

Table III-5

**FORECASTED RESIDENT POPULATION AND JOBS BY SECTOR  
FOR THE CITY AND COUNTY OF HONOLULU TO THE YEAR 2035**

	2005	2010	2015	2020	2025	2030	2035
<b><u>Resident Population</u></b>							
Civilians	808,384	835,260	873,630	910,290	945,960	980,620	1,013,250
Military & Dependents	93,651	96,860	100,080	100,080	100,080	100,080	100,080
<b>Total Population, Civilian + Military</b>	<b>902,035</b>	<b>932,120</b>	<b>973,710</b>	<b>1,010,370</b>	<b>1,046,040</b>	<b>1,080,700</b>	<b>1,113,330</b>
	2006	2010	2015	2020	2025	2030	2035
<b><u>Jobs By Sector, Including Self-Employed (1)</u></b>							
Agriculture	5,280	5,380	5,520	5,570	5,600	5,610	5,570
Mining & Construction	31,840	31,850	33,880	33,780	34,570	35,410	36,570
Food Processing	4,490	4,580	4,710	4,770	4,820	4,830	4,830
Other Manufacturing	9,370	9,500	9,780	9,890	10,010	10,060	10,090
Transportation	24,580	25,750	27,470	28,990	30,510	31,990	33,450
Information	10,360	10,740	11,290	11,680	12,090	12,450	12,810
Utilities	1,820	1,890	2,000	2,070	2,160	2,240	2,310
Wholesale Trade	17,910	18,590	19,700	20,480	21,370	22,250	23,130
Retail Trade	62,290	64,380	67,430	69,350	71,380	73,230	74,860
Finance & Insurance	22,040	22,910	24,170	25,080	26,000	26,860	27,640
Real Estate & Rentals	28,900	30,080	31,680	32,790	33,880	34,850	35,670
Professional Services	34,510	37,050	40,920	44,700	49,170	54,070	59,670
Business Services	50,090	53,950	59,710	65,320	71,660	78,640	86,340
Educational Services	14,570	15,470	16,750	17,890	19,120	20,400	21,730
Health Services	53,840	57,390	62,370	66,840	71,740	76,890	82,260
Arts & Entertainment	12,800	13,600	14,720	15,740	16,810	17,910	19,030
Hotels	14,480	14,880	15,380	15,770	16,010	16,130	16,140
Eating & Drinking	41,140	42,920	45,370	47,350	49,340	51,250	53,090
Other Services	35,540	37,840	41,120	44,040	47,230	50,570	54,040
Government	101,840	105,200	109,740	113,490	117,320	121,060	124,620
<b>Total Jobs, Wage &amp; Salary + Self-Employed (2)</b>	<b>577,640</b>	<b>603,910</b>	<b>643,670</b>	<b>675,560</b>	<b>710,790</b>	<b>746,660</b>	<b>783,830</b>

(1) Jobs By Sector rounded to the nearest 10.

(2) Total Jobs may not add due to rounding.

Source: Department of Business Economic Development and Tourism (DBEDT), Population and Economic Projections for the State of Hawaii to 2035.

**Table III-6**

**FORECASTED POPULATION AND JOBS BY DEVELOPMENT PLAN (DP) AREA  
FOR THE CITY AND COUNTY OF HONOLULU TO THE YEAR 2030**

	2005	2010	2015	2020	2025	2030
<b><u>POPULATION FORECAST:</u></b>						
<b>City and County of Honolulu</b>	<b>912,913</b>	<b>952,661</b>	<b>995,562</b>	<b>1,037,252</b>	<b>1,078,058</b>	<b>1,117,322</b>
Primary Urban Center	423,621	440,981	452,048	463,335	475,700	487,148
Ewa	84,015	97,111	116,183	137,125	156,302	177,026
Central Oahu	159,018	163,153	170,643	179,833	188,719	195,617
East Honolulu	49,748	52,387	53,436	52,642	51,952	51,304
Koolaupoko	118,763	119,856	121,292	119,567	118,062	116,676
Koolauloa	14,697	15,014	15,422	15,824	16,188	16,516
North Shore	18,395	18,987	19,547	20,035	20,450	20,750
Waianae	44,656	45,172	46,991	48,891	50,685	52,285
<b><u>EMPLOYMENT/JOB FORECAST:</u></b>						
<b>City and County of Honolulu</b>	<b>522,851</b>	<b>545,229</b>	<b>566,862</b>	<b>588,030</b>	<b>610,113</b>	<b>632,711</b>
Primary Urban Center	379,355	391,512	398,747	407,927	417,758	426,591
Ewa	27,542	36,863	48,168	56,209	64,201	73,370
Central Oahu	55,838	55,296	59,090	62,599	66,341	70,031
East Honolulu	6,931	6,907	6,622	6,650	6,676	6,795
Koolaupoko	36,140	36,764	36,792	36,923	37,172	37,498
Koolauloa	5,883	6,480	6,294	6,500	6,684	6,945
North Shore	3,909	4,201	4,208	4,235	4,261	4,355
Waianae	7,253	7,206	6,941	6,987	7,020	7,126

Source: Department of Planning and Permitting (DPP), Socioeconomic Projections, 2000-2030 By Development Plan Area.

**Table III-7**

**FORECASTED JOBS BY EMPLOYMENT CATEGORY TO THE YEAR 2030  
FOR THE CITY AND COUNTY OF HONOLULU AND WAIANA E DP AREA**

	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
<b><u>City and County of Honolulu</u></b>						
Armed Forces	40,368	40,368	40,370	40,370	40,370	40,370
Public Administration	36,703	37,606	38,601	39,392	40,304	41,282
Hotel	16,795	17,399	17,900	18,500	18,998	19,500
Agriculture	4,627	4,769	4,854	4,945	5,110	5,255
Transportation, Communication, Utilities	39,531	41,599	43,591	45,711	47,816	49,997
Industrial	30,143	31,094	32,052	32,873	33,715	34,636
Construction	25,086	26,187	26,281	26,464	26,975	27,475
Finance, Insurance, Real Estate	33,965	35,611	37,311	38,910	40,603	42,299
Services	201,186	211,296	221,665	231,745	242,163	252,844
Retail	94,447	99,300	104,237	109,120	114,059	119,053
<b>Total Jobs, C &amp; C of Honolulu</b>	<b>522,851</b>	<b>545,229</b>	<b>566,862</b>	<b>588,030</b>	<b>610,113</b>	<b>632,711</b>
<b><u>Waianae Development Plan (DP) Area</u></b>						
Armed Forces	47	47	47	47	47	47
Public Administration	401	401	401	405	414	421
Hotel	26	109	109	109	109	110
Agriculture	534	553	569	581	607	620
Transportation, Communication, Utilities	193	196	208	221	224	234
Industrial	115	115	115	115	115	115
Construction	801	649	356	373	368	443
Finance, Insurance, Real Estate	245	245	245	245	245	245
Services	3,586	3,586	3,586	3,586	3,586	3,586
Retail	1,305	1,305	1,305	1,305	1,305	1,305
<b>Total Jobs, Waianae DP Area</b>	<b>7,253</b>	<b>7,206</b>	<b>6,941</b>	<b>6,987</b>	<b>7,020</b>	<b>7,126</b>

Source: Department of Planning and Permitting (DPP), Socioeconomic Projections, 2000-2030 By Development Plan Area.

Table III-8

**COMPARISON OF POPULATION AND EMPLOYMENT FORECASTS FOR THE  
CITY AND COUNTY OF HONOLULU & WAIANAE DEVELOPMENT PLAN AREA**

Year	2005	2010	2015	2020	2025	2030
<b><u>Resident Population Forecast</u></b>						
<b>City and County of Honolulu (Island of Oahu)</b>	912,913	952,661	995,562	1,037,252	1,078,058	1,117,322
Percent of City & County/Island Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
<b>Waianae Development Plan Area</b>	44,656	45,172	46,991	48,891	50,685	52,285
Percent of City & County/Island Total	4.9%	4.7%	4.7%	4.7%	4.7%	4.7%
<b><u>Employment/Job Forecast (Total Jobs)</u></b>						
<b>City and County of Honolulu (Island of Oahu)</b>						
Total Jobs	522,851	545,229	566,862	588,030	610,113	632,711
Percent of City & County/Island Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
<b>Waianae Development Plan Area</b>						
Total Jobs	7,253	7,206	6,941	6,987	7,020	7,126
Percent of City & County/Island Total	1.4%	1.3%	1.2%	1.2%	1.2%	1.1%
<b><u>Employment/Job Forecast of Industrial Sector Jobs(1)</u></b>						
<b>City and County of Honolulu (Island of Oahu)</b>						
Industrial Sector Jobs(1)	94,760	98,880	101,924	105,048	108,506	112,108
Percent of City & County/Island Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
<b>Waianae Development Plan Area</b>						
Industrial Sector Jobs(1)	1,109	960	679	709	707	792
Percent of City & County/Island Total	1.2%	1.0%	0.7%	0.7%	0.7%	0.7%

(1) Industrial Sector Jobs include all jobs within the following DPP employment categories: Transportation, Communications, Utilities; Industrial; and Construction.

Source: Department of Planning and Permitting (DPP), Socioeconomic Projections, 2000-2030 By Development Plan Area.

Table III-9

**INDUSTRIAL LAND USE DEMAND FORECASTS, 2005-2030**  
**Proposed Tropic Land LLC Industrial Park**  
**Lualualei, Waianae, Island of Oahu**

Year	2005	2010	2015	2020	2025	2030
<b><u>Industrial Land Use Demand Forecast -- Employment Model</u></b>						
<b>City and County of Honolulu (Island of Oahu)</b>						
Industrial Sector Job Forecast	94,760	98,880	101,924	105,048	108,506	112,108
Land Use Conversion Factor (Land Area Per Employee/Job)	2,500 SF/Job	2,500 SF/Job	2,500 SF/Job	2,500 SF/Job	2,500 SF/Job	2,500 SF/Job
Industrial Land Use Demand (Acres)	5,438	5,675	5,850	6,029	6,227	6,434
Cumulative Additional Land Use Demand (Acres)	-	236	411	590	789	996
<b>Waianae Development Plan Area</b>						
Modified Industrial Job Forecast @ 2.0% of Island of Oahu	1,109	1,978	2,038	2,101	2,170	2,242
Land Use Conversion Factor (Land Area Per Employee/Job)	5,000 SF/Job	5,000 SF/Job	5,000 SF/Job	5,000 SF/Job	5,000 SF/Job	5,000 SF/Job
Industrial Land Use Demand (Acres)	127	227	234	241	249	257
<b><i>Cumulative Additional Land Use Demand (Acres) HIGH END</i></b>	<b>-</b>	<b>100</b>	<b>107</b>	<b>114</b>	<b>122</b>	<b>130</b>
<b>Waianae Development Plan Area</b>						
Modified Industrial Job Forecast @ 1.7% of Island of Oahu	1,109	1,681	1,733	1,786	1,845	1,906
Land Use Conversion Factor (Land Area Per Employee/Job)	5,000 SF/Job	5,000 SF/Job	5,000 SF/Job	5,000 SF/Job	5,000 SF/Job	5,000 SF/Job
Industrial Land Use Demand (Acres)	127	193	199	205	212	219
<b><i>Cumulative Additional Land Use Demand (Acres) MID-RANGE</i></b>	<b>-</b>	<b>66</b>	<b>72</b>	<b>78</b>	<b>85</b>	<b>92</b>
<b>Waianae Development Plan Area</b>						
Modified Industrial Job Forecast @ 1.5% of Island of Oahu	1,109	1,483	1,529	1,576	1,628	1,682
Land Use Conversion Factor (Land Area Per Employee/Job)	5,000 SF/Job	5,000 SF/Job	5,000 SF/Job	5,000 SF/Job	5,000 SF/Job	5,000 SF/Job
Industrial Land Use Demand (Acres)	127	170	176	181	187	193
<b><i>Cumulative Additional Land Use Demand (Acres) LOW END</i></b>	<b>-</b>	<b>43</b>	<b>49</b>	<b>54</b>	<b>60</b>	<b>66</b>

Source: Hastings, Conboy, Braig & Associates, Ltd., March 2008.

**Table IV-1**

**SHORT-TERM AND LONG-TERM EMPLOYMENT FORECASTS**  
**Proposed Tropic Land LLC Industrial Park**  
**Lualualei, Waianae, Island of Oahu**

<b>Short-Term, Interim Forecast (15-Month Construction Period):</b>	<b>Low</b>		<b>High</b>	
Average Number of On-Site Jobs/Workers	80	to	100	Persons
Multiplied by Length of Construction Period, In Years	<u>x 1.25</u>		<u>x 1.25</u>	
Equals Number of Person-Years	100.0	to	125.0	Person-Years
<b>On-Site Job Requirement, In Person-Years</b>	<b>100.0</b>	<b>to</b>	<b>125.0</b>	<b>Person-Years</b>
<b>Plus Off-Site Job Requirement @ 20%</b>	<b><u>20.0</u></b>	<b>to</b>	<b><u>25.0</u></b>	<b>Person-Years</b>
<b>Total Short-Term Employment Forecast</b>	<b>120.0</b>	<b>to</b>	<b>150.0</b>	<b>Person-Years</b>
<b>Long-Term, Stabilized Operational Forecast:</b>	<b>Low</b>		<b>High</b>	
Amount of Developed Industrial Land, In Acres	70		70	Acres
Multiplied by Number of Employees/Jobs Per Acre	<u>x 8</u>	to	<u>x 12</u>	Jobs Per Acre
Equals Number of Direct Jobs Created (On-Site)	560	to	840	Jobs
<b>Direct Jobs Created (On-Site)</b>	<b>560</b>	<b>to</b>	<b>840</b>	<b>Jobs</b>
<b>Employment Multiplier (Indirect and Induced Job Creation)</b>	<b><u>x 1.50</u></b>		<b><u>x 1.50</u></b>	
<b>Total Long-Term Employment Forecast</b>	<b>840</b>	<b>to</b>	<b>1,260</b>	<b>Jobs</b>

Source: Hastings, Conboy, Braig & Associates, Ltd., March 2008.

## **APPENDIX C**

Agricultural Feasibility Report, TMK 8-7-009: 002, Nanakuli, Oahu,  
Hawaii. John J. McHugh, Jr. Ph.D., May 2008

**Agricultural Feasibility Report**  
**TMK 8-7-009-002**  
**Nanakuli, Oahu, Hawaii**

**Prepared for**

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**TABLE OF CONTENTS**

	<u>Page</u>
INTRODUCTION .....	3
PROPERTY DESCRIPTION .....	3
Land Use Classification .....	3
Existing Uses and Site Conditions .....	3
Soil Analysis .....	3
Slope Conditions .....	4
LAND CLASSIFICATION/LAND STUDY BUREAU RATINGS .....	4
LAND AS RATED UNDER THE ALISH SYSTEM .....	4
CONCLUSION .....	6
ATTACHMENT A – Property Location .....	7
ATTACHMENT B – Soil Map .....	8
ATTACHMENT C – Topographical Map .....	9
ATTACHMENT D – Land Study Bureau Productivity Rating for Subject Property .....	10
ATTACHMENT E - ALISH Classification for the Island of Oahu .....	11
ATTACHMENT F - ALISH Classification for Subject Property .....	12

## INTRODUCTION

This Agricultural Feasibility Report relates to TMK 8-7-009-002 located in Nanakuli on the island of Oahu, hereafter referred to as the “Property”. The purpose of this report is to demonstrate that the property is unsuitable for agricultural uses. The Property consists of a total of 236.154 acres and is bounded by land zoned to a combination of preservation and agriculture. The Property has not been actively used for many years and is overgrown with non-native trees, shrubs, and grasses.

## PROPERTY DESCRIPTION

The Property is located in West Oahu, to the east of Farrington Highway in Nanakuli with frontage along Lualualei Naval Road (**ATTACHMENT A**). This Property is identified as TMK 8-7-009-002 and consists of a total of 236.154 acres.

### 1. Land Use Classification

The Property is within an area zoned P-2 General Preservation by the City and County of Honolulu and includes land also zoned P-1 Restricted Preservation.

### 2. Existing Uses and Site Conditions

The Property is undeveloped and not currently being used for agriculture. It is overgrown with non-native trees, shrubs, and grasses. There are no improvements on the Property. Much of the Property is heavily sloped with a gradient rise of over 70% in some sections. The lowest sections of the Property contain slopes of greater than 10%. Rainfall in the area is less than 20 inches annually which makes it difficult to graze animals without the use of expensive irrigation water.

### 3. Soil Analysis (**ATTACHMENT B**)

Half of the Property is Lualualei extremely stony clay soil (LPE) which is characterized by slopes of 3 to 35%. In most places the soil is moderately sloping to steep. Erosion hazard is moderate to severe. The natural vegetation consists of kiawe, haole koa, guinea grass, bristly foxtail, and swollen fingergrass. The LPE soil has a Capability Classification of VIIs which has very severe limitations rendering it unsuitable for cultivation because of unfavorable texture as well as being extremely stony or rocky.

Approximately 30% of the Property is considered to be Rock Land (rRK) with slopes of 5 to 70%. This soil type contains areas where exposed rock covers 25 to 90% of the surface. Rock outcrops and very shallow soils are the main characteristics. The land is nearly level to very steep. Natural vegetation at the elevation of the Property consists of kiawe, Japanese tea, koa haole, and guinea grass. A total of 80% of the Property is unusable for any type of agriculture because of the presence of the two dominant soil types.

The remainder of the soil is composed of 15% Lualualei clay (LuB) which has a slope of 2 to 6%, Lualualei clay of 0% slope (LuA) which makes up 2% of the

overall soil component, and Pulehu very stony clay loam (PvC), with slopes of 0 to 12%, comprises the remaining 3% of the total soil on the Property.

LuA and LuB soils, if not irrigated, have a Capability Classification of VIs which has extreme limitations that make them generally unsuited to cultivation and have a stony or rocky texture. If irrigated, the Capability Classification improves to IIIs for the LuA soil and IIIe for the LuB. Class III soils can have severe limitations that reduce the choice of crop plants. IIIs soils are challenged because of stoniness and/or unfavorable texture, resulting in poor water holding capacity, while IIIe soils are subject to severe erosion if cultivated and not protected. PvC soils have a Capability Classification of IVs which has very severe limitations that also can reduce the choice of crop plants, require very careful management, and are stony, shallow with unfavorable texture, and have low water holding capacity coupled with severe shrink/swell characteristics. Irrigation does not improve the Capability Classification of PvC soil.

Because of the high percentage of rocks, stony ground, poor soil texture, low water holding capacity, severe shrink/swell properties, steep slope, and severe erosion hazard agricultural options for the Property are extremely limited.

#### **4. Slope Conditions (ATTACHMENT C)**

The side of the Property that abuts Lualualei Naval Rd is about 60 to 80 feet above sea level. From that location the land rises slowly at first to 90 feet and then abruptly exceeds a 10% rise in gradient. The highest point on the property is approximately 1,870 feet above sea level in the southern corner of the lot.

#### **LAND CLASSIFICATION AND CROP PRODUCTIVITY RATINGS BY THE LAND STUDY BUREAU, UNIVERSITY OF HAWAII (ATTACHMENTS D)**

The Property has an overall agricultural productivity rating of E, as determined by the University of Hawaii Land Study Bureau, on 80% of the area. In general, the soils in their native state have serious limitations relative to agricultural productivity. Because much of the parcel is stony, agricultural options for the Property, without amendment or modification, are considered to be minimal. That portion of the Property with an overall agricultural productivity rating of B is accorded that rating if it is irrigated. The limitations of that particular piece, without irrigation, have been addressed in the preceding section.

#### **LAND AS RATED UNDER THE ALISH SYSTEM (ATTACHMENT E & F)**

Maps detailing Agricultural Lands of Importance to the State of Hawaii (ALISH) were first created in 1977 and was a joint effort between the USDA – Soil Conservation Source (now know as the Natural Resource Conservation Services – NRCS) and the College of Tropical Agriculture and Human Resources (CTAHR) at the University of Hawaii. Land was broken down into 4 categories: 0 = Unclassified, 1 = Prime

Agricultural Lands, 2 = Unique Lands, 3 = Other Lands  
([http://www.hawaii.gov/dbedt/gis/data/alish\\_n83.txt](http://www.hawaii.gov/dbedt/gis/data/alish_n83.txt) ).

The ALISH classification system was devised to identify lands which were agriculturally important with the intention of providing a break down of type of agricultural lands based on soil characteristics, establishing a process for classifying the lands, and ultimately identifying those lands which met specific criteria for their respective classes. Those lands that were not considered for designation of agricultural status were: developed urban land; natural or artificial bodies of water over 10 acres in size; forest reserves; public use lands such as parks; lands with slopes in excess of 35%; and military installations. The classification of any land to important agricultural status does not constitute a specific land use for that designation. The main objective for the process was to identify those lands for planning purposes.

A designation of Prime Agricultural Lands (PAL) is associated for those areas that are best suited for the production of food, feed, forage, and fiber. Soil quality, moisture (or availability of water), and length of growing season needed to obtain high yields were considered in PAL determination. Specific criteria used to evaluate land for PAL use include: soils with a good moisture holding capacity and good drainage; land with accessible water supply for irrigation purposes where the quality of the water is also appropriate for crop production; a very narrow range in variation of soil temperature between the warmest and coldest times of the year (less than 9°F) and with a minimum temperature of 47°F; soil chemistry, as expressed by pH, between 4.5 and 8.4 within 40 inches of the soil surface; soil with a water table far enough below the surface that it would not encroach on the crop root zone; soil that does not have a high sodium or salt content within a 40 inch root zone; soils that are not subject to frequent and regular flooding (less often than one every 2 years); soils without a serious erosion hazard; soil with a water permeability rate of at least 0.06 inches per hour; less than 10% of the soil surface layer consists of rock or stone fragments greater than 3 inches; soils must be stable (not subject to sliding).

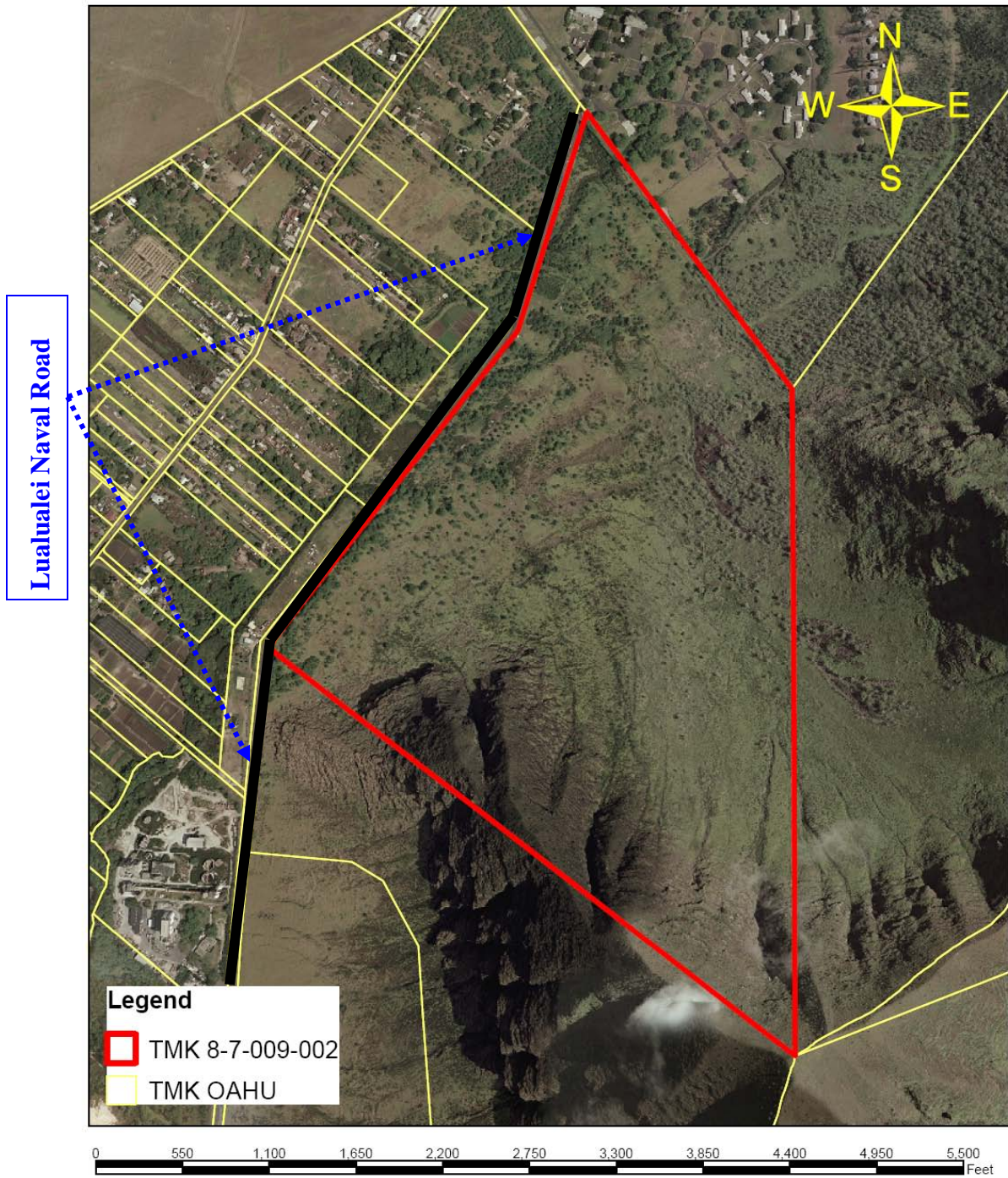
The Unique Agricultural Land (UAL) designation applies to those lands other than PAL which are used for production of specific high value crops such as coffee, taro, rice, and watercress. UAL lands have a special combination of soil quality, growing season, sunlight, elevation, moisture supply, temperature, and nearness to market place such that the year round production of specific commodities can remain unabated. Other Important Agricultural Land (OIAL) is land other than PAL and UAL on which agricultural crops can be farmed but they may be subjected to frequent flooding, drought, excessive rainy season moisture, or has slopes in excess of 35°. Inadequate moisture supply could include OIAL lands which might otherwise be considered to be PAL. However, these lands could be brought into productive agricultural use if an irrigation source is available. Generally OIAL may require additional inputs and management intensity beyond those required for farming PAL. Some of those additional inputs may include additional fertilizer, erosion control measures, improved drainage, flood protection and produce fair to good crops if managed properly.

The LuA, LuB, and PVC soils combine to form that portion of the property (approximately 17%) that is considered to be Other Ag Lands under the ALISH system (**ATTACHMENT F**). These soils have serious agricultural limitations as described under the Soil Analysis portion of this report. Their use for agriculture is further limited by the availability of affordable irrigation water. Water availability for new agricultural land on the leeward coast of Oahu is extremely limited and expensive (currently at \$2.46/1,000 gallons for the first 13,000 gallons and \$1.05/1,000 gallons for any amount over 13,000 gallons) and thus is not considered to be economically viable for agriculture because of the availability of large tracts of agricultural land located in Kunia (4,000 acres+), Waialua, and Wahiawa where agricultural water rates range from \$0.41 to \$0.55/1,000 gallons and land is plentiful.

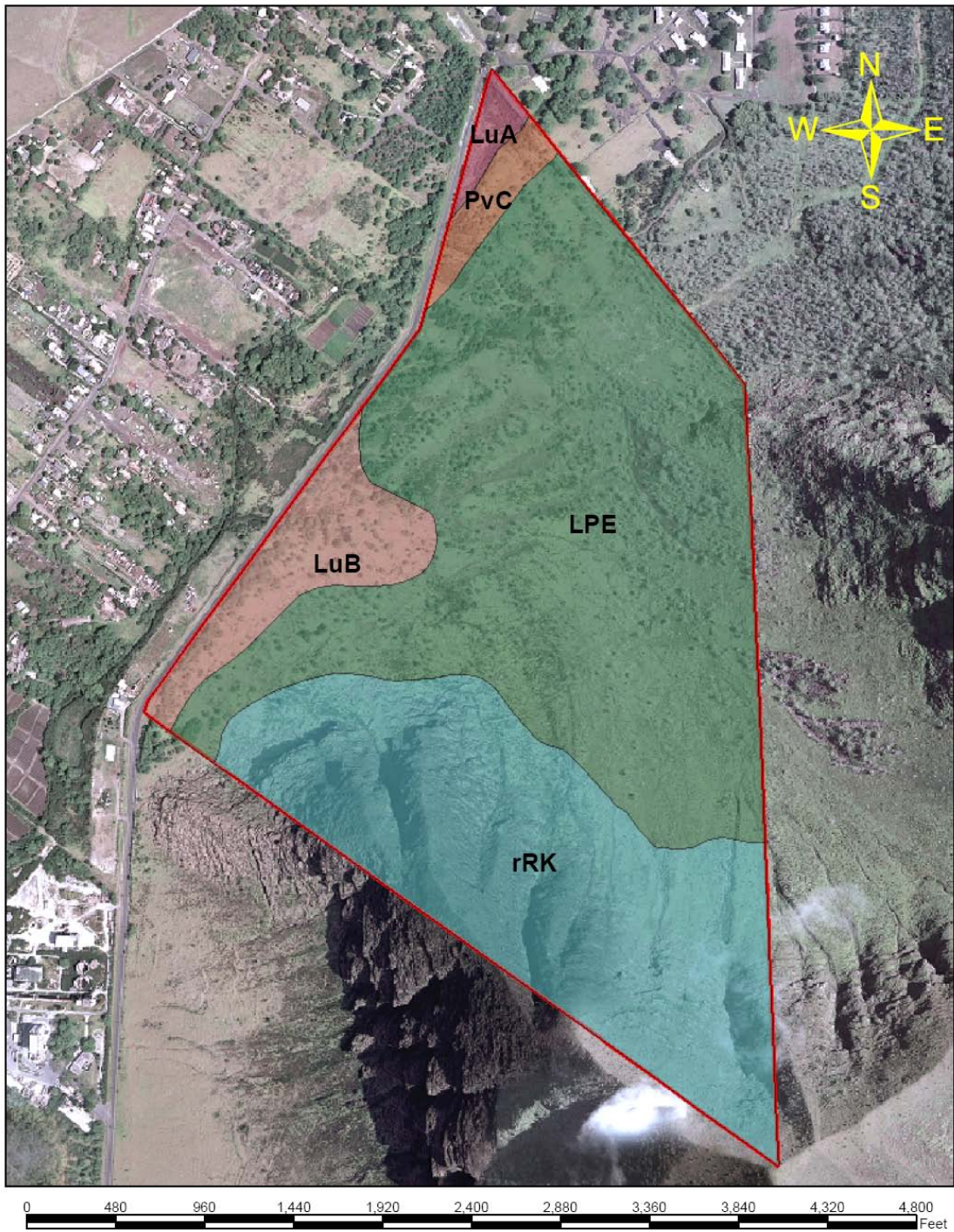
## **CONCLUSION**

The overall poor condition of the soil combined with topography and the lack of affordable irrigation water makes this Property poorly suited for agricultural operations. To bring the more agriculturally suitable 17% of the Property into agricultural use would require water resources which are not readily available to new agricultural operations on the leeward coast of Oahu. For the approximately 40 acres of farmable land the water requirement, in the hot and dry climate of Nanakuli, would be 5,400 gallons per acre a day using drip irrigation technology. This amounts to a water demand for crops grown on those acres of 216,000 gallons per day. This type of water consumption would be difficult to provide which further renders the property unsuitable to agricultural production. The combination of poor soil conditions and high water requirement would make it unlikely that any prospective farming operators would consider this property for active agriculture. Currently much more favorable options are available including several thousand acres of James Campbell Company land in Kunia recently sold to various agricultural businesses, Dole land in Wahiawa and Waialua, and the Galbraith Estate property in Wahiawa which have more affordable irrigation water options than are present on the leeward coast of Oahu.

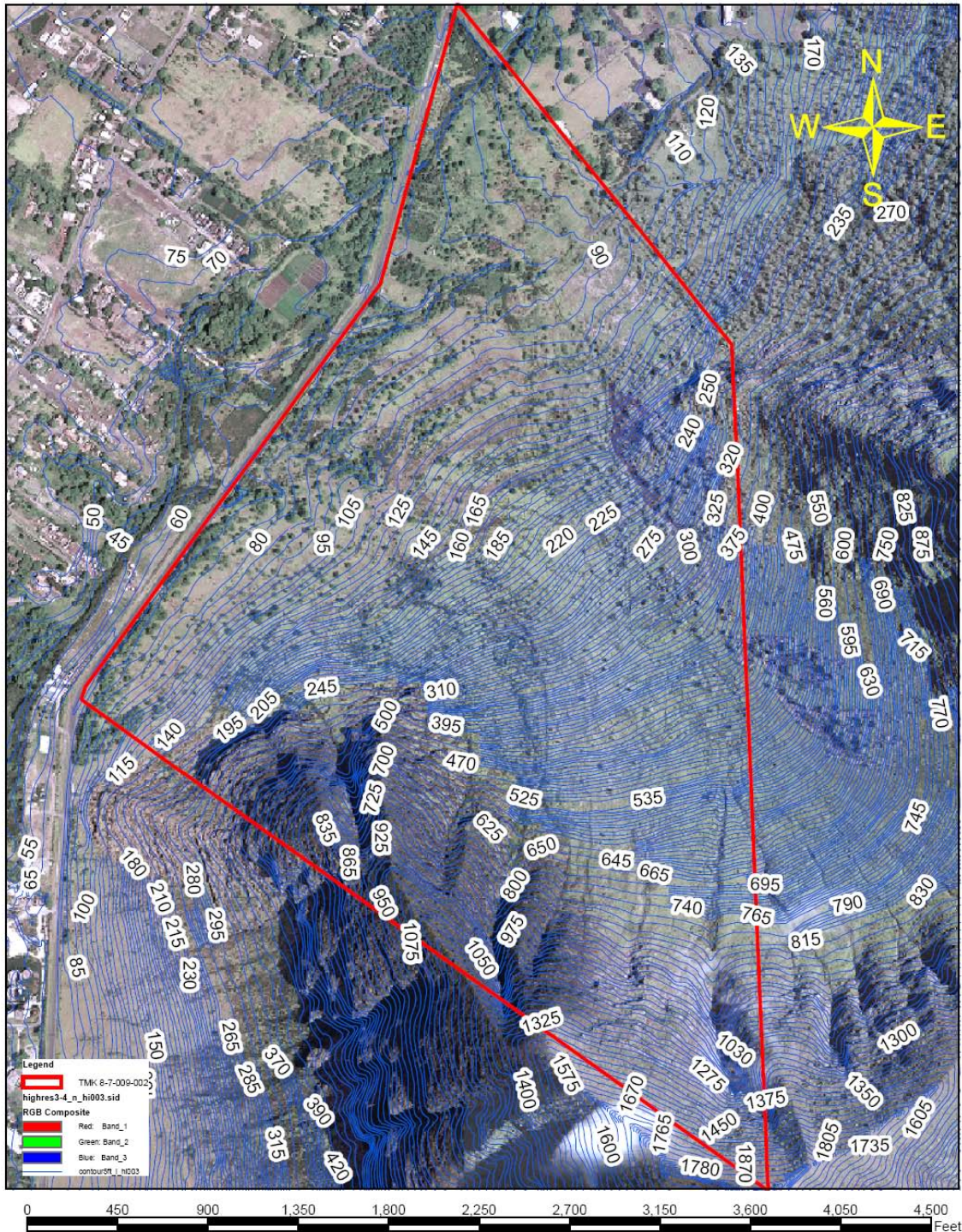
**ATTACHMENT A – Property Location**



**ATTACHMENT B – Soil Map**

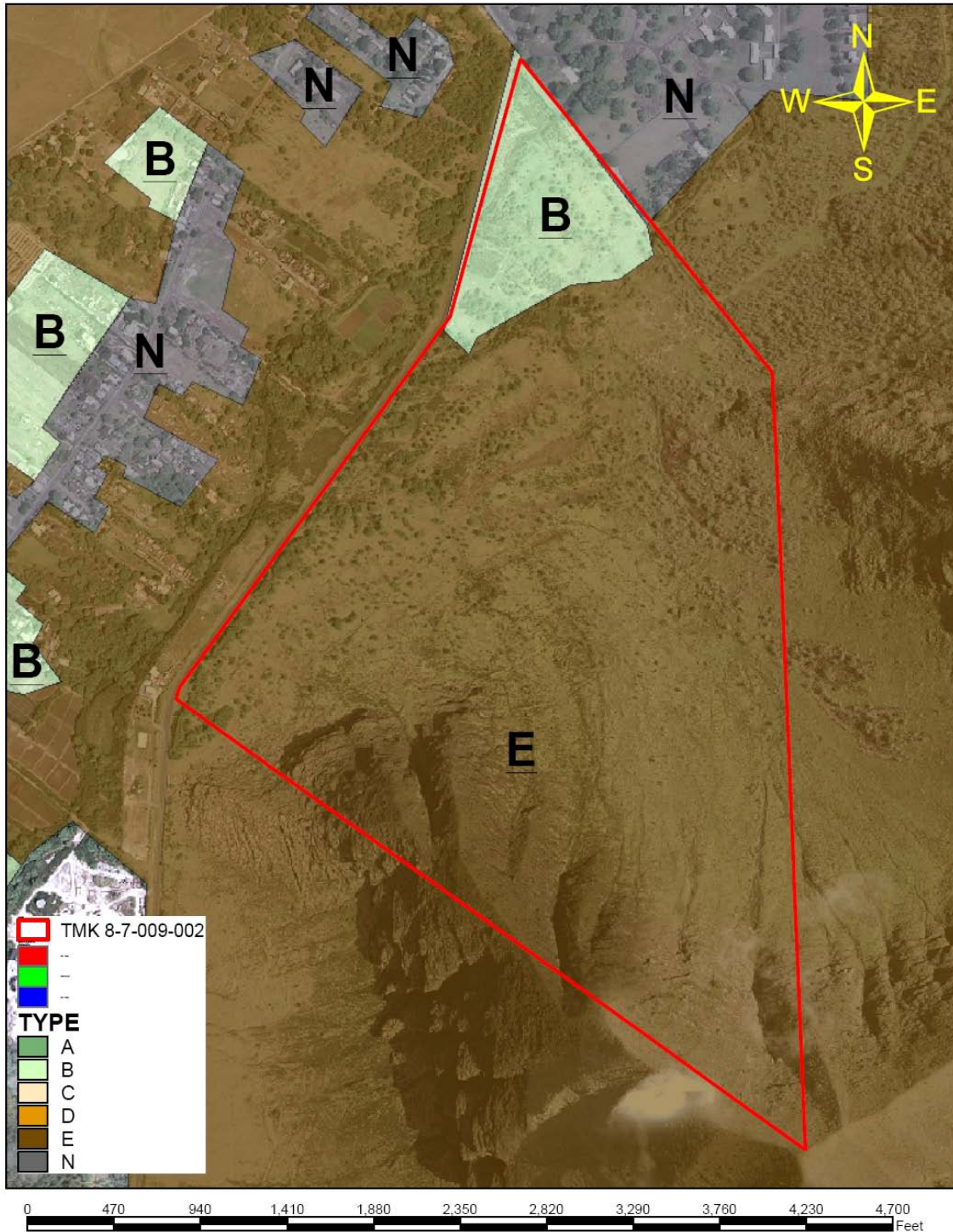


**ATTACHMENT C – Topographical Map (5 ft. contour)**

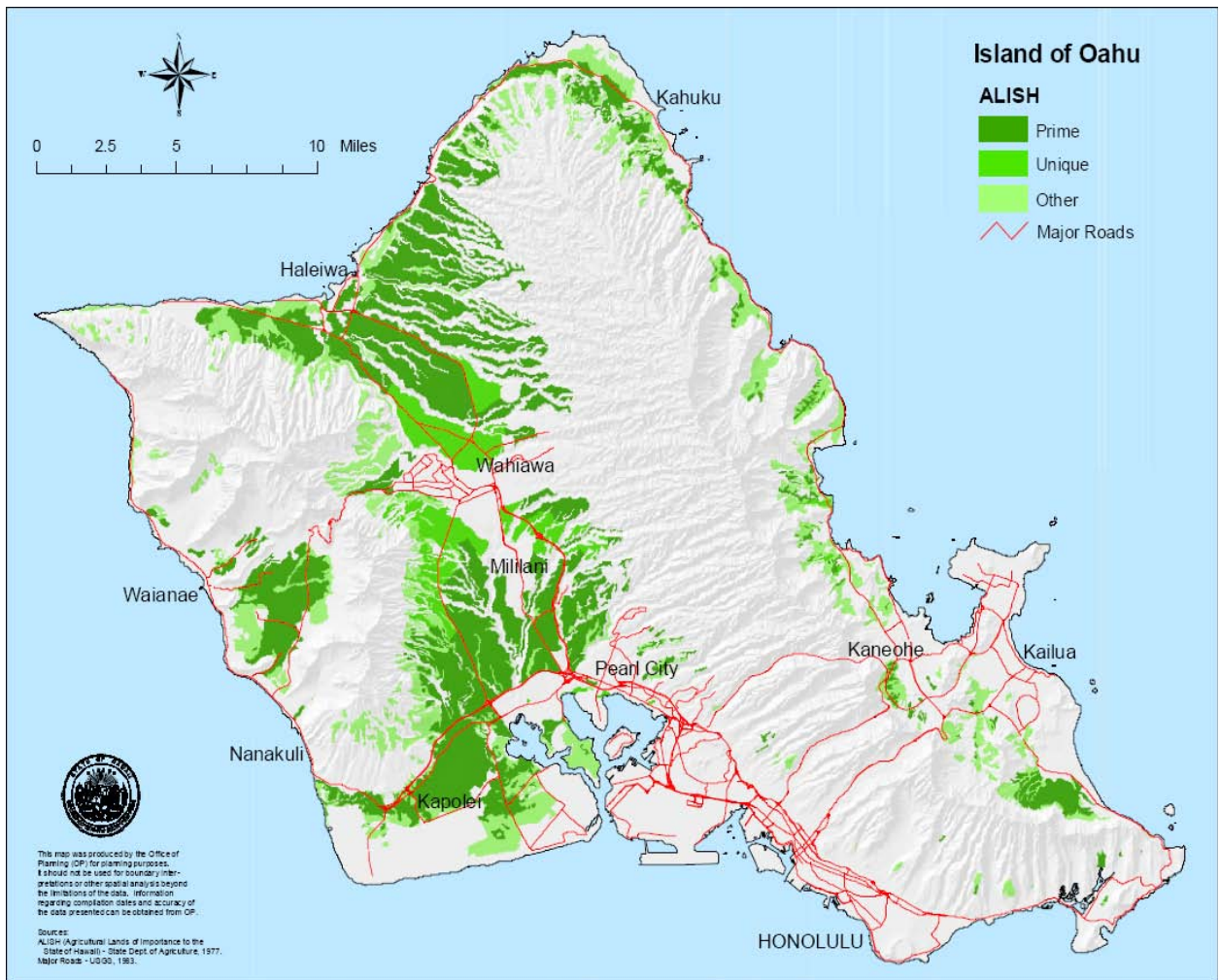




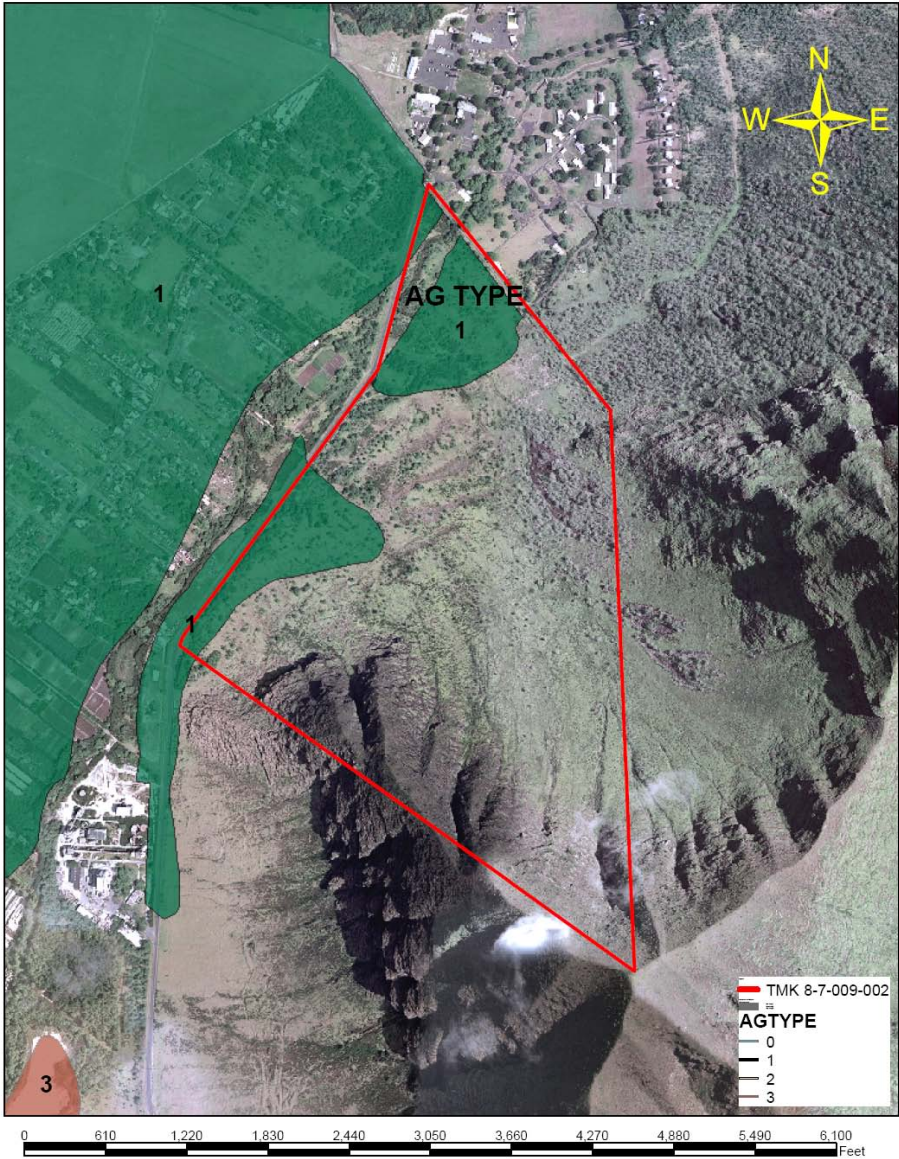
**ATTACHMENT D – Land Study Bureau Productivity Rating for Subject Property**



**ATTACHMENT E – ALISH Classification for the Island of Oahu**



**ATTACHMENT F – Alish Classification for Subject Property**



## **APPENDIX D**

Biological Surveys Conducted on the Tropic-Land LLC, Nānākuli Light Industrial Park Site, Waiʻanae District, Oʻahu, Hawaiʻi. Reginald E. David and Eric Guinther, June 2008

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**Biological Surveys Conducted on the  
Tropic-Land LLC, Nānākuli Light Industrial  
Park Site, Wai‘anae District, O‘ahu, Hawai‘i.**

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*Table of Contents*

*Table of Contents* .....2  
*Introduction*.....3  
*General Site and Project Description* .....3  
*Botanical Survey Methods*.....5  
*Botanical Survey Results* .....6  
*Avian Survey Methods* .....9  
*Avian Survey Result* .....9  
*Mammalian Survey Methods*..... 11  
*Mammalian Survey Results* ..... 11  
*Discussion* ..... 11  
    *Botanical Resources*..... 11  
    *Avian Resources* ..... 14  
    *Mammalian Resources*..... 15  
*Potential Impacts to Critical Habitat* ..... 15  
*Conclusions*..... 16  
*Recommendations*..... 16  
*Glossary*..... 17  
*Literature Cited*..... 18

*Figures*

Figure 1. Development Area and State Conservation District Boundaries .....4  
Figure 2. Typical aspect of the Tropic Land site with modest, grass-covered slopes and scattered kiawe trees. Pu'u Kaua towers over Lualualei Valley in the background.....5  
Figure 3. Unnamed ridge rising over 1800 ft (550 m) to the east above the project site. Note that the steep slopes are still green ..... 12  
Figure 4. The fern, *Marsilea villosa* or '*ili'ihilauākea*, is an endangered species, here growing among grasses at Naval Transmitting Facility property at Lualualei 14

*Tables*

Table 1. Listing of plants (flora) for the Tropic Land, Light Industrial Park Site .....6  
Table 2. Avian Species Detected on the Tropic Land Light Industrial Park Site..... 10

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## **Introduction**

Tropic-Land LLC is proposing to develop a light industrial park on approximately 96-acres of a 236.154-acre parcel of land identified as TMK: 8-7-009:002. The currently undeveloped property is located in Nānākuli, Wai‘anae District, Island of O‘ahu (Figure 1). This report documents the methodologies used and the results of the botanical, avian and mammalian surveys that were conducted on the site as part of the environmental disclosure process,

The primary purpose of the surveys was to determine if there were any botanical, avian or mammalian species currently listed, or proposed for listing under either federal or State of Hawai‘i endangered species statutes within or adjacent to the study area. We were also asked to evaluate the potential impacts that the development of the project might pose to any sensitive or protected native botanical, avian or mammalian species, and to propose appropriate minimization and or mitigative measures that could be implemented to reduce or eliminate any such impacts. The federal and State of Hawai‘i listed species status follows species identified in the following referenced documents, (Division of Land and Natural Resources (DLNR) 1998, Federal Register 2005, U. S. Fish & Wildlife Service (USFWS) 2005, 2008). Fieldwork was conducted on the site on June 25, 2008.

The avian phylogenetic order and nomenclature used in this report follows *The American Ornithologists’ Union Checklist of North American Birds 7<sup>th</sup> Edition* (American Ornithologists’ Union 1998), and the 42<sup>nd</sup> through the 48<sup>th</sup> supplements to *Check-list of North American Birds* (American Ornithologists’ Union 2000; Banks et al. 2002, 2003, 2004, 2005, 2006, 2007). Mammal scientific names follow *Mammals in Hawaii* (Tomich 1986). Plant names follow *Hawai‘i’s Ferns and Fern Allies* (Palmer 2003) for ferns, *Manual of the Flowering Plants of Hawai‘i* (Wagner et al., 1990, 1999) for native and naturalized flowering plants, and *A Tropical Garden Flora* (Staples and Herbst, 2005) for crop and ornamental plants. Place names follow *Place Names of Hawaii* (Pukui et al., 1974).

Hawaiian and scientific names are italicized in the text. A glossary of technical terms and acronyms used in the document, which may be unfamiliar to the reader, are included at the end of the narrative text on Page 17.

## **General Site and Project Description**

The site is bound to the west by the existing Lualualei Naval Road, to the north and east by the U.S. Naval Magazine Lualualei, and to the south by Pu‘uheleakalā ridge, and undeveloped land (Figure 1). The terrain slopes from the southeast to the northwest, from a maximum elevation of approximately 566 meters (1859 feet) above mean sea level, at the summit of Pu‘uheleakalā, down to 28 meters (92 feet) above mean sea level at the northwest corner the site, at the intersection of Lualualei Naval Road and 61<sup>st</sup> street (Figure 1).

As previously mentioned Tropic-Land LLC is proposing to develop approximately 96-acres of a 236.154-acre parcel of land. The bulk of the site is too steep to allow development, as can be seen in Figure 1 and 2, development will occur on 96-acres of the site, essentially all lands that