIVE SUMMARY

III. EXISTING WASTEWATER SYSTEM

IV. LAND USE

V. GEOGRAPHY AND TOPOGRAPHY

VI. WASTEWATER FLOW STANDARDS
1. **Design Flows**

VII. INDUSTRIAL PARK WASTEWATER FLOWS

VIII. PROPOSED WASTEWATER SYSTEM

IX. COST CONSIDERATIONS

X. EXHIBITS

1. **Exhibit 1: Location Map**
2. **Exhibit 2: Wastewater Flow Summation**
3. **Exhibit 3: Wastewater Flow Map**

XI. REFERENCES (Not attached)

1. County of Maui, Wastewater Reclamation Division. Wastewater Flow Standards. February 2, 2006.
2. City and County of Honolulu, Department of Environmental Services. Wastewater System Design Standards. July 2017
3. Hawaii Administrative Rules (HAR), Title 11, Chapter 62, Subchapter 3
4. United States Department of Agriculture (USDA), Web Soil Survey (online)
5. United States Federal Emergency Management Agency (FEMA), Flood Insurance Maps (online)
6. Hawaii Statewide GIS Program, Streams (online)

REF-467

I. INTRODUCTION

The Wastewater Master Plan for Pūlama Lānaʻi Miki Basin 200-Acre Industrial Park provides the basic information for the design of the wastewater treatment system for the Miki Basin 200-Acre Industrial Park, herein referred to as the "Industrial Park", based on zoning requirements.

The Miki Basin 200 Acre Industrial Park consists of approximately 200 acres of agricultural zoned lands. Pūlama Lānaʻi is in the process of rezoning the area for light and heavy industrial lands. The project area is located directly south of Lānaʻi Airport within the Palawai Irrigation Grid (see **Exhibit 1: Location Map**). The majority of the proposed Industrial Park is currently undeveloped and is adjacent to the Maui Electric Company (MECO) Miki Basin substation and the 20-acre approved subdivision which is currently used by Pūlama Lānaʻi for concrete batch plant (CBP), Pūlama Lānaʻi warehouses and by other commercial industrial on-island uses (e.g., Hawaii Gas, Maui Disposal, etc.). Pūlama Lānaʻi is in the process of finalizing documents for the relocation of the CBP to the 200-acre Industrial Park via a State Special Use Permit in the interim. The 200-acres of the proposed Industrial Park do not include the MECO facility and the 20-acre subdivision.

The purpose of the wastewater master plan is to provide engineering planning services for the project site as part of the Environmental Assessment (EA) submission required to complete the Land Use Commission (LUC) rezoning process.

II. EXECUTIVE SUMMARY

There is currently no existing County or privately owned or operated wastewater treatment system in the vicinity of Miki Basin. The construction of onsite Individual Wastewater Systems (IWS), decentralized Wastewater Treatment Plants (WWTP) and collection systems will be required to support development activity.

Since development plans for the Industrial Park are not yet available, proposed wastewater flows for buildout of the Industrial Park is based on the proposed land use and an estimated developable area for each area. Ten (10) percent of the overall land (approximately 20 acres) has been allocated to infrastructure that will consist of areas with no wastewater flows such as roads and parking areas. Some of the areas have been designated as having no contribution. Large areas with little onsite development will have wastewater flows based off the projected number of employees. The

proposed design average wastewater flow for full buildout of the Industrial Park is 80,179 gpd, with a design peak flow of 333,688 gpd.

III. EXISTING WASTEWATER SYSTEM

There is currently no existing County or privately owned or operated wastewater treatment system in the vicinity of Miki Basin. Wastewater is currently treated via onsite individual wastewater systems (IWS).

IV. LAND USE

Pūlama Lānaʻi is in the process of rezoning approximately 200 acres of land from agriculture to urban for light and heavy industrial uses as shown below:

Description	Land Use	Area (ac.)
Renewable Energy Projects	Light Industrial / Heavy Industrial	127.0
Concrete Crushing Facility	Heavy Industrial	14.5
Asphalt Plant	Heavy Industrial	12.5
New Industrial Uses	Light Industrial	26.0
Infrastructure	Light Industrial / Heavy Industrial	20.0

This conceptual plan is intended to provide a basis for the design of the wastewater system and may not reflect the final development densities. The area designated for Renewable Energy Projects will contain no facilities and will not contribute any wastewater flows. Since development plans for the Industrial Park are not yet available, proposed wastewater flows for buildout of the Industrial Park is based on the proposed land use or the estimated number of employees and an estimated developable area for each area. For areas that contain vast area for stockpiling and little building development (the Concrete Crushing Facility and Asphalt Plant), the wastewater flow contributions will be based on the number of employees servicing the area. Ten (10) percent of the overall land (approximately 20 acres) has been allocated to infrastructure that will consist of areas with no wastewater flows such as roads, parking, common areas, etc.

V. GEOGRAPHY AND TOPOGRAPHY

According to the U.S. Department of Agriculture (USDA) Web Soil Survey, the project area soil consists mainly of silty clay loams with moderate to high water infiltration. The Hawaii Statewide GIS Program for streams shows potentially two (2) non-perennial streams located within or near the project

REF-468

area, the Miki stream east of Miki Road, and the Kalulu stream west of Miki Road. The project site does not lie within flood zones as shown on the Federal Emergency Management Agency (FEMA) Flood Insurance maps. Any potential sewer line will be above the water table. In the absence of a topographical survey of the project site, a site development grading plan, or contour maps from Hawaii Statewide GIS or the U.S. Geological Survey (USGS) with contours less than 100 feet spacing, Google Earth was used to estimate the topographical features for certain areas within the project site. Of note is an apparent hill just west of Miki Road in the light industrial area allocated for "New Industrial Uses."

VI. WASTEWATER FLOW STANDARDS

As outlined in the County of Maui's Wastewater Flow Standards and the Design Standards of the Department of Wastewater Management, the following criteria are used in determining the minimum requirements for the wastewater system.

1. Design Flows

a. For planning purposes, flows are based on estimated occupancy as determined by the standards.

b. The unit flows for the various land uses that may be found in typical industrial zoned area are as follows:

Land Use	Unit	Average Flows (Gal/Unit/Day)
Factory	Employee	30
Industrial Shop	Employee	25
Laundry (coin operated)	Machine	300
Office	Employee	20
Storage, w/offices	Employee	15
Storage w/ offices and showers	Employee	30
Store Customer bathroom usage	Use	5

The following standards were used to compute the minimum number of units required per land use type:

Storage/Industrial Employees	1 per 500 square feet of floor area

c. The maximum flow factor for the flow entering a sewer system is determined by the Babbit formula. For populations less than 1,000, the Babbit flow factor shall be 5.

d. For an IWS with a flow less than 1,500 gpd, the peak flow is calculated using a flow factor of 1.5.

e. The wet weather infiltration/inflow was calculated using the rates as shown on the County of Maui Wastewater Reclamation Division Wastewater Flow Standards. For areas with little developed area, 25 feet on either side of the sewer line was used to find the area for wet weather infiltration/inflow in lieu of the entire area as defined in the Wastewater System Design Standards, City and County of Honolulu (July 2017) Section 2.2.I.

f. For an IWS, no infiltration/inflow is added to the peak flow due to the short run of closed piping to the septic system.

VII. INDUSTRIAL PARK WASTEWATER FLOWS

Since site layouts, land uses and unit densities for each area are not yet determined, wastewater flows were based on the minimum number of units required by land use type. For the areas containing the asphalt and concrete plants, it is estimated that 30 employees will share facilities. This was used to calculate the generated wastewater flow in lieu of the 1 employee per 500 feet of floor area above. Since the majority of onsite flows will be generated by employees, the industrial activity with the highest average flow for employees, "Factory", was used to estimate wastewater flows. Based on the proposed land use, the design peak flow for full buildout of the Industrial Park is 333,688 gpd (see **Exhibit 2: Wastewater Flow Summation**). Of that, 1,350 is ideally serviced by an IWS (for the New Concrete Facility and Asphalt Plant) and 332,338 is serviced by a gravity sewer and decentralized WWTP.

VIII. PROPOSED WASTEWATER SYSTEM

Since there is no existing wastewater treatment system in the vicinity of the Industrial Park, wastewater flows within the Industrial Park will be treated by onsite IWS systems and a decentralized WWTP. These systems are ideal for areas that are remote and have factors that can make tying into an existing wastewater system difficult or infeasible. Each development within the Industrial Park will be required to provide its own wastewater treatment system and associated wastewater collection system. The type of treatment system used will

REF-469

be determined by the size and type of development. Sizing of each system will be determined during the design phase of each development.

Onsite IWS systems and decentralized WWTPs are regulated by the Department of Health (DOH) under Chapter 62 of Title 11, Hawaii Administrative Rules (HAR). Under Subchapter 3 of the rules, IWS systems can be used as a temporary onsite means of wastewater disposal in lieu of a wastewater treatment works under the following conditions:

1. There is 10,000 square feet of land area for each individual wastewater system;
2. The total wastewater flow of the development does not exceed 15,000 gpd;
3. Area of the lot is not less than 10,000 square feet; and
4. The total wastewater flow into each individual wastewater system will not exceed one thousand gallons per day.

Multiple IWS systems may be used provided that the building is owned by one person. At DOH's discretion, multiple buildings may connect to one IWS provided that the buildings are located on the same lot and generate wastewater of similar strength and character. IWS are required to consist of a septic tank and soil absorption system, sand filter, subsurface irrigation system or other treatment unit as approved by DOH. Cesspools are prohibited as adequate treatment is not provided.

Where developments do not meet the requirements for an IWS, decentralized WWTPs are recommended. WWTPs can be sized to accommodate flows from multiple properties located in the same general area. Depending on the development timeline, construction of the WWTP can be phased such that the system can be adapted and expanded to accommodate additional flows at a later date. WWTPs should be located in the lowest region of the service area to allow for gravity flow into the WWTP and avoid the use of pump stations and force mains. The lowest point in the project site is on the southwestern edge of the light industrial area west of Miki Rd.

The areas for the New Concrete Facility and Asphalt Plant are likely to be the first sites developed and will require the installation of an IWS septic system. The wastewater flow generated from the facilities on these areas are minimal compared to the lots designated for new industrial uses and could be managed with an IWS even after development of a nearby decentralized WWTP. Connection of this flow to the WWTP will likely require the need for pump stations and force mains.

The light industrial area west of Miki Rd. produces the majority of the projected design wastewater flow. A WWTP located in the location stated above in this area could collect the wastewater from this development by gravity without the need for pump stations and force mains (see **Exhibit 3: Wastewater Flow Map**). If the WWTP was to be moved to the unused area of the project site just below the old CBP location, pump stations and a force main would be required to move the sewage over the hill to the WWTP, greatly increasing the capital and operating/maintenance cost for the wastewater system.

Site development grading plans are needed to further verify the practicality of the wastewater system designs.

IX. COST CONSIDERATIONS

Since site layouts are not yet available, budgetary costs for development of the Industrial Park could not be determined. General costs for the various improvements are as follows:

Sewer Pipe, PVC

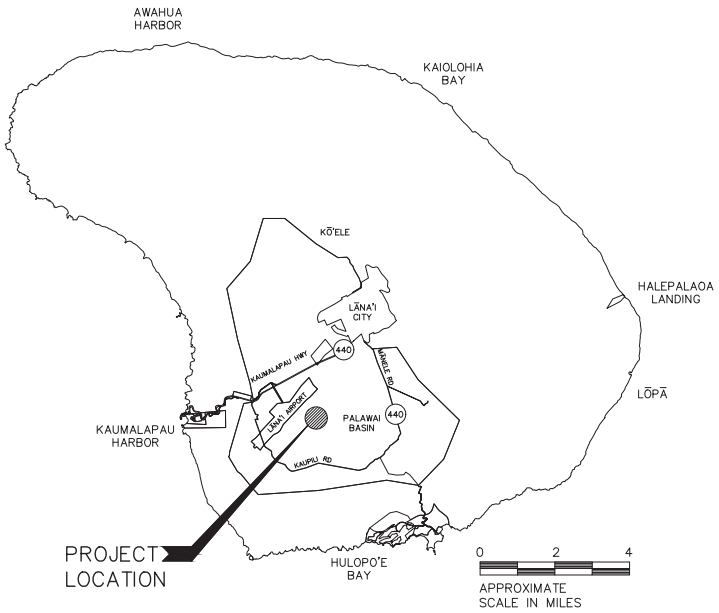
8-inch sewer pipe	$200 per linear foot
10-inch sewer pipe	$250 per linear foot
15-inch sewer pipe	$325 per linear foot

Treatment Systems

IWS, Septic tank with absorption trenches	$26,500 – 66,000 / 1,000 gallons
WWTP (1,000 to 10,000 gpd)	$31,000 – 88,000 / 1,000 gallons
WWTP (greater than 10,000 gpd)	$68,000 - 125,200 / 1,000 gallons

REF-470

EXHIBITS



ISLAND OF LĀNA'I

EXHIBIT 1

NORTH

PŪLAMA LĀNA'I MIKI BASIN
200-ACRE INDUSTRIAL PARK

LOCATION MAP

AKINAKA & ASSOCIATES, LTD.

SCALE: AS SHOWN DATE: AUGUST 2021

G:\PL2101 PULAMA LANAI WATER&WASTEWATER MASTER PLAN V2\200 PLANNING\02 WASTEWATER\EXHIBIT\PL2101- EXHIBIT 1 - LOCATION MAP.DWG

REF-471

EXHIBIT 2: WASTEWATER FLOW SUMMATION

Description	Land Use	Area (ac.)	Estimated Floor Area (ac.)	Estimated Floor Area (sf)	Estimated Required Employees (1 per 500 sf of floor area)	Avg. Daily Flow Per Capita (gpdc)	Avg. Wastewater Flow (gpd)	Max. Flow Factor	Max. Wastewater Flow (gpd)	Dry Weather Infiltration/Inflow (gpd)	Wet Weather Infiltration/Inflow (gpd)	Design Avg. Flow (gpd)	Design Max. Flow (gpd)	Design Peak Flow (gpd)
Renewable Energy Projects	Light Industrial / Heavy Industrial	127	0.0	0	0	0	0	0	0	0	0	0	0	0
Concrete Crushing Facility	Heavy Industrial	14.5	0.3	15,000	30	30	900	1.5*	1,350	0	0	900	1,350	1,350
Asphalt Plant	Heavy Industrial	12.5	0.0	0	0	0	0	0.0	0	0	0	0	0	0
New Industrial Uses	Light Industrial	26	26.0	1,132,560	2,265	30	67,954	4.2**	288,512	11,326	32,500	79,279	299,838	332,338
Infrastructure	Light Industrial / Heavy Industrial	20	0.0	0	0	0	0	0	0	0	0	0	0	0
											Total Design Avg. Flow (gpd)	**80,179**	**Total Design Peak Flow (gpd)**	**333,688**

*Flow factor determined using IWS with flow less than 1,500 gpd

**Flow factor determined using the Babbit Formula

REF-472

DRAINAGE REPORT

APPENDIX

J

REF-473

DRAINAGE REPORT - FINAL

Project: Miki Basin Industrial Park Drainage Study
Lanai City, Lanai
TMK: (2)4-9-002: 061

Owner: Pulama Lanai

Consultant: R. M. Towill Corporation
2024 North King Street, Suite 200
Honolulu, Hawaii 96819

Prepared by: Gordon Ring

Checked by: Gordon Ring

Date: July 9, 2021

GORDON T. RING
LICENSED PROFESSIONAL ENGINEER
No. 9300-C
HAWAII, U.S.A.

This work was prepared by me or under my supervision. Construction of this project will be under my observation.

4/30/22
Signature Lic. Expiration

1.0 PURPOSE

To determine the offsite and onsite drainage system requirements for the proposed Miki Basin Industrial Park that meets the County of Maui Storm Drainage Standards. The Miki Basin Industrial Park project is located adjacent to Miki Road, within a portion of a large parcel (TMK (2)4-9-002: 061). The project site will consist of light and heavy industrial uses. For the location of the proposed site, see Figure 1.

2.0 REFERENCES

2.1 *Rules for the Design of Storm Drainage Facilities in the County of Maui*, Department of Public Works and Waste Management, County of Maui, July 14, 1995.

2.2 LIDAR Countour Maps provided by Pulama Lanai dated December 2006.

2.3 Hydraflow Hydrographs Extensions for AutoCAD Program by Auto Desk dated August 2017 to February 2018.

2.4 *Grading and Drainage Report for Miki Basin Heavy Industrial Site*, Austin Tsutsumi & Associates, October 2015.

3.0 EXISTING SITE CONDITIONS

The proposed project site is mostly undeveloped and adjacent to the existing Miki Basin Industrial Condominium site and MECO facility. Existing improvements bordering the project site include the Miki Basin Industrial Condominium project and MECO facility. The existing onsite terrain is covered with vegetation and slopes at about 5% from Miki Road toward the southeast. There is no existing storm drain system within the project area. Runoff collected in Drain Area (DA) 1 and 2 of the project site flows into existing natural drainage ways and discharges into the existing Miki Basin sump, located approximately 2000 feet away (see Figure 2). Runoff collected in Drain Area 3 flows to the existing Palawai Basin.

Southeast of the proposed 100 acre heavy industrial area are the Miki Basin Industrial CPR and an existing MECO facility (see Figure 2). Runoff generated within the existing Miki Basin Industrial CPR site is collected by an onsite drainage system and is discharged offsite. Runoff from the Miki Basin Industrial CPR site will not impact the proposed development since it has a separate discharge point, located south of the heavy industrial area. See "Grading and Drainage Report for Miki Basin Heavy Industrial Site" by Austin Tsutsumi & Associates, Inc. for drainage calculations. Offsite runoff, including runoff generated from the MECO facility, is diverted around the Miki Basin Industrial CPR site (within the heavy industrial area) and is discharged into the existing drainage way. These existing offsite flows will need to be addressed by the development of the heavy industrial area.

Offsite runoff generated from the area north of Miki Road sheet flows and is intercepted by an unlined ditch along Miki Road (see Figure 2). Once in the unlined ditch, the runoff flows towards the southeast direction to a low point in Miki Road, near the existing MECO facility.

4.0 PROPOSED SITE CONDITIONS

The proposed 200 acre industrial development will consist of a 65-acre light industrial area (Drain Area 1), 100-acre heavy industrial area (Drain Area 2), and a 35-acre light industrial area (Drain Area 3). The proposed development breakdown is as follows:

Proposed Use	Area (acres)
Renewable Energy Projects	127
Concrete Crushing Facility	14.5
Asphalt Plant	12.5
Other Industrial Uses	26
Infrastructure	20
Total	**200**

The proposed development will increase the amount of impervious area within the project. Offsite runoff will be intercepted before entering the project site by proposed drainage ditches. The drainage ditches will divert runoff around the perimeter of the project site to an

offsite discharge point downstream. Onsite runoff will be collected by a proposed underground storm drain system consisting of pipes and inlets. Runoff from 65-acre light industrial area, 100-acre heavy industrial area, and DA Offsite 1 through 3 will be discharged to the existing drainageway that drains to Miki Basin (see Figure 4). Runoff generated from the 35-acre light industrial area and DA Offsite 4 drain to the existing Palawai Basin.

5.0 CALCULATIONS FOR RUNOFF INCREASE

Onsite

Runoff flow rates for areas less than 100 acres were calculated for a 10-year, 1-hour storm event using the rational method for the existing and proposed site conditions of Drain Area 1 and Drain Area 3. The runoff flow rate for a 100-year, 24-hour storm event were calculated using the SCS method for the existing and proposed site conditions of Drain Area 2 since the drainage area is 100 acres. See Tables 1 and 2 for a summary of the existing and proposed runoff quantities. The proposed industrial park will increase the runoff generated within the project site by 141.36 cfs (see Table 3).

Offsite

Runoff flow rates for a 100-year, 24-hour storm event were calculated using the SCS method for the existing site conditions of DA Offsite 1 and DA Offsite 2, since these offsite areas are greater than 100 acres. Runoff flow rates for a 10-year, 1-hour storm event were calculated using the rational method for the existing and proposed site conditions of DA Offsite 3 and DA Offsite 4, since these offsite areas are less than 100 acres. See Tables 1 and 2 for the existing and proposed runoff quantities.

Runoff generated from areas DA Offsite 1, 2, and 4 will be collected by interceptor ditches located along the project site exterior boundary and will ultimately discharge into the existing drainageway south of the project site and to Miki Basin per existing conditions. Offsite runoff for DA Offsite 3 will be diverted under Miki Road by a culvert and around the existing Miki Basin Warehouse area. Runoff from DA Offsite 3 will be discharged into an existing offsite drainageway adjacent to the industrial CPR site. Therefore, the offsite runoff will not affect the design of the onsite drain systems.

At a depth of 10 feet, the existing Miki Basin has a capacity of 891 ac-ft. Since the increase in runoff from Drain Area 1 and Drain Area 2 only contributes 8.7 acre-feet, the increase in runoff depth and flow rate will be contained within the existing basin. See Table 4 for the volume summary.

At a depth of 10 feet, the existing Palawai Basin has a capacity of 3010 ac-ft. Since the increase in runoff from Drain Area 3 contributes only 2.5 acre-feet, the increase in runoff depth and flow rate will be contained within the existing basin. See Table 4 for the volume summary.

Table 1 – Existing Runoff Quantities

Drainage Area Name	Area (Acres)	Q_{10} (cfs)	Q_{100} (cfs)
DA 1*	65.0	87.36	-
DA 2**	100.0	-	529.9
DA 3*	32.6	25.56	-
DA OFFSITE 1**	165.8	-	337.7
DA OFFSITE 2**	78.2	-	159.4
DA OFFSITE 3*	88.5	71.86	-
DA OFFSITE 4*	8.6	11.56	-
	Total	196.34	1027.0

* Calculated using Rational Method
**Calculated using SCS Method

Table 2 – Proposed Runoff Quantities

Drainage Area Name	Area (Acres)	Q_{10} (cfs)	Q_{100} (cfs)
DA 1*	65.0	106.1	-
DA 2**	100.0	-	566.1
DA 3*	35.0	112.00	-
DA OFFSITE 1**	165.8	-	337.7
DA OFFSITE 2**	78.2	-	159.4
DA OFFSITE 3*	86.1	69.9	-
DA OFFSITE 4*	8.6	11.6	-
	Total	299.6	1063.20

* Calculated using Rational Method
**Calculated using SCS Method

Table 3 – Runoff Summary

Drainage Area Name	Existing Q (cfs)	Proposed Q (cfs)	Increase in Q (cfs)
DA 1	87.36	106.1	18.72
DA 2	529.9	566.10	36.2
DA 3	25.56	112.00	86.44
		Total	141.36

Table 4 – Volume Summary

Drainage Area Name	Existing Volume (ac-ft)	Proposed Volume (ac-ft)	Increase in Volume (ac-ft)
DA 1 + DA 2 (to Miki Basin)	74.9	83.6	8.7
DA 3 (to Palawai Basin)	3.2	5.7	2.5

6.0 STORM WATER MANAGEMENT

Existing drainage patterns will be maintained by discharging intercepted offsite runoff to its original flow path. Offsite runoff will be collected by interceptor ditches located on the perimeter of the site that discharge to existing drainage way and ultimately to Miki Basin (see Figure 4). The proposed concrete rectangular drainage ditches vary in size from 8 feet by 8 feet to 2 feet by 3 feet. The ditches are sized to accommodate the peak runoff flow from the 100-yr, 24-hour storm and 10-yr, 1-hour storm where necessary and provide a minimum 2-foot freeboard.

Runoff from the proposed 65-acre light industrial area (Drain Area 1) will be discharged to the interceptor ditch at the southwest corner of the area (see Figure 4). Runoff flow for this area is 106.1 cfs and ultimately flows to Miki Basin. Offsite runoff from DA Offsite 1 flowing towards the 65-acre area is 337.70 cfs and will be intercepted by a 6 ft. by 6 ft. interceptor ditch on the north perimeter of the area.

Runoff from the proposed 100-acre heavy industrial area (Drain Area 2) will be discharged at the south end of the area (see Figure 4). Runoff flow for this area is 566.1 cfs. The runoff from DA Offsite 3 that is diverted around the existing Miki Basin Industrial site is also discharged at the south end of the area. Runoff flow for DA Offsite 3 is 69.91 cfs. Both the runoff flow from the proposed 100-acre site and the DA Offsite 3 flow to Miki Basin. Design of the drainage system for the 100-acre site should consider the impacts of incorporating the existing flows into the proposed drainage system versus keeping them separate. Offsite runoff from DA Offsite 2 flowing towards the 100-acre area is 159.35 cfs and will be intercepted an 8 ft. by 8 ft. interceptor ditch on the west perimeter of the area.

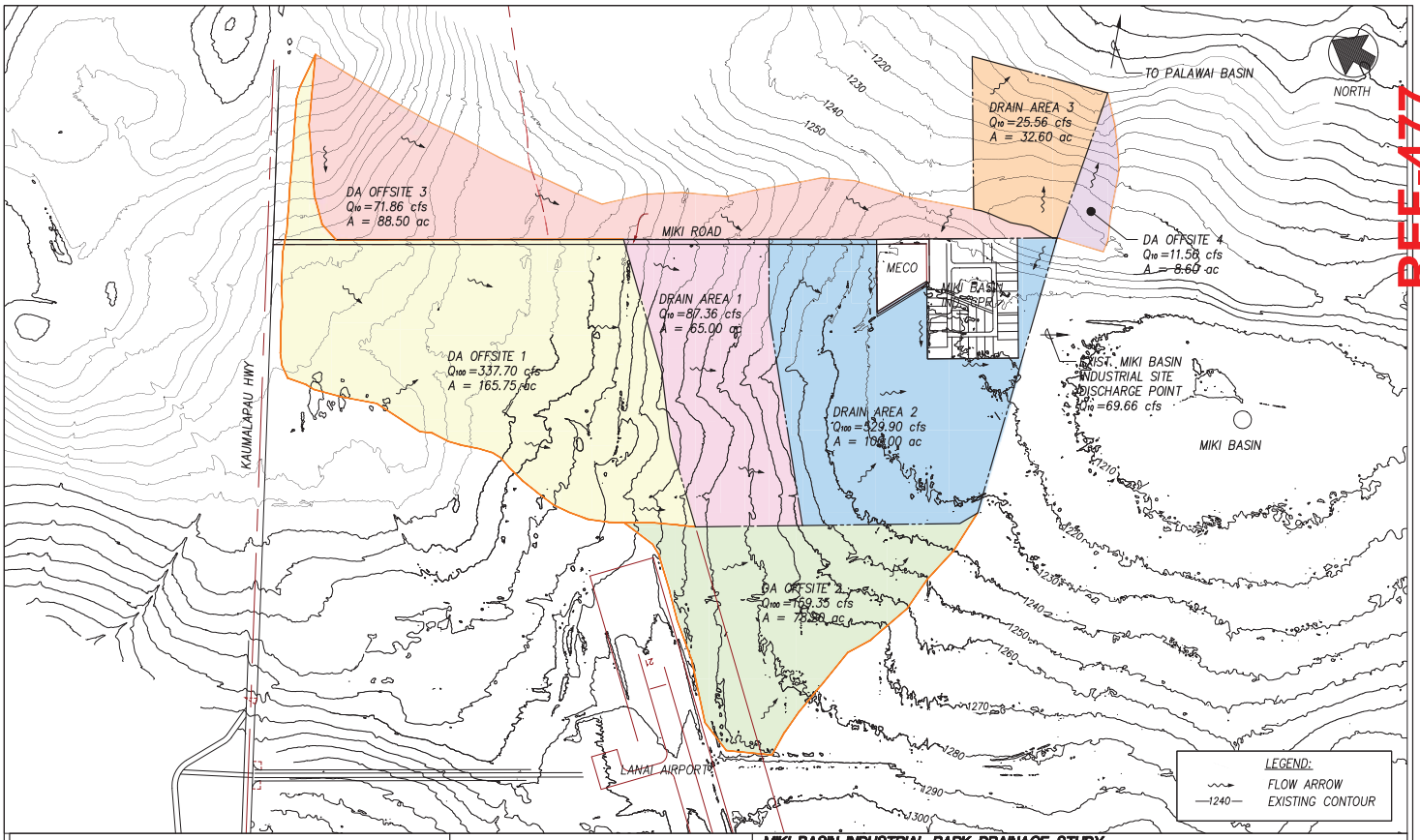
Runoff from the proposed 35-acre light industrial area (Drain Area 3) will be discharged at the eastern side of the area (see Figure 4). Onsite runoff flow for this area is 112.00 cfs and ultimately flows to Palawai Basin. Offsite runoff south of the 35-acre area from DA Offsite 4 will be intercepted by a 2 ft. by 3ft. interceptor ditch on the south perimeter of the area and will discharge to Palawai Basin. Runoff flow for the offsite area is 11.56 cfs.

The increase in onsite runoff volume from Drain Area 1 and Drain Area 2 will be conveyed to the existing drainage way and can be easily accommodated in the existing Miki Basin. The additional runoff volume is negligible compared to the available basin capacity. The increase in onsite runoff volume from Drain Area 3 will be conveyed to the existing Palawai Basin. The additional runoff volume is negligible compared to the available basin capacity.

Storm water treatment will not be provided for this project since the runoff flows into an existing offsite sump with no outlet to the ocean.

7.0 CONCLUSION

The development of the proposed industrial park will increase the runoff onsite by 141.36 cfs (see Table 3). The additional flow generated within the proposed project can be accommodated by the existing Miki Basin and Palawai Basin. Therefore, the proposed 200-acre industrial development will not have an adverse impact on any existing downstream properties.



Planning – Engineering – Environmental Services – Photogrammetry – Surveying – Construction Management

R. M. TOWILL CORPORATION

808 842 1133 2024 North King Street, Suite 200 Honolulu Hawaii 96819-3494

800' 400' 0 800' 1600'

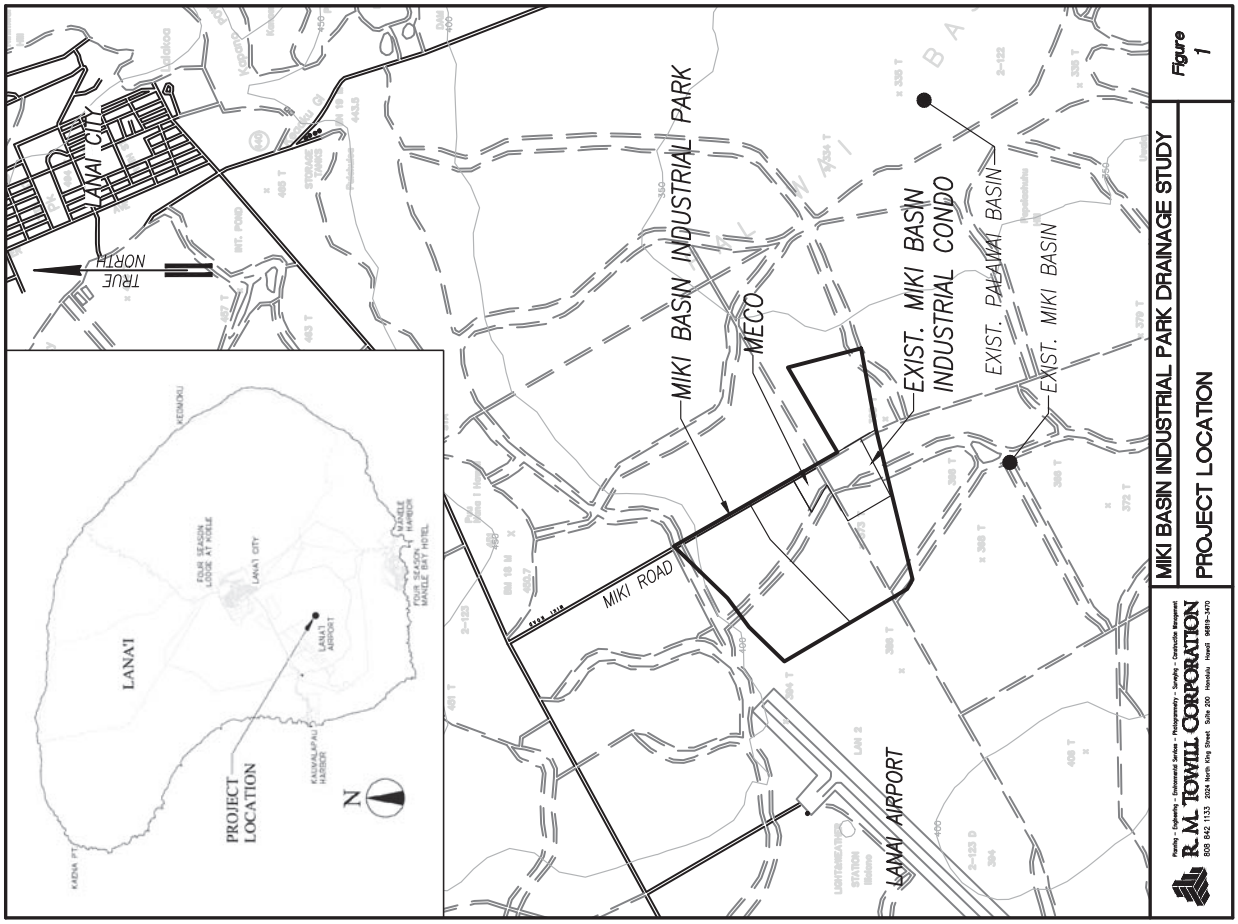
1" = 800'

MIKI BASIN INDUSTRIAL PARK DRAINAGE STUDY

EXISTING DRAINAGE RUNOFF MAP

Figure 2

REF-477



Planning – Engineering – Environmental Services – Photogrammetry – Surveying – Construction Management

R. M. TOWILL CORPORATION

808 842 1133 2024 North King Street Suite 200 Honolulu Hawaii 96819-3470

MIKI BASIN INDUSTRIAL PARK DRAINAGE STUDY

PROJECT LOCATION

Figure 1

KAUMALAPAU HWY
LAHAI AIRPORT
MIKI ROAD
MIKI BASIN
MECO
MIKI BASIN IND. CPR
DA OFFSITE 3
Q100 =69.91 cfs
A = 66.10 ac
DA OFFSITE 1
Q100 =337.70 cfs
A = 165.75 ac
DRAIN AREA 1
Q100 =106.08 cfs
A = 65.00 ac
DRAIN AREA 2
Q100 =566.10 cfs
A = 108.00 ac
DA OFFSITE 2
Q100 =159.35 cfs
A = 78.20 ac
DRAIN AREA 3
Q100 =112.00 cfs
A = 35.00 ac
DA OFFSITE 4
Q10 =11.56 cfs
A = 8.60 ac
TO PALAWAI BASIN
NORTH
LEGEND:
FLOW ARROW
1240 EXISTING CONTOUR
1" = 800'
800' 400' 0 800' 1600'
R. M. TOWILL CORPORATION
Planning – Engineering – Environmental Services – Photogrammetry – Surveying – Construction Management
808 842 1133 2024 North King Street Suite 200 Honolulu Hawaii 96819-3494
MIKI BASIN INDUSTRIAL PARK DRAINAGE STUDY
PROPOSED DRAINAGE RUNOFF MAP
Figure 3

TO PALAWAI BASIN
NORTH
DRAIN AREA 3
LIGHT INDUSTRIAL
PARCEL
Q10 =112.00 cfs
A = 35.00 ac
2' X 3'
INTERCEPTOR
DITCH
Q10 =11.56 cfs
60" CULVERT UNDER
MIKI ROAD
MIKI ROAD
DA OFFSITE 3
DA OFFSITE 4
MECO
MIKI BASIN
IND. CPR
DRAIN AREA 1
LIGHT INDUSTRIAL
PARCEL
Q100 =106.08 cfs
A = 65.00 ac
DA OFFSITE 1
DRAIN AREA 2
HEAVY INDUSTRIAL
PARCEL
Q100 =566.10 cfs
A =108.00 ac
HEAVY INDUSTRIAL 100
ACRE ONSITE RUNOFF
DISCHARGE POINT
Q100 =636.01 cfs
6' X 6'
INTERCEPTOR DITCH
Q100 =337.70 cfs
DISCHARGE DA 1 TO
INTERCEPTOR DITCH
END INTERCEPTOR
DITCH, DISCHARGE TO
EXIST. DRAINAGE WAY
Q100 =603.13 cfs
6' X 7'
INTERCEPTOR DITCH
Q100 =497.05 cfs
8' X 8'
INTERCEPTOR DITCH
Q100 =603.13 cfs
DA OFFSITE 2
LEGEND:
FLOW ARROW
1240 EXISTING CONTOUR
R. M. TOWILL CORPORATION
Planning – Engineering – Environmental Services – Photogrammetry – Surveying – Construction Management
808 842 1133 2024 North King Street Suite 200 Honolulu Hawaii 96819-3470
MIKI BASIN INDUSTRIAL PARK DRAINAGE STUDY
PROPOSED SITE IMPROVEMENTS
Figure 4

REF-478

APPENDIX

HYDROLOGIC AND HYDRAULIC
CALCULATIONS

R. M. TOWILL CORPORATION

2024 N King Street, Suite 200, Honolulu, Hawaii 96819
Ph. (808) 842-1133 Fax (808) 842-1937

Project:	Miki Industrial	Job No.			
Location:	Lanai	Prepared By:	DAA	Date:	2021-05-18
Item:	Runoff Calculations	Checked By:	GR	Date:	2021-05-18

Purpose: Determine the existing runoff from project site.

Assumptions

Rational Method

Runoff Coefficient, C

RUNOFF COEFFICIENT FOR SMALL AGRICULTURAL AREAS

Watershed Characteristics	Description	Value
Infiltration	Medium	0.07
Relief	Rolling	0.03
Vegetal Cover	Good	0.03
Development Type	Agricultural	0.15
Sum		0.28

Small agriculatural areas = 0.28
Solar Farm Areas = 0.34 (drain area 1)
Light Industrial Areas = 0.8 (drain area 3)
Heavy Industrial Areas = 0.9 (drain area 2)

Rainfall Intensity, I (10 Year-1 hr)

I = 1.85 in /hr NOAA Data

See TC spreadsheet for adjusted rainfall intensities.

SCS Method

	Curve No. (CN)
Existing Condition	65
Proposed Condition	78

RESULTS

Calculate Peak Runoff, Q

EXISTING CONDITION

Drainage Area Name	Area (Acres)	C	I (in/hr)	Q (cfs)
DA 1*	65.00	0.28	4.8	87.36
DA 2**	100.00	-	-	529.90
DA 3*	32.6	0.28	2.8	25.56
DA OFFSITE 1**	162.0	-	-	330.00
DA OFFSITE 2**	81.7	-	-	166.5
DA OFFSITE 3*	88.5	0.28	2.9	71.86
DA OFFSITE 4*	8.6	0.28	4.8	11.56

REF-479

R. M. TOWILL CORPORATION

2024 N King Street, Suite 200, Honolulu, Hawaii 96819
Ph. (808) 842-1133 Fax (808) 842-1937

Project: Miki Industrial
Location: Lanai
Item: Runoff Calculations

Job No.
Prepared By: DAA Date: 2021-05-18
Checked By: GR Date: 2021-05-18

Calculate Peak Runoff, Q

PROPOSED CONDITION

Drainage Area Name	Area (Acres)	C	I (in/hr)	Q (cfs)
DA 1*	65.00	0.34	4.8	106.08
DA 2**	100.00	-	-	566.10
DA 3*	35	0.8	4	112.00
DA OFFSITE 1**	165.75	-	-	337.70
DA OFFSITE 2**	78.20	-	-	159.35
DA OFFSITE 3*	86.10	0.28	2.9	69.91
DA OFFSITE 4*	8.6	0.28	4.8	11.56

*Calculated using Rational Method
**Calculated using SCS Method

Drainage Area Name	Existing Q	Proposed Q	Increase in Q
DA 1*	87.36	106.08	18.72
DA 2**	529.90	566.10	36.20
DA 3*	25.56	112.00	86.44

R. M. TOWILL CORPORATION

2024 N King Street, Suite 200, Honolulu, Hawaii 96819
Ph. (808) 842-1133 Fax (808) 842-1937

Project: Miki Industrial
Location: Lanai
Item: Runoff Calculations

Job No.
Prepared By: Date: 2021-05-18
Checked By: Date: 2021-05-18

Purpose: Determine the runoff from project site.

Assumptions

Drain Area 1 Calculate Runoff Coefficient

Drainage Area Name	Land Use Type	C	Area (ac)	Weighted C
DA 1	Impervious	0.9	0.07	0.34
	Gravel	0.8	5.67	
	Rangeland	0.3	59.26	
Total			65	

Drain Area 2 Calculate CN

Area (Acres)	CN	Description
0.02	98	Impervious, HSG B
0.04	98	Impervious, HSG C
0.18	49	Coarse Gravel, HSG A
1.61	69	Coarse Gravel, HSG B
2.73	79	Coarse Gravel, HSG C
1.87	65	Brush—brush-weed-grass mixture with brush HSG C
16.85	65	
28.53	65	
13.50	91	Industrial, HSG C
33.98	91	
1.30	91	
100.60	78	Weighted Average

REF-480

Miki Basin
Maui County Drainage Standards - Rational Method
13-05-20

	TRIBUTARY SUBAREAS	AREA (acres)	WEIGHTED RUNOFF COEFFICIENT "C"	MAXIMUM LENGTH OF TRAVEL (feet)	DIFFERENCE IN ELEVATION (feet)	Slope %	k-value	TIME OF CONCENTRATION "Tc" (minutes)	10-YEAR "I" (in/hr)
EXISTING	DA 1 (Light Industrial)	65.00	0.28	1140	56.0	4.91%	5143.6	5.6	4.80
	DA 3 (Light Industrial)	32.60	0.28	1600	100.0	6.25%	6400.0	26.0	2.80
	DA OFFSITE 3	88.50	0.28	7570	272.0	3.59%	39935.5	27.2	2.90
	DA OFFSITE 4	8.60	0.28	1330	85.0	6.39%	5261.0	5.7	4.8
PROPOSED	DA 1 (Light Industrial)	65.00	0.38	-	-	-	-	15.0	4.8
	DA 3 (Light Industrial)	35.00	0.80	-	-	-	-	10.0	4
	DA OFFSITE 3	86.10	0.28	7570.00	272.00	3.59%	39935.52	27.24	2.90
	DA OFFSITE 4	8.6	0.28	1330	85.0	6.39%	5261.0	5.7	4.8

Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Monday, 11 / 5 / 2018

Hyd. No. 13

MIKI 35 AC EXIST

Hydrograph type	= Rational	Peak discharge	= 29.87 cfs
Storm frequency	= 10 yrs	Time to peak	= 0.43 hrs
Time interval	= 1 min	Hyd. volume	= 139,813 cuft
Drainage area	= 35.000 ac	Runoff coeff.	= 0.28
Intensity	= 3.048 in/hr	Tc by User	= 26.00 min
IDF Curve	= MIKI NOAA DATA.IDF	Asc/Rec limb fact	= 1/5

REF-481

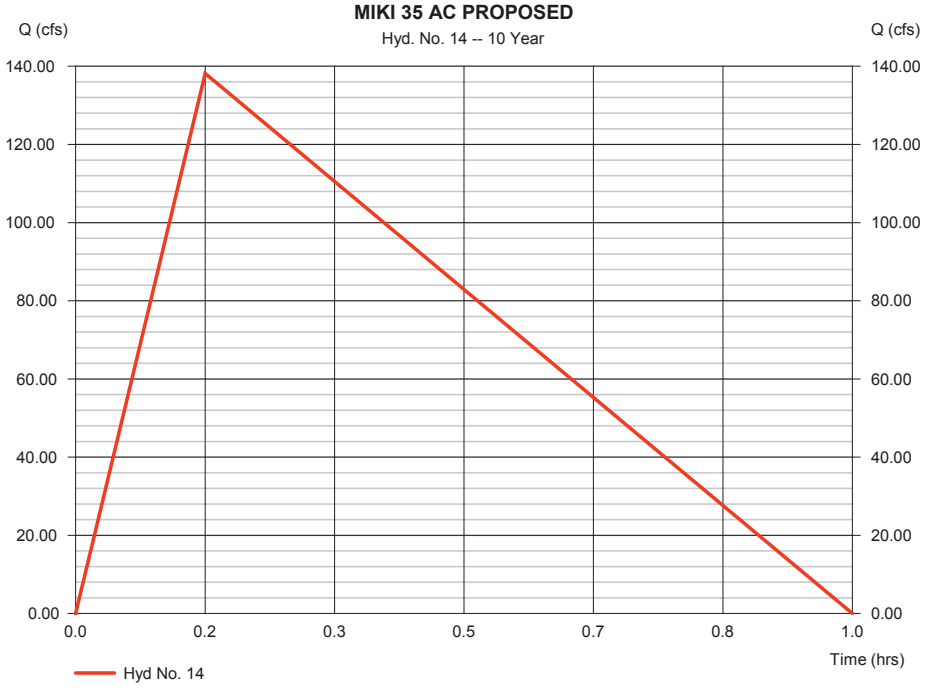
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Monday, 11 / 5 / 2018

Hyd. No. 14

MIKI 35 AC PROPOSED

Hydrograph type	= Rational	Peak discharge	= 138.15 cfs
Storm frequency	= 10 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 248,674 cuft
Drainage area	= 35.000 ac	Runoff coeff.	= 0.8
Intensity	= 4.934 in/hr	Tc by User	= 10.00 min
IDF Curve	= MIKI NOAA DATA.IDF	Asc/Rec limb fact	= 1/5



Hydrograph Report

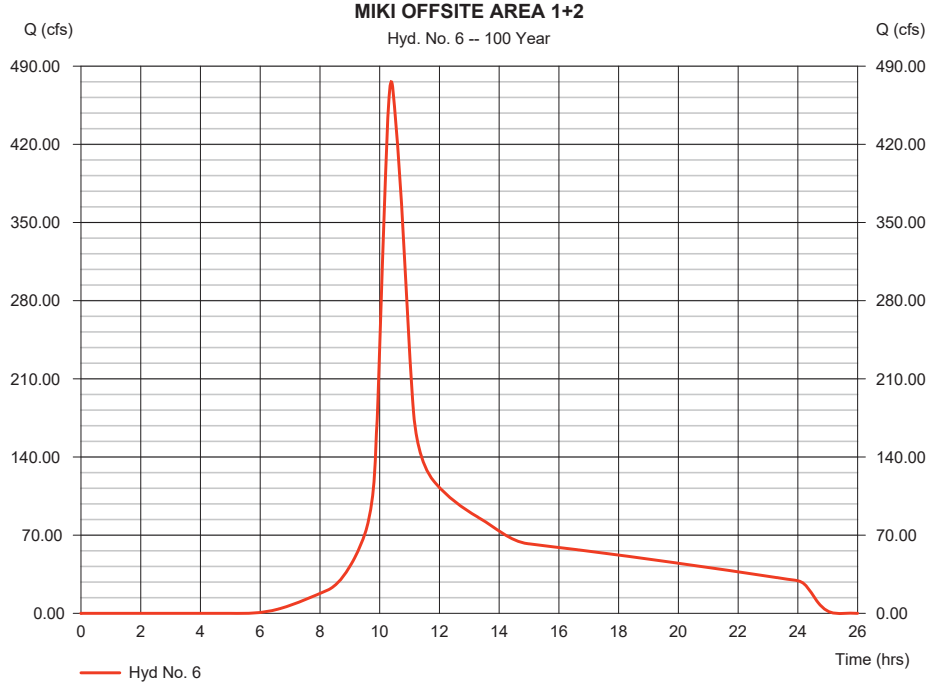
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020 — Thursday, 05 / 13 / 2021

Hyd. No. 6

MIKI OFFSITE AREA 1+2

Hydrograph type	= SCS Runoff	Peak discharge	= 475.96 cfs
Storm frequency	= 100 yrs	Time to peak	= 10.38 hrs
Time interval	= 1 min	Hyd. volume	= 4,800,937 cuft
Drainage area	= 243.950 ac	Curve number	= 65*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 48.50 min
Total precip.	= 9.86 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(243.700 x 65)] / 243.950



REF-482

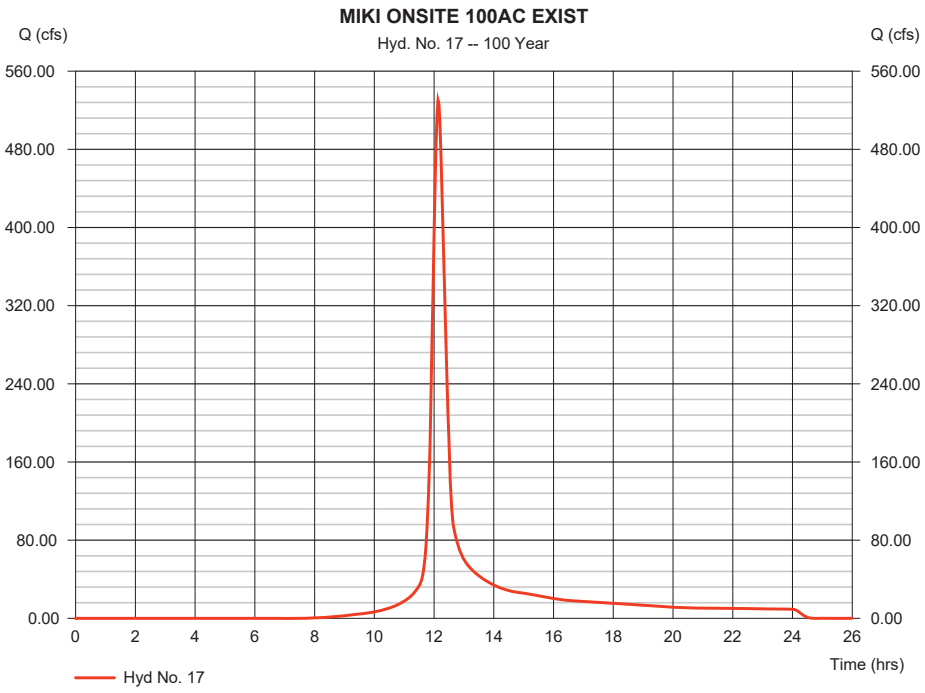
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020 — Tuesday, 05 / 18 / 2021

Hyd. No. 17

MIKI ONSITE 100AC EXIST

Hydrograph type	= SCS Runoff	Peak discharge	= 529.92 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 1,945,636 cuft
Drainage area	= 100.000 ac	Curve number	= 65
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 25.60 min
Total precip.	= 9.86 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



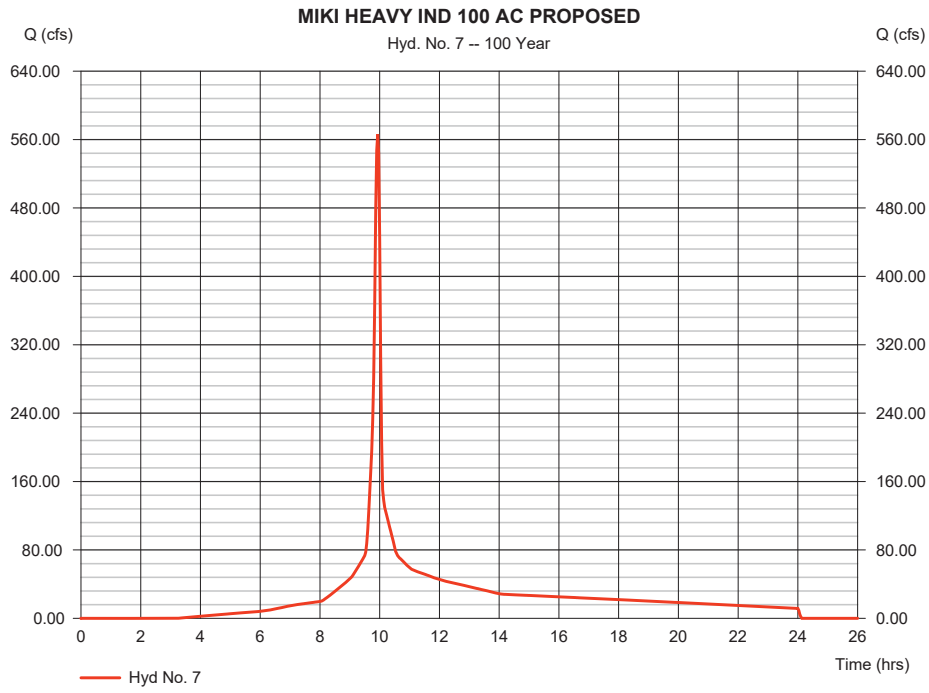
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020 — Tuesday, 05 / 18 / 2021

Hyd. No. 7

MIKI HEAVY IND 100 AC PROPOSED

Hydrograph type	= SCS Runoff	Peak discharge	= 566.08 cfs
Storm frequency	= 100 yrs	Time to peak	= 9.93 hrs
Time interval	= 2 min	Hyd. volume	= 2,427,091 cuft
Drainage area	= 100.000 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 4.20 min
Total precip.	= 9.86 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484



REF-483

Hydrograph Report

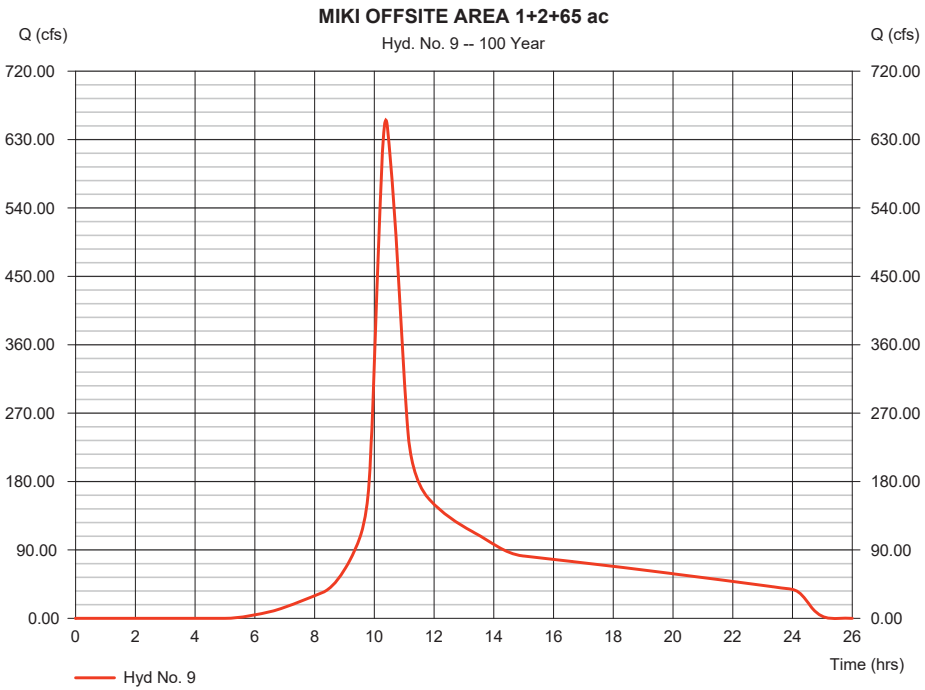
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020 — Thursday, 05 / 13 / 2021

Hyd. No. 9

MIKI OFFSITE AREA 1+2+65 ac

Hydrograph type	= SCS Runoff	Peak discharge	= 655.58 cfs
Storm frequency	= 100 yrs	Time to peak	= 10.38 hrs
Time interval	= 1 min	Hyd. volume	= 6,519,391 cuft
Drainage area	= 308.950 ac	Curve number	= 68*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 48.50 min
Total precip.	= 9.86 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(243.950 x 65) + (65.000 x 78)] / 308.950



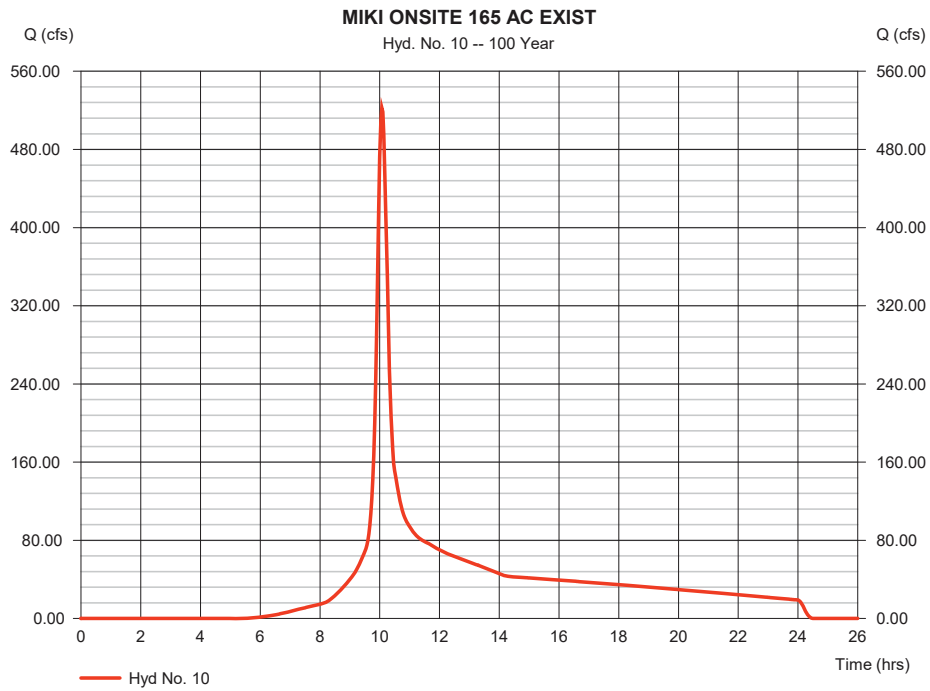
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Tuesday, 06 / 8 / 2021

Hyd. No. 10

MIKI ONSITE 165 AC EXIST

Hydrograph type	= SCS Runoff	Peak discharge	= 522.53 cfs
Storm frequency	= 100 yrs	Time to peak	= 10.07 hrs
Time interval	= 2 min	Hyd. volume	= 3,261,255 cuft
Drainage area	= 165.000 ac	Curve number	= 65
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 17.00 min
Total precip.	= 9.86 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484



REF-484

Hydrograph Report

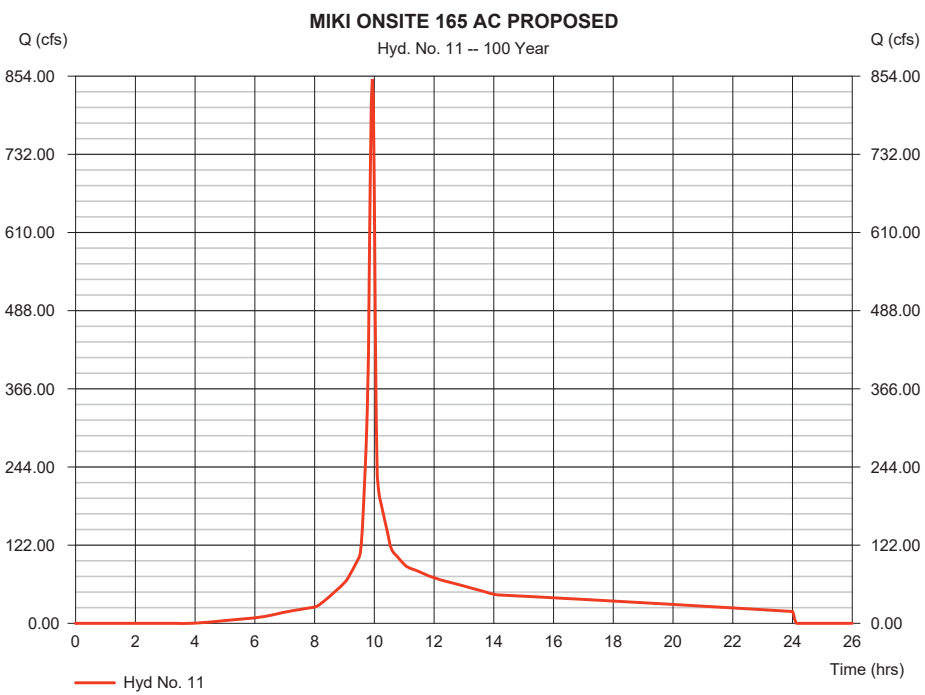
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020 — Tuesday, 05 / 18 / 2021

Hyd. No. 11

MIKI ONSITE 165 AC PROPOSED

Hydrograph type	= SCS Runoff	Peak discharge	= 849.46 cfs
Storm frequency	= 100 yrs	Time to peak	= 9.93 hrs
Time interval	= 2 min	Hyd. volume	= 3,643,567 cuft
Drainage area	= 165.000 ac	Curve number	= 73*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 5.20 min
Total precip.	= 9.86 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(65.000 x 65) + (100.000 x 78)] / 165.000



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. — Thursday, May 13 2021

6' X 6' Interceptor Ditch

Rectangular

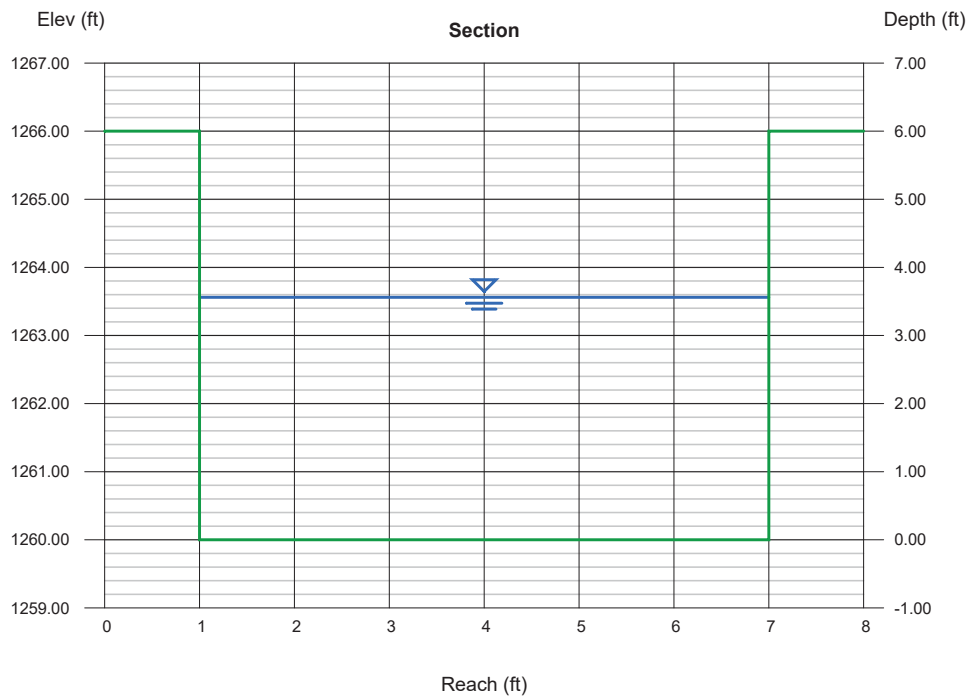
Bottom Width (ft)	= 6.00
Total Depth (ft)	= 6.00
Invert Elev (ft)	= 1260.00
Slope (%)	= 1.00
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 337.70

Highlighted

Depth (ft)	= 3.56
Q (cfs)	= 337.70
Area (sqft)	= 21.36
Velocity (ft/s)	= 15.81
Wetted Perim (ft)	= 13.12
Crit Depth, Yc (ft)	= 4.62
Top Width (ft)	= 6.00
EGL (ft)	= 7.45



REF-485

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, May 13 2021

6' X 7' Interceptor Ditch

Rectangular

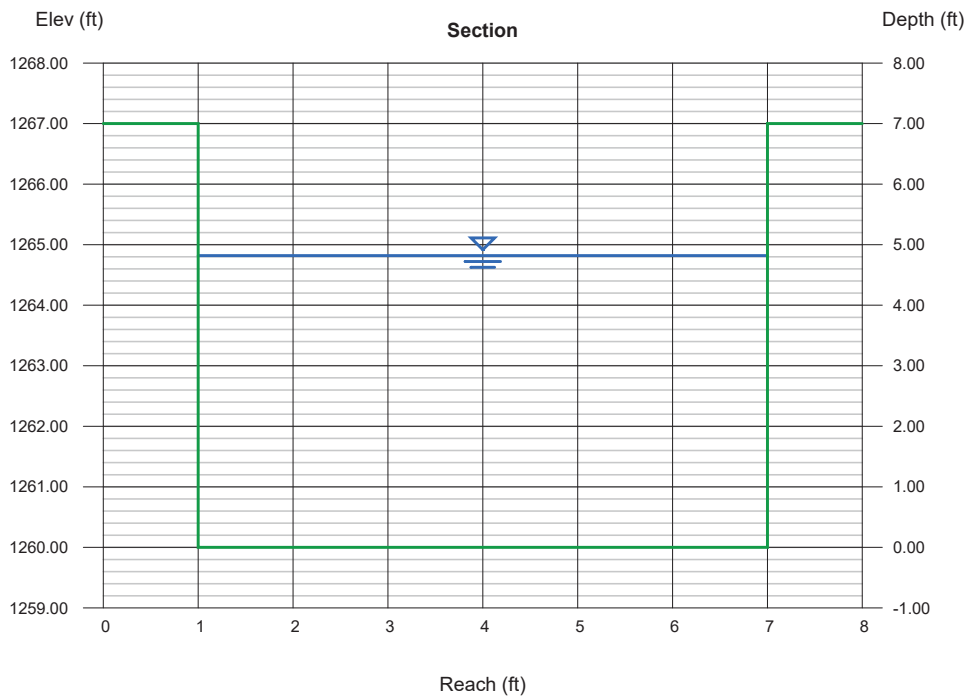
Bottom Width (ft)	= 6.00
Total Depth (ft)	= 7.00
Invert Elev (ft)	= 1260.00
Slope (%)	= 1.00
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 497.05

Highlighted

Depth (ft)	= 4.82
Q (cfs)	= 497.05
Area (sqft)	= 28.92
Velocity (ft/s)	= 17.19
Wetted Perim (ft)	= 15.64
Crit Depth, Yc (ft)	= 5.98
Top Width (ft)	= 6.00
EGL (ft)	= 9.41



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, May 13 2021

8' X 8' Interceptor Ditch

Rectangular

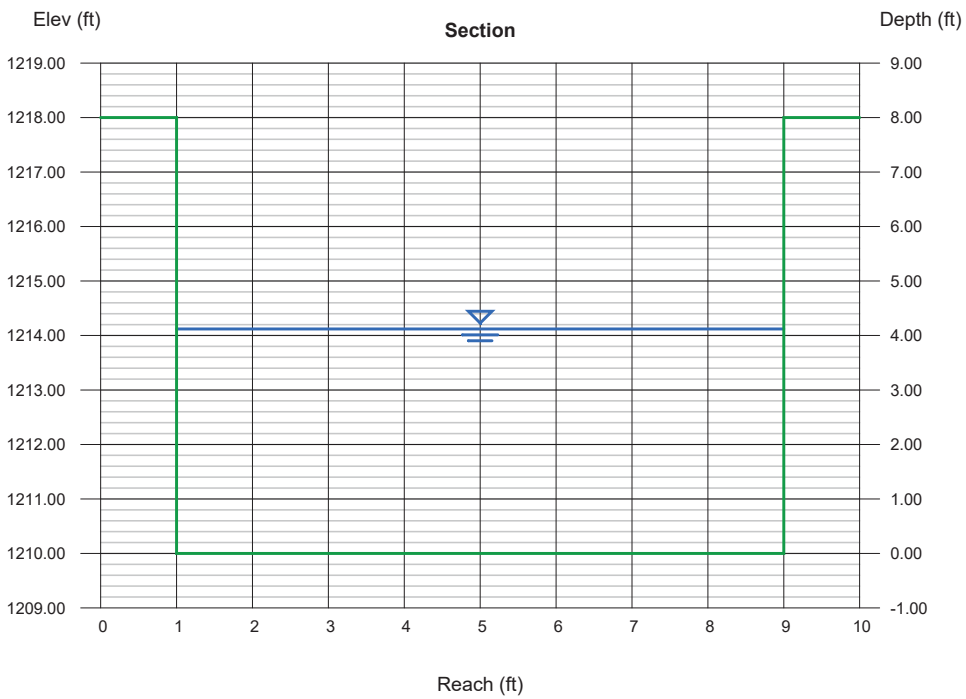
Bottom Width (ft)	= 8.00
Total Depth (ft)	= 8.00
Invert Elev (ft)	= 1210.00
Slope (%)	= 1.00
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 603.13

Highlighted

Depth (ft)	= 4.12
Q (cfs)	= 603.13
Area (sqft)	= 32.96
Velocity (ft/s)	= 18.30
Wetted Perim (ft)	= 16.24
Crit Depth, Yc (ft)	= 5.62
Top Width (ft)	= 8.00
EGL (ft)	= 9.33



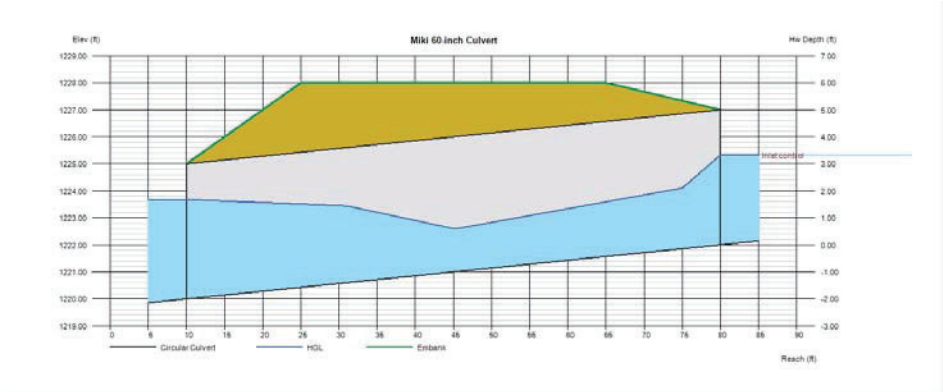
REF-486

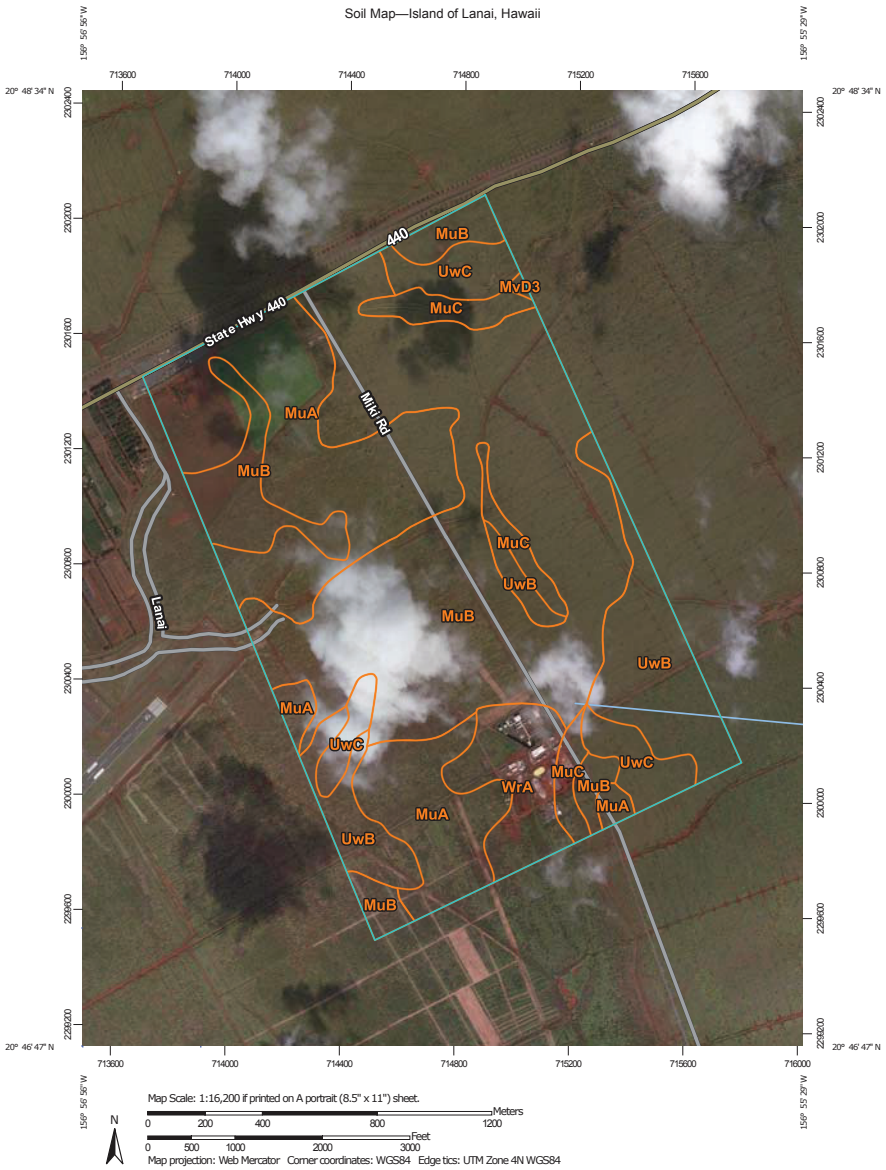
Culvert Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Friday, Nov 2 2018

Miki 60-inch Culvert

Invert Elev Dn (ft)	= 1220.00	**Calculations**	
Pipe Length (ft)	= 70.00	Qmin (cfs)	= 69.91
Slope (%)	= 2.86	Qmax (cfs)	= 69.91
Invert Elev Up (ft)	= 1222.00	Tailwater Elev (ft)	= (dc+D)/2
Rise (in)	= 60.0		
Shape	= Circular	**Highlighted**	
Span (in)	= 60.0	Qtotal (cfs)	= 69.91
No. Barrels	= 1	Qpipe (cfs)	= 69.91
n-Value	= 0.012	Qovertop (cfs)	= 0.00
Culvert Type	= Circular Concrete	Veloc Dn (ft/s)	= 4.51
Culvert Entrance	= Square edge w/headwall (C)	Veloc Up (ft/s)	= 7.68
Coeff. K,M,c,Y,k	= 0.0098, 2, 0.0398, 0.67, 0.5	HGL Dn (ft)	= 1223.68
		HGL Up (ft)	= 1224.36
Embankment		Hw Elev (ft)	= 1225.33
Top Elevation (ft)	= 1228.00	Hw/D (ft)	= 0.67
Top Width (ft)	= 40.00	Flow Regime	= Inlet Control
Crest Width (ft)	= 80.00		





Natural Resources Conservation Service | Web Soil Survey National Cooperative Soil Survey | 10/20/2018 Page 1 of 3

REF-487

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Island of Lanai, Hawaii
Survey Area Data: Version 13, Sep 11, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Feb 12, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MuA	Molokai silty clay loam, 0 to 3 percent slopes, MLRA 158	193.2	26.3%
MuB	Molokai silty clay loam, 3 to 7 percent slopes, MLRA 158	346.1	47.1%
MuC	Molokai silty clay loam, 7 to 15 percent slopes, MLRA 158	29.0	3.9%
MvD3	Lithic Eutrotorrox, 15 to 25 percent slopes, severely eroded, MLRA 158	1.0	0.1%
UwB	Uwala silty clay loam, 2 to 7 percent slopes	84.6	11.5%
UwC	Uwala silty clay loam, 7 to 15 percent slopes	42.3	5.8%
WrA	Waikapu silty clay loam, 0 to 3 percent slopes, MLRA 158	38.8	5.3%
Totals for Area of Interest		**735.0**	**100.0%**

REF-488

PROPOSED CONDITION CN
SOIL GROUP C

Table 2-2a Runoff curve numbers for urban areas [1]

Cover description: Cover type and hydrologic condition	Average percent impervious area [2]	Curve numbers for hydrologic soil group: A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) [3]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) [4]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation) [5]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

1 Average runoff condition, and $I_a = 0.2S$.
2 The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.
3 CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.
4 Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.
5 Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

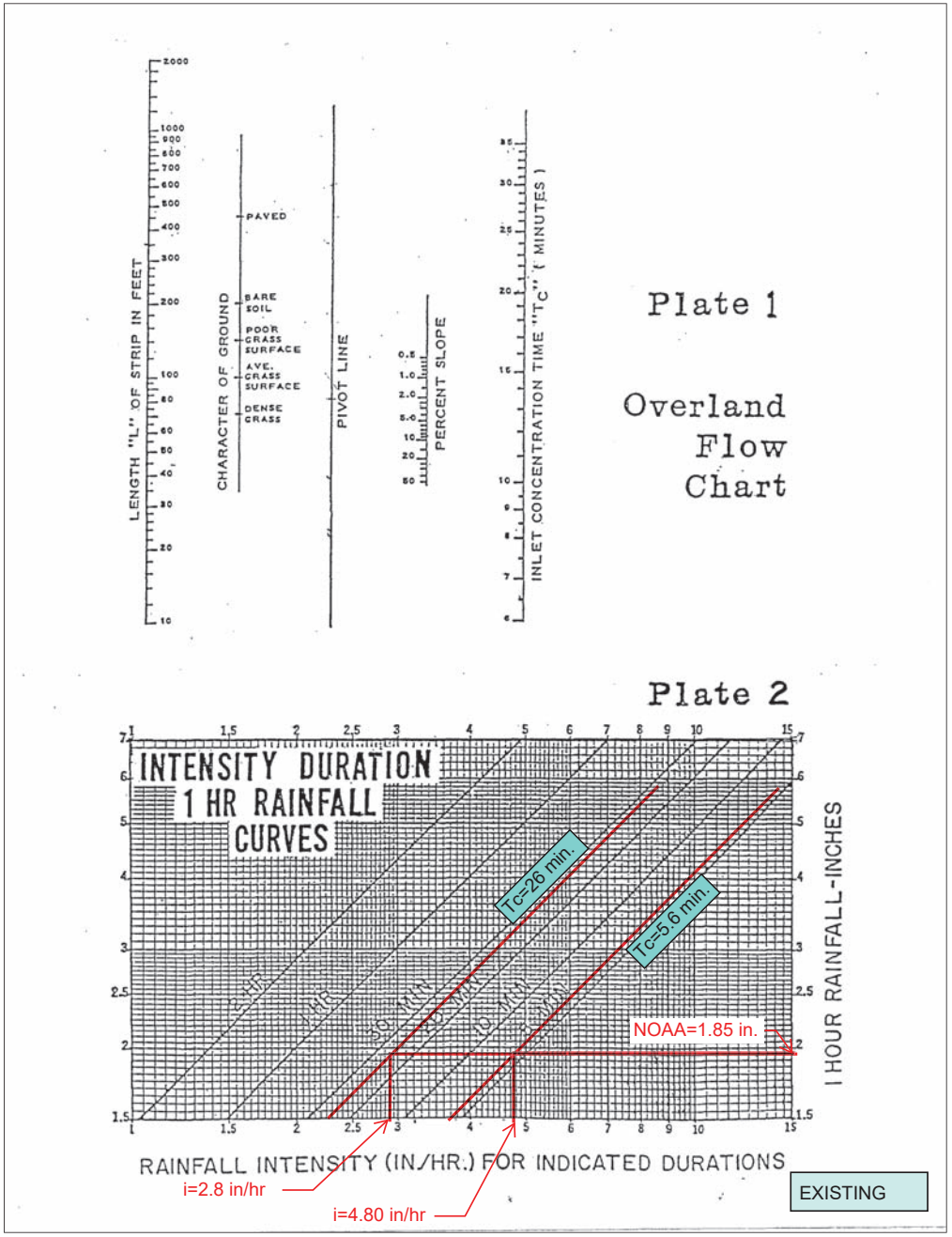
EXISTING CONDITION CN
SOIL GROUP C

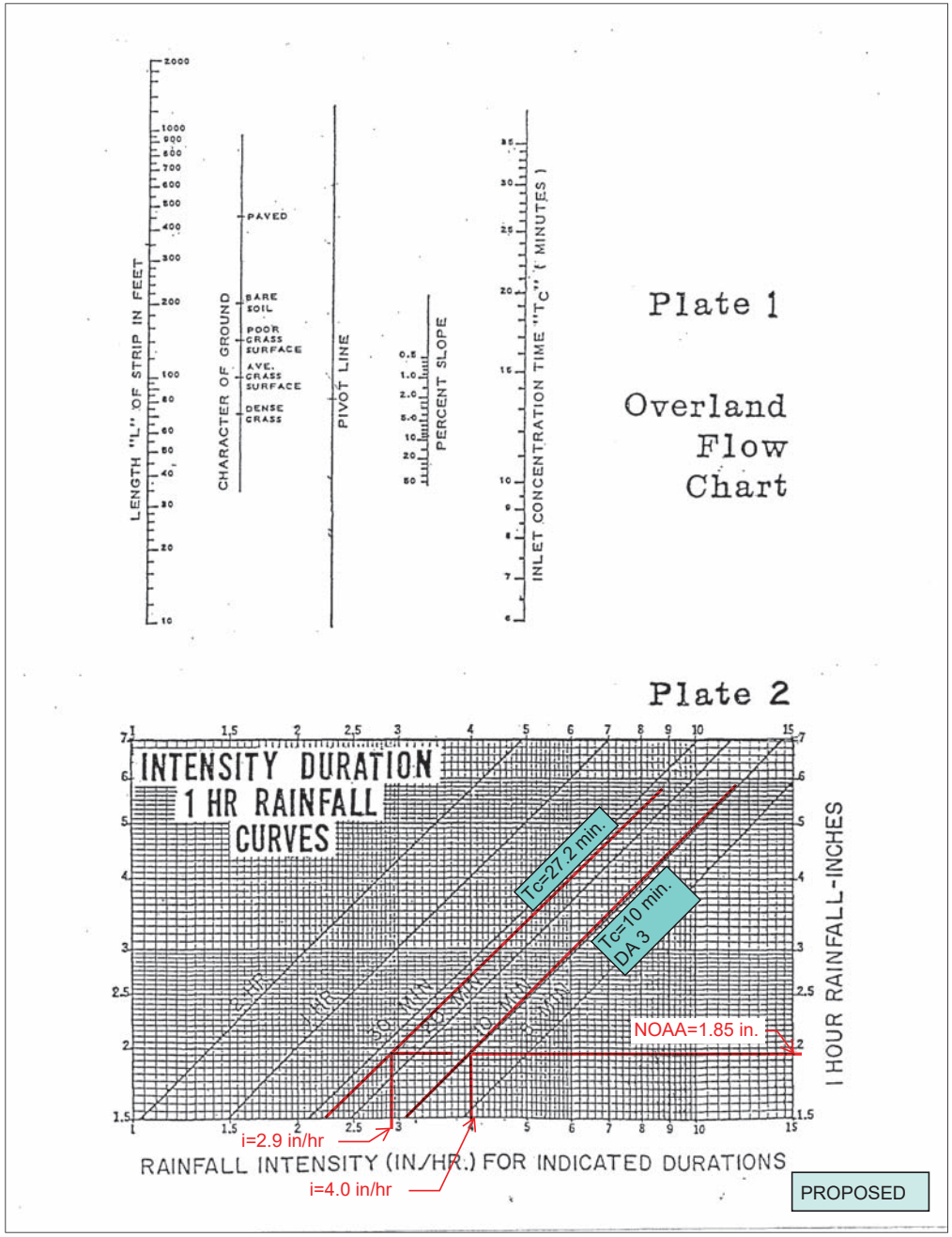
Table 2-2c Runoff curve numbers for other agricultural lands [1]

Cover description: Cover type	Hydrologic condition	Curve numbers for hydrologic soil group: A	B	C	D
Pasture, grassland, or range—continuous forage for grazing. [2]	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element. [3]	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30 [4]	48	65	73
Woods—grass combination (orchard or tree farm). [5]	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods. [6]	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30 [4]	55	70	77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

1 Average runoff condition, and $I_a = 0.2S$.
2 *Poor:* <50%) ground cover or heavily grazed with no mulch.
Fair: 50 to 75% ground cover and not heavily grazed.
Good: > 75% ground cover and lightly or only occasionally grazed.
3 *Poor:* <50% ground cover.
Fair: 50 to 75% ground cover.
Good: >75% ground cover.
4 Actual curve number is less than 30; use CN = 30 for runoff computations.
5 CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.
6 *Poor:* Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.
Fair: Woods are grazed but not burned, and some forest litter covers the soil.
Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

REF-489


LENGTH "L" OF STRIP IN FEET
CHARACTER OF GROUND
PAVED
BARE SOIL
POOR GRASS SURFACE
AVE. GRASS SURFACE
DENSE GRASS
PIVOT LINE
PERCENT SLOPE
INLET CONCENTRATION TIME "TC" (MINUTES)
Plate 1
Overland Flow Chart
Plate 2
INTENSITY DURATION 1 HR RAINFALL CURVES
Tc=26 min.
Tc=5.6 min.
NOAA=1.85 in.
I HOUR RAINFALL-INCHES
RAINFALL INTENSITY (IN/HR.) FOR INDICATED DURATIONS
i=2.8 in/hr
i=4.80 in/hr
EXISTING


LENGTH "L" OF STRIP IN FEET
CHARACTER OF GROUND
PAVED
BARE SOIL
POOR GRASS SURFACE
AVE. GRASS SURFACE
DENSE GRASS
PIVOT LINE
PERCENT SLOPE
INLET CONCENTRATION TIME "TC" (MINUTES)
Plate 1
Overland Flow Chart
Plate 2
INTENSITY DURATION 1 HR RAINFALL CURVES
Tc=27.2 min.
Tc=10 min.
DA 3
NOAA=1.85 in.
I HOUR RAINFALL-INCHES
RAINFALL INTENSITY (IN/HR.) FOR INDICATED DURATIONS
i=2.9 in/hr
i=4.0 in/hr
PROPOSED

REF-490

	(2.48-3.49)	(3.43-4.85)	(4.79-6.83)	(5.89-8.47)	(7.43-10.8)	(8.67-12.8)	(9.94-15.0)	(11.3-17.4)	(13.1-20.9)	(14.5-23.8)
4-day	**3.12** (2.64-3.71)	**4.32** (3.65-5.15)	**6.06** (5.09-7.24)	**7.47** (6.24-8.96)	**9.49** (7.86-11.5)	**11.2** (9.14-13.5)	**12.9** (10.5-15.8)	**14.8** (11.8-18.2)	**17.5** (13.7-21.8)	**19.8** (15.1-24.8)
7-day	**3.60** (3.03-4.28)	**4.96** (4.17-5.92)	**6.91** (5.78-8.24)	**8.47** (7.04-10.1)	**10.7** (8.78-12.8)	**12.4** (10.1-15.1)	**14.3** (11.5-17.4)	**16.3** (12.9-20.0)	**19.1** (14.8-23.6)	**21.4** (16.2-26.7)
10-day	**4.03** (3.43-4.74)	**5.55** (4.71-6.54)	**7.67** (6.48-9.06)	**9.36** (7.87-11.1)	**11.7** (9.74-13.9)	**13.6** (11.2-16.2)	**15.5** (12.6-18.7)	**17.6** (14.1-21.3)	**20.4** (16.0-25.0)	**22.7** (17.4-28.0)
20-day	**5.12** (4.36-6.04)	**7.01** (5.94-8.27)	**9.59** (8.09-11.3)	**11.6** (9.72-13.7)	**14.3** (11.9-17.1)	**16.4** (13.5-19.7)	**18.5** (15.1-22.4)	**20.8** (16.6-25.2)	**23.8** (18.6-29.2)	**26.1** (20.0-32.3)
30-day	**5.82** (4.94-6.85)	**7.94** (6.73-9.37)	**10.8** (9.14-12.8)	**13.1** (11.0-15.5)	**16.1** (13.4-19.2)	**18.4** (15.2-22.1)	**20.8** (16.9-25.1)	**23.3** (18.6-28.3)	**26.6** (20.8-32.6)	**29.1** (22.4-36.1)
45-day	**7.16** (6.08-8.42)	**9.77** (8.28-11.5)	**13.3** (11.2-15.7)	**16.0** (13.4-19.0)	**19.6** (16.3-23.4)	**22.3** (18.3-26.8)	**25.1** (20.4-30.3)	**27.9** (22.3-33.9)	**31.7** (24.8-38.9)	**34.5** (26.5-42.8)
60-day	**8.07** (6.85-9.50)	**11.0** (9.30-13.0)	**14.9** (12.5-17.6)	**17.8** (14.9-21.1)	**21.7** (18.0-25.9)	**24.7** (20.3-29.6)	**27.7** (22.5-33.4)	**30.7** (24.6-37.3)	**34.7** (27.1-42.6)	**37.7** (28.9-46.7)

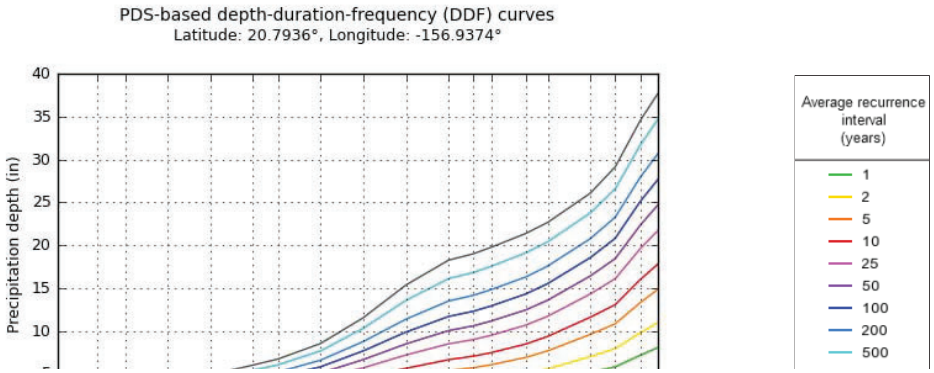
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical



NOAA Atlas 14, Volume 4, Version 3
Location name: Lanai City, Hawaii, USA*
Latitude: 20.7936°, Longitude: -156.9374°
Elevation: 1295.93 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

S. Perica, D. Martin, B. Lin, T. Parzybok, D. Riley, M. Yekta, L. Hiner, L.-C. Chen, D. Brewer, F. Yan, K. Maitaria, C. Trypaluk, G. M. Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

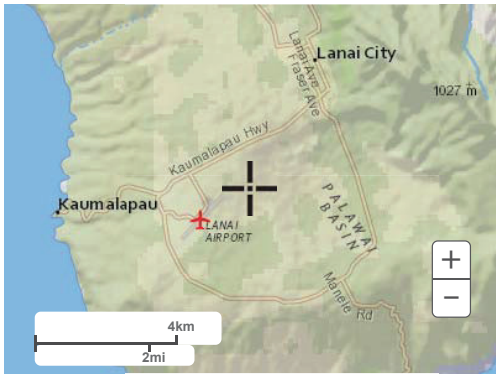
PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

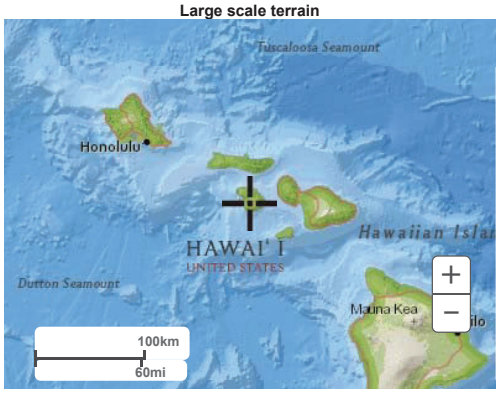
PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.235** (0.208-0.293)	**0.320** (0.260-0.388)	**0.440** (0.354-0.534)	**0.536** (0.430-0.655)	**0.679** (0.535-0.838)	**0.794** (0.621-0.992)	**0.918** (0.708-1.16)	**1.05** (0.798-1.35)	**1.25** (0.922-1.63)	**1.41** (1.02-1.88)
10-min	**0.349** (0.308-0.434)	**0.474** (0.386-0.575)	**0.652** (0.525-0.792)	**0.794** (0.638-0.971)	**1.01** (0.794-1.24)	**1.18** (0.921-1.47)	**1.36** (1.05-1.72)	**1.56** (1.18-2.00)	**1.85** (1.37-2.42)	**2.09** (1.51-2.78)
15-min	**0.438** (0.387-0.545)	**0.595** (0.485-0.722)	**0.819** (0.660-0.994)	**0.997** (0.801-1.22)	**1.26** (0.997-1.56)	**1.48** (1.16-1.85)	**1.71** (1.32-2.16)	**1.96** (1.49-2.51)	**2.33** (1.72-3.04)	**2.63** (1.90-3.49)
30-min	**0.616** (0.544-0.768)	**0.838** (0.682-1.02)	**1.15** (0.929-1.40)	**1.40** (1.13-1.72)	**1.78** (1.40-2.20)	**2.08** (1.63-2.60)	**2.41** (1.85-3.04)	**2.76** (2.09-3.54)	**3.27** (2.42-4.28)	**3.70** (2.67-4.91)
60-min	**0.811** (0.716-1.01)	**1.10** (0.898-1.34)	**1.52** (1.22-1.84)	**1.85** (1.48-2.26)	**2.34** (1.85-2.89)	**2.74** (2.14-3.42)	**3.17** (2.44-4.00)	**3.63** (2.75-4.65)	**4.31** (3.18-5.63)	**4.87** (3.51-6.47)
2-hr	**1.12** (0.952-1.33)	**1.48** (1.21-1.80)	**2.04** (1.64-2.48)	**2.47** (1.98-3.01)	**3.08** (2.44-3.80)	**3.58** (2.80-4.45)	**4.08** (3.15-5.14)	**4.63** (3.51-5.91)	**5.41** (3.99-7.04)	**6.02** (4.35-7.98)
3-hr	**1.25** (1.05-1.48)	**1.67** (1.36-2.02)	**2.29** (1.85-2.78)	**2.77** (2.23-3.38)	**3.47** (2.75-4.28)	**4.02** (3.15-5.01)	**4.59** (3.55-5.79)	**5.20** (3.94-6.64)	**6.04** (4.47-7.89)	**6.72** (4.86-8.92)
6-hr	**1.58** (1.31-1.88)	**2.09** (1.70-2.52)	**2.88** (2.32-3.49)	**3.50** (2.81-4.27)	**4.38** (3.48-5.41)	**5.08** (3.99-6.33)	**5.82** (4.49-7.34)	**6.59** (5.00-8.42)	**7.67** (5.66-10.0)	**8.53** (6.14-11.3)
12-hr	**1.96** (1.62-2.36)	**2.66** (2.16-3.22)	**3.68** (2.97-4.47)	**4.51** (3.62-5.51)	**5.69** (4.52-7.03)	**6.66** (5.22-8.29)	**7.67** (5.92-9.66)	**8.76** (6.64-11.2)	**10.3** (7.60-13.4)	**11.5** (8.30-15.3)
24-hr	**2.37** (1.98-2.82)	**3.26** (2.72-3.90)	**4.57** (3.80-5.47)	**5.64** (4.67-6.77)	**7.20** (5.90-8.69)	**8.48** (6.90-10.3)	**9.86** (7.92-12.0)	**11.4** (9.00-14.0)	**13.6** (10.5-16.8)	**15.4** (11.7-19.2)
2-day	**2.75** (2.32-3.27)	**3.82** (3.22-4.55)	**5.36** (4.50-6.41)	**6.65** (5.54-7.97)	**8.50** (7.01-10.2)	**10.0** (8.21-12.2)	**11.7** (9.43-14.3)	**13.5** (10.7-16.6)	**16.1** (12.5-20.0)	**18.2** (13.9-22.9)
3-day	**2.93**	**4.07**	**5.71**	**7.06**	**8.99**	**10.6**	**12.3**	**14.2**	**16.8**	**19.0**

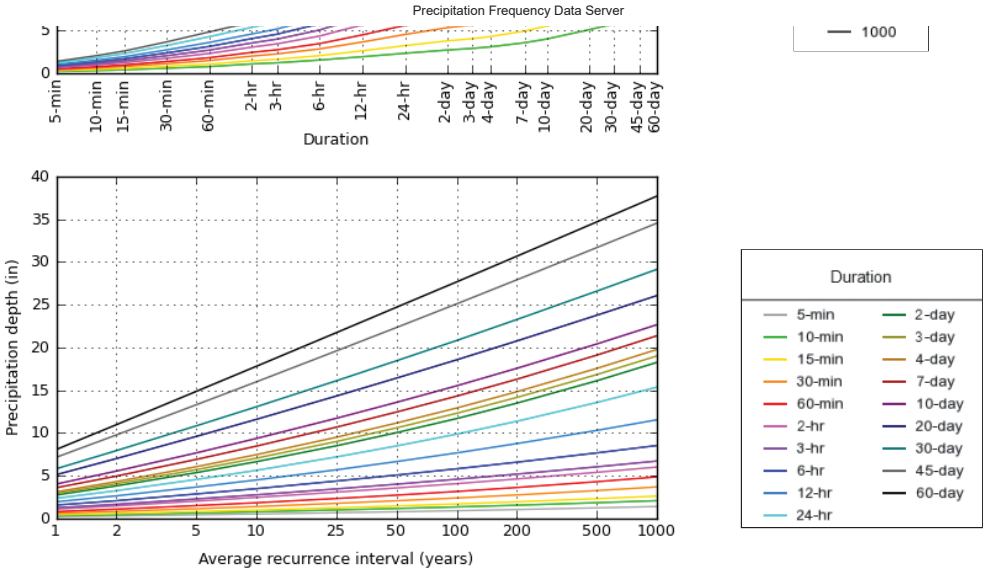
REF-491



Large scale terrain



Large scale map



NOAA Atlas 14, Volume 4, Version 3 Created (GMT): Sat Oct 20 20:28:31 2018

Back to Top

Maps & aerials

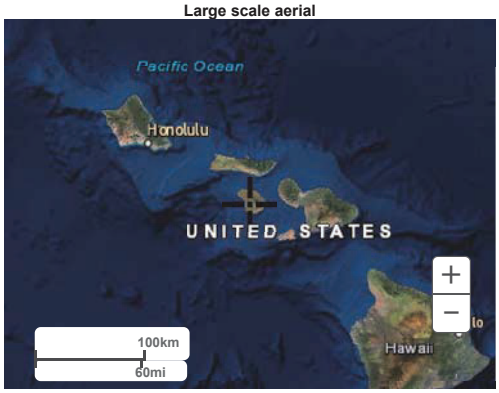
Small scale terrain

REF-492

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Large scale aerial



Back to Top

REF-493

NOAA Atlas 14, Volume 4, Version 3
Location name: Lanai City, Hawaii, USA*
Latitude: 20.7907°, Longitude: -156.9376°
Elevation: 1246.73 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

S. Perica, D. Martin, B. Lin, T. Parzybok, D. Riley, M. Yekta, L. Hiner, L.-C. Chen, D. Brewer, F. Yan, K. Maitaria, C. Trypaluk, G. M. Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	2.82 (2.50-3.52)	3.84 (3.12-4.66)	5.28 (4.25-6.41)	6.43 (5.16-7.86)	8.15 (6.42-10.1)	9.53 (7.45-11.9)	11.0 (8.50-13.9)	12.6 (9.58-16.2)	15.0 (11.1-19.6)	16.9 (12.2-22.5)
10-min	2.09 (1.85-2.60)	2.84 (2.32-3.45)	3.91 (3.15-4.75)	4.76 (3.83-5.83)	6.04 (4.76-7.45)	7.06 (5.53-8.83)	8.17 (6.29-10.3)	9.37 (7.10-12.0)	11.1 (8.20-14.5)	12.6 (9.05-16.7)
15-min	1.75 (1.55-2.18)	2.38 (1.94-2.89)	3.28 (2.64-3.98)	3.99 (3.20-4.88)	5.06 (3.99-6.24)	5.91 (4.63-7.39)	6.84 (5.27-8.63)	7.85 (5.94-10.0)	9.30 (6.87-12.2)	10.5 (7.58-14.0)
30-min	1.23 (1.09-1.54)	1.68 (1.36-2.03)	2.30 (1.86-2.80)	2.81 (2.25-3.43)	3.56 (2.81-4.39)	4.16 (3.26-5.20)	4.81 (3.71-6.08)	5.52 (4.18-7.07)	6.55 (4.83-8.56)	7.39 (5.33-9.83)
60-min	0.811 (0.716-1.01)	1.10 (0.898-1.34)	1.52 (1.22-1.84)	1.85 (1.48-2.26)	2.34 (1.85-2.89)	2.74 (2.14-3.42)	3.17 (2.44-4.00)	3.63 (2.75-4.65)	4.31 (3.18-5.63)	4.87 (3.51-6.47)
2-hr	0.561 (0.476-0.666)	0.742 (0.604-0.898)	1.02 (0.822-1.24)	1.24 (0.989-1.51)	1.54 (1.22-1.90)	1.79 (1.40-2.22)	2.04 (1.58-2.57)	2.31 (1.76-2.96)	2.70 (1.99-3.52)	3.01 (2.17-3.99)
3-hr	0.417 (0.350-0.494)	0.554 (0.452-0.671)	0.763 (0.615-0.925)	0.923 (0.742-1.13)	1.15 (0.915-1.43)	1.34 (1.05-1.67)	1.53 (1.18-1.93)	1.73 (1.31-2.21)	2.01 (1.49-2.63)	2.24 (1.62-2.97)
6-hr	0.263 (0.219-0.315)	0.349 (0.283-0.421)	0.480 (0.388-0.583)	0.584 (0.469-0.713)	0.731 (0.581-0.903)	0.849 (0.665-1.06)	0.971 (0.750-1.23)	1.10 (0.835-1.41)	1.28 (0.946-1.67)	1.43 (1.03-1.89)
12-hr	0.163 (0.134-0.196)	0.220 (0.179-0.267)	0.306 (0.247-0.371)	0.374 (0.301-0.457)	0.473 (0.375-0.584)	0.553 (0.433-0.688)	0.637 (0.491-0.802)	0.727 (0.551-0.928)	0.855 (0.631-1.11)	0.958 (0.689-1.27)
24-hr	0.099 (0.082-0.118)	0.136 (0.114-0.163)	0.190 (0.158-0.228)	0.235 (0.195-0.282)	0.300 (0.246-0.362)	0.353 (0.287-0.429)	0.411 (0.330-0.502)	0.474 (0.375-0.582)	0.565 (0.438-0.702)	0.640 (0.486-0.802)
2-day	0.057 (0.048-0.068)	0.080 (0.067-0.095)	0.112 (0.094-0.133)	0.138 (0.115-0.166)	0.177 (0.146-0.213)	0.209 (0.171-0.253)	0.243 (0.197-0.297)	0.281 (0.224-0.345)	0.335 (0.261-0.416)	0.380 (0.290-0.476)
3-day	0.041 (0.034-0.048)	0.057 (0.048-0.067)	0.079 (0.067-0.095)	0.098 (0.082-0.118)	0.125 (0.103-0.151)	0.147 (0.120-0.178)	0.171 (0.138-0.208)	0.197 (0.157-0.242)	0.234 (0.182-0.290)	0.264 (0.202-0.331)
4-day	0.032 (0.027-0.039)	0.045 (0.038-0.054)	0.063 (0.053-0.075)	0.078 (0.065-0.093)	0.099 (0.082-0.119)	0.116 (0.095-0.141)	0.135 (0.109-0.164)	0.154 (0.123-0.190)	0.183 (0.143-0.227)	0.206 (0.157-0.258)
7-day	0.021 (0.018-0.025)	0.030 (0.025-0.035)	0.041 (0.034-0.049)	0.050 (0.042-0.060)	0.064 (0.052-0.076)	0.074 (0.060-0.090)	0.085 (0.069-0.104)	0.097 (0.077-0.119)	0.114 (0.088-0.141)	0.127 (0.097-0.159)
10-day	0.017 (0.014-0.020)	0.023 (0.020-0.027)	0.032 (0.027-0.038)	0.039 (0.033-0.046)	0.049 (0.041-0.058)	0.057 (0.047-0.068)	0.065 (0.053-0.078)	0.073 (0.059-0.089)	0.085 (0.067-0.104)	0.094 (0.073-0.117)
20-day	0.011 (0.009-0.013)	0.015 (0.012-0.017)	0.020 (0.017-0.024)	0.024 (0.020-0.029)	0.030 (0.025-0.036)	0.034 (0.028-0.041)	0.039 (0.031-0.047)	0.043 (0.035-0.053)	0.049 (0.039-0.061)	0.054 (0.042-0.067)
30-day	0.008 (0.007-0.010)	0.011 (0.009-0.013)	0.015 (0.013-0.018)	0.018 (0.015-0.022)	0.022 (0.019-0.027)	0.026 (0.021-0.031)	0.029 (0.023-0.035)	0.032 (0.026-0.039)	0.037 (0.029-0.045)	0.040 (0.031-0.050)
45-day	0.007 (0.006-0.008)	0.009 (0.008-0.011)	0.012 (0.010-0.015)	0.015 (0.012-0.018)	0.018 (0.015-0.022)	0.021 (0.017-0.025)	0.023 (0.019-0.028)	0.026 (0.021-0.031)	0.029 (0.023-0.036)	0.032 (0.025-0.040)
60-day	0.006 (0.005-0.007)	0.008 (0.006-0.009)	0.010 (0.009-0.012)	0.012 (0.010-0.015)	0.015 (0.013-0.018)	0.017 (0.014-0.021)	0.019 (0.016-0.023)	0.021 (0.017-0.026)	0.024 (0.019-0.030)	0.026 (0.020-0.032)

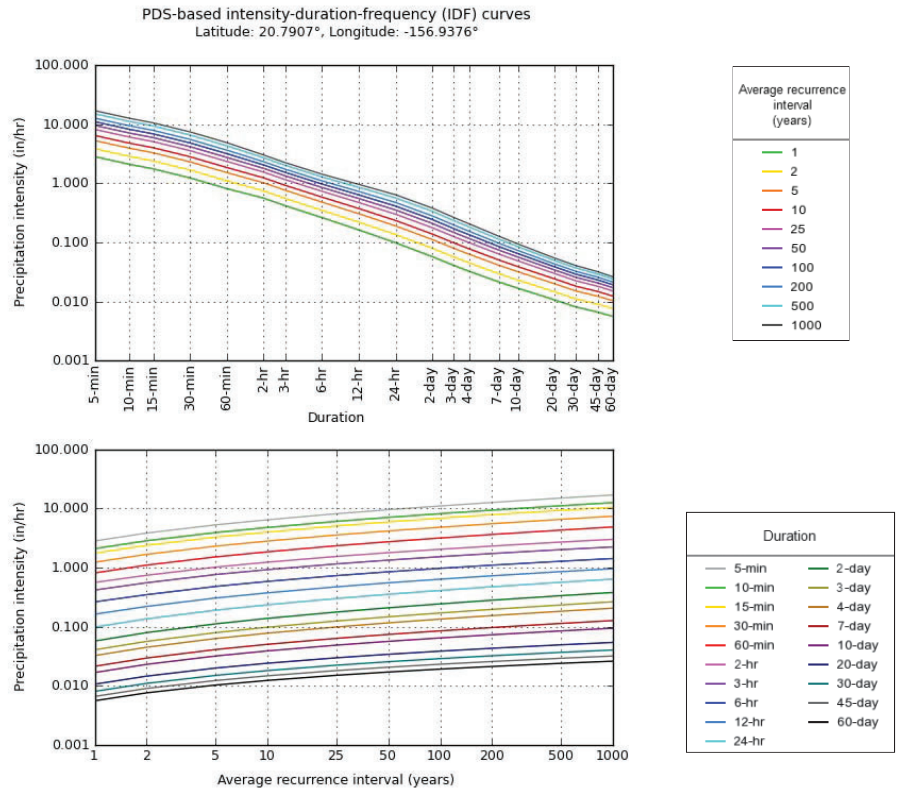
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical



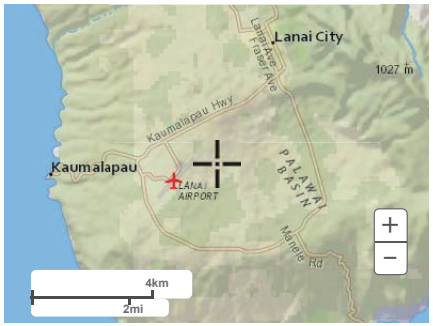
NOAA Atlas 14, Volume 4, Version 3 Created (GMT): Sun Oct 28 07:36:38 2018

Back to Top

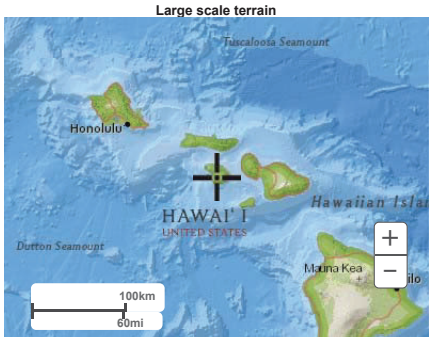
Maps & aerials

Small scale terrain

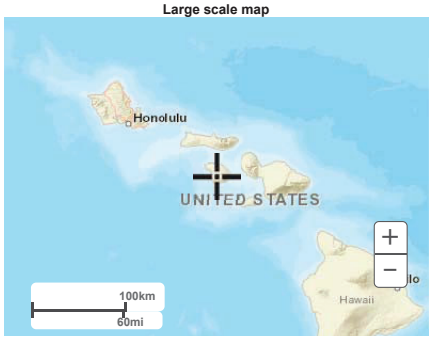
REF-494



Large scale terrain



Large scale map



Large scale aerial

Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

REF-495

Table 1

GUIDE FOR THE DETERMINATION OF RUNOFF COEFFICIENTS FOR BUILT-UP AREAS*

WATERSHED CHARACTERISTICS	EXTREME	HIGH	MODERATE	LOW
INFILTRATION	NEGLIGIBLE 0.20	SLOW 0.14	MEDIUM 0.07	HIGH 0.0
RELIEF	STEEP (> 25%) 0.08	HILLY (15-25%) 0.06	ROLLING (5-15%) 0.03	FLAT (0-5%) 0.0
VEGETAL COVER	NONE 0.07	POOR (< 10%) 0.05	GOOD (10-50%) 0.03	HIGH (50-90%) 0.0
DEVELOPMENT TYPE	INDUSTRIAL & BUSINESS 0.55	HOTEL-APARTMENT 0.45	RESIDENTIAL 0.40	AGRICULTURAL 0.15

NOTE: The design coefficient "c" must result from a total of the values for all four watershed characteristics of the site.

Table 2

RUNOFF COEFFICIENTS

Type of Drainage Area	Runoff Coefficient C
Business:	
Downtown areas	0.95
Neighborhood areas	0.70
Residential:	
Single-family areas	0.50
Multi-units, detached	0.60
Multi-units, attached	0.75
Suburban	0.40
Apartment dwelling areas	0.70
Industrial:	
Light areas	0.80
Heavy areas	0.90
Parks, cemeteries	0.25
Playgrounds	0.35
Railroad-yard areas	0.40
Unimproved areas	0.30
Streets:	
Asphaltic	0.95
Concrete	0.95
Brick	0.85
Drive and walks	0.85
Roofs	0.95
Lawns:	
Sandy, soil, flat, 2%	0.10
Sandy, soil, avg., 2-7%	0.15
Sandy, soil, steep, 7%	0.20
Heavy soil, flat, 2%	0.17
Heavy soil, avg., 2-7%	0.22
Heavy soil, steep, 7%	0.35

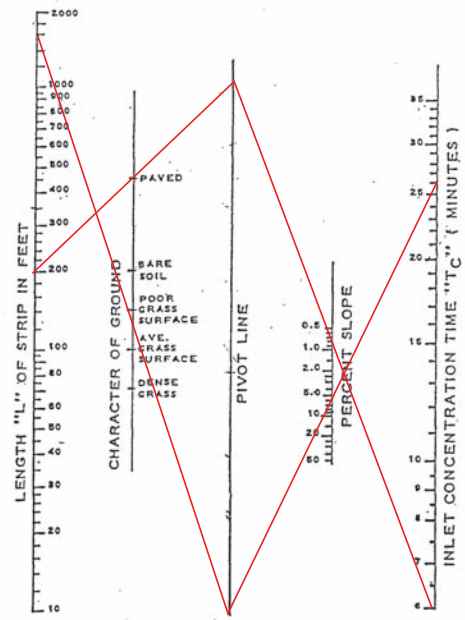
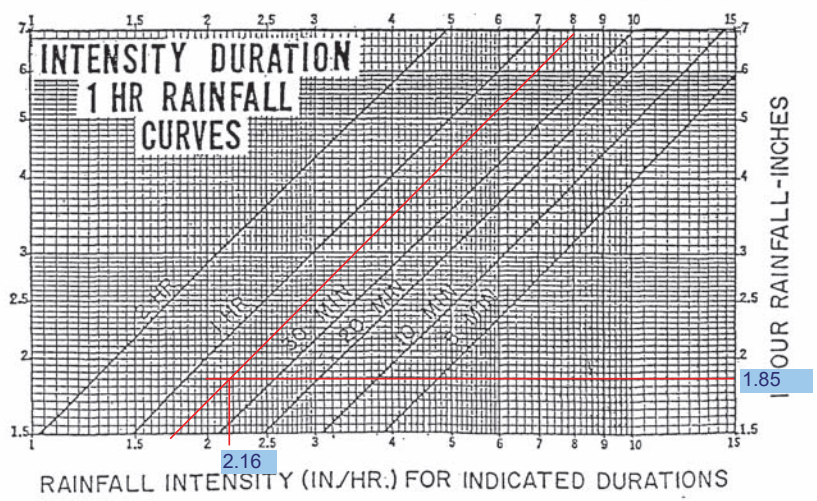


Plate 1

Overland Flow Chart

Plate 2



REF-496

HAWAI'I STATE PLAN – ASSESSMENT OF PROJECT APPLICABILITY TO GOALS, OBJECTIVES, AND POLICIES

APPENDIX

K-1

APPENDIX K-1

Analysis of Project Applicability to Hawai‘i State Plan

Chapter 226, HRS, also known as the Hawai‘i State Plan, is a long-range comprehensive plan which serves as a guide for the future long-term development of the State by identifying goals, objectives, policies, and priorities, as well as implementation mechanisms. The Plan consists of three (3) parts. Part I includes the Overall Theme, Goals, Objectives, and Policies; Part II includes Planning, Coordination, and Implementation; and Part III establishes Priority Guidelines. Inasmuch as Part II of the State Plan covers its administrative structure and implementation process, discussion of the proposed project's applicability to Part II is not appropriate. Below is an analysis of the project's applicability to Part I and Part III of the Hawai‘i State Plan.

The methodology for the analysis involves examining the project's applicability to the Hawai‘i State Plan's goals, objectives, and policies. "Applicability" refers to a project's need, purpose and effects, and how these advance or promote a particular set of goals, objectives and priority guidelines. In assessing the relationship between a proposed action and the Hawai‘i State Plan, an action may be categorized in one of the following groups:

1. **Directly applicable**: the action and its potential effects directly advances or promotes the objective, policy or priority guideline.

   Example: A county project to develop a new water source and related transmission facilities would be directly applicable to the objectives and policies for Facility Systems-Water (HRS 226-16) which states" *(5) Support water supply services to areas experiencing critical water problems.*

2. **Indirectly applicable**: the action and its potential effects indirectly supports or advances the objective, policy or priority guideline.

   Example: The county water source project cited above supports other related objectives and policies for the economy (HRS 226-6, General), which, by example, states: *(9) Strive to achieve a level of construction activity responsive to, and consistent with, state growth objectives.* In this case, the principle purpose of the project was not to create new construction activities, but nonetheless, supports this policy by creating temporary construction activity during the implementation of the project. In this instance, the proposed action may be deemed to be indirectly applicable to the objective and policy of the Hawai‘i State Plan.

3. **Not applicable**: the action and its potential effects have no direct or indirect relationship to the objectives and policies of the Hawai‘i State Plan.

Example: That same county water source improvement project referenced above, may not have direct or indirect linkage to objectives and policies for the economy-Federal Expenditures (HRS 226-9) which states: *(1) Encourage the sustained flow of federal expenditures in Hawaii that generates long-term government civilian employment*. From the standpoint of the agency proposing the water system improvement, and assuming no Federal Funding for the project, there is an unlikely intent that the proposed water source project would be connected to or reliant upon the foregoing policy. Hence, from the standpoint of judiciously applied policy analysis, the proposed action would be considered not applicable to the policy.

In general, a proposed action's applicability the objectives, policies and priority guidelines of the Hawai‘i State Plan is judged on the basis of the action's direct or indirect relationship to the respective objectives, policies and priority directions. It is recognized that the categorization of "applicability" is subject to interpretation and should be appropriately considered in the context of local and regional conditions.

Hawai‘i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies **Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable**	**DA**	**IA**	**NA**
HRS 226-1: Findings and Purpose			
HRS 226-2: Definitions			
HRS 226-3: Overall Theme			
HRS 226-4: State Goals. In order to guarantee, for the present and future generations, those elements of choice and mobility that insure that individuals and groups may approach their desired levels of self-reliance and self determination, it shall be the goal of the State to achieve: (1) A strong, viable economy, characterized by stability, diversity, and growth, that enables the fulfillment of the needs and expectations of Hawaii's present and future generations. (2) A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people. (3) Physical, social, and economic well-being, for individuals and families in Hawaii, that nourishes a sense of community responsibility, of caring, and of participation in community life.			
Analysis: **The proposed Miki Basin Expansion Project encompasses a planned industrial area designed to accommodate a diverse range of uses including traditional industrial uses, renewable energy products, and endeavors which advance new business ventures. In the context of a master planned complex, the proposed action ensures a strong and viable economy for the island of Lāna‘i, while addressing environmental and socio-economic needs of the island's residents.**			
Chapter 226-5 Objective and Policies for Population			
Objective: It shall be the objective in planning for the State's population to guide population growth to be consistent with the achievement of physical, economic and social objectives contained in this chapter.	✓		
Policies:			
(1) Manage population growth statewide in a manner that provides increased opportunities for Hawaii's people to pursue their physical, social, and economic aspirations while recognizing the unique needs of each county.		✓	
(2) Encourage an increase in economic activities and employment opportunities on the neighbor islands consistent with community needs and desires.	✓		

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	NA
(3) Promote increased opportunities for Hawaii's people to pursue their socio-economic aspirations throughout the islands.	✓		
(4) Encourage research activities and public awareness programs to foster an understanding of Hawaii's limited capacity to accommodate population needs and to address concerns resulting from an increase in Hawaii's population.		✓	
(5) Encourage federal actions and coordination among major governmental agencies to promote a more balanced distribution of immigrants among the states, provided that such actions do not prevent the reunion of immediate family members.			✓
(6) Pursue an increase in federal assistance for states with a greater proportion of foreign immigrants relative to their state's population.			✓
(7) Plan the development and availability of land and water resources in a coordinated manner so as to provide for the desired levels of growth in each geographic area.		✓	
Analysis: **The proposed actions are directly applicable to the goal of a strong economy as it will create new employment during the construction phase of project development. With the implementation of the project, long-term employment opportunities will also be created. The project will provide a land use hub where new business formation can be supported. In this regard, the proposed action provides opportunity for residents of Lāna'i to pursue their economic aspirations. Through the planning process, water resource requirements will be studied to ensure that project can be implemented within the capacity parameters of the island's water resources.**			
Chapter 226-6 Objectives and policies for the economy – – in general			
Objectives: Planning for the State's economy in general shall be directed toward achievement of the following objectives:			
(1) Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people, while at the same time stimulating the development and expansion of economic activities capitalizing on defense, dual-use, and science and technology assets, particularly on the neighbor islands where employment opportunities may be limited.		✓	
(2) A steadily growing and diversified economic base that is not overly dependent on a few industries, and includes the development and expansion of industries on the neighbor islands.	✓		
Policies:			
(1) Promote and encourage entrepreneurship within Hawaii by residents and nonresidents of the State.		✓	
(2) Expand Hawaii's national and international marketing, communication, and organizational ties, to increase the State's capacity to adjust to and capitalize upon economic changes and opportunities occurring outside the State.			✓
(3) Promote Hawaii as an attractive market for environmentally and socially sound investment activities that benefit Hawaii's people.			✓
(4) Transform and maintain Hawaii as a place that welcomes and facilitates innovative activity that may lead to commercial opportunities.			✓
(5) Promote innovative activity that may pose initial risks, but ultimately contribute to the economy of Hawaii.			✓

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	NA
(6) Seek broader outlets for new or expanded Hawaii business investments.			✓
(7) Expand existing markets and penetrate new markets for Hawaii's products and services.			✓
(8) Assure that the basic economic needs of Hawaii's people are maintained in the event of disruptions in overseas transportation.		✓	
(9) Strive to achieve a level of construction activity responsive to, and consistent with, state growth objectives.	✓		
(10) Encourage the formation of cooperatives and other favorable marketing arrangements at the local or regional level to assist Hawaii's small scale producers, manufacturers, and distributors.			✓
(11) Encourage labor-intensive activities that are economically satisfying and which offer opportunities for upward mobility.		✓	
(12) Encourage innovative activities that may not be labor-intensive, but may otherwise contribute to the economy of Hawaii.			✓
(13) Foster greater cooperation and coordination between the government and private sectors in developing Hawaii's employment and economic growth opportunities.			✓
(14) Stimulate the development and expansion of economic activities which will benefit areas with substantial or expected employment problems.			✓
(15) Maintain acceptable working conditions and standards for Hawaii's workers.		✓	
(16) Provide equal employment opportunities for all segments of Hawaii's population through affirmative action and nondiscrimination measures.		✓	
(17) Stimulate the development and expansion of economic activities capitalizing on defense, dual-use, and science and technology assets, particularly on the neighbor islands where employment opportunities may be limited.			✓
(18) Encourage businesses that have favorable financial multiplier effects within Hawaii's economy, particularly with respect to emerging industries in science and technology.			✓
(19) Promote and protect intangible resources in Hawaii, such as scenic beauty and the aloha spirit, which are vital to a healthy economy.			✓
(20) Increase effective communication between the educational community and the private sector to develop relevant curricula and training programs to meet future employment needs in general, and requirements of new or innovative potential growth industries in particular.			✓
(21) Foster a business climate in Hawaii--including attitudes, tax and regulatory policies, and financial and technical assistance programs-- that is conducive to the expansion of existing enterprises and the creation and attraction of new business and industry.			✓
Analysis: **The proposed action is directly and indirectly applicable to this objective and its related policies of increasing economic activities and supporting Hawaii's people to pursue their socio-economic aspirations. New employment opportunities will be available during the construction phase of project development. As well, permanent employment opportunities will be available once construction is completed and tenant business operations initiated. Such opportunities may include business ventures which advance entrepreneurship by local residents.**			

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	NA
Chapter 226-7 Objectives and policies for the economy – – agriculture.			
Objectives: Planning for the State's economy with regard to agriculture shall be directed towards achievement of the following objectives:			
(1) Viability of Hawaii's sugar and pineapple industries.			✓
(2) Growth and development of diversified agriculture throughout the State.			✓
(3) An agriculture industry that continues to constitute a dynamic and essential component of Hawaii's strategic, economic, and social well-being.			✓
Policies:			
(1) Establish a clear direction for Hawaii's agriculture through stakeholder commitment and advocacy.			✓
(2) Encourage agriculture by making the best use of natural resources.			✓
(3) Provide the governor and the legislature with information and options needed for prudent decision-making for the development of agriculture.			✓
(4) Establish strong relationships between the agricultural and visitor industries for mutual marketing benefits.			✓
(5) Foster increased public awareness and understanding of the contributions and benefits of agriculture as a major sector of Hawaii's economy.			✓
(6) Seek the enactment and retention of federal and state legislation that benefits Hawaii's agricultural industries.			✓
(7) Strengthen diversified agriculture by developing an effective promotion, marketing, and distribution system between Hawaii's food producers and consumers in the State, nation, and world.			✓
(8) Support research and development activities that strengthen economic productivity in agriculture, stimulate greater efficiency, and enhance the development of new products and agricultural by-products.			✓
(9) Enhance agricultural growth by providing public incentives and encouraging private initiatives.			✓
(10) Assure the availability of agriculturally suitable lands with adequate water to accommodate present and future needs.			✓
(11) Increase the attractiveness and opportunities for an agricultural education and livelihood.			✓
(12) In addition to the State's priority on food, expand Hawaii's agricultural base by promoting growth and development of flowers, tropical fruits and plants, livestock, feed grains, forestry, food crops, aquaculture, and other potential enterprises.		✓	
(13) Promote economically competitive activities that increase Hawaii's agricultural self-sufficiency, including the increased purchase and use of Hawaii-grown food and food products by residents, businesses, and governmental bodies as defined under section 103D-104.			✓
(14) Promote and assist in the establishment of sound financial programs for diversified agriculture.			✓

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	NA
(15) Institute and support programs and activities to assist the entry of displaced agricultural workers into alternative agricultural or other employment.			✓
(16) Facilitate the transition of agricultural lands in economically nonfeasible agricultural production to economically viable agricultural uses.			✓
(17) Perpetuate, promote, and increase use of traditional Hawaiian farming systems, such as the use of loko i'a, māla, and irrigated lo'i, and growth of traditional Hawaiian crops, such as kalo, 'uala, and 'ulu.			✓
(18) Increase and develop small-scale farms.			✓
Analysis: **The proposed action, in general, does not directly affect the economic objectives and policies for agriculture. In this regard, the project does not affect the viability of Hawaii's sugar and pineapple industries, and does not affect the growth and development of diversified agriculture throughout the State. As well, the project does not impact the agricultural industry's position as a dynamic and essential component of Hawaii' strategic, economic and social well- being. Notwithstanding, the potential for a new slaughterhouse to be implemented within the proposed project limits is supportive of livestock production activities which holds potential as an important economic activity on the island.**			
Chapter 226-8 Objective and policies for the economy – – visitor industry.			
Objective: Planning for the State's economy with regard to the visitor industry shall be directed towards the achievement of the objective of a visitor industry that constitutes a major component of steady growth for Hawaii's economy.			✓
Policies:			
(1) Support and assist in the promotion of Hawaii's visitor attractions and facilities.			✓
(2) Ensure that visitor industry activities are in keeping with the social, economic, and physical needs and aspirations of Hawaii's people.			✓
(3) Improve the quality of existing visitor destination areas by utilizing Hawaii's strengths in science and technology.			✓
(4) Encourage cooperation and coordination between the government and private sectors in developing and maintaining well-designed, adequately serviced visitor industry and related developments which are sensitive to neighboring communities and activities.			✓
(5) Develop the industry in a manner that will continue to provide new job opportunities and steady employment for Hawaii's people.			✓
(6) Provide opportunities for Hawaii's people to obtain job training and education that will allow for upward mobility within the visitor industry.			✓
(7) Foster a recognition of the contribution of the visitor industry to Hawaii's economy and the need to perpetuate the aloha spirit.			✓
(8) Foster an understanding by visitors of the aloha spirit and of the unique and sensitive character of Hawaii's cultures and values.			✓
Analysis: **The proposed action does not hold direct and indirect applicability to the objective and policies for the economy as it relates to the visitor industry. For example, the proposed action does not improve the quality of visitor destination areas, nor does it provide opportunity for upward mobility of residents in the visitor industry. Instead, the proposed action is intended to provide diversification opportunities related to renewable energy, existing industrial uses which may relocate to the project area, and new industrial ventures.**			

REF-500

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	NA
Chapter 226-9 Objective and policies for the economy – – federal expenditures.			
Objective: Planning for the State's economy with regard to federal expenditures shall be directed towards achievement of the objective of a stable federal investment base as an integral component of Hawaii's economy.			✓
Policies:			
(1) Encourage the sustained flow of federal expenditures in Hawaii that generates long-term government civilian employment;			✓
(2) Promote Hawaii's supportive role in national defense, in a manner consistent with Hawaii's social, environmental, and cultural goals by building upon dual-use and defense applications to develop thriving ocean engineering, aerospace research and development, and related dual-use technology sectors in Hawaii's economy;			✓
(3) Promote the development of federally supported activities in Hawaii that respect statewide economic concerns, are sensitive to community needs, and minimize adverse impacts on Hawaii's environment;			✓
(4) Increase opportunities for entry and advancement of Hawaii's people into federal government service;			✓
(5) Promote federal use of local commodities, services, and facilities available in Hawaii;			✓
(6) Strengthen federal-state-county communication and coordination in all federal activities that affect Hawaii; and			✓
(7) Pursue the return of federally controlled lands in Hawaii that are not required for either the defense of the nation or for other purposes of national importance, and promote the mutually beneficial exchanges of land between federal agencies, the State, and the counties.			✓
Analysis: **The proposed action does not hold direct and indirect applicability to the objective and policies for the economy as it relates to the federal expenditures.**			
Chapter 226-10 Objective and policies for the economy – – potential growth and innovative activities.			
Objective: Planning for the State's economy with regard to potential growth and innovative activities shall be directed towards achievement of the objective of development and expansion of potential growth and innovative activities that serve to increase and diversify Hawaii's economic base.		✓	
Policies:			
(1) Facilitate investment and employment growth in economic activities that have the potential to expand and diversify Hawaii's economy, including but not limited to diversified agriculture, aquaculture, renewable energy development, creative media, health care, and science and technology-based sectors;		✓	
(2) Facilitate investment in innovative activity that may pose risks or be less labor-intensive than other traditional business activity, but if successful, will generate revenue in Hawaii through the export of services or products or substitution of imported services or products;			✓
(3) Encourage entrepreneurship in innovative activity by academic researchers and instructors who may not have the background, skill, or initial inclination to commercially exploit their discoveries or achievements;			✓

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	NA
(4) Recognize that innovative activity is not exclusively dependent upon individuals with advanced formal education, but that many self-taught, motivated individuals are able, willing, sufficiently knowledgeable, and equipped with the attitude necessary to undertake innovative activity;			✓
(5) Increase the opportunities for investors in innovative activity and talent engaged in innovative activity to personally meet and interact at cultural, art, entertainment, culinary, athletic, or visitor-oriented events without a business focus;			✓
(6) Expand Hawaii's capacity to attract and service international programs and activities that generate employment for Hawaii's people;			✓
(7) Enhance and promote Hawaii's role as a center for international relations, trade, finance, services, technology, education, culture, and the arts;			✓
(8) Accelerate research and development of new energy-related industries based on wind, solar, ocean, underground resources, and solid waste;		✓	
(9) Promote Hawaii's geographic, environmental, social, and technological advantages to attract new or innovative economic activities into the State;			✓
(10) Provide public incentives and encourage private initiative to attract new or innovative industries that best support Hawaii's social, economic, physical, and environmental objectives;			✓
(11) Increase research and the development of ocean-related economic activities such as mining, food production, and scientific research;			✓
(12) Develop, promote, and support research and educational and training programs that will enhance Hawaii's ability to attract and develop economic activities of benefit to Hawaii;			✓
(13) Foster a broader public recognition and understanding of the potential benefits of new or innovative growth-oriented industry in Hawaii;			✓
(14) Encourage the development and implementation of joint federal and state initiatives to attract federal programs and projects that will support Hawaii's social, economic, physical, and environmental objectives;			✓
(15) Increase research and development of businesses and services in the telecommunications and information industries;			✓
(16) Foster the research and development of nonfossil fuel and energy efficient modes of transportation; and			✓
(17) Recognize and promote health care and health care information technology as growth industries.			✓
Analysis: **The proposed action does not have a direct relationship to economic objectives and policies relating to potential growth and innovative activities. However, it does have an indirect relationship to this policy area as the proposed action does support the development and expansion of a diversified economic base. In particular, the proposed action envisions the promotion of renewable energy activities as part of its land use portfolio.**			
Chapter 226-10.5 Objectives and policies for the economy – – information industry.			
Objective: Planning for the State's economy with regard to telecommunications and information technology shall be directed toward recognizing that broadband and wireless communication capability and infrastructure are foundations for an innovative economy and positioning Hawaii as a leader in broadband and wireless communications and applications in the Pacific Region.			✓

REF-501

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	NA
Policies:			
(1) Promote efforts to attain the highest speeds of electronic and wireless communication within Hawaii and between Hawaii and the world, and make high speed communication available to all residents and businesses in Hawaii;			✓
(2) Encourage the continued development and expansion of the telecommunications infrastructure serving Hawaii to accommodate future growth and innovation in Hawaii's economy;			✓
(3) Facilitate the development of new or innovative business and service ventures in the information industry which will provide employment opportunities for the people of Hawaii;			✓
(4) Encourage mainland- and foreign-based companies of all sizes, whether information technology-focused or not, to allow their principals, employees, or contractors to live in and work from Hawaii, using technology to communicate with their headquarters, offices, or customers located out-of-state;			✓
(5) Encourage greater cooperation between the public and private sectors in developing and maintaining a well-designed information industry;			✓
(6) Ensure that the development of new businesses and services in the industry are in keeping with the social, economic, and physical needs and aspirations of Hawaii's people;			✓
(7) Provide opportunities for Hawaii's people to obtain job training and education that will allow for upward mobility within the information industry;			✓
(8) Foster a recognition of the contribution of the information industry to Hawaii's economy; and			✓
(9) Assist in the promotion of Hawaii as a broker, creator, and processor of information in the Pacific.			✓
Analysis: **The objectives and policies for the economy as it relates to information technology are not directly or indirectly affected by the proposed action. The project is not anticipated to have a linkage to the development and enhancement of broadband and wireless communication capability and infrastructure, and is not an influencing factor in positioning Hawaii as a leader telecommunications and information technology in the Pacific Region.**			
Chapter 226-11 Objectives and policies for the physical environment – – land based, shoreline, and marine resources.			
Objectives: Planning for the State's physical environment with regard to land-based, shoreline, and marine resources shall be directed towards achievement of the following objectives:			
(1) Prudent use of Hawaii's land-based, shoreline, and marine resources.		✓	
(2) Effective protection of Hawaii's unique and fragile environmental resources.			✓
Policies:			
(1) Exercise an overall conservation ethic in the use of Hawaii's natural resources.		✓	
(2) Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.		✓	
(3) Take into account the physical attributes of areas when planning and designing activities and facilities.		✓	

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	NA
(4) Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.			✓
(5) Consider multiple uses in watershed areas, provided such uses do not detrimentally affect water quality and recharge functions.			✓
(6) Encourage the protection of rare or endangered plant and animal species and habitats native to Hawaii.		✓	
(7) Provide public incentives that encourage private actions to protect significant natural resources from degradation or unnecessary depletion.			✓
(8) Pursue compatible relationships among activities, facilities, and natural resources.			✓
(9) Promote increased accessibility and prudent use of inland and shoreline areas for public recreational, educational, and scientific purposes.			✓
Analysis: **The proposed action has both direct and indirect relationships to the objective and policies for the physical environment as it relates to land-based, shoreline, and marine resources. While the project is not located in proximity to the shoreline, attention will be given to ensure that impacts of land-based activities do not detrimentally affect natural resources, including parameters of water quality, marine habitats, and related ecological systems. The biological resources study conducted as part of the environmental review process represents an effort to protect any rare and endangered plant and animal species, and their habitats native to Hawai'i that may be present in the vicinity of the proposed action. In addition, preliminary engineering analysis has identified Best Management Practices (BMPs) intended to protect the environment from the adverse effects of construction.**			
Chapter 226-12 Objective and policies for the physical environment – – scenic, natural beauty, and historic resources.			
Objective: Planning for the State's physical environment shall be directed towards achievement of the objective of enhancement of Hawaii's scenic assets, natural beauty, and multi-cultural/historical resources.		✓	
Policies:			
(1) Promote the preservation and restoration of significant natural and historic resources.		✓	
(2) Provide incentives to maintain and enhance historic, cultural, and scenic amenities.			✓
(3) Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.			✓
(4) Protect those special areas, structures, and elements that are an integral and functional part of Hawaii's ethnic and cultural heritage.			✓
(5) Encourage the design of developments and activities that complement the natural beauty of the islands.	✓		
Analysis: **The objectives and policies for the physical environment (scenic, natural beauty, and historic resources) are directly and indirectly applicable to the proposed action. An archaeological inventory survey and a cultural impact assessment were undertaken for the project. These studies are aimed at identifying valued resources and practices which should be addressed and respected as part of the project development process. The project site is not part of a scenic corridor and will not affect scenic vistas or view planes.**			

REF-502

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	NA
Chapter 226-13 Objectives and policies for the physical environment – – land, air, and water quality.			
Objectives: Planning for the State's physical environment with regard to land, air, and water quality shall be directed towards achievement of the following objectives.			
(1) Maintenance and pursuit of improved quality in Hawaii's land, air, and water resources.	✓		
(2) Greater public awareness and appreciation of Hawaii's environmental resources.		✓	
Policies:			
(1) Foster educational activities that promote a better understanding of Hawaii's limited environmental resources.			✓
(2) Promote the proper management of Hawaii's land and water resources.		✓	
(3) Promote effective measures to achieve desired quality in Hawaii's surface, ground, and coastal waters.			✓
(4) Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawaii's people.		✓	
(5) Reduce the threat to life and property from erosion, flooding, tsunamis, hurricanes, earthquakes, volcanic eruptions, and other natural or man-induced hazards and disasters.	✓		
(6) Encourage design and construction practices that enhance the physical qualities of Hawaii's communities.			✓
(7) Encourage urban developments in close proximity to existing services and facilities.	✓		
(8) Foster recognition of the importance and value of the land, air, and water resources to Hawaii's people, their cultures and visitors.			✓
Analysis: **The proposed action has both direct and indirect relationships to the objective and policies for the physical environment, land, air, and water quality. The proposed project will be implemented in proximity to existing infrastructure and services at Miki Basin and the nearby Lāna'i Airport. Construction BMPs will be used to manage and control erosion during grading operations to minimize downstream water quality impacts. Work on the project is not anticipated to be affected by natural hazards, and industry standard design and construction practices have been and will be employed for the project. DISCUSSION FROM HYDROGEOLOGICAL STUDY TO BE ADDED UPON RECEIPT**			
Chapter 226-14 Objective and policies for facility systems – – in general.			
Objective: Planning for the State's facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal, and energy and telecommunication systems that support statewide social, economic, and physical objectives.		✓	
Policies:			
(1) Accommodate the needs of Hawaii's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.		✓	
(2) Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities.		✓	

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	NA
(3) Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user.		✓	
(4) Pursue alternative methods of financing programs and projects and cost-saving techniques in the planning, construction, and maintenance of facility systems.		✓	
Analysis: **Facility system objectives and policies refers to water, transportation, waste disposal, energy and telecommunications systems. These facility policies are indirectly applicable to the proposed action. In general, water, transportation, waste disposal, and energy system capacities must be available to service the proposed action. Where improvements are needed, the applicant would be responsible for providing the requisite upgrades, in accordance with agency design standards.**			
Chapter 226-15 Objectives and policies for facility systems – – solid and liquid waste.			
Objectives: Planning for the State's facility systems with regard to solid and liquid wastes shall be directed towards the achievement of the following objectives:			
(1) Maintenance of basic public health and sanitation standards relating to treatment and disposal of solid and liquid wastes.		✓	
(2) Provision of adequate sewerage facilities for physical and economic activities that alleviate problems in housing, employment, mobility, and other areas.	✓		
Policies:			
(1) Encourage the adequate development of sewerage facilities that complement planned growth.	✓		
(2) Promote re-use and recycling to reduce solid and liquid wastes and employ a conservation ethic.	✓		
(3) Promote research to develop more efficient and economical treatment and disposal of solid and liquid wastes.		✓	
Analysis: **The proposed action has applicability, both direct and indirect to the objective and policies for solid and liquid wastes. The applicant will be responsible for providing code compliant wastewater systems. As well, the project contractor will be responsible for managing construction waste disposal in accordance with policies of the Solid Waste Division of the Department of Environmental Management. Once the project is completed, tenants will be responsible for managing private solid waste collection services for their respective enterprises. In this regard, each tenant shall be responsible for supporting a conservation ethic through operations which encourage reuse and recycling.**			
Chapter 226-16 Objective and policies for facility systems – – water.			
Objective: Planning for the State's facility systems with regard to water shall be directed towards achievement of the objective of the provision of water to adequately accommodate domestic, agricultural, commercial, industrial, recreational, and other needs within resource capacities.	✓		
Policies:			
(1) Coordinate development of land use activities with existing and potential water supply.	✓		
(2) Support research and development of alternative methods to meet future water requirements well in advance of anticipated needs.			✓
(3) Reclaim and encourage the productive use of runoff water and wastewater discharges.			✓

REF-503

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	NA
(4) Assist in improving the quality, efficiency, service, and storage capabilities of water systems for domestic and agricultural use.		✓	
(5) Support water supply services to areas experiencing critical water problems.		✓	
(6) Promote water conservation programs and practices in government, private industry, and the general public to help ensure adequate water to meet long-term needs.	✓		
Analysis: **The objective and policies for facility systems—water, are directly and indirectly applicable to the proposed project. The applicant's engineer will coordinate with the Lana'i Water Company and the Department of Water Supply, as applicable, to ensure the adequacy of supply and transmission/distribution capacity. In addition, the design and operation of individual tenant facilities will include measures which will promote the conservation of water resources.**			
Chapter 226-17 Objectives and policies for facility systems – – transportation.			
Objectives: Planning for the State's facility systems with regard to transportation shall be directed towards the achievement of the following objectives:			
(1) An integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods.			✓
(2) A statewide transportation system that is consistent with and will accommodate planned growth objectives throughout the State.			✓
Policies:			
(1) Design, program, and develop a multi-modal system in conformance with desired growth and physical development as stated in this chapter;			✓
(2) Coordinate state, county, federal, and private transportation activities and programs toward the achievement of statewide objectives;			✓
(3) Encourage a reasonable distribution of financial responsibilities for transportation among participating governmental and private parties;			✓
(4) Provide for improved accessibility to shipping, docking, and storage facilities;			✓
(5) Promote a reasonable level and variety of mass transportation services that adequately meet statewide and community needs;			✓
(6) Encourage transportation systems that serve to accommodate present and future development needs of communities;			✓
(7) Encourage a variety of carriers to offer increased opportunities and advantages to interisland movement of people and goods;			✓
(8) Increase the capacities of airport and harbor systems and support facilities to effectively accommodate transshipment and storage needs;			✓
(9) Encourage the development of transportation systems and programs which would assist statewide economic growth and diversification;			✓
(10) Encourage the design and development of transportation systems sensitive to the needs of affected communities and the quality of Hawaii's natural environment;			✓
(11) Encourage safe and convenient use of low-cost, energy-efficient, non-polluting means of transportation;			✓

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	NA
(12) Coordinate intergovernmental land use and transportation planning activities to ensure the timely delivery of supporting transportation infrastructure in order to accommodate planned growth objectives; and			✓
(13) Encourage diversification of transportation modes and infrastructure to promote alternate fuels and energy efficiency.			✓
Analysis: **The proposed action is not directly or indirectly applicable to the objectives and policies for facility systems—transportation. For example, the project will not affect ocean and air transportation systems, nor will it affect intergovernmental coordination relating to transportation planning. In general, the proposed action does not promote the development of an integrated statewide multi-modal transportation system.**			
Chapter 226-18 Objectives and policies for facility systems – – energy.			
Objectives: Planning for the State's facility systems with regard to energy shall be directed toward the achievement of the following objectives, giving due consideration to all:			
(1) Dependable, efficient, and economical statewide energy systems capable of supporting the needs of the people;		✓	
(2) Increased energy security and self-sufficiency through the reduction and ultimate elimination of Hawaii's dependence on imported fuels for electrical generation and ground transportation.	✓		
(3) Greater diversification of energy generation in the face of threats to Hawaii's energy supplies and systems;	✓		
(4) Reduction, avoidance, or sequestration of greenhouse gas emissions from energy supply and use; and	✓		
(5) Utility models that make the social and financial interests of Hawaii's utility customers a priority.			✓
Policies:			
(b) To achieve the energy objectives, it shall be the policy of this State to ensure the short- and long-term provision of adequate, reasonably prices, and dependable energy services to accommodate demand.			✓
(1) Support research and development as well as promote the use of renewable energy sources;	✓		
(2) Ensure that the combination of energy supplies and energy-saving systems is sufficient to support the demands of growth;		✓	
(3) Base decisions of least-cost supply-side and demand-side energy resource options on a comparison of their total costs and benefits when a least-cost is determined by a reasonably comprehensive, quantitative, and qualitative accounting of their long-term, direct and indirect economic, environmental, social, cultural, and public health costs and benefits;			✓
(4) Promote all cost-effective conservation of power and fuel supplies through measures, including:		✓	
(A) Development of cost-effective demand-side management programs;		✓	
(B) Education;			✓
(C) Adoption of energy-efficient practices and technologies; and		✓	

REF-504

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	NA
(D) Increasing energy efficiency and decreasing energy use in public infrastructure			✓
(5) Ensure, to the extent that new supply-side resources are needed, that the development or expansion of energy systems uses the least-cost energy supply option and maximizes efficient technologies; and			✓
(6) Support research, development, demonstration, and use of energy efficiency, load management, and other demand-side management programs, practices, and technologies;			✓
(7) Promote alternate fuels and transportation energy efficiency;			✓
(8) Support actions that reduce, avoid, or sequester greenhouse gases in utility, transportation, and industrial sector applications;	✓		
(9) Support actions that reduce, avoid, or sequester Hawaii's greenhouse gas emissions through agriculture and forestry initiatives;			✓
(10) Provide priority handling and processing for all state and county permits required for renewable energy projects;			✓
(11) Ensure that liquefied natural gas is used only as a cost-effective transitional, limited-term replacement of petroleum for electricity generation and does not impede the development and use of other cost-effective renewable energy sources; and			✓
(12) Promote the development of indigenous geothermal energy resources that are located on public trust land as an affordable and reliable source of firm power for Hawaii.			✓
Analysis: **The proposed action has direct and indirect applicability to the objectives and policies for facility systems—energy. The proposed project will include 127 acres of land dedicated to renewable energy for the island of Lāna'i. As well, energy savings technologies will be employed during the operations phase of the project to the extent practicable. Such technologies relate to the use of high efficiency HVAC systems as well as energy efficient refrigeration systems in storage operations. The above actions are considered supportive of polices aimed at reducing greenhouse gases. Broader policies for energy savings such as those relating to transportation energy efficiency, priority processing of permits and geothermal energy resources are not applicable to the proposed action.**			
Chapter 226-18.5 Objectives and policies for facility systems – – telecommunications.			
Objectives: Planning for the State's telecommunications facility systems shall be directed towards the achievement of dependable, efficient, and economical statewide telecommunications systems capable of supporting the needs of the people.			
Policies:			
(b) To achieve the telecommunications objective, it shall be the policy of this State to ensure the provision of adequate, reasonably priced, and dependable telecommunications services to accommodate demand.			✓
(1) Facilitate research and development of telecommunications systems and resources;			✓
(2) Encourage public and private sector efforts to develop means for adequate, ongoing telecommunications planning;			✓
(3) Promote efficient management and use of existing telecommunications systems and services; and			✓

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	NA
(4) Facilitate the development of education and training of telecommunications personnel.			✓
Analysis: **The proposed action does not hold direct or indirect applicability to the objectives and policies for facility systems—telecommunications. For example, the project does not promote or advance research and development of telecommunications systems and resources, nor does it promote efficient management of existing telecommunications systems and services.**			
Chapter 226-19 Objectives and policies for socio-cultural advancement – – housing.			
Objectives: Planning for the State's socio-cultural advancement with regard to housing shall be directed toward the achievement of the following objectives:			✓
(1) Greater opportunities for Hawaii's people to secure reasonably priced, safe, sanitary, and livable homes, located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals, through collaboration and cooperation between government and nonprofit and for-profit developers to ensure that more affordable housing is made available to very low-, low- and moderate-income segments of Hawaii's population.			✓
(2) The orderly development of residential areas sensitive to community needs and other land uses.			✓
(3) The development and provision of affordable rental housing by the State to meet the housing needs of Hawaii's people.			✓
Policies:			
(1) Effectively accommodate the housing needs of Hawaii's people.			✓
(2) Stimulate and promote feasible approaches that increase housing choices for low-income, moderate-income, and gap-group households.			✓
(3) Increase homeownership and rental opportunities and choices in terms of quality, location, cost, densities, style, and size of housing.			✓
(4) Promote appropriate improvement, rehabilitation, and maintenance of existing housing units and residential areas.			✓
(5) Promote design and location of housing developments taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas.			✓
(6) Facilitate the use of available vacant, developable, and underutilized urban lands for housing.			✓
(7) Foster a variety of lifestyles traditional to Hawaii through the design and maintenance of neighborhoods that reflect the culture and values of the community.			✓
(8) Promote research and development of methods to reduce the cost of housing construction in Hawaii.			✓
Analysis: **The objectives and policies for socio-cultural advancement—housing are not applicable to the proposed action. As a planned industrial area for the island of Lana'i, there are no project-related plans directed towards the achievement of providing reasonably priced, safe, sanitary, and livable homes, nor are there project-related incentives which would advance the orderly development of residential areas, including affordable rental properties. From a policy standpoint, the proposed action does not promote rehabilitation and maintenance of existing housing nor does it promote research and development of methods to reduce housing construction.**			

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	NA
Chapter 226-20 Objectives and policies for socio-cultural advancement – – health.			
Objectives: Planning for the State's socio-cultural advancement with regard to health shall be directed towards achievement of the following objectives:			
(1) Fulfillment of basic individual health needs of the general public.			✓
(2) Maintenance of sanitary and environmentally healthful conditions in Hawaii's communities.			✓
(3) Elimination of health disparities by identifying and addressing social determinants of health.			✓
Policies:			
(1) Provide adequate and accessible services and facilities for prevention and treatment of physical and mental health problems, including substance abuse.			✓
(2) Encourage improved cooperation among public and private sectors in the provision of health care to accommodate the total health needs of individuals throughout the State.			✓
(3) Encourage public and private efforts to develop and promote statewide and local strategies to reduce health care and related insurance costs.			✓
(4) Foster an awareness of the need for personal health maintenance and preventive health care through education and other measures.			✓
(5) Provide programs, services, and activities that ensure environmentally healthful and sanitary conditions.			✓
(6) Improve the State's capabilities in preventing contamination by pesticides and other potentially hazardous substances through increased coordination, education, monitoring, and enforcement.			✓
(7) Prioritize programs, services, interventions, and activities that address identified social determinants of health to improve native Hawaiian health and well-being consistent with the United States Congress' declaration of policy as codified in title 42 United States Code section 11702, and to reduce health disparities of disproportionately affected demographics, including native Hawaiians, other Pacific Islanders, and Filipinos. The prioritization of affected demographic groups other than native Hawaiians may be reviewed every ten years and revised based on the best available epidemiological and public health data.			✓
Analysis: **The objectives and policies for socio-cultural advancement—health, do not have direct and indirect applicability to the proposed project. The action does not address health disparities or conditions of health in Hawaii's communities. For example, the project does not have a direct and indirect relationship to the policy of reducing health care and insurance costs, nor does it have a relationship to the adequacy and accessibility to services and facilities for addressing mental health needs.**			
Chapter 226-21 Objectives and policies for Socio-cultural advancement – – education.			
Objective: Planning for the State's socio-cultural advancement with regard to education shall be directed towards achievement of the objective of the provision of a variety of educational opportunities to enable individuals to fulfill their needs, responsibilities, and aspirations.		✓	

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	NA
Policies:			
(1) Support educational programs and activities that enhance personal development, physical fitness, recreation, and cultural pursuits of all groups.		✓	
(2) Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs.			✓
(3) Provide appropriate educational opportunities for groups with special needs.			✓
(4) Promote educational programs which enhance understanding of Hawaii's cultural heritage.			✓
(5) Provide higher educational opportunities that enable Hawaii's people to adapt to changing employment demands.			✓
(6) Assist individuals, especially those experiencing critical employment problems or barriers, or undergoing employment transitions, by providing appropriate employment training programs and other related educational opportunities.			✓
(7) Promote programs and activities that facilitate the acquisition of basic skills, such as reading, writing, computing, listening, speaking, and reasoning.			✓
(8) Emphasize quality educational programs in Hawaii's institutions to promote academic excellence.			✓
(9) Support research programs and activities that enhance the education programs of the State.			✓
Analysis: **The objectives and policies for socio-cultural advancement—education have indirect applicability to the proposed project. For example, the uses envisioned to be located within the proposed project, such renewable energy initiatives will require employee training programs to ensure the effective conduct of operations. Other education-related policies of the Hawai'i State Plan, however, are not applicable to the proposed action, including policies related to educational programs promoting academic excellence.**			
Chapter 226-22 Objective and policies for socio-cultural advancement – – social services.			
Objective: Planning for the State's socio-cultural advancement with regard to social services shall be directed towards the achievement of the objective of improved public and private social services and activities that enable individuals, families, and groups to become more self-reliant and confident to improve their well-being.			✓
Policies:			
(1) Assist individuals, especially those in need of attaining a minimally adequate standard of living and those confronted by social and economic hardship conditions, through social services and activities within the State's fiscal capacities.			✓
(2) Promote coordination and integrative approaches among public and private agencies and programs to jointly address social problems that will enable individuals, families, and groups to deal effectively with social problems and to enhance their participation in society.			✓
(3) Facilitate the adjustment of new residents, especially recently arrived immigrants, into Hawaii's communities.			✓
(4) Promote alternatives to institutional care in the provision of long-term care for elder and disabled populations.			✓

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	NA
(5) Support public and private efforts to prevent domestic abuse and child molestation, and assist victims of abuse and neglect.			✓
(6) Promote programs which assist people in need of family planning services to enable them to meet their needs.			✓
Analysis: **The proposed action does not hold direct or indirect relationships to the objectives and policies for socio-cultural advancement--social services. The project will not affect programs related to victims of abuse and neglect, nor will affect the State's capacity to promote long-term care for elder and disabled populations. In general, the proposed action will not advance programs to improve public and private social services and activities.**			
Chapter 226-23 Objective and policies for socio-cultural advancement – – leisure.			
Objective: Planning for the State's socio-cultural advancement with regard to leisure shall be directed towards the achievement of the objective of the adequate provision of resources to accommodate diverse cultural, artistic, and recreational needs for present and future generations.			✓
Policies:			
(1) Foster and preserve Hawaii's multi-cultural heritage through supportive cultural, artistic, recreational, and humanities-oriented programs and activities.			✓
(2) Provide a wide range of activities and facilities to fulfill the cultural, artistic, and recreational needs of all diverse and special groups effectively and efficiently.			✓
(3) Enhance the enjoyment of recreational experiences through safety and security measures, educational opportunities, and improved facility design and maintenance.			✓
(4) Promote the recreational and educational potential of natural resources having scenic, open space, cultural, historical, geological, or biological values while ensuring that their inherent values are preserved.			✓
(5) Ensure opportunities for everyone to use and enjoy Hawaii's recreational resources.			✓
(6) Assure the availability of sufficient resources to provide for future cultural, artistic, and recreational needs.			✓
(7) Provide adequate and accessible physical fitness programs to promote the physical and mental well-being of Hawaii's people.			✓
(8) Increase opportunities for appreciation and participation in the creative arts, including the literary, theatrical, visual, musical, folk, and traditional art forms.			✓
(9) Encourage the development of creative expression in the artistic disciplines to enable all segments of Hawaii's population to participate in the creative arts.			✓
(10) Assure adequate access to significant natural and cultural resources in public ownership.			✓
Analysis: **The proposed action is not applicable to the objectives and policies for socio-cultural advancement leisure. In general, the project is not oriented towards the provision of resources to accommodate cultural, artistic, and recreational needs. While business venture within the project may include artisans and recreation-related ventures (e.g., gyms), at this early planning stage, such users have not indicated a commitment to locate their ventures within the project.**			
Chapter 226-24 Objective and policies for socio-cultural advancement – – individual rights and personal well-being.			
Objective: Planning for the State's socio-cultural advancement with regard to individual rights and personal well-being shall be directed towards achievement of			✓

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	NA
the objective of increased opportunities and protection of individual rights to enable individuals to fulfill their socio-economic needs and aspirations.			
Policies:			
(1) Provide effective services and activities that protect individuals from criminal acts and unfair practices and that alleviate the consequences of criminal acts in order to foster a safe and secure environment.			✓
(2) Uphold and protect the national and state constitutional rights of every individual.			✓
(3) Assure access to, and availability of, legal assistance, consumer protection, and other public services which strive to attain social justice.			✓
(4) Ensure equal opportunities for individual participation in society.			✓
Analysis: **The proposed action does not have a direct or indirect relationship to the objective and policies for socio-cultural advancement--individual rights. The project will not affect individual's access to legal rights and will not affect their opportunities for protection of individual rights.**			
Chapter 226-25 Objective and policies for socio-cultural advancement – – culture.			
Objective: Planning for the State's socio-cultural advancement with regard to culture shall be directed toward the achievement of the objective of enhancement of cultural identities, traditions, values, customs, and arts of Hawaii's people.		✓	
Policies:			
(1) Foster increased knowledge and understanding of Hawaii's ethnic and cultural heritages and the history of Hawaii.		✓	
(2) Support activities and conditions that promote cultural values, customs, and arts that enrich the lifestyles of Hawaii's people and which are sensitive and responsive to family and community needs.		✓	
(3) Encourage increased awareness of the effects of proposed public and private actions on the integrity and quality of cultural and community lifestyles in Hawaii.			✓
(4) Encourage the essence of the aloha spirit in people's daily activities to promote harmonious relationships among Hawaii's people and visitors.			✓
Analysis: **The objective and policies for socio-cultural advancement--culture have indirect applicability to the proposed action. The project's CIA and AIS indirectly supports a greater understanding of Hawai'i's ethnic and cultural heritages. Such understanding is particularly important in raising awareness of the role of our Host culture in enriching the lifestyle of Hawai'i's people.**			
Chapter 226-26 Objectives and policies for socio-cultural advancement – – public safety.			
Objective: Planning for the State's socio-cultural advancement with regard to public safety shall be directed towards the achievement of the following objectives:			
(1) Assurance of public safety and adequate protection of life and property for all people.			✓
(2) Optimum organizational readiness and capability in all phases of emergency management to maintain the strength, resources, and social and economic well-being of the community in the event of civil disruptions, wars, natural disasters, and other major disturbances.			✓

REF-507

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	NA
(3) Promotion of a sense of community responsibility for the welfare and safety of Hawaii's people.			✓
Policies (Public Safety):			
(1) Ensure that public safety programs are effective and responsive to community needs.			✓
(2) Encourage increased community awareness and participation in public safety programs.			✓
Policies (Public Safety-Criminal Justice):			
(1) Support criminal justice programs aimed at preventing and curtailing criminal activities.			✓
(2) Develop a coordinated, systematic approach to criminal justice administration among all criminal justice agencies.			✓
(3) Provide a range of correctional resources which may include facilities and alternatives to traditional incarceration in order to address the varied security needs of the community and successfully reintegrate offenders into the community.			✓
Policies (Public Safety – Emergency Management):			
(1) Ensure that responsible organizations are in a proper state of readiness to respond to major war-related, natural, or technological disasters and civil disturbances at all times.			✓
(2) Enhance the coordination between emergency management programs throughout the State.			✓
Analysis: **The proposed action has no direct or indirect relationship to the objectives and policies for socio-cultural advancement--public safety. In particular, the proposed action is not aimed at supporting criminal justice programs nor does it provide assurance of adequate protection of life and property, optimum organizational readiness and capacity for emergency management, and a sense of community responsibility for the welfare and safety of Hawai'i's people. It is noted however, that in the context of the built-out project, appropriate measures for project security and tenant safety will be implemented (e.g., use of security contractors and systems, as appropriate).**			
Chapter 226-27 Objectives and policies for socio-cultural advancement – – government.			
Objectives: Planning the State's socio-cultural advancement with regard to government shall be directed towards the achievement of the following objectives:			
(1) Efficient, effective, and responsive government services at all levels in the State.			✓
(2) Fiscal integrity, responsibility, and efficiency in the state government and county governments.			✓
Policies:			
(1) Provide for necessary public goods and services not assumed by the private sector.			✓
(2) Pursue an openness and responsiveness in government that permits the flow of public information, interaction, and response.			✓
(3) Minimize the size of government to that necessary to be effective.			✓

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	NA
(4) Stimulate the responsibility in citizens to productively participate in government for a better Hawaii.			✓
(5) Assure that government attitudes, actions, and services are sensitive to community needs and concerns.			✓
(6) Provide for a balanced fiscal budget.			✓
(7) Improve the fiscal budgeting and management system of the State.		✓	
(8) Promote the consolidation of state and county governmental functions to increase the effective and efficient delivery of government programs and services and to eliminate duplicative services wherever feasible.			✓
Analysis: **The objective for socio-cultural advancement--government, in general, is not applicable to the proposed action. The project does not promote or advance efficient, effective, and responsive government services, and does not support fiscal integrity, responsibility and efficiency in State and County governments. It is noted however, that the proposed action will generate added property tax revenue for the County of Maui, thereby supporting the policy for a balanced fiscal budget.**			

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	N/A
Chapter 226-101: Purpose. The purpose of this part is to establish overall priority guidelines to address areas of statewide concern.			
Chapter 226-102: Overall direction. The State shall strive to improve the quality of life for Hawaii's present and future population through the pursuit of desirable courses of action in seven major areas of statewide concern which merit priority attention: economic development, population growth and land resource management, affordable housing, crime and criminal justice, quality education, principles of sustainability, and climate change adaptation.			
Chapter 226-103: Economic priority guidelines.			
(a) Priority guidelines to stimulate economic growth and encourage business expansion and development to provide needed jobs for Hawaii's people and achieve a stable and diversified economy:		✓	
(1) Seek a variety of means to increase the availability of investment capital for new and expanding enterprises.			✓
(A) Encourage investments which:			✓
(i) Reflect long term commitments to the State;			✓
(ii) Rely on economic linkages within the local economy;			✓
(iii) Diversify the economy;			✓
(iv) Reinvest in the local economy;		✓	
(v) Are sensitive to community needs and priorities; and		✓	
(vi) Demonstrate a commitment to provide management opportunities to Hawaii residents; and			✓
(B) Encourage investments in innovative activities that have a nexus to the State, such as:			✓
(i) Present or former residents acting as entrepreneurs or principals;			✓

REF-508

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	N/A
(ii) Academic support from an institution of higher education in Hawaii;			✓
(iii) Investment interest from Hawaii residents;			✓
(iv) Resources unique to Hawaii that are required for innovative activity; and			✓
(v) Complementary or supportive industries or government programs or projects.			✓
(2) Encourage the expansion of technological research to assist industry development and support the development and commercialization of technological advancements.			✓
(3) Improve the quality, accessibility, and range of services provided by government to business, including data and reference services and assistance in complying with governmental regulations.			✓
(4) Seek to ensure that state business tax and labor laws and administrative policies are equitable, rational, and predictable.			✓
(5) Streamline the processes for building and development permit and review, and telecommunication infrastructure installation approval and eliminate or consolidate other burdensome or duplicative governmental requirements imposed on business, where scientific evidence indicates that public health, safety and welfare would not be adversely affected.			✓
(6) Encourage the formation of cooperatives and other favorable marketing or distribution arrangements at the regional or local level to assist Hawaii's small-scale producers, manufacturers, and distributors.			✓
(7) Continue to seek legislation to protect Hawaii from transportation interruptions between Hawaii and the continental United States.			✓
(8) Provide public incentives and encourage private initiative to develop and attract industries which promise long-term growth potentials and which have the following characteristics:			✓
(A) An industry that can take advantage of Hawaii's unique location and available physical and human resources.			✓
(B) A clean industry that would have minimal adverse effects on Hawaii's environment.			✓
(C) An industry that is willing to hire and train Hawaii's people to meet the industry's labor needs at all levels of employment.			✓
(D) An industry that would provide reasonable income and steady employment.			✓
(9) Support and encourage, through educational and technical assistance programs and other means, expanded opportunities for employee ownership and participation in Hawaii business.			✓
(10) Enhance the quality of Hawaii's labor force and develop and maintain career opportunities for Hawaii's people through the following actions:			✓
(A) Expand vocational training in diversified agriculture, aquaculture, information industry, and other areas where growth is desired and feasible.			✓
(B) Encourage more effective career counseling and guidance in high schools and post-secondary institutions to inform students of present and future career opportunities.			✓
(C) Allocate educational resources to career areas where high employment is expected and where growth of new industries is desired.			✓
(D) Promote career opportunities in all industries for Hawaii's people by encouraging firms doing business in the State to hire residents.			✓
(E) Promote greater public and private sector cooperation in determining industrial training needs and in developing relevant curricula and on-			✓

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	N/A
the-job training opportunities.			
(F) Provide retraining programs and other support services to assist entry of displaced workers into alternative employment.			✓
(b) Priority guidelines to promote the economic health and quality of the visitor industry:			✓
(1) Promote visitor satisfaction by fostering an environment which enhances the Aloha Spirit and minimizes inconveniences to Hawaii's residents and visitors.			✓
(2) Encourage the development and maintenance of well-designed, adequately serviced hotels and resort destination areas which are sensitive to neighboring communities and activities and which provide for adequate shoreline setbacks and beach access.			✓
(3) Support appropriate capital improvements to enhance the quality of existing resort destination areas and provide incentives to encourage investment in upgrading, repair, and maintenance of visitor facilities.			✓
(4) Encourage visitor industry practices and activities which respect, preserve, and enhance Hawaii's significant natural, scenic, historic, and cultural resources.			✓
(5) Develop and maintain career opportunities in the visitor industry for Hawaii's people, with emphasis on managerial positions.			✓
(6) Support and coordinate tourism promotion abroad to enhance Hawaii's share of existing and potential visitor markets.			✓
(7) Maintain and encourage a more favorable resort investment climate consistent with the objectives of this chapter.			✓
(8) Support law enforcement activities that provide a safer environment for both visitors and residents alike.			✓
(9) Coordinate visitor industry activities and promotions to business visitors through the state network of advanced data communication techniques.			✓
(c) Priority guidelines to promote the continued viability of the sugar and pineapple industries:			✓
(1) Provide adequate agricultural lands to support the economic viability of the sugar and pineapple industries.			✓
(2) Continue efforts to maintain federal support to provide stable sugar prices high enough to allow profitable operations in Hawaii.			✓
(3) Support research and development, as appropriate, to improve the quality and production of sugar and pineapple crops.			✓
(d) Priority guidelines to promote the growth and development of diversified agriculture and aquaculture:			✓
(1) Identify, conserve, and protect agricultural and aquacultural lands of importance and initiate affirmative and comprehensive programs to promote economically productive agricultural and aquacultural uses of such lands.			✓
(2) Assist in providing adequate, reasonably priced water for agricultural activities.			✓
(3) Encourage public and private investment to increase water supply and to improve transmission, storage, and irrigation facilities in support of diversified agriculture and aquaculture.			✓
(4) Assist in the formation and operation of production and marketing associations and cooperatives to reduce production and marketing costs.			✓
(5) Encourage and assist with the development of a waterborne and airborne freight and cargo system capable of meeting the needs of Hawaii's agricultural community.			✓
(6) Seek favorable freight rates for Hawaii's agricultural products from interisland and overseas transportation operators.			✓

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	N/A
(7) Encourage the development and expansion of agricultural and aquacultural activities which offer long-term economic growth potential and employment opportunities.			✓
(8) Continue the development of agricultural parks and other programs to assist small independent farmers in securing agricultural lands and loans.			✓
(9) Require agricultural uses in agricultural subdivisions and closely monitor the uses in these subdivisions.			✓
(10) Support the continuation of land currently in use for diversified agriculture.			✓
(11) Encourage residents and visitors to support Hawaii's farmers by purchasing locally grown food and food products.			✓
(e) Priority guidelines for water use and development:		✓	
(1) Maintain and improve water conservation programs to reduce the overall water consumption rate.		✓	
(2) Encourage the improvement of irrigation technology and promote the use of nonpotable water for agricultural and landscaping purposes.			✓
(3) Increase the support for research and development of economically feasible alternative water sources.			✓
(4) Explore alternative funding sources and approaches to support future water development programs and water system improvements.			✓
(f) Priority guidelines for energy use and development:	✓		
(1) Encourage the development, demonstration, and commercialization of renewable energy sources.	✓		
(2) Initiate, maintain, and improve energy conservation programs aimed at reducing energy waste and increasing public awareness of the need to conserve energy.			✓
(3) Provide incentives to encourage the use of energy conserving technology in residential, industrial, and other buildings.			✓
(4) Encourage the development and use of energy conserving and cost-efficient transportation systems.			✓
(g) Priority guidelines to promote the development of the information industry:			✓
(1) Establish an information network, with an emphasis on broadband and wireless infrastructure and capability that will serve as the foundation of and catalyst for overall economic growth and diversification in Hawaii.			✓
(2) Encourage the development of services such as financial data processing, a products and services exchange, foreign language translations, telemarketing, teleconferencing, a twenty-four-hour international stock exchange, international banking, and a Pacific Rim management center.			✓
(3) Encourage the development of small businesses in the information field such as software development; the development of new information systems, peripherals, and applications; data conversion and data entry services; and home or cottage services such as computer programming, secretarial, and accounting services.			✓
(4) Encourage the development or expansion of educational and training opportunities for residents in the information and telecommunications fields.			✓
(5) Encourage research activities, including legal research in the information and telecommunications fields.			✓
(6) Support promotional activities to market Hawaii's information industry services.			✓

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	N/A
(7) Encourage the location or co-location of telecommunication or wireless information relay facilities in the community, including public areas, where scientific evidence indicates that the public health, safety, and welfare would not be adversely affected.			✓
Analysis: **The proposed action indirectly supports priority guidelines to stimulate economic growth and to encourage business expansion. In particular, the project provides an opportunity for investment in the local economy which will translate to new employment opportunities for local residents. These investments are anticipated to create businesses which are responsive to community needs and priorities.** **The proposed action does not have applicability to guidelines relating to the viability of the sugar and pineapple industries, nor does it have applicability to guidelines relating to diversified agriculture and aquaculture.** **With respect to priority guidelines for water use and development, the proposed project will utilize water conservation measures (i.e., low flow devices) in building designs to the extent that such measures are compatible with tenant uses. Similarly, the proposed action will employ energy conservation measures such as high efficiency HVAC and refrigeration systems in warehousing and cold storage operations. (TO BE VERIFIED BY PL) As previously noted, renewable energy is envisioned to be a part of the project development area.** **Last, but not least, the proposed action is not applicable to priority guidelines relating to the development of the information technology industry. In particular, the proposed action does not affect marketing activities for information industry services, nor does it encourage research in the information and telecommunications fields.**			
Chapter 226-104: Population growth and land resources priority guidelines.			
(a) Priority guidelines to effect desired statewide growth and distribution:			✓
(1) Encourage planning and resource management to insure that population growth rates throughout the State are consistent with available and planned resource capacities and reflect the needs and desires of Hawaii's people.			✓
(2) Manage a growth rate for Hawaii's economy that will parallel future employment needs for Hawaii's people.			✓
(3) Ensure that adequate support services and facilities are provided to accommodate the desired distribution of future growth throughout the State.			✓
(4) Encourage major state and federal investments and services to promote economic development and private investment to the neighbor islands, as appropriate.			✓
(5) Explore the possibility of making available urban land, low-interest loans, and housing subsidies to encourage the provision of housing to support selective economic and population growth on the neighbor islands.			✓
(6) Seek federal funds and other funding sources outside the State for research, program development, and training to provide future employment opportunities on the neighbor islands.			✓
(7) Support the development of high technology parks on the neighbor islands.			✓
(b) Priority guidelines for regional growth distribution and land resource utilization:	✓		
(1) Encourage urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditures, and away from areas where other important benefits are present, such as protection of important agricultural land or preservation of lifestyles.	✓		

REF-510

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	N/A
(2) Make available marginal or nonessential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the agricultural district.		✓	
(3) Restrict development when drafting of water would result in exceeding the sustainable yield or in significantly diminishing the recharge capacity of any groundwater area.			✓
(4) Encourage restriction of new urban development in areas where water is insufficient from any source for both agricultural and domestic use.			✓
(5) In order to preserve green belts, give priority to state capital-improvement funds which encourage location of urban development within existing urban areas except where compelling public interest dictates development of a noncontiguous new urban core.			✓
(6) Seek participation from the private sector for the cost of building infrastructure and utilities, and maintaining open spaces.	✓		
(7) Pursue rehabilitation of appropriate urban areas.			✓
(8) Support the redevelopment of Kakaako into a viable residential, industrial, and commercial community.			✓
(9) Direct future urban development away from critical environmental areas or impose mitigating measures so that negative impacts on the environment would be minimized.	✓		
(10) Identify critical environmental areas in Hawaii to include but not be limited to the following: watershed and recharge areas; wildlife habitats (on land and in the ocean); areas with endangered species of plants and wildlife; natural streams and water bodies; scenic and recreational shoreline resources; open space and natural areas; historic and cultural sites; areas particularly sensitive to reduction in water and air quality; and scenic resources.			✓
(11) Identify all areas where priority should be given to preserving rural character and lifestyle.			✓
(12) Utilize Hawaii's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline, conservation lands, and other limited resources for future generations.		✓	
(13) Protect and enhance Hawaii's shoreline, open spaces, and scenic resources.			✓
Analysis: **The proposed action is located within an area designated by the Lāna'i Community Plan for "Light Industrial" and "Heavy Industrial" use. While the underlying lands are designated "Agricultural" by the State Land Use Commission and County zoning, the Community Plan's "Light Industrial" and "Heavy Industrial" land use designations recognize the need to provide for these critical economic development uses which may include relocation of uses from Lāna'i City and as a staging area for shipments from the Kaumalapau Harbor. This location, adjacent to Lāna'i Airport also assures that sensitive environments such as shoreline areas, open spaces, and scenic resources will be avoided.**			
Chapter 226-105: Crime and criminal justice.			
Priority guidelines in the area of crime and criminal justice:			✓
(1) Support law enforcement activities and other criminal justice efforts that are directed to provide a safer environment.			✓
(2) Target state and local resources on efforts to reduce the incidence of violent crime and on programs relating to the apprehension and prosecution of repeat offenders.			✓

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	N/A
(3) Support community and neighborhood program initiatives that enable residents to assist law enforcement agencies in preventing criminal activities.			✓
(4) Reduce overcrowding or substandard conditions in correctional facilities through a comprehensive approach among all criminal justice agencies which may include sentencing law revisions and use of alternative sanctions other than incarceration for persons who pose no danger to their community.			✓
(5) Provide a range of appropriate sanctions for juvenile offenders, including community-based programs and other alternative sanctions.			✓
(6) Increase public and private efforts to assist witnesses and victims of crimes and to minimize the costs of victimization.			✓
Analysis: **The proposed action will not affect guidelines related to crime and criminal justice. For example, the project will not directly or indirectly affect law enforcement activities, levels of crime and violence, or conditions within correctional facilities.**			
Chapter 226-106: Affordable housing.			
Priority guidelines for the provision of affordable housing:			✓
(1) Seek to use marginal or nonessential agricultural land and public land to meet housing needs of low- and moderate-income and gap-group households.			✓
(2) Encourage the use of alternative construction and development methods as a means of reducing production costs.			✓
(3) Improve information and analysis relative to land availability and suitability for housing.			✓
(4) Create incentives for development which would increase home ownership and rental opportunities for Hawaii's low- and moderate-income households, gap-group households, and residents with special needs.			✓
(5) Encourage continued support for government or private housing programs that provide low interest mortgages to Hawaii's people for the purchase of initial owner-occupied housing.			✓
(6) Encourage public and private sector cooperation in the development of rental housing alternatives.			✓
(7) Encourage improved coordination between various agencies and levels of government to deal with housing policies and regulations.			✓
(8) Give higher priority to the provision of quality housing that is affordable for Hawaii's residents and less priority to development of housing intended primarily for individuals outside of Hawaii.			✓
Analysis: **With respect to the Hawai'i State Plan's priority guidelines for affordable housing, the proposed action is not applicable, either directly or indirectly, to the guidelines set forth in this section. For example, the project does not advance the provision of afford able rental housing projects, nor does it create incentives for increasing homeownership. In keeping with the Lana'i Community Plan, the primary goal o of the project is to provide appropriately zoned lands which can accommodate light industrial and heavy industrial users.**			
Chapter 226-107: Quality education.			
Priority guidelines to promote quality education:			✓
(1) Pursue effective programs which reflect the varied district, school, and student needs to strengthen basic skills achievement;			✓
(2) Continue emphasis on general education "core" requirements to provide common background to students and essential support to other university programs;			✓

REF-511

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	N/A
(3) Initiate efforts to improve the quality of education by improving the capabilities of the education work force;			✓
(4) Promote increased opportunities for greater autonomy and flexibility of educational institutions in their decision making responsibilities;			✓
(5) Increase and improve the use of information technology in education by the availability of telecommunications equipment for:			✓
(A) The electronic exchange of information;			✓
(B) Statewide electronic mail; and			✓
(C) Access to the Internet.			✓
(6) Encourage programs that increase the public's awareness and understanding of the impact of information technologies on our lives;			✓
(7) Pursue the establishment of Hawaii's public and private universities and colleges as research and training centers of the Pacific;			✓
(8) Develop resources and programs for early childhood education;			✓
(9) Explore alternatives for funding and delivery of educational services to improve the overall quality of education; and			✓
(10) Strengthen and expand educational programs and services for students with special needs.			✓
Analysis: **The proposed project will not affect the priority guidelines relating to quality education. For example, the project will not affect the quality of educational programs and will not affect organizational and decision-making frameworks for educational institutions.**			
CHAPTER 226-108: Sustainability			
Priority guidelines and principles to promote sustainability shall include:		✓	
(1) Encouraging balanced economic, social, community, and environmental priorities;			✓
(2) Encouraging planning that respects and promotes living within the natural resources and limits of the State;			✓
(3) Promoting a diversified and dynamic economy;		✓	
(4) Encouraging respect for the host culture;			✓
(5) Promoting decisions based on meeting the needs of the present without compromising the needs of future generations;		✓	
(6) Considering the principles of the ahupuaa system; and			✓
(7) Emphasizing that everyone, including individuals, families, communities, businesses, and government, has the responsibility for achieving a sustainable Hawaii.			✓
Analysis: **The priority guidelines for sustainability are indirectly applicable to the proposed action. The project supports economic development, and over the long-term, will provide employment opportunities for Lāna'i residents. As an area set aside for light industrial and heavy industrial uses, the proposed action is in keeping with the Lāna'i Community Plan, which considers the needs of present and future generations.**			
CHAPTER 226-109: Climate change adaptation			
Priority guidelines and principles to promote climate change adaptation shall include:		✓	
(1) Ensure that Hawaii's people are educated, informed, and aware of the impacts climate change may have on their communities;			✓
(2) Encourage community stewardship groups and local stakeholders to participate in planning and implementation of climate change policies;			✓

Hawai'i State Plan, Chapter 226, HRS Part I. Overall Themes, Goals, Objectives and Policies Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable	DA	IA	N/A
(3) Invest in continued monitoring and research of Hawaii's climate and the impacts of climate change on the State;			✓
(4) Consider native Hawaiian traditional knowledge and practices in planning for the impacts of climate change;			✓
(5) Encourage the preservation and restoration of natural landscape features, such as coral reefs, beaches and dunes, forests, streams, floodplains, and wetlands, that have the inherent capacity to avoid, minimize, or mitigate the impacts of climate change;			✓
(6) Explore adaptation strategies that moderate harm or exploit beneficial opportunities in response to actual or expected climate change impacts to the natural and built environments;		✓	
(7) Promote sector resilience in areas such as water, roads, airports, and public health, by encouraging the identification of climate change threats, assessment of potential consequences, and evaluation of adaptation options;			✓
(8) Foster cross-jurisdictional collaboration between county, state, and federal agencies and partnerships between government and private entities and other nongovernmental entities, including nonprofit entities;			✓
(9) Use management and implementation approaches that encourage the continual collection, evaluation, and integration of new information and strategies into new and existing practices, policies, and plans; and			✓
(10) Encourage planning and management of the natural and built environments that effectively integrate climate change policy.			✓
Analysis: **The proposed action will support efforts which advance climate change policies. The planned use of a portion of the project area for renewable energy uses is viewed as an adaptation strategy for moderating climate change impacts.**			

COUNTYWIDE POLICY PLAN – ASSESSMENT OF PROJECT APPLICABILITY TO GOALS OBJECTIVES, AND POLICIES

APPENDIX

K-2

REF-513

APPENDIX K-2

Analysis of Project Applicability to Countywide Policy Plan

The Countywide Policy Plan was adopted in March 2010 and is a comprehensive policy document for the islands of Maui County to the year 2030. The plan replaces the *General Plan of the County of Maui 1990 Update* and provides the policy framework for the development of the forthcoming Maui Island Plan as well as for updating the nine detailed Community Plans.

The Countywide Policy Plan provides broad goals, objectives, policies and implementing actions that portray the desired direction of the County's future. Goals are intended to describe a desirable condition of the County by the year 2030 and are intentionally general. Objectives tend to be more specific and may be regarded as milestones to achieve the larger goals. Policies are not intended as regulations, but instead provide a general guideline for County decision makers, departments, and collaborating organizations toward the attainment of goals and objectives. Implementing actions are specific tasks, procedures, programs, or techniques that carry out policy.

Discussion of the proposed project conforms to the relevant goals, objectives, policies, and implementing actions of the Countywide Policy Plan is provided below. The methodology for assessing a project's relationship to the Countywide Policy Plan involves examining the project's applicability to the Plan's goals, objectives, and policies. "Applicability" refers to a project's need, purpose and effects, and how they advance or promote a particular set of goals, objectives and policies. In assessing the relationship between a proposed action and the Countywide Policy Plan, an action may be categorized in one of the following groups:

1. **Directly applicable:** the action and its potential effects directly advances, promotes or affects the relevant goal, objective, or policy.

   Example: A County project to develop a new water source and related transmission facilities would be directly applicable to improving physical infrastructure. The relevant objective states: *"Improve water systems to assure access to sustainable, clean, reliable, and affordable sources of water*" (Objective I.1). A policy within this objective category states: *Ensure that adequate supplies of water are available prior to approval of subdivision or construction documents* (Policy I.1.a).

   In this instance, the proposed action is considered to be directly applicable to the cited objective and policy.

2. **Indirectly applicable:** the action and its potential effects indirectly supports, advances or affects the objective, policy or priority guideline.

   Example: The county water source project cited above supports the objective to: *"Improve land use management and implement a directed-growth strategy"* (Objective J.1). A related policy encompassed by this objective states: *"Direct new development in*

and around communities with existing infrastructure and service capacity, and protect natural, scenic, shoreline, and cultural resources" (Policy J.1.h). In this case, the principle purpose of the project is not to create source specifically intended to improve land use management. Nonetheless, the proposed action indirectly supports the Countywide Policy Plan's directives relating to appropriate locations for new development.

3. **Not applicable:** the action and its potential effects have no direct or indirect relationship to the objectives and policies of the Countywide Policy Plan.

   Example: The county water source improvement project referenced above, may not have direct or indirect linkage to Objective D.1, which states: *"In cooperation with the Federal and State governments and nonprofit agencies, broaden access to social and healthcare services and expand options to improve the overall wellness of the people of Maui County"*. Hence, from a policy analysis and linkage standpoint, the proposed action would be considered not applicable to this set of objectives and policies.

It is recognized that policy analysis is subject to interpretation and is best considered in the context of the proposed action's local and regional conditions.

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
A. PROTECT THE NATURAL ENVIRONMENT			
Goal: Maui County's natural environment and distinctive open spaces will be preserved, managed, and cared for in perpetuity.		✓	
Objective:			
(1) Improve the opportunity to experience the natural beauty and native biodiversity of the islands for present and future generations.		✓	
Policies:			
(a) Perpetuate native Hawaiian biodiversity by preventing the introduction of invasive species, containing or eliminating existing noxious pests, and protecting critical habitat areas.			✓
(b) Preserve and reestablish indigenous and endemic species' habitats and their connectivity.		✓	
(c) Restore and protect forests, wetlands, watersheds, and stream flows, and guard against wildfires, flooding, and erosion.			✓
(d) Protect baseline stream flows for perennial streams, and support policies that ensure adequate stream flow to support Native Hawaiian aquatic species, traditional kalo cultivation, and self-sustaining ahupua'a.			✓
(e) Protect undeveloped beaches, dunes, and coastal ecosystems, and restore natural shoreline processes.			✓
(f) Protect the natural state and integrity of unique terrain, valued natural environments, and geological features.			✓
(g) Preserve and provide ongoing care for important scenic vistas, view planes, landscapes, and open-space resources.			✓
(h) Expand coordination with the State and nonprofit agencies and their volunteers to reduce invasive species, replant indigenous species, and identify critical habitat.			✓
Implementing Actions:			
(a) Develop island-wide networks of greenways, watercourses, and habitat corridors.			✓

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
Analysis: **The assessment of the proposed action included a biological resources survey addressing flora and fauna in the project area. While this assessment does not directly advance the policy of securing an interconnected network of indigenous and endemic species habitat, it does add to a data base which may be used to support future studies.**			
Objective:			
(2) Improve the quality of environmentally sensitive, locally valued natural resources and native ecology of each island.			✓
Policies:			
(a) Protect and restore nearshore reef environments and water quality.			✓
(b) Protect marine resources and valued wildlife.			✓
(c) Improve the connection between urban environments and the natural landscape, and incorporate natural features of the land into urban design.			✓
(d) Utilize land-conservation tools to ensure the permanence of valued open spaces.			✓
(e) Mitigate the negative effects of upland uses on coastal wetlands, marine life, and coral reefs.			✓
(f) Strengthen coastal-zone management, re-naturalization of shorelines, where possible, and filtration or treatment of urban and agricultural runoff.			✓
(g) Regulate the use and maintenance of stormwater-treatment systems that incorporate the use of native vegetation and mimic natural systems.			✓
(h) Advocate for stronger regulation of fishing, boating, cruise ship, and ecotourism activities.			✓
(i) Restore watersheds and aquifer-recharge areas to healthy and productive status, and increase public knowledge about the importance of watershed stewardship, water conservation, and groundwater protection.			✓
Implementing Actions:			
(a) Develop regulations to minimize runoff of pollutants into nearshore waters and reduce nonpoint and point source pollution.			✓
Analysis: **The proposed action does not have direct or indirect relationships to the objective to improve the quality of environmentally sensitive, valued natural environment and native ecology. However, the project will implement BMPs to ensure that stormwater runoff is appropriately mitigated. The proposed action does not affect open space preservation or regulatory mechanisms for ecotourism.**			
Objective:			
(3) Improve the stewardship of the natural environment.	✓		
Policies:			
(a) Preserve and protect natural resources with significant scenic, economic, cultural, environmental, or recreational value.			✓
(b) Improve communication, coordination, and collaboration among government agencies, nonprofit organizations, communities, individuals, and land owners that work for the protection of the natural environment.			✓
(c) Evaluate development to assess potential short-term and long-term impacts on land, air, aquatic, and marine environments.	✓		
(d) Improve efforts to mitigate and plan for the impact of natural disasters, human influenced emergencies, and global warming.			✓
(e) Regulate access to sensitive ecological sites and landscapes.			✓
(f) Reduce air, noise, light, land, and water pollution, and reduce Maui County's contribution to global climate change.			✓

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
(g) Plan and prepare for and educate visitors and residents about the possible effects of global warming.			✓
(h) Provide public access to beaches and shorelines for recreational and cultural purposes where appropriate.			✓
(i) Educate the construction and landscape industries and property owners about the use of best management practices to prevent erosion and nonpoint source pollution.	✓		
(j) Support the acquisition of resources with scenic, environmental, and recreational value, and encumber their use.			✓
(k) Improve enforcement activities relating to the natural environment.			✓
(l) For each shoreline community, identify and prioritize beach-conservation objectives, and develop action plans for their implementation.			✓
Implementing Actions:			✓
(a) Document, record, and monitor existing conditions, populations, and locations of flora and fauna communities.	✓		
(b) Implement Federal and State policies that require a reduction of greenhouse-gas emissions.			✓
(c) Establish a baseline inventory of available natural resources and their respective carrying capacities.			✓
Analysis: **The assessment of the proposed action included a biological resources survey addressing flora and fauna in the project area. This assessment addresses the objective of improving the stewardship of our natural environment by documenting the biological resources in the project area. Additionally, project specifications will include BMPs to address soil erosion during construction activities.**			
Objective:			
(4) Educate residents and visitors about responsible stewardship practices and the interconnectedness of the natural environment and people.		✓	
Policies:			
(a) Expand education about native flora, fauna, and ecosystems.		✓	
(b) Align priorities to recognize that the health of the natural environment and the health of people are inextricably linked.			✓
(c) Promote programs and incentives that decrease greenhouse-gas emissions and improve environmental stewardship.			✓
Analysis: **While the biological resource survey does not directly educate residents and visitors about responsible stewardship practices and the interconnectedness of the natural environment and people, it indirectly provides data that could enhance such educational efforts. The project's biological resources inventory provides an additional data source for education.**			
B. PRESERVE LOCAL CULTURES AND TRADITIONS			
Goal: Maui County will foster a spirit of pono and protect, perpetuate, and reinvigorate its residents" multi-cultural values and traditions to ensure that current and future generations will enjoy the benefits of their rich island heritage.		✓	
Objective:			
(1) Perpetuate the Hawaiian culture as a vital force in the lives of residents.		✓	
Policies:			
(a) Protect and preserve access to mountain, ocean, and island resources for traditional Hawaiian cultural practices.			✓
(b) Prohibit inappropriate development of cultural lands and sites that are important for traditional Hawaiian cultural practices, and establish mandates for the special protection of these lands in perpetuity.		✓	

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
(c) Promote the use of ahupuaʻa and moku management practices.			✓
(d) Encourage the use of traditional Hawaiian architecture and craftsmanship.			✓
(e) Promote the use of the Hawaiian language.			✓
(f) Recognize and preserve the unique natural and cultural characteristics of each ahupuaʻa or district.			✓
(g) Encourage schools to promote broader incorporation of Hawaiian and other local cultures' history and values lessons into curriculum.			✓
(h) Ensure the protection of Native Hawaiian rights.		✓	
(i) Promote, encourage, and require the correct use of traditional place names, particularly in government documents, signage, and the tourism industry.			✓
Implementing Actions:			
(a) Establish alternative land use and overlay zoning designations that recognize and preserve the unique natural and cultural characteristics of each ahupuaʻa or district.			✓
(b) Develop requirements for all County applicants to perpetuate and use proper traditional place names in all applications submitted.			✓
Analysis: **While the proposed action itself does not directly address Hawaiian cultural practices and rights, the CIA does serve to acknowledge the valued cultural context associated with the project area. In particular, the CIA address the relationship between land resources and cultural practices.**			
Objective:			
(2) Emphasize respect for our island lifestyle and our unique local cultures, family, and natural environment.			✓
Policies:			
(a) Acknowledge the Hawaiian culture as the host culture, and foster respect and humility among residents and visitors toward the Hawaiian people and their practices.			✓
(b) Perpetuate a respect for diversity, and recognize the historic blending of cultures and ethnicities.			✓
(c) Encourage the perpetuation of each culture's unique cuisine, attire, dance, music, and folklore, and other unique island traditions and recreational activities.			✓
(d) Recognize the interconnectedness between the natural environment and the cultural heritage of the islands.			✓
(e) Protect and prioritize funding for recreational activities that support local cultural practices, such as surfing, fishing, and outrigger-canoe paddling.			✓
Analysis: **The proposed action does not directly or indirectly affect a community's relationship to island lifestyle local cultures and the natural environment.**			
Objective:			
(3) Preserve for present and future generations the opportunity to know and experience the arts, culture, and history of Maui County.		✓	
Policies:			
(a) Foster teaching opportunities for cultural practitioners to share their knowledge and skills.			✓
(b) Support the development of cultural centers.			✓
(c) Broaden opportunities for public art and the display of local artwork.			✓

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
(d) Foster the Aloha Spirit by celebrating the Hawaiian host culture and other Maui County cultures through support of cultural-education programs, festivals, celebrations, and ceremonies.			✓
(e) Support the perpetuation of Hawaiian arts and culture.			✓
(f) Support programs and activities that record the oral and pictorial history of residents.			✓
(g) Support the development of repositories for culture, history, genealogy, oral history, film, and interactive learning.		✓	
Implementing Actions:			
(a) Establish incentives for the display of public art.			✓
(b) Establish centers and programs of excellence for the perpetuation of Hawaiian arts and culture.			✓
Analysis: **Although the proposed action does not directly address the perpetuation of the arts, culture and history, the CIA does serve to document and acknowledge the valued cultural context associated with the project area. The CIA provides information and data sources relating to the culture and history of the project area. As well, the CIA's documentation provides insight to Native Hawaiian cultural practices.**			
Objective:			
(4) Preserve and restore significant historic architecture, structures, cultural sites, cultural districts, and cultural landscapes.		✓	
Policies:			
(a) Support the development of island-wide historic, archaeological, and cultural resources inventories.		✓	
(b) Promote the rehabilitation and adaptive reuse of historic sites, buildings, and structures to perpetuate a traditional sense of place.			✓
(c) Identify a sustainable rate of use and set forth specific policies to protect cultural resources.			✓
(d) Protect and preserve lands that are culturally or historically significant.		✓	
(e) Support programs that protect, record, restore, maintain, provide education about, and interpret cultural districts, landscapes, sites, and artifacts in both natural and museum settings.		✓	
(f) Perpetuate the authentic character and historic integrity of rural communities and small towns.			✓
(g) Seek solutions that honor the traditions and practices of the host culture while recognizing the needs of the community.		✓	
(h) Support the development of an Archaeological District Ordinance.			✓
(i) Protect summits, slopes, and ridgelines from inappropriate development.			✓
(j) Support the registering of important historic sites on the State and Federal historic registers.			✓
(k) Provide opportunities for public involvement with restoration and enhancement of all types of cultural resources.			✓
(l) Foster partnerships to identify and preserve or revitalize historic and cultural sites.			✓
Implementing Actions:			
(a) Identify, develop, map, and maintain an inventory of locally significant natural. cultural, and historical resources for protection.			✓
(b) Prepare, continually update, and implement a cultural-management plan for cultural sites, districts, and landscapes, where appropriate.			✓

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
(c) Enact an Archaeological District Ordinance.			✓
(d) Nominate important historic sites to the State and Federal historic registers.			✓
Analysis: **The proposed action has indirect relationships to the objective to preserve and restore historic architecture, structures, cultural sites, cultural districts, and cultural landscapes. Both the AIS and CIA provide additional resources inventory for the project area's archaeology, history and culture. Additionally, the AIS process supports the protection and preservation of sites and artifacts that are culturally or historically significant. The CIA study process, as well, honors the traditions and practices of the host culture.**			
C. IMPROVE EDUCATION			
Goal: Residents will have access to lifelong formal and informal educational options enabling them to realize their ambitions.			✓
Objective:			
(1) Encourage the State to attract and retain school administrators and educators of the highest quality.			✓
Policies:			
(a) Encourage the State to provide teachers with nationally competitive pay and benefit packages.			✓
(b) Encourage the State to ensure teachers will have the teaching tools and support staff needed to provide students with an excellent education.			✓
(c) Explore Maui County district- and school-based decision making in public education.			✓
Analysis: **The proposed action does not have direct or indirect relationships to the goal to provide access to educational options, including the objectives of attracting and retaining administrators and educators of the highest quality**			
Objective:			
(2) Provide nurturing learning environments that build skills for the 21st century.			✓
Policies:			
(a) Expand professional-development opportunities in disciplines that support the economic-development goals of Maui County.			✓
(b) Plan for demographic, social, and technological changes in a timely manner.			✓
(c) Encourage collaborative partnerships to improve conditions of learning environments.			✓
(d) Promote development of neighborhood schools and educational centers.			✓
(e) Integrate schools, community parks, and playgrounds, and expand each community's use of these facilities.			✓
(f) Support coordination between land use and school-facility planning agencies.			✓
(g) Encourage the upgrade and ongoing maintenance of public-school facilities.			✓
(h) Encourage the State Department of Education to seek reliable, innovative, and alternative methods to support a level of per-pupil funding that places Hawai'i among the top tier of states nationally for its financial support of public schools.			✓
(i) Encourage the State to promote healthier, more productive learning environments, including by providing healthy meals, more physical activity, natural lighting, and passive cooling.			✓

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
(j) Encourage the State to support the development of benchmarks to measure the success of Hawai'i's public-education system and clarify lines of accountability.			✓
(k) Design school and park facilities in proximity to residential areas.			✓
(l) Support technology- and natural-environment-based learning.			✓
(m) Encourage the State to support lower student-teacher ratios in public schools.			✓
(n) Encourage alternative learning and educational opportunities.			✓
Implementing Actions:			
(a) Develop safe walking and bicycling programs for school children.			✓
Analysis: **The proposed action does not have direct or indirect relationships to the goal to provide access to educational options, including the objective of providing nurturing learning environments that build skills for the 21st Century.**			
Objective:			
(3) Provide all residents with educational opportunities that can help them better understand themselves and their surroundings and allow them to realize their ambitions.			✓
Policies:			
(a) Encourage the State to improve Maui Community College as a comprehensive community college that will serve each community.			✓
(b) Broaden the use of technology and telecommunications to improve educational opportunities throughout the County.			✓
(c) Attract graduate-level research programs and institutions.			✓
(d) Promote the teaching of traditional practices, including aquaculture; subsistence agriculture; Pacific Island, Asian, and other forms of alternative health practices; and indigenous Hawaiian architecture.			✓
(e) Integrate cultural and environmental values in education, including self-sufficiency and sustainability.			✓
(f) Foster a partnership and ongoing dialogue between business organizations, formal educational institutions, and vocational training centers to tailor learning and mentoring programs to County needs.			✓
(g) Ensure teaching of the arts to all ages.			✓
(h) Expand and develop vocational learning opportunities by establishing trade schools.			✓
(i) Encourage the State to integrate financial and economic literacy in elementary, secondary, and higher-education levels.			✓
Implementing Actions:			
(a) Encourage the State to establish a four-year university, and support the development of other higher-education institutions to enable residents to obtain bachelor degrees and postgraduate degrees in Maui County.			✓
Analysis: **The proposed action does not have direct or indirect relationships to the objective of providing educational opportunities for residents. For example, policies relating to the teaching of the arts, vocational learning opportunities and graduate-level research programs and institutions are not advanced by the proposed action.**			
Objective:			
(4) Maximize community-based educational opportunities.			✓

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
Policies:			
(a) Encourage the State and others to expand pre-school, after-school, and homebased (parent-child) learning.			✓
(b) Support public-private partnerships to develop youth-internship, -apprenticeship, and -mentoring programs.			✓
(c) Support the development of a wide range of informal educational and cultural programs for all residents.			✓
(d) Improve partnerships that utilize the skills and talents at Hawai'i's colleges and universities to benefit the County.			✓
(e) Support career-development and job-recruitment programs and centers.			✓
(f) Attract learning institutions and specialty schools to diversify and enhance educational opportunities.			✓
(g) Expand education of important life skills for the general public.			✓
(h) Support community facilities such as museums, libraries, nature centers, and open spaces that provide interactive-learning opportunities for all ages.			✓
Analysis: **The proposed action does not have direct or indirect relationships to the objective of maximizing community-based educational opportunities. (i.e., support for community facilities such as museums, libraries, and nature centers)**			
D. STRENGTHEN SOCIAL AND HEALTHCARE SERVICES			
Goal: Health and social services in Maui County will fully and comprehensively serve all segments of the population.			✓
Objective:			
(1) In cooperation with the Federal and State governments and nonprofit agencies, broaden access to social and healthcare services and expand options to improve the overall wellness of the people of Maui County.			✓
Policies:			
(a) Work with other levels of government and the nonprofit sector to expand services to address hunger, homelessness, and poverty.			✓
(b) Support the improvement of opportunities for disadvantaged youth, encourage the tradition of hanai relatives, and support expanded opportunities for foster care.			✓
(c) Support expanded long-term-care options, both in institutions and at home, for patients requiring ongoing assistance and medical attention.			✓
(d) Encourage the expansion and improvement of local hospitals, facilitate the establishment of new healthcare facilities, and facilitate prompt and high-quality emergency- and urgent-care services for all.			✓
(e) Support broadened access to affordable health insurance and health care, and recognize the unique economic challenges posed to families when healthcare services are provided off-island.			✓
(f) Encourage equal access to social and healthcare services through both technological and traditional means.			✓
Analysis: **The proposed action is not applicable to the goal to provide comprehensive health services to all segments of the population, including the objective of broadening access to social and healthcare services and expanding options to improving overall wellness.**			
Objective:			
(2) Encourage the Federal and State governments and the private sector to improve the quality and delivery of social and healthcare services.			✓

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
Policies:			
(a) Strengthen partnerships with government, nonprofit, and private organizations to provide funding and to improve counseling and other assistance to address substance abuse, domestic violence, and other pressing social challenges.			✓
(b) Encourage the State to improve the quality of medical personnel, facilities, services, and equipment.			✓
(c) Encourage investment to improve the recruitment of medical professionals and the quality of medical facilities and equipment throughout Maui County.			✓
(d) Promote the development of continuum-of-care facilities that provide assisted living, hospice, home-care, and skilled-nursing options allowing the individual to be cared for in a manner congruent with his or her needs and desires.			✓
(e) Support improved social, healthcare, and governmental services for special needs populations.			✓
(f) Plan for the needs of an aging population and the resulting impacts on social services, housing, and healthcare delivery.			✓
(g) Improve coordination among the police, the courts, and the public in the administration of social and healthcare services.			✓
(h) Support programs that address needs of veterans.			✓
(i) Support programs that address the needs of immigrants.			✓
Implementing Actions:			
(a) Invest in programs designed to improve the general welfare and quality of life of Native Hawaiians.			✓
(b) Assist and facilitate the State Department of Public Safety and others in efforts to strengthen programs and facilities that will improve the mental and social health of incarcerated people and assist in prison inmates' successful transition back into Maui County communities.			✓
(c) Develop and maintain a comprehensive index that will measure the health and wellness needs of families.			✓
(d) Provide heliports countywide for emergency health and safety purposes.			✓
Analysis: **The goal for strengthening social and health care services and its objective of encouraging Federal and State governments and the private sector to improve the quality and delivery of social and health care services are not advanced by the proposed action.**			
Objective:			
(3) Strengthen public-awareness programs related to healthy lifestyles and social and medical services.			✓
Policies:			
(a) Expand public awareness about personal safety and crime prevention.			✓
(b) Encourage residents to pursue education and training for careers in the healthcare, social services, and community-development fields.			✓
(c) Expand public awareness and promote programs to achieve healthy eating habits and drug-free lifestyles.			✓
Analysis: **The objective of strengthening public awareness programs related to healthy lifestyles and social and medical services has no direct or indirect relationship to the proposed action.**			

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
E. EXPAND HOUSING OPPORTUNITIES FOR RESIDENTS			
Goal: Quality, island-appropriate housing will be available to all residents.			✓
Objective:			
(1) Reduce the affordable housing deficit for residents.			✓
Policies:			
(a) Ensure that an adequate and permanent supply of affordable housing, both new and existing units, is made available for purchase or rental to our resident and/or workforce population, with special emphasis on providing housing for low- to moderate-income families, and ensure that all affordable housing remains affordable in perpetuity.			✓
(b) Seek innovative ways to lower housing costs without compromising the quality of our island lifestyle.			✓
(c) Seek innovative methods to secure land for the development of low- and moderate- income housing.			✓
(d) Provide the homeless population with emergency and transitional shelter and other supportive programs.			✓
(e) Provide for a range of senior-citizen and special needs housing choices on each island that affordably facilitates a continuum of care and services.			✓
(f) Support the Department of Hawaiian Home Lands' development of homestead lands.			✓
(g) Manage property-tax burdens to protect affordable resident homeownership.			✓
(h) Explore taxation mechanisms to increase and maintain access to affordable housing.			✓
(i) Improve awareness regarding available affordable homeowner's insurance.			✓
(j) Redevelop commercial areas with a mixture of affordable residential and business uses, where appropriate.			✓
(k) Ensure residents are given priority to obtain affordable housing units developed in their communities, consistent with all applicable regulations.			✓
(l) Establish pricing for affordable housing that is more reflective of Maui County's workforce than the United States Housing and Urban Development's median-income estimates for Maui County.			✓
(m) Develop neighborhoods with a mixture of accessible and integrated community facilities and services.			✓
(n) Provide alternative regulatory frameworks to facilitate the use of Kuleana lands by the descendants of Native Hawaiians who received those lands pursuant to the Kuleana Act of 1850.			✓
(o) Work with lending institutions to expand housing options and safeguard the financial security of homeowners.			✓
(p) Promote the use of the community land trust model and other land-lease and land- financing options.			✓
(q) Support the opportunity to age in place by providing accessible and appropriately designed residential units.			✓
Analysis: **The proposed action does not have direct or indirect relationships to the objective of reducing the affordable housing deficit for residents.**			
Objective:			
(2) Increase the mix of housing types in towns and neighborhoods to promote sustainable land use planning, expand consumer choice, and protect the County's rural and small town character.			✓

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
Policies:			
(a) Seek innovative ways to develop 'ohana cottages and accessory-dwelling units as affordable housing.			✓
(b) Design neighborhoods to foster interaction among neighbors.			✓
(c) Encourage a mix of social, economic, and age groups within neighborhoods.			✓
(d) Promote infill housing in urban areas at scales that capitalize on existing infrastructure, lower development costs, and are consistent with existing or desired patterns of development.			✓
(e) Encourage the building industry to use environmentally sustainable materials, technologies, and site planning.			✓
(f) Develop workforce housing in proximity to job centers and transit facilities.			✓
(g) Provide incentives to developers and owners who incorporate green building practices and energy-efficient technologies into their housing developments.			✓
Implementing Actions:			
(a) Revise laws to support neighborhood designs that incorporate a mix of housing types that are appropriate for island living.			✓
Analysis: **The proposed action does not have direct or indirect relationships to the objective to increase a mix of housing types in appropriate areas of the island. As an example, the proposed action does not affect taxation mechanisms to increase affordable housing, nor does it promote innovative methods for lowering the cost of housing.**			
Objective:			
(3) Increase and maintain the affordable housing inventory.			✓
Policies:			
(a) Recognize housing as a basic human need, and work to fulfill that need.			✓
(b) Prioritize available infrastructure capacity for affordable housing.			✓
(c) Improve communication, collaboration, and coordination among housing providers and social-service organizations.			✓
(d) Study future projected housing needs, monitor economic cycles, and prepare for future conditions on each island.			✓
(e) Develop public-private and nonprofit partnerships that facilitate the construction of quality affordable housing.			✓
(f) Streamline the review process for high-quality, affordable housing developments that implement the goals, objectives, and policies of the General Plan.			✓
(g) Minimize the intrusion of housing on prime, productive, and potentially productive agricultural lands and regionally valuable agricultural lands.			✓
(h) Encourage long-term residential use of existing and future housing to meet residential needs.			✓
Implementing Actions:			
(a) Develop policies to even out the peaks and valleys in Maui County's construction-demand cycles.			✓
Analysis: **The proposed action does not have a direct or indirect relationship to increasing and maintaining the affordable housing inventory.**			
Objective:			
(4) Expand access to education related to housing options, homeownership, financing, and residential construction.			✓

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
Policies:			
(a) Broaden access to information about County, State, and Federal programs that provide financial assistance to renters and home buyers.			✓
(b) Expand access to information about opportunities for homeownership and self-help housing.			✓
(c) Educate residents about making housing choices that support their individual needs, the needs of their communities, and the health of the islands' natural systems.			✓
(d) Improve home buyers' education on all aspects of homeownership.			✓
Analysis: **The objective of expanding access to education related to housing options, homeownership, financing, and residential construction is not applicable to the proposed action.**			
F. STRENGTHEN THE LOCAL ECONOMY			
Goal: Maui County's economy will be diverse, sustainable, and supportive of community values.	✓		
Objective:			
(1) Promote an economic climate that will encourage diversification of the County's economic base and a sustainable rate of economic growth.	✓		
Policies:			
(a) Support economic decisions that create long-term benefits.	✓		
(b) Promote lifelong education, career development, and technical training for existing and emerging industries.			✓
(c) Invest in infrastructure, facilities, and programs that foster economic diversification.	✓		
(d) Support and promote locally produced products and locally owned operations and businesses that benefit local communities and meet local demand.	✓		
(e) Support programs that assist industries to retain and attract more local labor and facilitate the creation of jobs that offer a living wage.		✓	
(f) Encourage work environments that are safe, rewarding, and fulfilling to employees.			✓
(g) Support home-based businesses that are appropriate for and in character with the community.			✓
(h) Encourage businesses that promote the health and well-being of the residents, produce value-added products, and support community values.			✓
(i) Foster an understanding of the role of all industries in our economy.			✓
(j) Support efforts to improve conditions that foster economic vitality in our historic small towns.			✓
(k) Support and encourage traditional host-culture businesses and indigenous agricultural practices.			✓
(l) Support public and private entities that assist entrepreneurs in establishing locally operated businesses.			✓
Implementing Actions:			
(a) Develop regulations and programs that support opportunities for local merchants, farmers, and small businesses to sell their goods and services directly to the public.			✓
(b) Monitor the carrying capacity of the islands' social, ecological, and infrastructure systems with respect to the economy.			✓

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
Analysis: **The proposed action promotes the goal for economic diversification, sustainability and community values. The proposed action is an investment in the local economy, which will support local businesses that are linked to the construction industry. Such businesses may include materials suppliers, equipment rental companies and specialty construction companies. From a long-term perspective, the proposed action supports economic diversification and the overall business environment by providing opportunities for new enterprises to establish places of operations for their respective ventures.**			
Objective:			
(2) Diversify and expand sustainable forms of agriculture and aquaculture.			✓
Policies:			
(a) Support programs that position Maui County's agricultural products as premium export products.			✓
(b) Prioritize the use of agricultural land to feed the local population, and promote the use of agricultural lands for sustainable and diversified agricultural activities.			✓
(c) Capitalize on Hawai'i's economic opportunities in the ecologically sensitive aquaculture industries.			✓
(d) Assist farmers to help make Maui County more self-sufficient in food production.			✓
(e) Support ordinances, programs, and policies that keep agricultural land and water available and affordable to farmers.			✓
(f) Support a tax structure that is conducive to the growth of the agricultural economy.			✓
(g) Enhance County efforts to monitor and regulate important agricultural issues.			✓
(h) Support education, research, and facilities that strengthen the agricultural industry.			✓
(i) Maintain the genetic integrity of existing food crops.			✓
(j) Encourage healthy and organic farm practices that contribute to land health and regeneration.			✓
(k) Support cooperatives and other types of nontraditional communal farming and efforts.			✓
(l) Encourage methods of monitoring and controlling genetically modified crops to prevent adverse effects.			✓
(m) Work with the State to ease the permitting process for the revitalization of traditional fish ponds.			✓
Implementing Actions:			
(a) Redirect efforts in the Office of Economic Development to further facilitate the development of the agricultural section and to monitor agricultural legislation and issues.			✓
(b) Publicly identify, with signage and other means, the field locations of all genetically modified crops.			✓
(c) Create agricultural parks in areas distant from genetically modified crops.			✓
Analysis: **The proposed action does not have direct or indirect relationships to the objective to expand sustainable agriculture and aquaculture. By example, the proposed project does not affect management of genetically modified crops or support self-sufficiency in food production.**			
Objective:			
(3) Support a visitor industry that respects the resident culture and the environment.			✓

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
Policies:			
(a) Promote traditional Hawaiian practices in visitor-related facilities and activities.			✓
(b) Encourage and educate the visitor industry to be sensitive to island lifestyles and cultural values.			✓
(c) Encourage a spirit of welcome for residents at visitor facilities, such as by offering kamaʻaina incentives and discount programs.			✓
(d) Support the renovation and enhancement of existing visitor facilities.			✓
(e) Support policies, programs, and a tax structure that redirect the benefits of the visitor industry back into the local community.			✓
(f) Encourage resident ownership of visitor-related businesses and facilities.			✓
(g) Develop partnerships to provide educational and training facilities to residents employed in the visitor industry.			✓
(h) Foster an understanding of local cultures, customs, and etiquette, and emphasize the importance of the Aloha Spirit as a common good for all.			✓
(i) Support the diversification, development, evolution, and integration of the visitor industry in a way that is compatible with the traditional, social, economic, spiritual, and environmental values of island residents			✓
(j) Improve collaboration between the visitor industry and the other sectors of Maui County's economy.			✓
(k) Perpetuate an authentic image of the Hawaiian culture and history and an appropriate recognition of the host culture.			✓
(l) Support the programs and initiatives outlined in the Maui County Tourism Strategic Plan 2006-2015.			✓
(m) Promote water conservation, beach conservation, and open-space conservation in areas providing services for visitors.			✓
(n) Recognize the important contributions that the visitor industry makes to the County's economy, and support a healthy and vibrant visitor industry.			✓
Analysis: **The objective of supporting the visitor industry is not applicable to the proposed action. By example, the proposed action does not affect beach and open space conservation for visitors, nor does it promote initiatives outlined in the Maui County Tourism Strategic Plan.**			
Objective:			
(4) Expand economic sectors that increase living-wage job choices and are compatible with community values.	✓		
Policies:			
(a) Support emerging industries, including the following: • Health and wellness industry; • Sports and recreation industry; • Film and entertainment industry; • Arts and culture industry; • Renewable-energy industry; • Research and development industry; • High-technology and knowledge-based industries; • Education and training industry; • Ecotourism industry; and • Agritourism industry.	✓		
Analysis: **The proposed action does have a direct relationship to the objective to expand economic sectors that increase living-wage job choices compatible with community values. The proposed action is envisioned to incorporate renewable energy, developments, and operating spaces involved in other emerging industries.**			

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
G. IMPROVE PARKS AND PUBLIC FACILITIES			
Goal: A full range of island-appropriate public facilities and recreational opportunities will be provided to improve the quality of life for residents and visitors.			✓
Objective:			
(1) Expand access to recreational opportunities and community facilities to meet the present and future needs of residents of all ages and physical abilities.			✓
Policies:			
(a) Protect, enhance, and expand access to public shoreline and mountain resources.			✓
(b) Expand and enhance the network of parks, multi-use paths, and bikeways.			✓
(c) Assist communities in developing recreational facilities that promote physical fitness.			✓
(d) Expand venue options for recreation and performances that enrich the lifestyles of Maui County's people.			✓
(e) Expand affordable recreational and after-school programs for youth.			✓
(f) Encourage and invest in recreational, social, and leisure activities that bring people together and build community pride.			✓
(g) Promote the development and enhancement of community centers, civic spaces, and gathering places throughout our communities.			✓
(h) Expand affordable access to recreational opportunities that support the local lifestyle.			✓
Implementing Actions:			
(a) Identify and reserve lands for cemeteries, and preserve existing cemeteries on all islands, appropriately accommodating varying cultural and, faith-based traditions.			✓
Analysis: **The proposed action does not expand access to recreational opportunities and community facilities. As a proposed industrial land use, the project does not directly or indirectly affect recreational facilities nor does it affect programs intended to enhance community gathering places.**			
Objective:			
(2) Improve the quality and adequacy of community facilities.			✓
Policies:			
(a) Provide an adequate supply of dedicated shelters and facilities for disaster relief.			✓
(b) Provide and maintain community facilities that are appropriately designed to reflect the traditions and customs of local cultures.			✓
(c) Ensure that parks and public facilities are safe and adequately equipped for the needs of all ages and physical abilities to the extent reasonable.			✓
(d) Maintain, enhance, expand, and provide new active and passive recreational facilities in ways that preserve the natural beauty of their locations.			✓
(e) Redesign or retrofit public facilities to adapt to major shifts in environmental or urban conditions to the extent reasonable.			✓
Analysis: **The proposed project does not have direct or indirect relationships to the objective to improve community facilities. The project does not affect the provision of shelters for disaster, relief, and does not address parks and facility requirements for the spectrum of ages and physical abilities.**			

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
Objective:			
(3) Enhance the funding, management, and planning of public facilities and park lands.			✓
Policies:			
(a) Identify and encourage the establishment of regulated and environmentally sound campgrounds.			✓
(b) Manage park use and control access to natural resources in order to rest sensitive places and utilize the resources in a sustainable manner.			✓
(c) Provide public-recreational facilities that are clean and well-maintained.			✓
(d) Develop partnerships to ensure proper stewardship of the islands' trails, public lands, and access systems.			✓
(e) Ensure that there is an adequate supply of public restrooms in convenient locations.			✓
Implementing Actions:			
(a) Encourage the State to allow for overnight fishing along the shoreline in accordance with management plans and regulations.			✓
(b) Develop and regularly update functional plans, including those relating to public facilities, parks, and campgrounds.			✓
(c) Develop and adopt local level-of service standards for public facilities and parks.			✓
(d) Identify, acquire, and develop lands for parks, civic spaces, and public uses.			✓
Analysis: **The objective of enhancing funding, management and planning for public facilities and parks is not applicable to the proposed project.**			
H. DIVERSIFY TRANSPORTATION OPTIONS			
Goal: Maui County will have an efficient, economical, and environmentally sensitive means of moving people and goods.		✓	
Objective:			
(1) Provide an effective, affordable, and convenient ground-transportation system that is environmentally sustainable.		✓	
Policies:			
(a) Execute planning strategies to reduce traffic congestion.		✓	
(b) Plan for the efficient relocation of roadways for the public benefit.			✓
(c) Support the use of alternative roadway designs, such as traffic-calming techniques and modern roundabouts.			✓
(d) Increase route and mode options in the ground-transportation network.			✓
(e) Ensure that roadway systems are safe, efficient, and maintained in good condition.		✓	
(f) Preserve roadway corridors that have historic, scenic, or unique physical attributes that enhance the character and scenic resources of communities.			✓
(g) Design new roads and roadway improvements to retain and enhance the existing character and scenic resources of the communities through which they pass.			✓
(h) Promote a variety of affordable and convenient transportation services that meet countywide and community needs and expand ridership of transit systems.			✓
(i) Collaborate with transit agencies, government agencies, employers, and operators to provide planning strategies that reduce peak-hour traffic.			✓

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
(j) Develop and expand an attractive, island-appropriate, and efficient public transportation system.			✓
(k) Provide and encourage the development of specialized transportation options for the young, the elderly, and persons with disabilities.			✓
(l) Evaluate all alternatives to preserve quality of life before widening roads.			✓
(m) Encourage businesses in the promotion of alternative transportation options for resident and visitor use.			✓
(n) Support the development of carbon-emission standards and an incentive program aimed at achieving County carbon-emission goals.			✓
Implementing Actions:			
(a) Create incentives and implement strategies to reduce visitor dependence on rental cars.			✓
(b) Establish efficient public-transit routes between employment centers and primary workforce residential areas.			✓
(c) Create attractive, island-appropriate, conveniently located park-and-ride and ride- share facilities.			✓
Analysis: **A traffic impact study has been prepared for the proposed action. The traffic study identifies impact mitigation measures which will alleviate traffic operational issues which may be created by the project. As well, roadway improvements proposed for the project will be designed and constructed to meet current design standards to ensure the safe and efficient movement of vehicles to and from and within the project area.**			
Objective:			
(2) Reduce the reliance on the automobile and fossil fuels by encouraging walking, bicycling, and other energy-efficient and safe alternative modes of transportation.			✓
Policies:			
(a) Make walking and bicycling transportation safe and easy between and within communities.			✓
(b) Require development to be designed with the pedestrian in mind.			✓
(c) Design new and retrofit existing rights-of-way with adequate sidewalks, bicycle lanes, or separated multi-use transit corridors.			✓
(d) Support the development of a countywide network of bikeways, equestrian trails, and pedestrian paths.			✓
(e) Support the reestablishment of traditional trails between communities, to the ocean, and through the mountains for public use.			✓
(f) Encourage educational programs to increase safety for pedestrians and bicyclists.			✓
Implementing Actions:			
(a) Design, build, and modify existing bikeways to improve safety and separation from automobiles.			✓
(b) Increase enforcement to reduce abuse of bicycle and pedestrian lanes by motorized vehicles.			✓
(c) Identify non-motorized transportation options as a priority for new sources of funding.			✓
Analysis: **The proposed action does not have direct or indirect applicability to the objective and policies for reducing reliance on automobiles and fossil fuels.**			
Objective:			
(3) Improve opportunities for affordable, efficient, safe, and reliable air transportation.			✓

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
Policies:			
(a) Discourage private helicopter and fixed-wing landing sites to mitigate environmental and social impacts.			✓
(b) Encourage the use of quieter aircraft and noise-abatement procedures for arrivals and departures.			✓
(c) Encourage the modernization and maintenance of air-transportation facilities for general-aviation activities.			✓
(d) Encourage a viable and competitive atmosphere for air carriers to expand service and ensure sufficient intra-County flights and affordable fares for consumers.			✓
(e) Continue to support secondary airports, and encourage the State to provide them with adequate funding.			✓
(f) During Community Plan updates, explore the use of the smaller airports.			✓
(g) Encourage the State to provide efficient, adequate, and affordable parking and transit connections within and around airports.			✓
Analysis: **The proposed action does not have direct or indirect relationships to the objective of improving the affordability, efficiency, safety, and reliability of air transportation.**			
Objective:			
(4) Improve opportunities for affordable, efficient, safe, and reliable ocean transportation.			✓
Policies:			
(a) Support programs and regulations that reduce the disposal of maritime waste and prevent spills into the ocean.			✓
(b) Encourage the upgrading of harbors to resist damage from natural hazards and disasters.			✓
(c) Encourage the State to study the use of existing harbors and set priorities for future use.			✓
(d) Explore all options to protect the traditional recreational uses of harbors, and mitigate harbor-upgrade impacts to recreational uses where feasible.			✓
(e) Encourage the upgrading of harbors and the separation of cargo and bulk materials from passenger and recreational uses.			✓
(f) Encourage the State to provide for improved capacity at shipping, docking, and storage facilities.			✓
(g) Encourage the State to provide adequate parking facilities and transit connections within and around harbor areas.			✓
(h) Encourage the redevelopment and revitalization of harbors while preserving historic and cultural assets in harbor districts.			✓
(i) Encourage the State to provide adequate facilities for small-boat operations, including small-boat launch ramps, according to community needs.			✓
(j) Support the maintenance and cleanliness of harbor facilities.			✓
(k) Support the redevelopment of harbors as pedestrian-oriented gathering places.			✓
Analysis: **The objective of improving opportunities for affordable, efficient, safe, and reliable ocean transportation is not affected by the proposed action.**			
Objective:			
(5) Improve and expand the planning and management of transportation systems.			✓

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
Policies:			
(a) Encourage progressive community design and development that will reduce transportation trips.			✓
(b) Require new developments to contribute their pro rata share of local and regional infrastructure costs.			✓
(c) Establish appropriate user fees for private enterprises that utilize public transportation facilities for recreational purposes.			✓
(d) Support the revision of roadway-design criteria and standards so that roads are compatible with surrounding neighborhoods and the character of rural areas.			✓
(e) Plan for multi-modal transportation and utility corridors on each island.			✓
(f) Support designing all transportation facilities, including airport, harbor, and mass- transit stations, to reflect Hawaiian architecture.			✓
(g) Utilize transportation-demand management as an integral part of transportation planning.			✓
(h) Accommodate the planting of street trees and other appropriate landscaping in all public rights-of-way.			✓
Analysis: **The objective of improving and expanding the planning and management of transportation systems is not affected by the proposed action.**			
I. IMPROVE PHYSICAL INFRASTRUCTURE			
Goal: Maui County's physical infrastructure will be maintained in optimum condition and will provide for and effectively serve the needs of the County through clean and sustainable technologies.		✓	
Objective:			
(1) Improve water systems to assure access to sustainable, clean, reliable, and affordable sources of water.		✓	
Policies:			
(a) Ensure that adequate supplies of water are available prior to approval of subdivision or construction documents.		✓	
(b) Develop and fund improved water-delivery systems.		✓	
(c) Ensure a reliable and affordable supply of water for productive agricultural uses.			✓
(d) Promote the reclamation of gray water, and enable the use of reclaimed, gray, and brackish water for activities that do not require potable water.			✓
(e) Retain and expand public control and ownership of water resources and delivery systems.			✓
(f) Improve the management of water systems so that surface-water and groundwater resources are not degraded by overuse or pollution.			✓
(g) Explore and promote alternative water-source-development methods.			✓
(h) Seek reliable long-term sources of water to serve developments that achieve consistency with the appropriate Community Plans.			✓
Implementing Actions:			
(a) Develop a process to review all applications for desalination.			✓
Analysis: **While the proposed action does not directly promote access to sustainable, clean, reliable, and affordable water sources, the project will go through applicable design reviews for the subdivision and construction documents phases of implementation, which indirectly addresses water system improvement needs. The applicant will be responsible for paying for water system improvements servicing the project area.**			

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
Objective:			
(2) Improve waste-disposal practices and systems to be efficient, safe, and as environmentally sound as possible.			✓
Policies:			
(a) Provide sustainable waste-disposal systems and comprehensive, convenient recycling programs to reduce the flow of waste into landfills.			✓
(b) Support innovative and alternative practices in recycling solid waste and wastewater and disposing of hazardous waste.			✓
(c) Encourage vendors and owners of automobile, appliance, and white goods to participate in the safe disposal and recycling of such goods, and ensure greater accountability for large waste producers.			✓
(d) Develop strategies to promote public awareness to reduce pollution and litter, and encourage residents to reduce, reuse, recycle, and compost waste materials.			✓
(e) Pursue improvements and upgrades to existing wastewater and solid-waste systems consistent with current and future plans and the County's Capital Improvement Program.			✓
Implementing Actions:			
(a) Establish recycling, trash-separation, and materials recovery programs and facilities to reduce the flow of waste into landfills.			✓
(b) Study the feasibility of developing environmentally safe waste-to-energy facilities.			✓
(c) Utilize taxes and fees as means to encourage conservation and recycling.			✓
(d) Implement and regularly update the Integrated Solid Waste Management Plan.			✓
(e) Phase out the use of injection wells.			✓
Analysis: **The proposed action is not directly or indirectly related to the improvement of waste disposal practices and systems to be safe, efficient, and environmentally sound. Notwithstanding, the project will provide wastewater and solid waste collection services which advance sound principles of engineering and public health.**			
Objective:			
(3) Significantly increase the use of renewable and green technologies to promote energy efficiency and energy self-sufficiency.	✓		
Policies:			
(a) Promote the use of locally renewable energy sources, and reward energy efficiency.	✓		
(b) Consider tax incentives and credits for the development of sustainable- and renewable-energy sources.			✓
(c) Expand education about energy conservation and self-sufficiency.			✓
(d) Encourage small-scale energy generation that utilizes wind, sun, water, biowaste, and other renewable sources of energy.	✓		
(e) Expand renewable-energy production.	✓		
(f) Develop public-private partnerships to ensure the use of renewable energy and increase energy efficiency.			✓
(g) Require the incorporation of locally appropriate energy-saving and green building design concepts in all new developments by providing energy efficient urban design guidelines and amendments to the Building Code.			✓
(h) Encourage the use of sustainable energy to power vehicles.			✓

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
(i) Promote the retrofitting of existing buildings and new development to incorporate energy-saving design concepts and devices.			✓
(j) Encourage green footprint practices.			✓
(k) Reduce Maui County's dependence on fossil fuels and energy imports.			✓
(l) Support green building practices such as the construction of buildings that aim to minimize carbon dioxide production, produce renewable energy, and recycle water.			✓
(m) Promote and support environmentally friendly practices in all energy sectors.			✓
Implementing Actions:			
(a) Adopt an energy-efficiency policy for Maui County government as a model for other jurisdictions.			✓
(b) Adopt a Green Building Code, and support green building practices.			✓
Analysis: **A land use plan envisioned for the project area includes 127 acres for renewable energy, which advances the objective of energy self-sufficiency.**			
Objective:			
(4) Direct growth in a way that makes efficient use of existing infrastructure and to areas where there is available infrastructure capacity.		✓	
Policies:			
(a) Capitalize on existing infrastructure capacity as a priority over infrastructure expansion.			✓
(b) Planning for new towns should only be considered if a region's growth is too large to be directed into infill and adjacent growth areas.			✓
(c) Utilize appropriate infrastructure technologies in the appropriate locations.			✓
(d) Promote land use patterns that can be provided with infrastructure and public facilities in a cost-effective manner.		✓	
(e) Support catchment systems and on-site wastewater treatment in rural areas and aggregated water and wastewater systems in urban areas if they are appropriately located.			✓
Implementing Actions:			
(a) Develop a streamlining system for urban infill projects.			✓
(b) Identify appropriate areas for urban expansion of existing towns where infrastructure and public facilities can be provided in a cost-effective manner.			✓
Analysis: **The project is located adjacent to existing industrial developments which allows for efficient design of infrastructure systems.**			
Objective:			
(5) Improve the planning and management of infrastructure systems.		✓	
Policies:			
(a) Provide a reliable and sufficient level of funding to enhance and maintain infrastructure systems.			✓
(b) Require new developments to contribute their pro rata share of local and regional infrastructure costs.		✓	
(c) Improve coordination among infrastructure providers and planning agencies to minimize construction impacts.		✓	
(d) Maintain inventories of infrastructure capacity, and project future infrastructure needs.			✓
(e) Require social-justice and -equity issues to be considered during the infrastructure-planning process.			✓

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
(f) Discourage the development of critical infrastructure systems within hazard zones and the tsunami-inundation zone to the extent practical.			✓
(g) Ensure that infrastructure is built concurrent with or prior to development.		✓	
(h) Ensure that basic infrastructure needs can be met during a disaster.			✓
(i) Locate public facilities and emergency services in appropriate locations that support the health, safety, and welfare of each community and that minimize delivery inefficiencies.			✓
(j) Promote the undergrounding of utility and other distribution lines for health safety, and aesthetic reasons.			✓
Implementing Actions:			
(a) Develop and regularly update functional plans for infrastructure systems.			✓
(b) Develop, adopt, and regularly update local or community-sensitive level-of service standards for infrastructure systems.			✓
Analysis: **The proposed action does not directly support the objective to improve planning and management of infrastructure systems. However, an indirect relationship to this objective exists as the applicant will coordinate with agencies to ensure that appropriate infrastructure design criteria is used.**			
J. PROMOTE SUSTAINABLE LAND USE AND GROWTH MANAGEMENT			
Goal: Community character, lifestyles, economies, and natural assets will be preserved by managing growth and using land in a sustainable manner.	✓		
Objective:			
(1) Improve land use management and implement a directed-growth strategy.	✓		
Policies:			
(a) Establish, map, and enforce urban- and rural-growth limits.			✓
(b) Direct urban and rural growth to designated areas.	✓		
(c) Limit the number of visitor-accommodation units and facilities in Community Plan Areas.			✓
(d) Maintain a sustainable balance between the resident, part-time resident, and visitor populations.			✓
(e) Encourage redevelopment and infill in existing communities on lands intended for urban use to protect productive farm land and open-space resources.			✓
(f) Discourage new entitlements for residential, resort, or commercial development along the shoreline.			✓
(g) Restrict development in areas that are prone to natural hazards, disasters, or sea-level rise.			✓
(h) Direct new development in and around communities with existing infrastructure and service capacity, and protect natural, scenic, shoreline, and cultural resources.	✓		
(i) Establish and maintain permanent open space between communities to protect each community's identity.			✓
(j) Support the dedication of land for public uses.			✓
(k) Preserve the public's rights of access to and continuous lateral access along all shorelines.			✓
(l) Enable existing and future communities to be self-sufficient through sustainable land use planning and management practices.			✓
(m) Protect summits, slopes, and ridgelines from inappropriate development.			✓

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
Implementing Actions:			
(a) Regularly update urban- and rural-growth boundaries and their maps.			✓
(b) Establish transfer and purchase of development rights programs.			✓
(c) Develop and adopt a green infrastructure plan.			✓
(d) Develop studies to help determine a sustainable social, environmental, and economic carrying capacity for each island.			✓
(e) Identify and define resort-destination areas.			✓
Analysis: **The proposed project directly supports the goal for managed growth, as the action is proposed within an area designated for industrial uses by the Lana'i Community Plan. In this connection, the proposed action has a relationship to the policy of directing development in and around communities having infrastructure service potential.**			
Objective:			
(2) Improve planning for and management of agricultural lands and rural areas.			✓
Policies:			
(a) Protect prime, productive, and potentially productive agricultural lands to maintain the islands' agricultural and rural identities and economies.			✓
(b) Provide opportunities and incentives for self-sufficient and subsistence homesteads and farms.			✓
(c) Discourage developing or subdividing agriculturally designated lands when non- agricultural activities would be primary uses.			✓
(d) Conduct agricultural-development planning to facilitate robust and sustainable agricultural activities.			✓
Implementing Actions:			
(a) Inventory and protect prime, productive, and potentially productive agricultural lands from competing non-agricultural land uses.			✓
Analysis: **The proposed action does not directly or indirectly support the objective to plan and manage agricultural and rural lands. For example, the project does support or advance the protection of productive agricultural lands or provide opportunities and incentives for subsistence homesteads and farms.**			
Objective:			
(3) Design all developments to be in harmony with the environment and to protect each community's sense of place.	✓		
Policies:			
(a) Support and provide incentives for green building practices.			✓
(b) Encourage the incorporation of green building practices and technologies into all government facilities to the extent practicable.			✓
(c) Protect and enhance the unique architectural and landscape characteristics of each Community Plan Area, small town, and neighborhood.			✓
(d) Ensure that adequate recreational areas, open spaces, and public-gathering places are provided and maintained in all urban centers and neighborhoods.			✓
(e) Ensure business districts are distinctive, attractive, and pedestrian-friendly destinations.			✓
(f) Use trees and other forms of landscaping along rights-of-way and within parking lots to provide shade, beauty, urban-heat reduction, and separation of pedestrians from automobile traffic in accordance with community desires.			✓

REF-525

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
(g) Where appropriate, integrate public-transit, equestrian, pedestrian, and bicycle facilities, and public rights-of-way as design elements in new and existing communities.			✓
(h) Ensure better connectivity and linkages between land uses.	✓		
(i) Adequately buffer and mitigate noise and air pollution in mixed-use areas to maintain residential quality of life.			✓
(j) Protect rural communities and traditional small towns by regulating the footprint, locations, site planning, and design of structures.			✓
(k) Support small-town revitalization and preservation.			✓
(l) Facilitate safe pedestrian access, and create linkages between destinations and within parking areas.		✓	
Implementing Actions:			
(a) Establish design guidelines and standards to enhance urban and rural environments.			✓
(b) Provide funding for civic-center and civic-space developments.			✓
(c) Establish and enhance urban forests in neighborhoods and business districts.			✓
Analysis: **The proposed action is directly related to this objective as it will provide an opportunity for similar industrial uses to co-locate in an area specifically designated for industrial use by the Lānaʻi Community Plan. Building the industrial park will allow existing industrial facilities currently scattered in business and residential areas in Lānaʻi City to relocate to more appropriate locations having the infrastructure and buffers necessary for industrial uses.**			
Objective:			
(4) Improve and increase efficiency in land use planning and management.		✓	
Policies:			
(a) Assess the cumulative impact of developments on natural ecosystems, natural resources, wildlife habitat, and surrounding uses.			✓
(b) Ensure that new development projects requiring discretionary permits demonstrate a community need, show consistency with the General Plan, and provide an analysis of impacts.		✓	
(c) Encourage public and private partnerships to preserve lands of importance, develop housing, and meet the needs of residents.			✓
(d) Promote creative subdivision designs that implement best practices in land development, sustainable management of natural and physical resources, increased pedestrian and bicycle functionality and safety, and the principles of livable communities.			✓
(e) Coordinate with Federal, State, and County officials in order to ensure that land use decisions are consistent with County plans and the vision local populations have for their communities.			✓
(f) Enable greater public participation in the review of subdivisions.			✓
(g) Improve land use decision making through the use of land- and geographic information systems.			✓
Implementing Actions:			
(a) Institute a time limit and sunsetting stipulations on development entitlements and their implementation.			✓
Analysis: **By engaging in the Chapter 343, Hawaiʻi Revised Statutes (HRS) and land use entitlements processes, the project advances transparency in the project planning process. As well, the applicant has facilitated a community outreach program which**			

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
fosters engagement with interested stakeholders, and which supports the project's analysis of impacts.			
K. STRIVE FOR GOOD GOVERNANCE			
Objective:			
(1) Strengthen governmental planning, coordination, consensus building, and decision making.			✓
Policies:			
(a) Plan and prepare for the effects of social, demographic, economic, and environmental shifts.			✓
(b) Plan for and address the possible implications of Hawaiian sovereignty.			✓
(c) Encourage collaboration among government agencies to reduce duplication of efforts and promote information availability and exchange.			✓
(d) Expand opportunities for the County to be involved in and affect State and Federal decision making.			✓
(e) Plan and prepare for large-scale emergencies and contingencies.			✓
(f) Improve public awareness about preparing for natural hazards, disasters, and evacuation plans.			✓
(g) Improve coordination among Federal, State, and County agencies.			✓
Implementing Actions:			
(a) Develop policies, regulations, and programs to protect and enhance the unique character and needs of the County's various communities.			✓
(b) Evaluate and if necessary, recommend modifications to the County Charter that could result in a possible change to the form of governance for Maui County.			✓
(c) Study and evaluate the feasibility and implications of voting in Maui County Council elections.			✓
(d) Study and evaluate the feasibility of authorizing town governments in Maui County.			✓
Analysis: **The objective of strengthening governmental planning, coordination, consensus building, and decision-making is not applicable to the proposed action. By example, the proposed action does not advance the policy relating to large-scale emergencies and contingencies nor does it affect opportunities for County involvement in State and Federal decision-making.**			
Objective:			
(2) Promote civic engagement.	✓		
Policies:			
(a) Foster consensus building through in-depth, innovative, and accessible public participatory processes.	✓		
(b) Promote and ensure public participation and equal access to government among all citizens.	✓		
(c) Encourage a broad cross-section of residents to volunteer on boards and commissions.			✓
(d) Encourage the State to improve its community-involvement processes.			✓
(e) Support community-based decision making.		✓	
(f) Expand advisory functions at the community level.			✓
(g) Expand opportunities for all members of the public to participate in public meetings and forums.	✓		

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
(h) Facilitate the community's ability to obtain relevant documentation.		✓	
(i) Increase voter registration and turnout.			✓
Implementing Actions:			
(a) Implement two-way communication using audio-visual technology that allows residents to participate in the County's planning processes.			✓
(b) Ensure and expand the use of online notification of County business and public meetings, and ensure the posting of all County board and commission meeting minutes.			✓
(c) Explore funding mechanisms to improve participation by volunteers on boards and commissions.			✓
(d) Develop a project-review process that mandates early and ongoing consultation in and with communities affected by planning and land use activities.	✓		
Analysis: **The proposed action promotes civic engagement through the Chapter 343, HRS, Environmental Assessment (EA) and land use entitlements processes. Public participation is promoted through review process for the Draft EA and land use applications, as well as through the Urban Design Review Board and Lanaʻi Planning Commission proceedings. Additionally, the applicant has undertaken a community outreach process designed to inform nearby residents and the larger community of the proposed project. Collectively, the foregoing processes support community-based decision-making.**			
Objective:			
(3) Improve the efficiency, reliability, and transparency of County government's internal processes and decision making.		✓	
Policies:			
(a) Use advanced technology to improve efficiency.			✓
(b) Simplify and clarify the permitting process to provide uniformity, reliability, efficiency, and transparency.		✓	
(c) Improve communication with Lanaʻi and Molokaʻi through the expanded use of information technologies, expanded staffing, and the creation and expansion of government-service centers.			✓
(d) Ensure that laws, policies, and regulations are internally consistent and effectuate the intent of the General Plan.		✓	
Implementing Actions:			
(a) Update the County Code to be consistent with the General Plan.			✓
(b) Identify and update County regulations and procedures to increase the productivity and efficiency of County government.			✓
(c) Develop local level-of-service standards for infrastructure, public facilities, and services.			✓
(d) Implement plans through programs, regulations, and capital improvements in a timely manner.			✓
(e) Expand government online services.			✓
Analysis: **Participation in the Chapter 343, HRS, and land use processes advances the objective to promote efficiency reliability and transparency in governmental decision-making. The concurrent processing of the EA and land use requests simplifies the permitting process. The project has been assessed in the context of the General Plan and advances transparency in the project planning process.**			

COUNTYWIDE POLICY PLAN (Key: DA = Directly Applicable, IA = Indirectly Applicable, NA = Not Applicable)	DA	IA	NA
Objective:			
(4) Adequately fund in order to effectively administer, implement, and enforce the General Plan.		✓	
Policies:			
(a) Adequately fund, staff, and support the timely update and implementation of planning policy, programs, functional plans, and enforcement activities.			✓
(b) Ensure that the County's General Plan process provides for efficient planning at the County, island, town, and neighborhood level.			✓
(c) Encourage ongoing professional development, education, and training of County employees.			✓
(d) Encourage competitive compensation packages for County employees to attract and retain County personnel.			✓
(e) Enable the County government to be more responsive in implementing our General Plan and Community Plans.		✓	
(f) Review discretionary permits for compliance with the Countywide Policy Plan.		✓	
(g) Strengthen the enforcement of County, State, and Federal land use laws.			✓
Implementing Actions:			
(a) Establish penalties to ensure compliance with County, State, and Federal land use laws.			✓
Analysis: **The proposed action has been assessed in the context of the General Plan and advances implementation of the land use objectives and policies in the Community Plan. The project's land use applications, which are discretionary approvals, will be reviewed in the context of the County General Plan.**			
Objective:			
(5) Strive for County government to be a role model for implementing cultural and environmental policies and practices.		✓	
Policies:			
(a) Educate residents on the benefits of sustainable practices.			✓
(b) Encourage the retention and hiring of qualified professionals who can improve cultural and environmental practices.		✓	
(c) Incorporate environmentally sound and culturally appropriate practices in government operations and services.			✓
(d) Encourage all vendors with County contracts to incorporate environmentally sound and culturally appropriate practices.			✓
Analysis: **Studies prepared for the proposed action have been assessed in the context of applicable cultural and environmental policies and objectives. As well, construction specifications for the project will incorporate environmentally sound and culturally appropriate measures for the project's contractor.**			

MUNEKIYO HIRAGA

Planning. Project Management. Sustainable Solutions.

REF-528