



HO'OPI LI

O'AHU

FINAL ENVIRONMENTAL IMPACT STATEMENT

VOLUME 1 OF 2

JULY 2008

Prepared by:



PBR HAWAII
& ASSOCIATES, INC.

Prepared for:

D-R HORTON PHI
America's Builder
SCHULER DIVISION

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FINAL ENVIRONMENTAL IMPACT STATEMENT

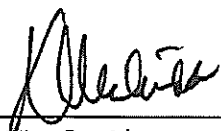
Submitted Pursuant to
Chapter 343, Hawai‘i Revised Statutes
and
Title 11, Chapter 200, Hawai‘i Administrative Rules

Prepared for:
D.R. Horton - Schuler Division

Prepared by:



This Final Environmental Impact Statement and all ancillary documents have been prepared under my direction or supervision and the information submitted, to the best of my knowledge, fully addresses document content requirements as set forth in Chapter 343, Hawai‘i Revised Statutes and Section 11-200-17, Hawai‘i Administrative Rules.

A handwritten signature in black ink, appearing to read "Dean Uchida", is positioned above a horizontal line.

Dean Uchida, Vice President
D.R. Horton - Schuler Division

July 2008

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	ix
1.0 INTRODUCTION	1
1.1 PROJECT PROFILE	1
1.2 PROJECT LOCATION	3
1.3 PROJECT AREA.....	3
1.4 EXISTING USE.....	4
1.5 LAND OWNERSHIP.....	5
1.6 PETITIONER.....	5
1.7 PLANNING CONSULTANT.....	5
1.8 ACCEPTING AUTHORITY	5
1.9 COMPLIANCE WITH STATE OF HAWAI'I AND CITY AND COUNTY OF HONOLULU ENVIRONMENTAL LAWS	6
1.9.1 <i>Studies Contributing to this Environmental Impact Statement.....</i>	<i>6</i>
2.0 DESCRIPTION OF THE PROJECT.....	9
2.1 BACKGROUND INFORMATION	9
2.1.1 <i>Location.....</i>	<i>9</i>
2.1.2 <i>Ownership.....</i>	<i>9</i>
2.1.3 <i>Surrounding Land Uses</i>	<i>9</i>
2.1.4 <i>Description of the Project Area.....</i>	<i>10</i>
2.1.5 <i>State Land Use District.....</i>	<i>11</i>
2.1.6 <i>Ewa Development Plan</i>	<i>11</i>
2.1.7 <i>City and County of Honolulu Zoning</i>	<i>11</i>
2.2 STATEMENT OF PURPOSE AND NEED	11
2.3 THE VISION	12
2.4 THE COMMUNITY PLANNING PROCESS	13
2.5 THE HO'OPILI COMMUNITY	16
2.5.1 <i>Ho'opili Conceptual Land Use Plan</i>	<i>16</i>
2.6 INFRASTRUCTURE IMPROVEMENTS	20
2.7 DEVELOPMENT TIMETABLE AND PRELIMINARY COSTS.....	21
2.8 SUSTAINABLE BUILDING DESIGN	25
3.0 ASSESSMENT OF THE NATURAL ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION MEASURES	27
3.1 CLIMATE.....	27
3.2 TOPOGRAPHY	27
3.3 SOILS.....	29
3.4 AGRICULTURAL IMPACT	32
3.5 GROUNDWATER RESOURCES/HYDROLOGY	35

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

3.6	NATURAL HAZARDS.....	37
3.7	FLORA	39
3.8	FAUNA.....	42
4.0	ASSESSMENT OF THE HUMAN ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION MEASURES	47
4.1	ARCHAEOLOGICAL AND HISTORIC RESOURCES.....	47
4.2	CULTURAL RESOURCES	49
4.3	NOISE.....	52
4.4	AIR QUALITY	54
4.5	MAN-MADE HAZARDS	59
4.6	VISUAL RESOURCES.....	60
4.7	SOCIAL-ECONOMIC CHARACTERISTICS	61
	4.7.1 <i>History of the Ewa Development Plan Area</i>	62
	4.7.2 <i>Population</i>	62
	4.7.3 <i>Housing</i>	63
	4.7.4 <i>Economic Impacts</i>	65
	4.7.5 <i>Employment</i>	66
4.8	INFRASTRUCTURE AND UTILITIES	67
	4.8.1 <i>Transportation</i>	67
	4.8.2 <i>Water Supply Facilities</i>	92
	4.8.3 <i>Wastewater Facilities</i>	95
	4.8.4 <i>Drainage Facilities</i>	97
	4.8.5 <i>Solid Waste Disposal Facilities</i>	101
	4.8.6 <i>Electrical Facilities</i>	104
	4.8.7 <i>Telephone/Communication Facilities</i>	109
4.9	PUBLIC SERVICES AND FACILITIES	110
	4.9.1 <i>Educational Facilities</i>	110
	4.9.2 <i>Police Protection</i>	112
	4.9.3 <i>Fire Protection</i>	113
	4.9.4 <i>Medical Facilities</i>	113
	4.9.5 <i>Recreational Facilities</i>	114
	4.9.6 <i>Public Transit</i>	115
	4.9.7 <i>Community Services</i>	118
5.0	RELATIONSHIP TO LAND USE PLANS, POLICIES, AND CONTROLS	121
5.1	FEDERAL	121
5.2	STATE OF HAWAI'I	121
	5.2.1 <i>Environmental Impact Statement Law, Chapter 343, Hawaii Revised Statutes</i>	121
	5.2.2 <i>State Environmental Policy, Chapter 344, Hawaii Revised Statutes</i>	121
	5.2.3 <i>State Land Use Law, Chapter 205, Hawaii Revised Statutes</i>	126
	5.2.4 <i>Coastal Zone Management Program, Chapter 205A, Hawaii Revised Statutes</i>	130

HO‘OPII

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

5.2.5	<i>Hawaii State Plan, Chapter 226, Hawaii Revised Statutes</i>	135
5.2.6	<i>Hawaii State Functional Plans</i>	165
5.3	CITY AND COUNTY OF HONOLULU.....	174
5.3.1	<i>General Plan</i>	174
5.3.2	<i>Ewa Development Plan</i>	195
5.3.3	<i>Land Use Ordinance</i>	228
5.3.4	<i>Special Management Area</i>	228
5.3.5	<i>Ewa, Central Oahu and Primary Urban Center Public Infrastructure Maps</i>	228
5.4	REQUIRED PERMITS AND APPROVALS	229
6.0	ALTERNATIVES TO THE PROPOSED ACTION	231
6.1	“NO-ACTION” ALTERNATIVE	231
6.2	ALTERNATIVE SITES.....	232
6.3	ALTERNATIVES RELATED TO DIFFERENT DESIGNS OR DETAILS OF THE PROPOSED ACTIONS WHICH WOULD PRESENT DIFFERENT ENVIRONMENTAL IMPACTS.....	232
6.4	ACTIONS OF A SIGNIFICANTLY DIFFERENT NATURE WHICH WOULD PROVIDE SIMILAR BENEFITS WITH DIFFERENT ENVIRONMENTAL IMPACTS.....	233
6.5	THE ALTERNATIVE OF POSTPONING ACTION PENDING FURTHER STUDY.....	234
7.0	CONTEXTUAL ISSUES	235
7.1	RELATIONSHIP BETWEEN THE SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY.....	235
7.2	CUMULATIVE AND SECONDARY IMPACTS.....	235
7.2.1	<i>Impacts on the Physical Environment</i>	236
7.2.2	<i>Impacts on the Human Environment</i>	237
7.2.3	<i>Impacts on the Socio-Economic Environment</i>	239
7.2.4	<i>Impacts on Infrastructure Facilities</i>	240
7.2.5	<i>Impacts on Public Facilities and Services</i>	242
7.3	IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES	246
7.4	PROBABLE ADVERSE ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED.....	247
7.5	RATIONALE FOR PROCEEDING WITH THE PROJECT NOTWITHSTANDING UNAVOIDABLE EFFECTS	249
7.6	UNRESOLVED ISSUES	250
8.0	CONSULTATION.....	251
9.0	LIST OF PREPARERS.....	255
10.0	GLOSSARY.....	257
11.0	REFERENCES	261
12.0	COMMENTS ON THE ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE AND RESPONSES	267

HO'OPILI

~~DRAFT~~ FINAL ENVIRONMENTAL IMPACT STATEMENT

13.0	COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT AND RESPONSES.....	271
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HO'OPII

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

LIST OF TABLES

Table		Page
1.1	Project Area Tax Map Key Parcels (and Current Zoning).....	4
2.1	Current Tenants and Existing Land Uses	11
2.2	Conceptual Land Use Plan – Land Use Summary for Petition Area	20
2.3	Required Permits/Approvals	22
3.1	Soil Types and Erosion Potential.....	30
3.2	FIRM Designations	38
4.1	Year 2030 Baseline AM Peak Hour Intersection Operations.....	73
4.2	Year 2030 Baseline PM Peak Hour Intersection Operations.....	74
4.3	Year 2030 Baseline Peak Hour Freeway Segment Operations	75
4.4	Year 2030 Baseline Ramp-Freeway Junction Operations	76
4.5	Year 2030 AM Peak Hour Intersection Operations	81
4.6	Year 2030 PM Peak Hour Intersection Operations.....	82
4.7	Year 2030 Peak Hour Freeway Segment Operations.....	83
4.8	Year 2030 Ramp-Freeway Junction Operations	84
4.9	Scenario A: AM Peak Hour Intersection Operations with Mitigations.....	86
4.10	Scenario A: PM Peak Hour Intersection Operations with Mitigations	87
4.11	Scenario B: AM Peak Hour Intersection Operations with Mitigations	88
4.12	Scenario B: PM Peak Hour Intersection Operations with Mitigations	89
4.13	<u>Comparison of Existing Traffic and Year 2030 Traffic With and Without the Project.....</u>	91
4.14	<u>Public School Enrollment</u>	110
4.14	<u>Existing School Construction Data.....</u>	111
4.15	'Ewa Parks.....	114
5.1	State Environmental Policy, Chapter 344, Hawaii Revised Statutes	122
5.2	State Land Use Law Chapter 205, Hawaii Revised Statutes, Section 15-15-77, Hawaii Administrative Rules.....	126
5.3	Coastal Zone Management Act, Chapter 205A, Hawaii Revised Statutes	130
5.4	Hawaii State Plan, Chapter 226, Hawaii Revised Statutes – Part I. Overall Theme, Goals, Objectives and Policies	135
5.5	Hawaii State Plan, Chapter 226, Hawaii Revised Statutes – Part III. Priority Guidelines	156
5.6	Hawaii State Functional Plans	165
5.7	City and County of Honolulu General Plan – Objectives and Policies ..	174
5.8	Ewa Development Plan – Objectives and Policies	195
5.9	Required Permits/Approvals	229
12.1	EISPN Comment Letters.....	267
13.1	<u>DEIS Comment Letters.....</u>	271

HO‘OPII

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

LIST OF FIGURES

Figure		Follows Page
1.1	Location Map	4
1.2	Tax Map Key	4
1.3	Tax Map Key (Zone 9, Section 1, Plat 17)	4
1.4	Tax Map Key (Zone 9, Section 1, Plat 18)	4
1.5	Parcels Map	4
2.1	Current Land Ownership	10
2.2	Surrounding Land Ownership.....	10
2.3	Current Lessees.....	10
2.4	State Land Use District	12
2.5	Ewa Development Plan	12
2.6	Ewa Development Plan Open Space Map.....	12
2.7	Current Zoning Map	12
2.8	Proposed Circulation Plan	16
2.9	Conceptual Land Use Plan	16
3.1	Natural Resources Conservation Services Soil Survey Map.....	30
3.2	Land Study Bureau Land Classification	30
3.3	Agricultural Lands of Importance to the State of Hawaii.....	32
3.4	Kapolei Area Long Range Master Plan	32
3.5	Flood Insurance Rate Map	38
<u>4.1</u>	<u>Historical Sites</u>	48
<u>4.2</u>	<u>‘Ewa Regional Transportation Plan</u>	72
<u>4.3</u>	<u>Internal Roadways</u>	78
<u>4.4</u>	<u>Preliminary Easement Map</u>	94
<u>4.5</u>	<u>Drainage Basins</u>	98
<u>4.6</u>	<u>East Kapolei Regional Bikeway Plan</u>	116
<u>4.7</u>	<u>Planned High-Capacity Transit Corridor & Proposed Transit Station</u> ..	118

HO'OPILI

~~DRAFT~~ FINAL ENVIRONMENTAL IMPACT STATEMENT

LIST OF APPENDICES

Appendix A	Agricultural Impact Analysis
Appendix B	Botanical Resources Assessment
Appendix C	Survey of Avian and Mammalian Resources
Appendix D	Archaeological Inventory Survey
Appendix E	SHPD Archaeological Inventory Acceptance Letter
Appendix F	Cultural Impact Assessment
Appendix G	Environmental Noise Assessment
Appendix H	Air Quality Study
Appendix I	Social Impact Assessment
Appendix J	Market Assessment
Appendix K	Economic and Fiscal Impact
Appendix L	Traffic Impact Analysis Report
Appendix M	Conceptual Water Master Plan
Appendix N	Preliminary Wastewater Collection System Master Plan
Appendix O	Drainage Master Plan
Appendix P	Preliminary Electrical and Communications Master Plan
Appendix Q	Draft Project Master Plan
<u>Appendix R</u>	<u>Arthropod Survey and Assessment</u>

HO'OPILI
~~DRAFT~~ FINAL ENVIRONMENTAL IMPACT STATEMENT

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Executive Summary

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

EXECUTIVE SUMMARY

DESCRIPTION OF THE ACTION

The Proposed Action involves development of a mixed-use community in 'Ewa which entails the reclassification of approximately 1,553.844 acres from the Agricultural District to the Urban District (Petition Area). Urbanization of the Petition Area will enable the Petitioner ("Petitioner" and "Applicant" used interchangeably, as discussed in Section 1.0, Introduction) to develop the proposed Conceptual Land Use Plan. The proposed plan for Ho'opili – which means "coming together" in Hawaiian – reflects the ideas, hopes and dreams of what the community wanted to see from and within Ho'opili. The plan reflects the community's desire for vibrant and safe neighborhoods where people feel a sense of connection with one another, and with the rest of O'ahu.

The Conceptual Land Use Plan reflects the desire for a community that is complete, with: employment centers; quality schools; shopping, gathering and recreational places; and parks and open space for residents; and diverse, including affordable, housing options. Residents will live, work, learn, play, and shop in one area. In addition, Ho'opili will incorporate green building practices to be an environmentally-sound, healthy and resource-efficient community.

To achieve the vision for Ho'opili, a Conceptual Land Use Plan has been formulated that illustrates a mixed-use community that would complete and connect 'Ewa with surrounding communities. Originating from the common vision and values of a community-driven planning effort, the conceptual plan contains a series of neighborhoods with a mix of uses including residential, retail, office and light industrial. Included in this mix are a series of parks, schools, public buildings and community centers which act as a focus and help define the identity of each neighborhood. Additionally, the project was designed in consultation with adjoining landowners, such the Department of Hawaiian Home Lands (DHHL), the University of Hawai'i at West O'ahu (UHWO) and the Hawaii Community Development Authority (HCDA).

Ho'opili is planned to be connected to the surrounding 'Ewa District (and neighboring DHHL, UHWO and HCDA properties) by a network of streets and bicycle paths which should allow a variety of circulation options for residents and visitors. During the public review period, the Hawai'i Community Development Authority (HCDA) wrote that: "The HCDA supports the development of an internal network of closely-spaced gridded streets and bike paths linking the project to the surrounding communities of University of Hawaii West Oahu (UHWO), Department of Hawaiian Home Lands (DHHL), Ewa Villages, and the KCDD. This objective is consistent with the HCDA Kalaeloa Master Plan. Improving connectivity throughout the region was one of the most important issues identified during the strategic planning meetings for the region as well as the KCDD. The extension of the

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

Kapolei Area Bikeway Plan to include UHWO, DHHL, and the KCDD in the DEIS is also noteworthy and consistent with our Master Plan."

Wider tree-lined boulevards are intended to create a distinct axis running north-south and east-west across the site. Ho'opili is being designed to be transit-ready, and the land use plan, while subject to change, has been designed to accommodate a high-capacity transit corridor either along Farrington Highway or diagonally through the project site, with either one or two transit station locations. Also possible is a transit maintenance and storage facility. While the proposed residential unit count should not materially change, it will need to be adjusted depending on the final alignment of the high-capacity transit corridor, as ridership generation, "capture" of transit-oriented development potential and the potential for noise impact from an elevated high-capacity transit alignment would likely require taller, higher density residential or industrial uses along the alignment. The final siting of the transit station location(s) will concentrate higher intensity development (and density) around the transit station(s). A site for a transit maintenance and storage facility is also possible. (As of this writing, the City and County of Honolulu (City) has begun work on the Draft Environmental Impact Statement (EIS) for the Honolulu High-Capacity Transit Corridor (HHCTC) project, with a target publication date in the second quarter of 2008. By the time the HHCTC Draft EIS is published, the final alignment of the high-capacity transit corridor, the location of transit stations, and the location of the transit maintenance and storage facility will be known).

In the geographical center of the site there is a public square or Civic Plaza that is surrounded by higher density housing development and mixed-use buildings. Housing density transitions to lower-density small-lot single-family homes along the eastern and southern peripheries of the site. A significant open space and pedestrian/bicycle trail network provide a wide variety of recreational opportunities for residents and other members of the 'Ewa community. Ho'opili is planned to incorporate traditional Hawaiian building styles with a modern, contemporary aesthetic that befits the landscape and climate.

SIGNIFICANT BENEFICIAL AND ADVERSE IMPACTS

The development of the proposed project will impact Petition Area resources; however, past and current agricultural uses of the property have significantly altered the natural landscape. Among the many regional transportation improvements long-planned by the State of Hawai'i (State) and the City and County of Honolulu (County) include: the proposed Honolulu High-Capacity Transit Corridor (HHCTC) mass-transit project; the completion of North-South Road and a new H-1 Freeway interchange; and the widening of Farrington Highway. Portions of each of the aforementioned regional transportation projects (as well as the recently proposed East-West Connector (connecting Farrington Highway to Fort Weaver Road through UHWO, DHHL and Ho'opili) will require land area from under the Ho'opili project.

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

Ho'opili has been planned with the reduction of traffic impacts in mind. First, it includes transit-oriented development. Bus lines have been identified to encourage residents throughout the project to use rapid transit or to use buses or bicycles within the project area. Street sizes and connectivity will encourage pedestrian and bicycle movement. To the extent that automobile use declines (or Ho'opili attracts new residents who are less committed to automobile use than others), residents can expect to have more exercise, and be healthier than people in other subdivisions of Leeward O'ahu.

Ho'opili will contribute to the growth of the urban community life in 'Ewa by providing new job locations, recreational areas, and schools as well as housing. It is designed as a community in which many residents will not need to drive to Honolulu often. Its transportation planning will work to address the region's serious traffic congestion problems. It will help to link existing and new communities, serving its neighbors as well as its residents.

PROPOSED MITIGATION MEASURES

Various mitigation measures will be implemented throughout the development of the proposed Ho'opili project to minimize impacts on the environment. Infrastructure improvements will incorporate appropriate engineering and design methods to meet basic infrastructure requirements.

Drainage/Flood Control/Water Quality/Soil Erosion. All grading operations will be conducted in accordance with dust and erosion control and other requirements of the City and County of Honolulu Grading Ordinance. All construction activities must comply with the relevant provisions regulating Fugitive Dust set forth under Section 11-60.1-33, Hawaii Administrative Rules (HAR). A grading permit is required to modify the topography, and additionally, a National Pollutant Discharge Elimination System (NPDES) permit will be required prior to construction to address ~~non~~ point source discharges.

Archaeological Resources. An archaeological inventory survey report prepared for the Petition Area has been accepted by the State Historic Preservation Division (SHPD) in fulfillment of Sections 13-284 and 13-276, HAR. In addition, a preservation plan and archaeological monitoring plan is being prepared and will be submitted to SHPD for its review and approval. If burials are encountered during project construction, the Petitioner will comply with the relevant notification and stop work requirements.

Noise. Noise will be generated by construction and earth-moving equipment during the project's development. However, construction noise will be relatively short-term (in the vicinity of where construction will occur), occur only during daytime hours, and comply with State Department of Health (DOH) noise regulations. If construction noise is expected to exceed DOH's maximum permissible property line noise levels, a permit will be obtained from the DOH to allow the operation of vehicles, construction equipment,

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

power tools, et cetera. Additionally, construction equipment, vehicles, or devices will be equipped with mufflers, as necessary.

Air Quality. During all phases of construction, there is a potential for fugitive dust emissions. These short-term air quality impacts will be mitigated by the implementation of a dust control management plan and compliance with the relevant provisions on Fugitive Dust set forth under Section 11-60.1-33, HAR.

After project construction, long-term impacts to air quality can result from increased activity within the Petition Area. Vehicles will increase exhaust emissions, although public transportation will be encouraged by proximity to the planned transit nodes and corridors. Stricter vehicular emission controls will also help to mitigate air quality impacts. The project is being designed to promote walking/biking by integrating land uses. This should encourage residents to walk/bicycle from home to work, school, day care, retail outlets, and parks and trails, and reduce the reliance on the use of personally-owned vehicles for commuting to work, going to the park, going shopping or attending school.

Transportation. As previously mentioned, there are several major transportation projects that have been long-planned for 'Ewa. The Ho'opili project has been planned assuming that certain planned transportation projects will be constructed including a portion of North-South Road between Farrington Highway and Kapolei Parkway; a portion of the North-South Road and a new H-1 Freeway interchange; a portion of the intersection of North-South Road and Farrington Highway; the long-planned widening of Farrington Highway fronting the Petition Area; the proposed East-West Connector Road through the Petition Area; and the segment of the proposed HHCTC mass-transit project through the Petition Area.

The proposed project has been designed to reduce future residents' reliance on private motorized vehicles through the following measures:

- the project is the first new project designed to ~~embrace~~ support the City and County of Honolulu's plan to develop a high-capacity transit (elevated, fixed-guideway) corridor and station(s) (and possible maintenance yard);
- the project is large enough to be designed and offer a full range of mixed land uses, including a wide range of places of live, work, shop, recreate and learn and will aspire to achieve a job-housing balance;
- the project is designed to maximize connectivity (transit, pedestrian, bicycle and vehicular) with surrounding streets and communities (including DHHL and UHWO), while minimizing cul-de-sacs and dead-end streets;
- the project will be designed to take advantage of the relatively flatness of the site and proximity to UHWO by designing streets and grade-separated multi-modal pathways for walking and bicycling; and

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

- the project will seek to implement other transportation management and transportation demand management strategies (such as requesting that the State/County consider extending or instituting contra-flow of major transportation corridors during a.m. and p.m. peak travel times).

Visual Resources. The visual appearance of the Petition Area will change from vacant scrub and cultivated vegetation to a landscaped mixed-use community with parks and open space. This is consistent with the *Kapolei Area Long Range Master Plan* as well the *Ewa Development Plan*. Project landscaping, the provision of open space buffers, and sensitive architectural design will help to establish the planned community visual character of the area.

Infrastructure/Public Facilities/Utilities. The de facto population associated with the project will require potable water (i.e., drinking water) from the existing municipal water system (including the existing source, transmission and storage components of the Board of Water Supply (BWS) safe drinking water system). It will be a requirement that the project provide system upgrades to the transmission and storage components to ensure that the system operates effectively and meets BWS standards. With respect to non-potable water requirements, the project will be maximizing non-drinking usage to minimize the demand on the safe drinking water system. Street right of ways of the Ho'opili project will have underground non-drinking distribution systems.

Over time the project will result in an increase in wastewater being generated than currently being generated on-site (by agricultural activities). To mitigate this effect, new collection system components consisting of gravity sewer, pump stations and relief sewers will be constructed. To date, the Petitioner has already contributed \$2 million towards increasing the capacity of the Makakilo/Kapolei Interceptor sewers from the intersection of North-South Road to the Honouliuli Wastewater Treatment Plant (WWTP). The project will generate additional flow that must be treated at the Honouliuli Wastewater Treatment Plant (WWTP). To mitigate the additional burden, the project will participate in the Wastewater System Facility Charge (WSFC) program and contribute funds (based on building permits) to expand the treatment plant. Land is available at the Honouliuli WWTP site to allow for expansion.

The project will increase impervious surfaces such as roadways, roofs, paved parking areas, and sidewalks. These surfaces will cause an increase in storm water discharge within the Petition Area. However, detention basins and/or retention basins are being planned and sited to detain and/or retain storm water to ensure that areas downstream of the project are not impacted.

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

Surface water quality can be impacted through development. The project will be providing detention basins to meet City and County of Honolulu Standards for water quality treatment. Structural methods may also be used to meet water quality requirements of the Rules Relating to Storm Drainage Standards. Structural methods include the use of Stormceptor® type storm drain manholes.

For the portion of the Petition Area within the West Loch drainage basin, it is planned to collect all storm water and route it to an existing detention basin located on the east side of Fort Weaver Road and south of the Oahu Railway & Land (OR&L) railroad tracks. The basin would be expanded to ensure that the water quality storage component of the City and County of Honolulu Standards was achieved. While there are existing drainage easements under Fort Weaver Road, additional drainage, access and utility easements may need to be obtained under Fort Weaver Road and other State and County road right-of-ways.

Solid Waste. Project construction will conform to the guidelines and objectives of the Integrated Solid Waste Management Act, Chapter 342G, Hawaii Revised Statutes (HRS). Construction will also comply with the City and County of Honolulu's approved integrated solid waste management plans in a schedule and time frame satisfactory to the DOH. The goal for waste management is to appropriately reduce, reuse and recycle materials, to minimize generation of solid waste and achieve diversion from landfills. As such, in conformance with Section 344-4(2), HRS, the project will promote the optimal use of solid wastes through programs of waste prevention, energy resource recovery, and recycling. The City and County of Honolulu is restarting its curbside pick up recycling program. In November, 2007, two pilot curbside recycling programs began in Mililani and Hawai'i Kai. During the six to twelve month evaluation period, the City and County of Honolulu Department of Environmental Services staff will be coordinating plans for islandwide expansion.

On June 27, 2008, the Associated Press reported that Mililani and Hawai'i Kai residents have recycled 54 percent of their cans, bottles, newspapers and green waste during the city's six-month curbside recycling pilot project. City Officials with the City and County of Honolulu Department of Environmental Services (DES) are reportedly satisfied with the results and are moving forward with plans to provide some 160,000 O'ahu homes the curbside recycling service by May 2010. In the new plan, the city will collect garbage and recyclables each once a week. The DES will no longer have garbage pickup twice-weekly. A study released by DES predicts the program will divert an estimated 53,800 tons of mixed recyclables and green waste from O'ahu landfills. They plan to begin expanding the program to more communities in November 2008.

ALTERNATIVES CONSIDERED

Development of the 'Ewa region as O'ahu's Second City has been studied and planned for over three decades. Further study or delay of any proposed development on the property

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

would not be consistent with the *Ewa Development Plan* or the County's objective of directing growth to 'Ewa. Therefore, various alternatives for the site were rejected, such as: 1) continued agricultural use; 2) locating the 1,554-acre development elsewhere on O'ahu; 3) more density (with the same number of units as proposed) resulting in more open space; and 4) less density, less open space; as it would not achieve the overall objectives for the project, which would create a mixed-use community including residential, business, and commercial areas, schools, parks and open space.

UNRESOLVED ISSUES

Honolulu High-Capacity Transit Corridor (HHCTC) Alignment Through Ho'opili. As of this writing, the high-capacity transit corridor alignment through Ho'opili has not been finalized by the City and County of Honolulu. As previously noted, Ho'opili is being designed to be transit-ready, and the land use plan, while subject to change, has been designed to accommodate a high-capacity transit corridor either along Farrington Highway or diagonally through the project site, with either one or two transit station locations. While the proposed residential unit count should not materially change, it will need to be adjusted depending on the final alignment of the high-capacity transit corridor, as ridership generation, "capture" of transit-oriented development potential and the potential for noise impact from an elevated high-capacity transit alignment would likely require taller, higher density residential or industrial uses along the alignment. The final siting of the transit station location(s) will concentrate higher intensity development (and density) around the transit station(s). (As of this writing, the City and County of Honolulu has begun work on the Draft EIS for the Honolulu High-Capacity Transit Corridor (HHCTC) project, with a target publication date in the second quarter of 2008. By the time the HHCTC Draft EIS is published, the final alignment of the high-capacity transit corridor, the location of transit stations, and the location of the transit maintenance and storage facility will be known).

State of Hawaii Department of Education (State DOE) School Fair Share Requirements.

The Petitioner is currently coordinating with the State DOE regarding the number of schools that will be required for the development of the Ho'opili project. During the Draft EIS public review period, the DOE commented that it will determine the actual number of schools required for the Ho'opili development after the developer provides more definitive data on respective market prices, size, and number of bedrooms for each type of unit planned. This will be identified as an unresolved issue until the number of schools required is finalized.

Drainage. The Petition Area falls within three different drainage basins. The portion of the Petition Area within the West Loch drainage basin is planned to collect all storm water and route it to an existing detention basin located on the east side of Fort Weaver Road and south of the OR&L railroad tracks. The basin would be expanded to ensure that the water quality storage component of the City and County of Honolulu Standards was achieved. An overflow from the detention basin would discharge to the West Loch of

HO'OPILI

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Pearl Harbor. The overflow from the proposed makai detention basin would have to cross Navy property. Permission of the Navy would be required. The concept of the overflow across Navy property is not new and was approved in concept back in the early- to mid-1990's. However, as of this date, the Navy has rejected any considerations to allow increased runoff to cross Navy land. Permission from the Navy needs to be resolved for the overflow option to move forward, otherwise the detention basin system for the West Loch drainage basin will need to be expanded to retain all increased runoff generated in the West Loch drainage basin.

COMPATIBILITY WITH LAND USE PLANS AND POLICIES

State Land Use Law, Chapter 205, HRS. The Petition Area is within the State Agricultural District. As such, a State Land Use District Boundary Amendment is being sought to change the site's district boundary from the Agricultural District to the Urban District.

Coastal Zone Management Program, Chapter 205A, HRS. All lands of the State of Hawai'i are included within the Coastal Zone Management (CZM) Area as defined in Chapter 205A, HRS. As such, the Petition Area is within the CZM Area; however, it is not located along a shoreline or within the Special Management Area.

Hawaii State Plan, Chapter 226, HRS. The Hawaii State Plan (Chapter 226, HRS), which serves as a guide for the long-range growth and development of the State, establishes a set of goals, objectives, policies, and priorities for the State. Conformance to applicable goals, objectives, and policies set forth by the Hawaii State Plan is discussed in detail in Section 5.2.4.

Hawaii State Functional Plans. The Hawaii State Plan is primarily guided by the State Functional Plans (Chapter 226, HRS) and implemented by the State Department of Budget and Finance and the State Land Use Commission (LUC). State Functional Plans are prepared by various state agencies to serve as the primary implementing vehicle for the goals, objectives, and policies of the Hawaii State Plan. The functional plans applicable to the proposed Ho'opili project are discussed in Section 5.2.5.

City and County of Honolulu General Plan. As required by the City Charter, the *General Plan* for the City and County of Honolulu establishes long-range objectives focusing on the social, economic, environmental, and design objectives for the general welfare and prosperity of the residents of O'ahu. The *General Plan* also establishes broad policies designed to achieve the objectives. Conformance with specific elements of the *General Plan* is discussed in Section 5.3.1.

Ewa Development Plan. The *Ewa Development Plan* was updated and officially adopted by the City Council in August 1997 and is presently being updated. The plan presents a vision for 'Ewa's future development and provides conceptual land use plans that will serve as a policy guide for more detailed zoning maps and regulations, and public and

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

private sector investment decisions. Provisions of the *Ewa Development Plan* that are applicable to the proposed project are discussed in Section 5.3.2.

Land Use Ordinance. The Petition Area is presently zoned AG-1 Restricted Agricultural District by the City and County of Honolulu Land Use Ordinance (LUO). As such, a Zone Change will be required for approximately 1,555.145 acres of the Project Area.

LISTING OF PERMITS AND APPROVALS REQUIRED

As presented below, a list of major permits and approvals is required for the project.

PERMIT/APPROVAL	APPROVING AUTHORITY	STATUS	PROJECT SUBMITTAL DATE
State Land Use District Boundary Amendment (with EIS)	State of Hawai'i Land Use Commission	Petition has been filed; processing on hold until EIS process has been completed.	<u>First Quarter 2007</u>
Zone Change	City and County of Honolulu Department of Planning and Permitting/City Council	Application to be filed assuming successful processing of SLUDBA.	<u>Third Quarter 2009</u>
<u>Large Lot Subdivision Approval Action</u>	City and County of Honolulu Department of Planning and Permitting	Application to be submitted after change the Zone Change application is approved.	<u>Third Quarter 2010</u>
National Pollutant Discharge Elimination System (NPDES) Permit	State of Hawai'i Department of Health	Application to be submitted prior to Building/Grading Permits.	<u>2011</u>
Building/Grading Permits	City and County of Honolulu Department of Planning and Permitting	Application to be filed after the Zone Change application is approved.	<u>2011</u>
Water Use Permit	State of Hawai'i Department of Land and Natural Resources, Commission on Water Resource Management	Application to be submitted prior to Building/Grading Permits	<u>2011</u>

HO'OPILI

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1.0
Introduction

HO'OPILI

~~DRAFT~~ FINAL ENVIRONMENTAL IMPACT STATEMENT

1.0 INTRODUCTION

This EIS is prepared in accordance with Chapter 343, HRS, and Title 11, Chapter 200, HAR, *ENVIRONMENTAL IMPACT STATEMENT RULES*. The applicant, as defined under §11-200-2, HAR, is the petitioner for district boundary amendment presently before the State Land Use Commission and proposes certain actions that would trigger compliance with Chapter 343, HRS, as discussed below. "Applicant" and "Petitioner" shall be used interchangeably to mean D.R. Horton – Schuler Homes, LLC.

1.1 PROJECT PROFILE

The following summary describes the existing entitlements and proposed actions:

Project Name: Ho'opili

Project Location: 'Ewa District, O'ahu, Hawai'i

Petitioner: D.R. Horton – Schuler Homes, LLC, a Delaware Limited Liability Company, d.b.a. D.R. Horton – Schuler Division

Landowner Within the Petition Area: D.R. Horton – Schuler Division

Landowners Outside the Petition Area but within Project Area: D.R. Horton – Schuler Division
Monsanto Company
United States Naval Reservation
City and County of Honolulu
Hawaiian Electric Company

Total Project Area: Approximately 1,600.265 acres. In addition, the project will require easements over State and County road right-of-ways for the installation of roadways and various infrastructure and utility lines such as water, sewer, drainage, electricity, telephone and communications.

Total Petition Area: Approximately 1,553.844 acres. (While the total Project Area is approximately 1,600.265 acres, it should be noted, that most of the difference in acreage between the total Project Area and the total Petition Area is required for off-site infrastructure which does not need to be located on lands within the State Urban Land Use District. Development of the Petition Area will require easements over State and County road right-of-ways for the installation of

HO'OPILI

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roadways and various infrastructure and utility lines such as water, sewer, drainage, electricity, telephone and communications. The Petition Area includes lands that would be condemned by various State and County agencies for the completion of North-South Road and its interchange with the H-1 Freeway, a portion of the intersection of North-South Road and Farrington Highway, the widening of Farrington Highway, the HHCTC project, and the proposed East-West Connector Road.

Tax Map Key Parcels: *Petition Area:* 9-1-17: 04 (portion), 59, and 72; 9-1-18: 01 and 04;
Remainder of the Project Area: 9-1-10: 02, 14 (portion), and 15 (portion); 9-1-17: 04 (portion); 9-2-01: 04, 05, 06 and 07; and 9-2-02: 02.

Proposed Action: Reclassification of approximately 1,553.844 acres of land from the Agricultural District to the Urban District, and the use of State and County lands for access, and various municipal infrastructure and utility improvements.

Existing Uses: Diversified agriculture, pasturage, storage/processing/distribution facility for produce, seed cultivation, agricultural research station, parking for school buses and Handi-Vans.

Proposed Uses: Development of a mixed-use, transit-ready community including: low-medium density residential/live-work, mixed-use medium density residential, mixed-use/high-density residential, light industrial mixed-use/business, schools, parks, open space and long-planned regional transportation improvements planned by others (including a portion of North-South Road and its intersections, the future widening of Farrington Highway, and a portion of the HHCTC alignment).

Existing State Land Use Designation: Agricultural District (within the Petition Area) and Urban and Agricultural Districts (outside of the Petition Area)

Existing Zoning Designation: AG-1 (Restricted Agricultural District)

Ewa Development Plan: Low and Medium Density Residential, High Density Residential, Agricultural and Preservation, Parks, Transit Node (High Density Residential and Commercial), and Future Intermediate School

HO'OPILI

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Special Designations: None. Petition Area is not situated in a Special Management Area or in the Shoreline Setback.

Permits/Approvals Required: Compliance with Chapter 343, HRS and Title 11, Chapter 200, HAR
State Land Use District Boundary Amendment
City and County of Honolulu Zone Change
Grading /Building Permits
National Pollutant Discharge Elimination System (NPDES) Permit
Subdivision Approval

Accepting Authority: State of Hawai'i Land Use Commission

1.2 PROJECT LOCATION

The approximately 1,600.265 acre Project Area is located in 'Ewa District, island of O'ahu (See Figure 1.1: Location Map). The Project Area is comprised of ten distinct parcels of land situated in between the H-1 Freeway (north) and Mango Tree Road (south), and in between the proposed University of Hawai'i West O'ahu (UHWO) property (west) and Old Fort Weaver Road (east). The Petition Area consists of 1,553.844 acres and three of the 10 parcels (See Table 1.1: Project Area Tax Map Key Parcels).

1.3 PROJECT AREA

The 10 parcels are identified as Tax Map Keys (TMK) and include 9-1-10: 02, 14 (portion), 15 (portion); 9-1-17: 04 (portion), 59, and 72; 9-1-18: 01 and 04, 9-2-01: 04, 05, 06, and 07 and 9-2-02:02 (See Figures 1.2 – 1.4: Tax Map Keys). For purposes of this EIS, the parcels labeled A through G are shown in Figure 1.5: Parcels Map, and listed below in Table 1.1. Parcels 9-1-10:02, 14 and 15 will be reserved for drainage only, and Parcels 9-2-01:04, 05, 06 and 07 and Parcel 9-2-02:02 will be used for reservoirs and storage, making the Petition Area approximately 1,553.844 acres. An additional 43.297 acres from 9-1-18:04 and 9-1-17:04 in the Petition Area will be condemned by the City and County of Honolulu for the creation of North-South Road.

HO'OPILI

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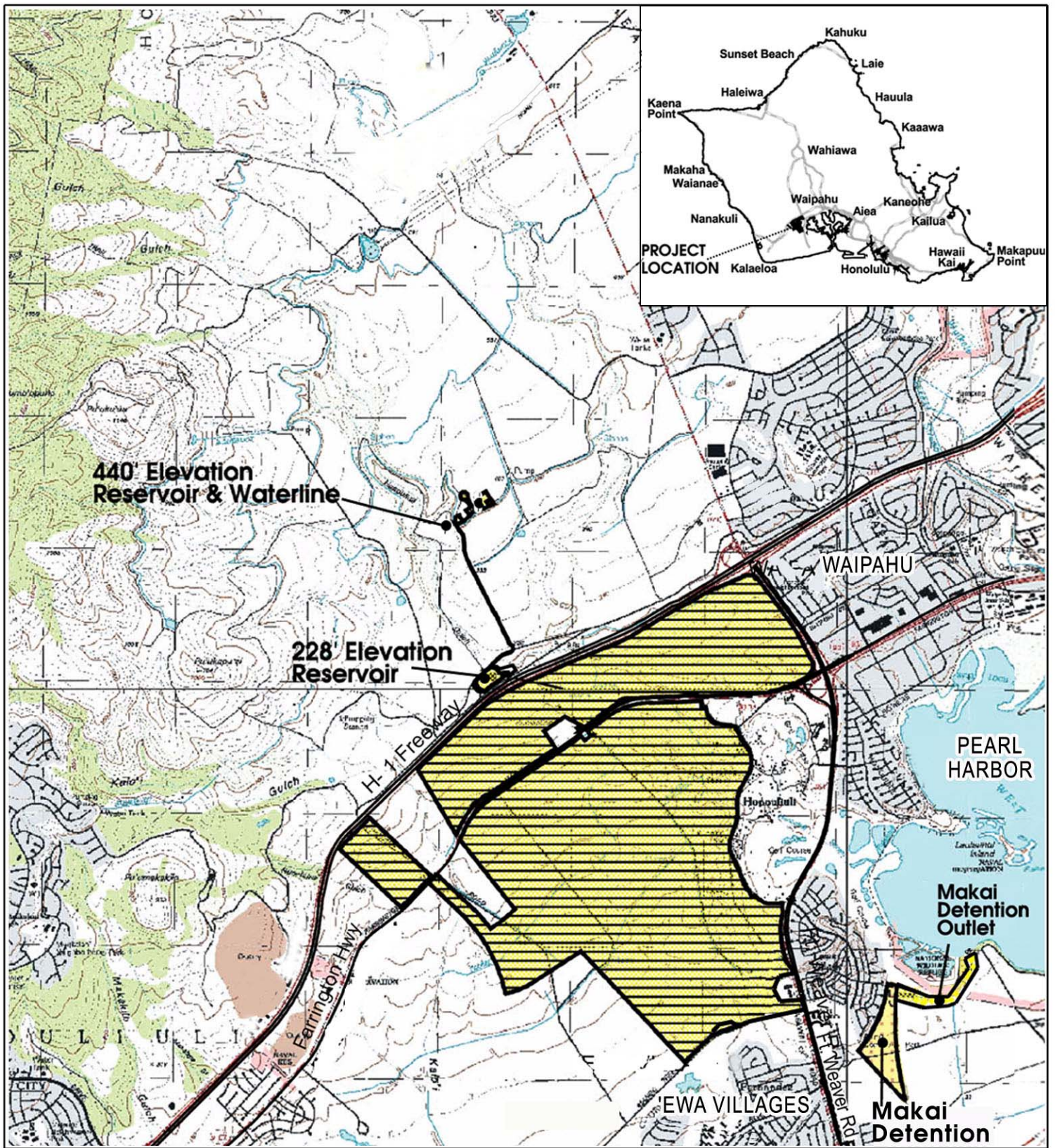
Table 1.1. Project Area Tax Map Key Parcels

PROJECT AREA	LANDOWNER	PARCEL NAME	TAX MAP KEY	ACREAGE
Petition Area	D.R. Horton-Schuler Homes LLC	A	9-1-18: 04	52.289
		B	9-1-18: 01	447.592
		C	9-1-17:04 (portion), 59, and 72	1053.963
TOTAL PETITION AREA				1,553.844
Non-Petition Area	D.R. Horton-Schuler Homes LLC	G	9-1-17:04 (portion)	1.301
	D.R. Horton-Schuler Homes LLC	D1	9-1-10: 02	30.825
	U.S. Naval Reservation	D2	9-1-10:14 (portion) and 15 (portion)	4.5*
	HECO	E1	9-2-01:04	.243
	Monsanto Company		9-2-01:05	.392
	City and County of Honolulu	E2	9-2-01:06	1.49*
		E3	9-2-01:07	.359
		F	9-2-02:02	7.311
* Approximate Acreage			TOTAL APPROXIMATE NON-PETITION AREA	46.421
TOTAL APPROXIMATE PROJECT AREA				1,600.265

In addition, the project will require easements over State and County road right-of-ways for the installation of various infrastructure and utility lines such as water, sewer, drainage, electricity, telephone and communications.

1.4 EXISTING USE

The Project Area currently contains cultivated fields for diversified agriculture, pasturage, and agricultural research, and fallow fields formerly used for sugar cane cultivation.



LEGEND


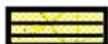
-  Project Site Boundary
-  Petition Area

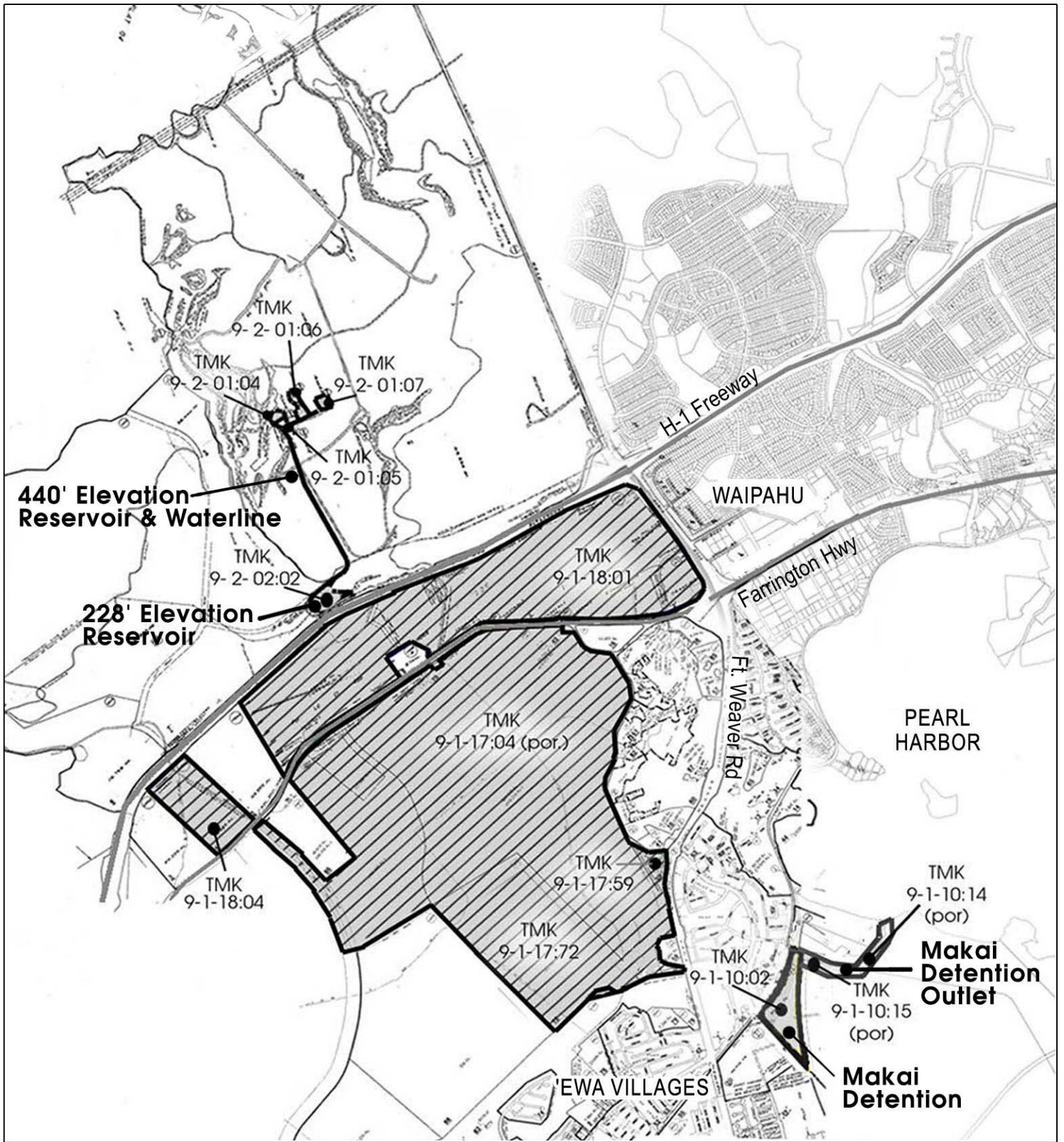
Figure 1.1: Location Map

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O'ahu, Hawai'i



Source: US Geological Survey
 Disclaimer: This graphic has been prepared for general planning purposes only.



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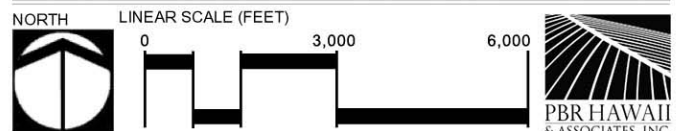
-  Project Site Boundary
-  Petition Area

Figure 1.2: Tax Map Key

HO'OPI LI

O'ahu, Hawai'i



Source: Tax maps Zone 9, Sec. 1, Plats 10, 17 and 18
Zone 9, Sec. 2, Plat 1 and 2



Disclaimer: This graphic has been prepared for general planning purposes only.





Figure 1.3: Tax Map Key
(Zone 9, Section 1, Plat 17)

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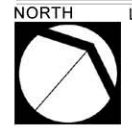
-  Project Site Boundary
-  Petition Area

Source: Tax Map Zone 9, Sec. 1, Plat 17
Disclaimer: This graphic has been prepared for general planning purposes only.

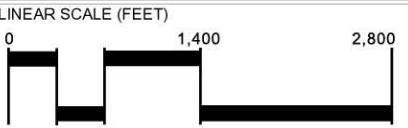
OWNERS, LESSEES, & VENDEES NAME RECORDED ON THIS TAX MAP PRINT MAY NOT BE CURRENT. PLEASE REFER TO COMPUTER AND HISTORY SHEETS FOR CURRENT OWNERS.
COPYRIGHT CITY & COUNTY OF HONOLULU - ALL RIGHTS RESERVED 2004
FOR PROPERTY ASSESSMENT PURPOSES, PARCELS MAY NOT BE LEGAL SUBDIVIDED LOTS - SUBJECT TO CHANGE


HO'OPI LI
O'ahu, Hawai'i

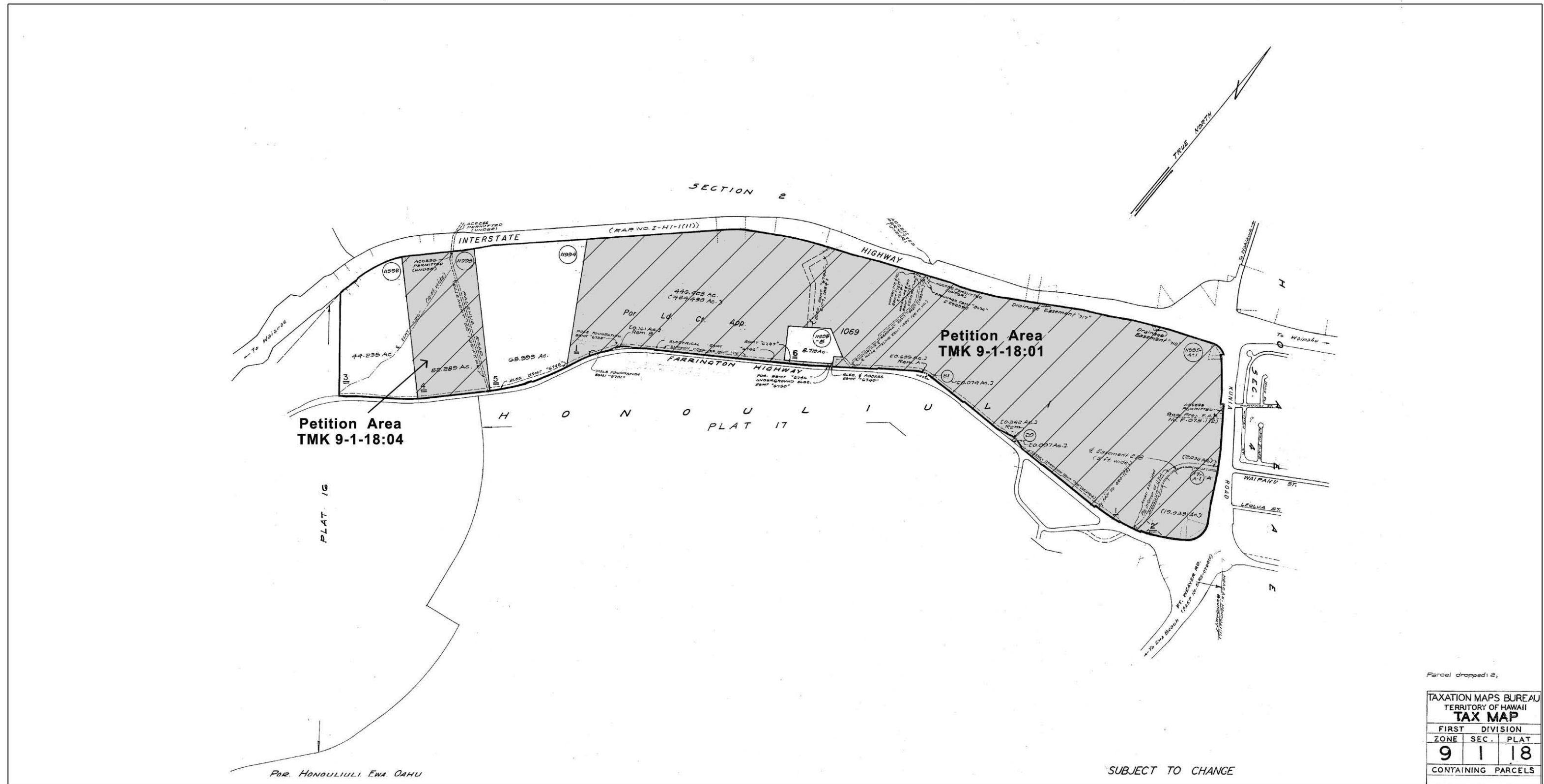
NORTH



LINEAR SCALE (FEET)







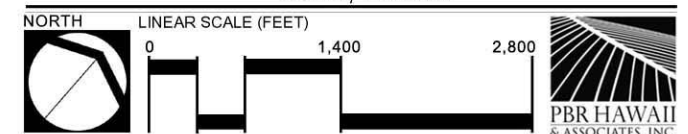
LEGEND

-  Project Site Boundary
-  Petition Area

Figure 1.4: Tax Map Key
(Zone 9, Section 1, Plat 18)

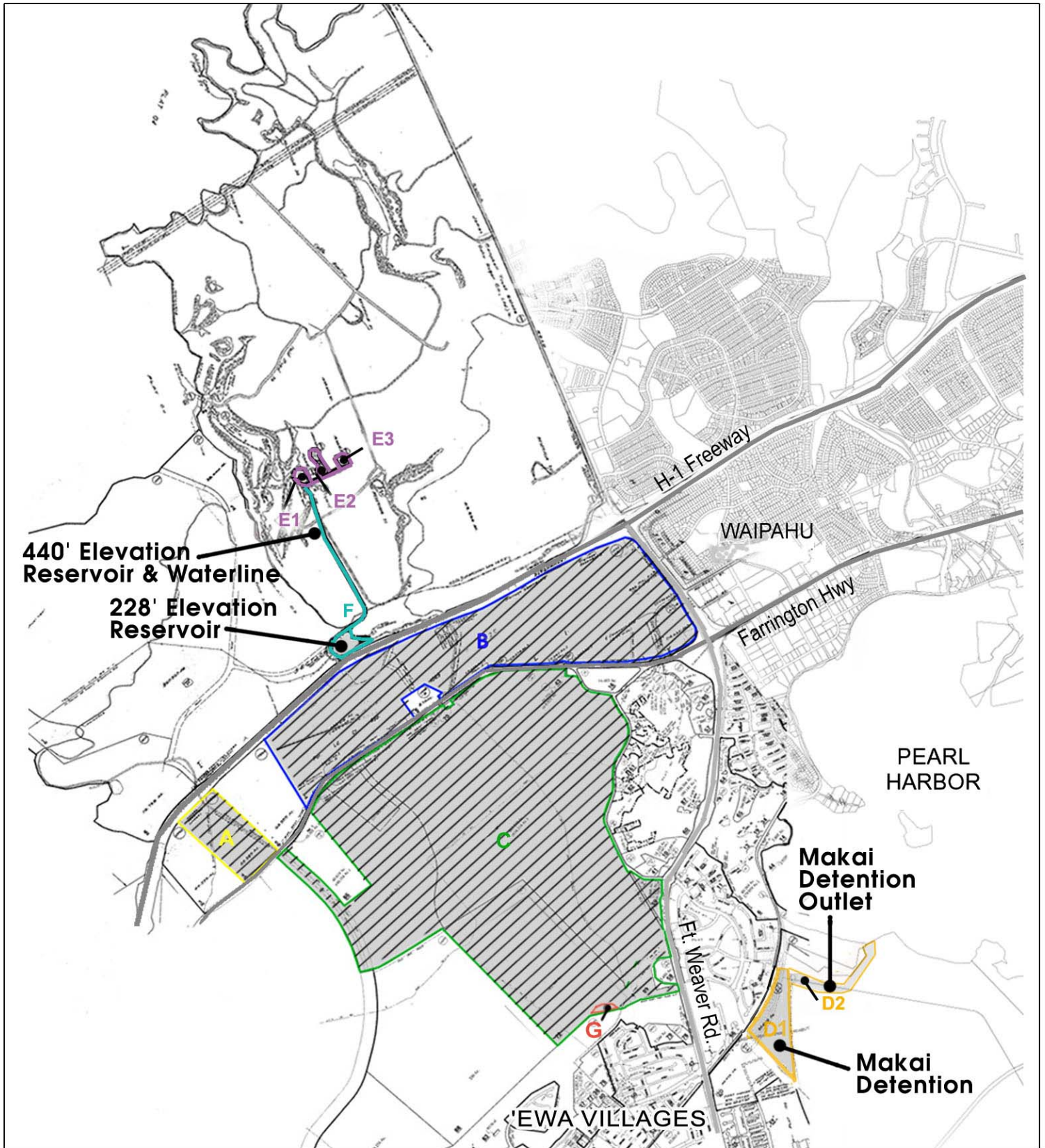
HO'OPI LI

O'ahu, Hawai'i



Source: Tax Map Zone 9, Sec. 1, Plat 18

Disclaimer: This graphic has been prepared for general planning purposes only.



440' Elevation Reservoir & Waterline

228' Elevation Reservoir

H-1 Freeway

WAIPAHU

Farrington Hwy

PEARL HARBOR

Makai Detention Outlet

Makai Detention

Ft. Weaver Rd.

EWA VILLAGES

LEGEND

Petition Area

-  Parcel A: 52.289 Acres
-  Parcel B: 447.592 Acres
-  Parcel C: 1,053.963 Acres
-  Parcel E1: .635 Acres
-  Parcel E2: 1.49 Acres*
-  Parcel E3: .359 Acres
-  Parcel F: 7.311 Acres
-  Parcel G: 1.301 Acres

* Approx Acres

Non-petition Area



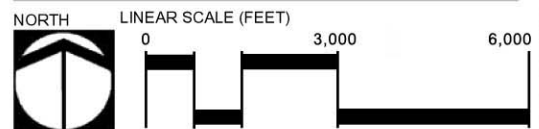
-  Parcel D1: 30.825 Acres
-  Parcel D2: 4.5 Acres*

Figure 1.5: Parcels Map

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O'ahu, Hawai'i



Source: Tax Maps Zone 9, Sec. 1, Plats 10, 15, 17 & 18 and Zone 9, Sec. 2, Plats 1 and 2
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HO'OPILI

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1.5 LAND OWNERSHIP

D.R. Horton – Schuler Division is the owner of the parcels (A, B and C) located in the Petition Area. D.R. Horton – Schuler Division, Hawaiian Electric Company (HECO), the City and County of Honolulu, the U.S. Naval Reservation and Monsanto Company own property situated within the non-petition area of the Project Area.

1.6 PETITIONER

The Petitioner is D.R. Horton – Schuler Homes LLC., a Delaware Limited Liability Company, d.b.a. D.R. Horton – Schuler Division (D.R. Horton).

Contacts: Mr. Michael Jones, Division President
Mr. Robert Q. Bruhl, Vice President, O'ahu Development
Mr. Dean Uchida, Vice President, Ho'opili
D.R. Horton – Schuler Division
828 Fort Street Mall, 4th Floor
Honolulu, Hawai'i 96813
Phone: (808) 521-5661
Fax: (808) 538-1476

1.7 PLANNING CONSULTANT

The Petitioner's environmental and entitlement planning consultant for the Ho'opili community is PBR HAWAII.

Contact: Mr. Vincent Shigekuni, Vice President
PBR HAWAII
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawai'i 96813
Telephone: (808) 521-5631
Fax: (808) 523-1402

1.8 ACCEPTING AUTHORITY

According to Section 343-5, HRS, "The authority to accept a final statement shall rest with the agency initially receiving and agreeing to process the request for approval." Privately-initiated EIS documents must be accepted by the government agency empowered to approve permits for a project. The accepting authority for this EIS is the State of Hawai'i Land Use Commission, hereinafter simply referred to as the "Commission."

HO'OPILI

~~DRAFT~~ FINAL ENVIRONMENTAL IMPACT STATEMENT

Contact: State of Hawai'i
Land Use Commission
P.O. Box 2359
Honolulu, Hawai'i 96804
Phone: (808) 587-3822
Fax: (808) 587-3827

1.9 COMPLIANCE WITH STATE OF HAWAII AND CITY AND COUNTY OF HONOLULU ENVIRONMENTAL LAWS

This document has been prepared in accordance with the provisions of Chapter 343, HRS, (Environmental Impact Statement Law) and Title 11, Chapter 200, HAR, (Environmental Impact Statement Rules). Section 343-6, HRS, establishes nine "triggers" that require compliance with these regulations. The trigger(s) for the proposed Ho'opili project include, but are not limited to, the following:

- Use of State/County lands and funds.

The proposed project's on- and off- site infrastructure improvements relating to roadway, traffic, water, sewer, utility (electricity, telephone and communications) and drainage facilities may affect State and/or County roadways or other lands. While the specific nature of each improvement is not known at this time, the EIS is intended to address all current and future instances involving the use of State and/or County lands and funds relating to the Ho'opili project.

1.9.1 Studies Contributing to this Environmental Impact Statement

A number of specific technical studies were prepared for the proposed Ho'opili project. These studies are included as appendices to the environmental impact statement and include:

- Agricultural Impact Analysis (Decision Analysts Hawaii, Inc.)
- Air Quality Study (B.D. Neal & Associates)
- Archaeological Inventory Survey (Cultural Surveys Hawai'i Inc.)
- Cultural Impact Survey (Cultural Surveys Hawai'i Inc.)
- Faunal Survey (Rana Productions, Ltd.)
- Flora Survey (LeGrande Biological Surveys Inc.)
- Fiscal Impact Study (Mikiko Corporation)
- Market Assessment Study (Mikiko Corporation)
- Acoustical Study (D.L. Adams Associates, Ltd.)
- Conceptual Water Master Plan (Bills Engineering Inc.)
- Preliminary Wastewater Collection System Master Plan (Bills Engineering Inc.)
- Drainage Master Plan (Bills Engineering Inc.)

HO'OPILI

~~DRAFT~~ FINAL ENVIRONMENTAL IMPACT STATEMENT

- Preliminary Electrical and Communications Master Plan (MK Engineers, Ltd.)
- Social Impact Assessment (Belt Collins Hawaii Ltd.)
- Traffic Impact Analysis Report (Wilbur Smith Associates)
- Arthropod Survey and Assessment (Pacific Analytics, L.L.C.)

HO'OPILI

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2.0

Description of the Project

HO'OPILI

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2.0 DESCRIPTION OF THE PROJECT

This section provides background information and a general description of the proposed Ho'opili project, and discusses the development timetable and preliminary development costs.

2.1 BACKGROUND INFORMATION

2.1.1 Location

The approximately 1,600.265 acre Project Area is located in the 'Ewa District on the island of O'ahu (See Figure 1.1: Location Map). The Project Area is comprised of eleven distinct parcels of land situated in between the H-1 Freeway (north) and Mango Tree Road (south), and in between the proposed University of Hawai'i West O'ahu (UHWO) property (west) and Old Fort Weaver Road (east). The Petition Area consists of 1,553.844 acres and three of the 10 parcels (A, B and C).

2.1.2 Ownership

D.R. Horton-Schuler Division is the owner of the parcels (A, B, and C) located in the Petition Area. D.R. Horton-Schuler Division, Hawaiian Electric Company (HECO), the City and County of Honolulu, the U.S. Naval Reservation and Monsanto Company own property situated within the non-petition area of the Project Area (See Figure 2.1: Current Land Ownership). In addition, the project will require easements over State and County road right-of-ways for the installation of various infrastructure and utility lines such as water, sewer, drainage, electricity and communications.

2.1.3 Surrounding Land Uses

The Petition Area consists of 1,553.844 acres of the 1,600.265 acres in the Project Area. The Project Area consists of 10 distinct parcels of land situated within the Agricultural District. For purposes of this EIS, the parcels have been labeled as A, B, C, D1, D2, E1, E2, E3, F and G (See Figure 1.5: Parcels Map). The Petition Area parcels are A, B and C. The remaining Project Area parcels, D1, D2, E1, E2, E3, F and G, do not need to be reclassified to urban.

Parcel A is located west of Parcels B and C, and north of the UHWO. It is bordered by State land to the west, Farrington Highway to the south, the proposed North-South Road (under construction) to the east, and the H-1 Freeway to the north.

Parcel B is located north (mauka) of Parcel C and Farrington Highway. It is the second largest of the 10 parcels. Parcel B is bordered to the west by land proposed for multi-family residential use by the HCDCH, to the south by Farrington Highway, to the east by Kunia Road, and to the north by the H-1 Freeway.

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

Parcel C is located south (makai) of Farrington Highway. It is the largest of the 10 parcels. Parcel C is bordered by the proposed North-South Road to the west; State Department of Hawaiian Home Lands (DHHL) landholdings, 'Ewa Villages, and the 'Ewa Villages Golf Course to the south; Old Fort Weaver Road and (new) Fort Weaver Road to the east; and Farrington Highway to the north. There are two out-parcels along Farrington Highway. One out-parcel of land near the planned University of Hawai'i West O'ahu (UHWO) campus and North-South Road is proposed for multi-family residential use by the Housing and Community Development Corporation of Hawaii (HCDCH). The other out-parcel of land is used by the City and County of Honolulu Board of Water Supply (BWS).

Parcel D1 is located east of the other four parcels and Fort Weaver Road. Pearl Harbor National Wildlife Refuge is located to the north, West Loch Estates is located to the northwest, 'Ewa by Gentry is located to the south and southwest, and Waipahu and Pearl Harbor are located to the east.

Parcel D2 functions as an outlet, connecting Parcel D1 to Pearl Harbor and its use would require approval from the United States Navy.

Parcels E1, E2 and E3 are located north (mauka) of the H-1 Freeway. The parcels are numbered from west to east, with E1 on the west and E3 on the east. All are surrounded by open space, and are connected to Parcel F via narrow parcel of land which will serve as a waterline.

Parcel F is located north (mauka) near to the H-1 Freeway. It is linked to Parcels E1, E2 and E3 by a narrow band of land. It is bordered by the H-1 Freeway on the southern boundary and by open space on its north, east and western sides.

Parcel G is adjacent to the makai boundary of Parcel C and is located north (mauka) of the 'Ewa Villages Golf Course, and is already located within the State Urban Land Use District boundaries.

Adjacent landowners to the Project Area, from a regional perspective, are identified in Figure 2.2: Surrounding Land Ownership.

2.1.4 Description of the Project Area

The Project Area has been used primarily for agricultural purposes. The Project Area was previously leased to the 'Ewa Plantation Company/'Ewa Sugar Company and the O'ahu Sugar Company. The Project Area's current tenants and existing land uses are listed in Table 2.1 below and shown on Figure 2.3: Current Lessees.

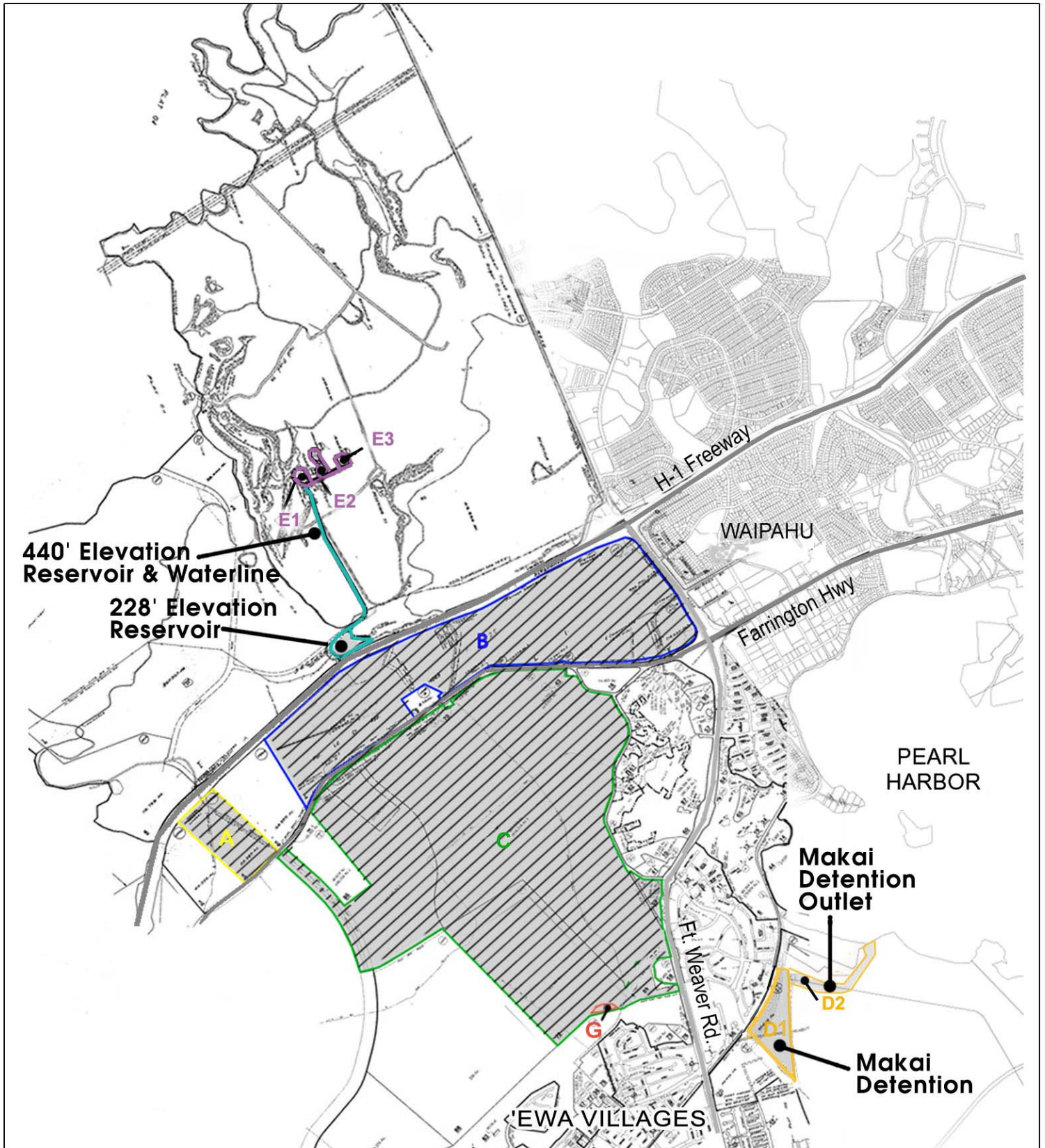


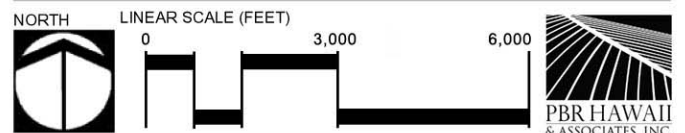
Figure 2.1: Current Land Ownership

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- Petition Area**
- Parcel A: D.R. Horton
 - Parcel B: D.R. Horton
 - Parcel C: D.R. Horton
 - Parcel E1: HECO/Monsanto Company
 - Parcel E2: City and County of Honolulu
 - Parcel E3: City and County of Honolulu
 - Parcel F: City and County of Honolulu
 - Parcel G: D.R. Horton
- Non-petition Area**
- Parcel D1: D.R. Horton
 - Parcel D2: U.S. Naval Reservation

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Source: Tax Maps Zone 9, Sec. 1, Plats 10, 15, 17 & 18 and Zone 9, Sec. 2, Plats 1 and 2
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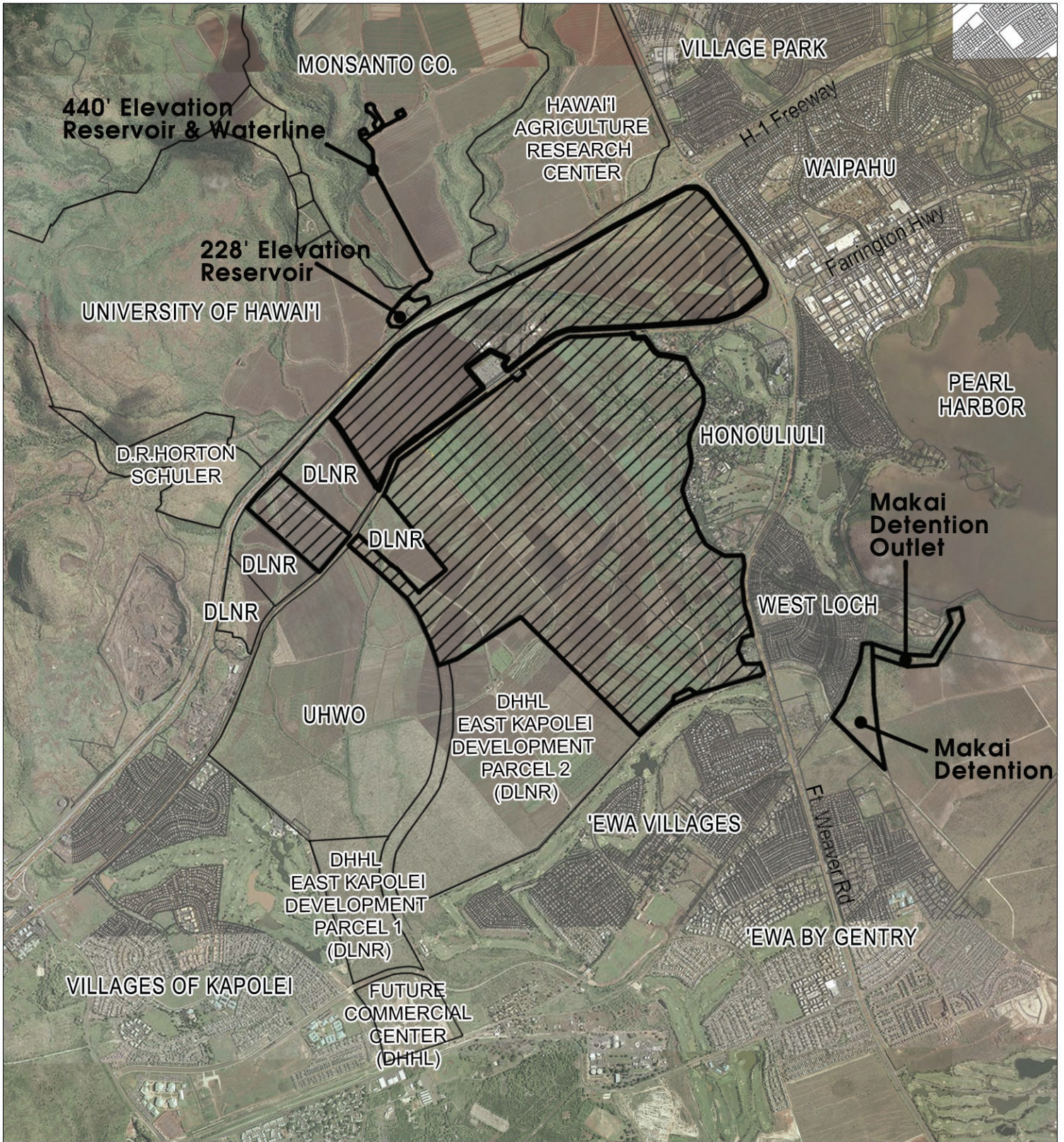

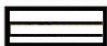


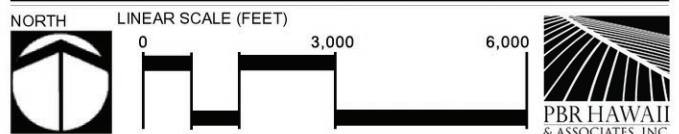
Figure 2.2: Surrounding Land Ownership

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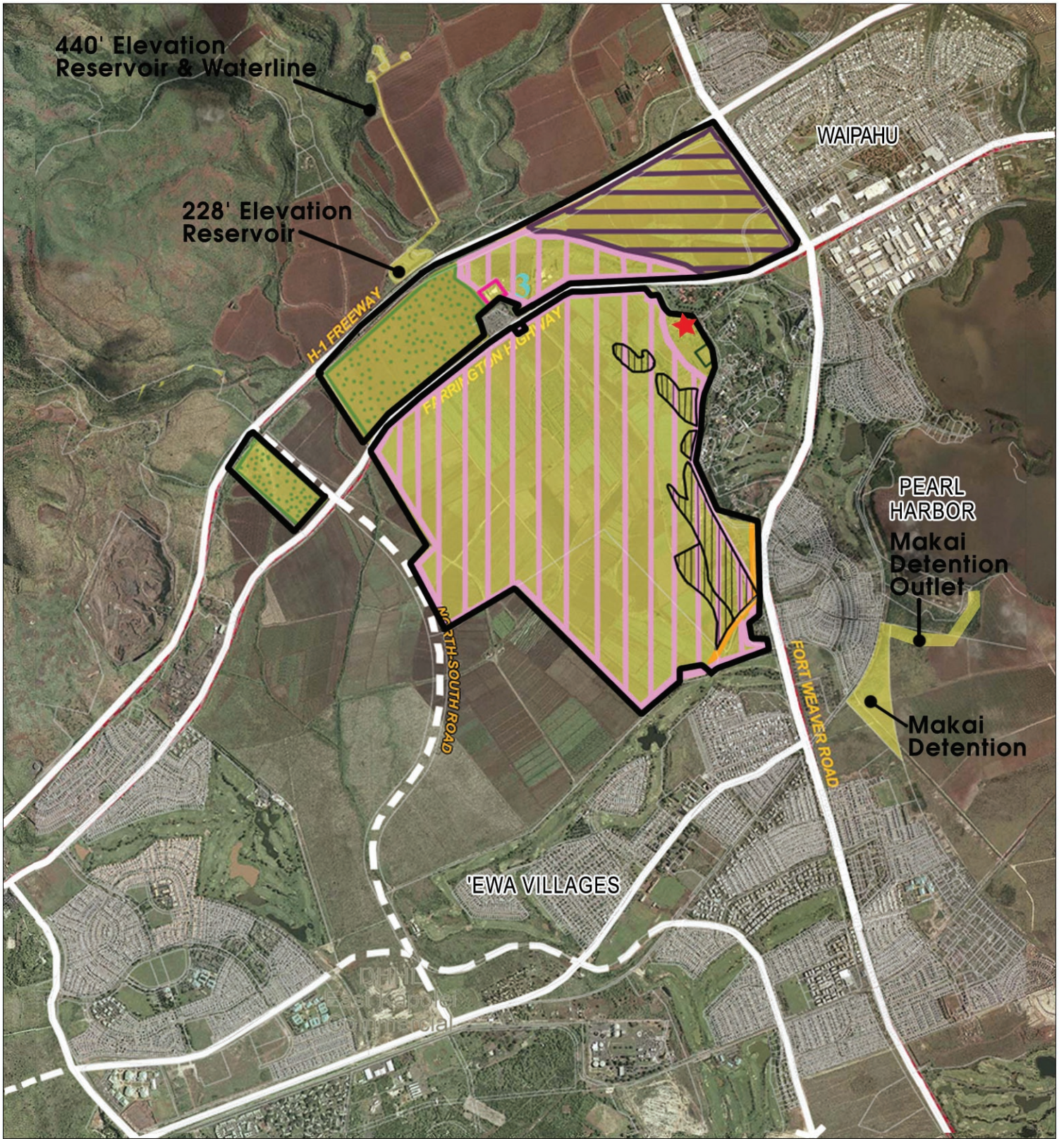
-  Project Site Boundary
-  Petition Area

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Source: USGS Seamless, 2004
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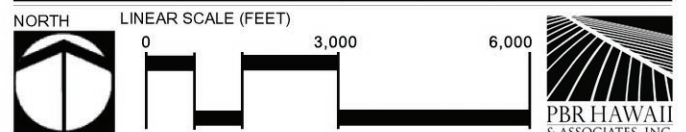
- | | | | |
|--|---|---|---|
|  | Project Site Boundary |  | U.S. Filter Operating Lease (Non-Major #3) |
|  | Petition Area |  | Subleased Areas |
|  | Aloun Processing Plant Lease (3 A.C.) |  | Approximate Location of Roberts Hawaii School Bus, Inc. |
|  | Aloun Farm Lease | | |
|  | Sugarland Lease | | |
|  | Garst Seed Lease | | |
|  | Hawaii's Agricultural Research Center Lease | | |

Source: D.R. Horton-Schuler Division
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Figure 2.3: Current Lessees

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Table 2.1. Current Tenants and Existing Land Uses

TENANT	LAND USES
Aloun Farm, Inc.	Diversified agriculture, pasturage, storage/processing/distribution facility for produce
Sugarland Farms, Inc.	Grazing of livestock, cultivation of crops
Rocker G. Livestock (d.b.a. Bud Gibson)	Pasturage
Larry G. Jefts	Diversified agriculture, ranching and grazing of cattle
Garst Seed Company	Cultivation of legal seed corn and other agricultural crops
Roberts Hawaii School Bus, Inc.	Parking of no more than 30 school buses and 60 Handi-Vans
Hawaii Agricultural Research Center	Agricultural research station

2.1.5 State Land Use District

The Petition Area is currently in the State Agricultural District (See Figure 2.4: State Land Use District). Lands outside of the Petition Area are located within the Urban and Agricultural Districts. D.R. Horton filed a petition (A06-771) with the State Land Use Commission to reclassify the Petition Area to the Urban district.

2.1.6 Ewa Development Plan

The *Ewa Development Plan* designates the Petition Area as Low and Medium Density Residential, High Density Residential, Agricultural Land Preservation, Parks, and Transit Node (High Density Residential and Commercial) and Future Intermediate School (See Figure 2.5: Ewa Development Plan and Figure 2.6: Ewa Development Plan Open Space Map).

2.1.7 City and County of Honolulu Zoning

The Petition Area is presently zoned AG-1 Restricted Agricultural District by the City and County of Honolulu's Land Use Ordinance (See Figure 2.7: Current Zoning Map). As such, the Petitioner will be seeking a Zone Change for the 1,553.844 acre Petition Area, and the 1.301 acre Parcel G [TMK: 9-1-17: 04 (por.)].

2.2 STATEMENT OF PURPOSE AND NEED

According to the City and County of Honolulu Department of Planning and Permitting (DPP), the year 2006 population of the *Ewa Development Plan Area* (Ewa DPA) was 86,000 (DPP, 2006). This comprised an increase of 25.1 percent from its 2000 population of 68,718. The DPP expects the population of the Ewa DPA to increase to 180,200 by the

HO'OPILI

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year 2030. In comparison, the population for the City and County of Honolulu as a whole increased only 3.8 percent from 876,156 to 909,863 between 2000 and 2006. The City and County of Honolulu is expected to experience a population growth of 27.5 percent (241,144 persons) from 876,156 to 1,117,300 total residents during the same 30-year period.

With the expected increase in population, most of O'ahu's new housing stock is planned for development in the 'Ewa and Central O'ahu regions. Indeed 'Ewa is the City and County of Honolulu's lone "Development Plan" area. This trend is expected to continue over the next several decades to accommodate the projected population growth and housing demand. Large-scale housing development projects in the 'Ewa region provide an opportunity for fee-simple home ownership at relatively affordable prices.

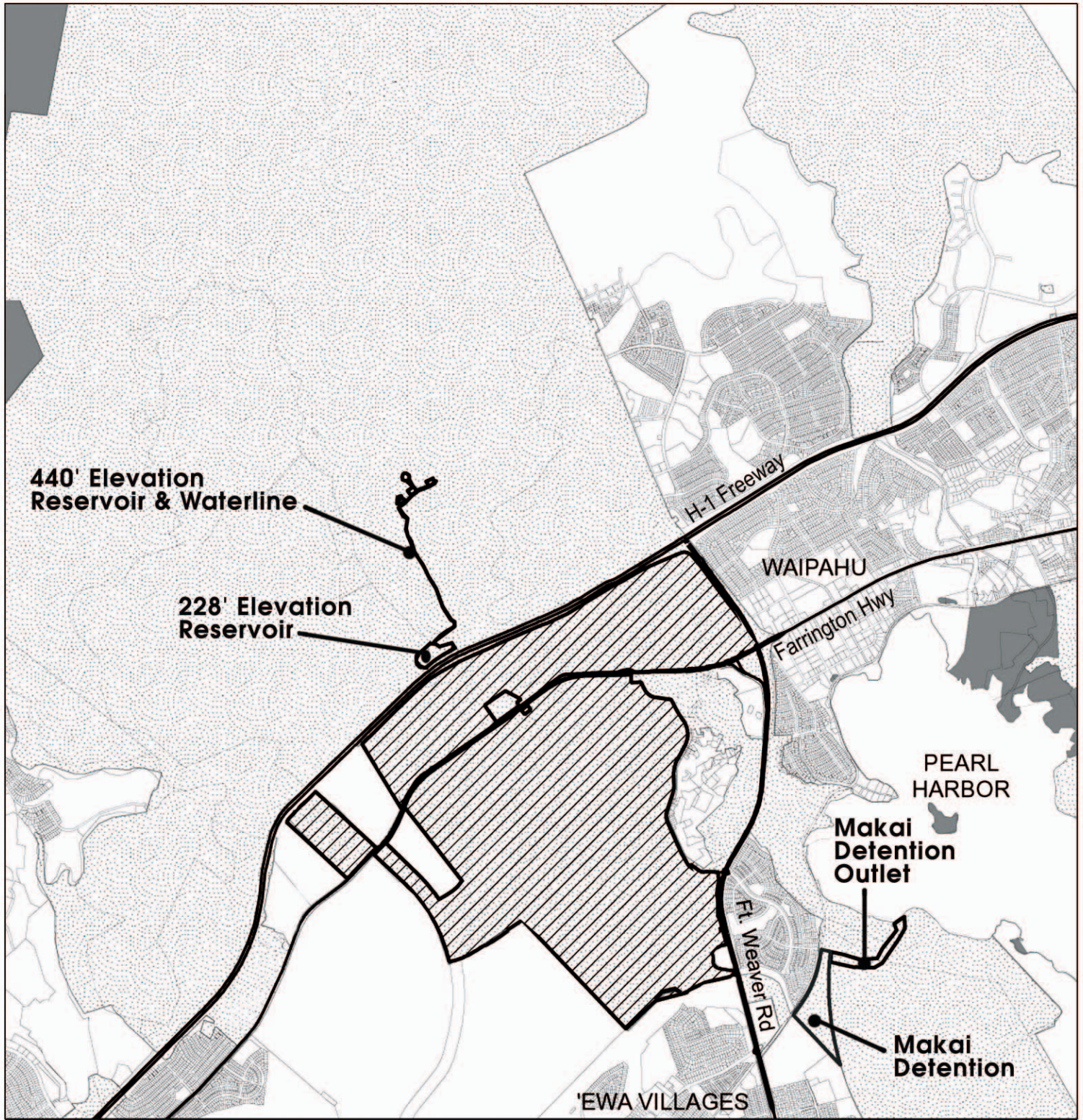
The Ho'opili community will provide numerous socio-economic opportunities to residents of Hawai'i. Development of the Petition Area would include development of a mixed-use, transit-ready community including residential, business, and commercial units; and transit stations, schools, and parks. As such, Ho'opili aims to provide: employment centers; quality schools; shopping, gathering and recreational places; and parks and open space for residents; and diverse, including affordable, housing options. Residents will live, work, learn, play, and shop in one area. In addition, the project will generate direct and indirect jobs during construction and post-construction, and enable residents to live, work, learn, play, and shop in one area.

2.3 THE VISION

Ho'opili – which means “coming together” in Hawaiian – reflects the ideas, hopes and dreams of what the community envisioned during the planning and preliminary design phases of the project. The plan envisions vibrant and safe neighborhoods where people feel a sense of connection with one another, and with the rest of O'ahu.

Ho'opili reflects the public's desire for a community that provides: affordable living options; employment centers; quality schools; shopping, gathering and recreational places; and parks and open space for residents, thus allowing community residents the ability to live, work, learn, play, and shop in one area. In addition, Ho'opili will incorporate green building practices and to be an environmentally-sound, healthy and resource-efficient community.

To achieve the vision for Ho'opili, a Conceptual Land Use Plan (See Section 2.5.1) has been formulated that illustrates a mixed-use community that would complete and connect 'Ewa with the surrounding communities. Originating from the common vision and values of a community-driven planning effort, the conceptual plan contains a series of neighborhoods with a mix of uses including residential, retail, office and light industrial. Included in this mix are a series of parks, schools, public buildings and community centers which act as a focus and help define the identity of each neighborhood.



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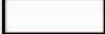
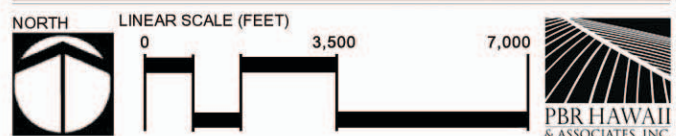
-  Project Site Boundary
-  Petition Area
-  Agricultural
-  Conservation
-  Urban

Figure 2.4 State Land Use District

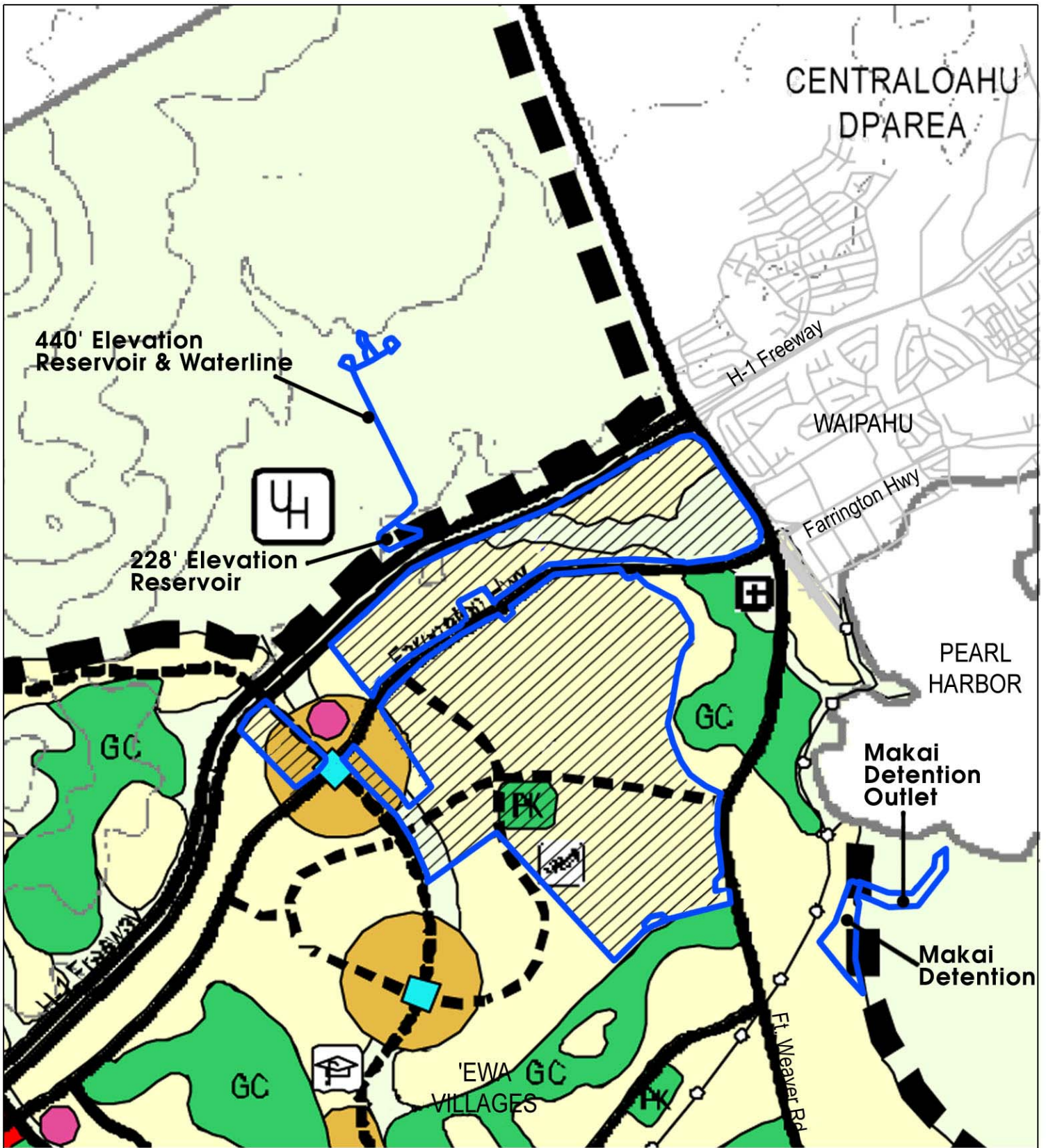
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Source: State Land Use Commission (2004)

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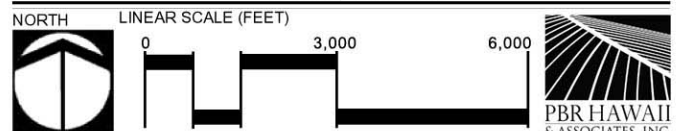
LEGEND

- | | |
|----------------------------------|--|
| Project Site Boundary | Parks & Golf Courses |
| Petition Area | Transit Nodes/
High Density Residential &
Commercial |
| Low & Medium Density Residential | Urban Growth Boundary |
| High Density Residential | |
| Community Commercial Center | |
| Agricultural Land Preservation | |

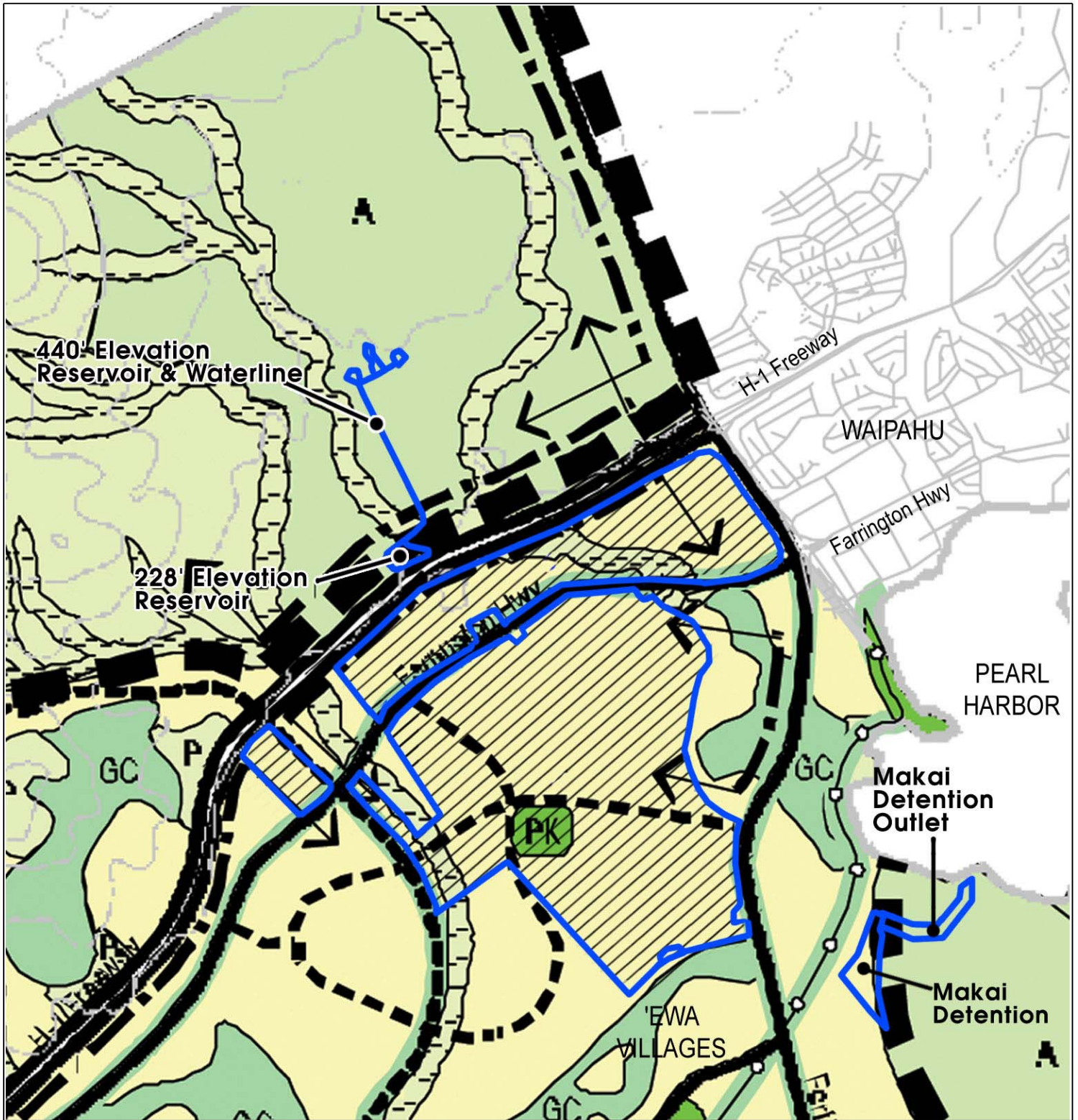
Figure 2.5: 'Ewa Development Plan

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Source: City & County of Honolulu 'Ewa Development Plan Urban Land Use Map (1997)
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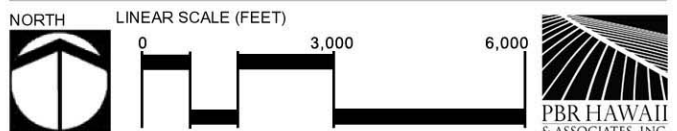
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- | | |
|--|------------------------------------|
| Project Site Boundary | Natural Drainageways/ Gulches |
| Petition Area | Panoramic Views |
| Preservation Areas | Historic Railway/ Bikeway Corridor |
| Agricultural Areas | Shoreline Access |
| Regional, District, Shoreline, and Nature Parks | Urban Areas |
| Golf Courses | Urban Growth Boundary |
| Existing/Future Highways, Arterial and Major Collector Streets | |
| Existing/Future Landscaped Boulevard/Greenway | |

Figure 2.6: 'Ewa Development Plan Open Space Map

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Source: City & County of Honolulu 'Ewa Development Plan Open Space Map (1997)
 Disclaimer: This graphic has been prepared for general planning purposes only.



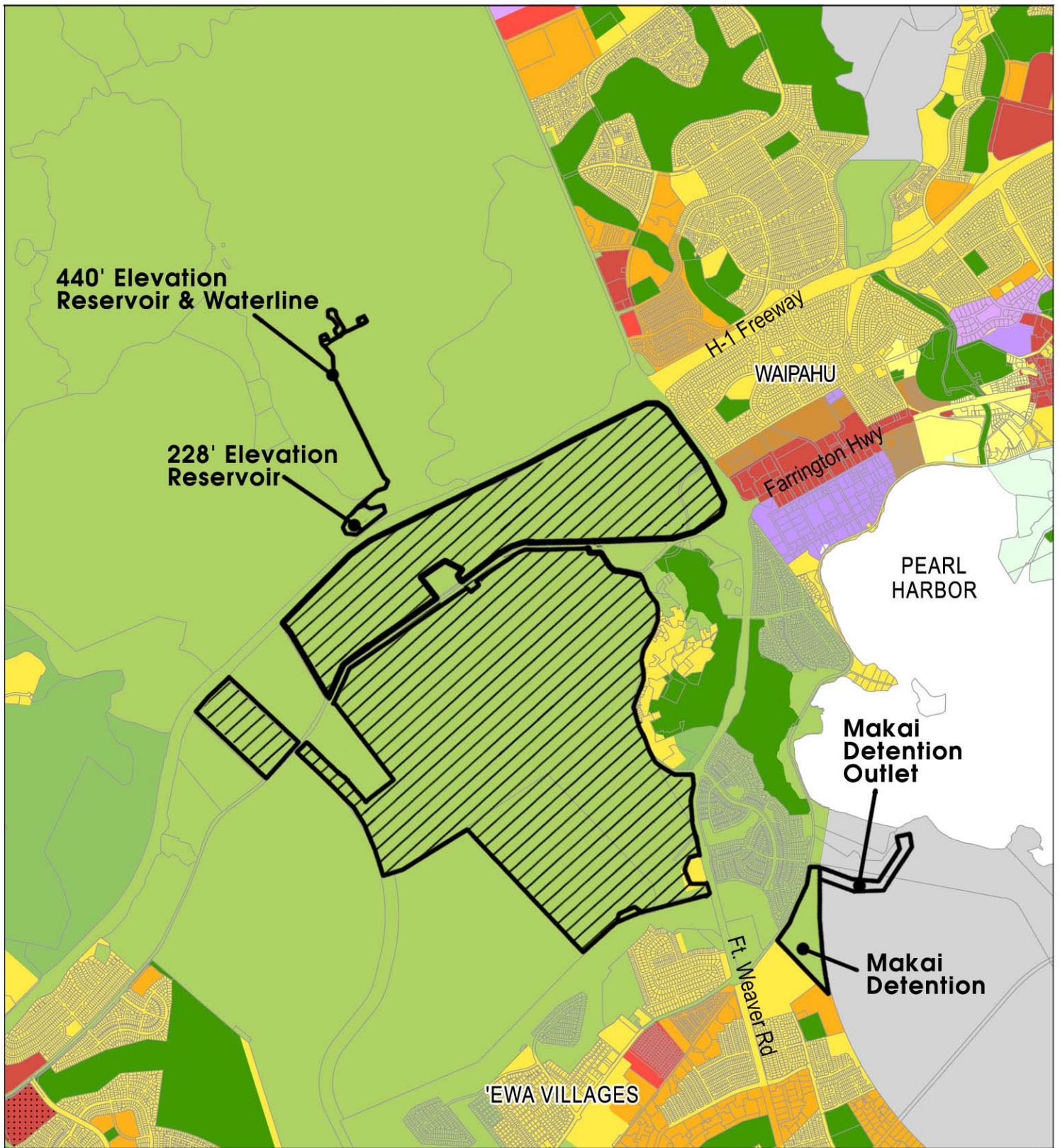







Figure 2.7: Current Zoning Map

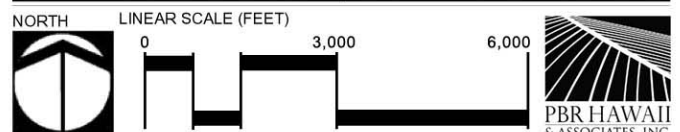
LEGEND

-  Project Site Boundary
-  Petition Area
-  AG-1 Restricted Agriculture Zone
-  F-1 Military and Federal Zone
-  R-5 Residential Zone

Source: City and County of Honolulu (2005)
 Disclaimer: This graphic has been prepared for general planning purposes only.

HO'OPI LI

O'ahu, Hawai'i



HO'OPILI

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2.4 THE COMMUNITY PLANNING PROCESS

Representatives from various West O'ahu community groups began work on formulating a vision and master plan for a new West O'ahu community being planned by D.R. Horton in October 2005. The group, the Ho'opili Community Task Force, met nearly once a month – and sometimes more often – for a year (October 13, 2005; November 9, 2006; February 1, 2006; March 1, 2006; March 29, 2006; April 17, 2006; May 15, 2006; June 5, 2006; June 26, 2006; August 14, 2006; and October 16, 2006), to explore the communities' needs and desires for the completion of the 'Ewa Vision on topics such as “gathering place,” “parks and community facilities,” “transportation and infrastructure,” “education,” “employment,” and “housing.” After the completion of the master plan, the Ho'opili Community Task Force has continued to meet (March 5, 2007; April 2, 2007; May 7, 2007; June 4, 2007; June 25, 2007; July 16, 2007; August 6, 2007; September 17, 2007; and October 15, 2007) to address the most challenging issue of the region, traffic, especially daily commuting to workplaces and schools outside of the 'Ewa region. The group will be asked to reconvene in early 2008 to continue its work on the plan and anticipated development issues.

The planning effort produced a community-driven vision for a new kind of development, one that improves the quality of people's lives by allowing them to live, work, learn, shop and play – all right in their own community.

The proposed plan for Ho'opili hopes and dreams of what the community wanted to see in this new community. The plan reflects the community's desire for vibrant and safe neighborhoods where people feel a sense of connection with one another, and with the rest of O'ahu.

The Conceptual Land Use Plan also reflects the desire for a community that provides: affordable living options; employment centers; quality schools; shopping, gathering and recreational places; and parks and open space for residents.

Finally, the community expressed a desire to see this new community incorporate green building practices and to be an environmentally-sound, healthy and resource-efficient community.

The Ho'opili Community Task Force identified three core values for its vision for 'Ewa:

- **Connected community**
 - Connects the City of Kapolei with the surrounding communities of 'Ewa, 'Ewa Beach, 'Ewa Villages, Honouliuli, Kalaeloa, Kunia, Makakilo, Waipahu, West Loch, and the rest of O'ahu
 - Make it easy for residents to connect to local shops, parks, schools, employment areas, such as the City of Kapolei and the planned

HO'OPILI

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- University of Hawai'i at West O'ahu through a walkable, transit-oriented community with pedestrian/bicycle paths
- Acknowledge the transportation issues in 'Ewa, and provide a thoughtful and real response to these issues
- Use technology to connect businesses and residents with others to create a healthy "live-work" environment
- **Lifestyle-enhanced community**
 - Create a healthy, balanced and vibrant community that offers a unique urban lifestyle in a "village" setting
 - Provide a wide diversity of housing, including truly "attainable" housing
 - Create a "gateway" to West O'ahu that establishes a strong sense of place and a warm sense of community, both for this generation and the next
 - Plan for schools of every type: public and private; daycare through bachelor's degree; and life-long learning opportunities
 - Provide more quality jobs so people can live, work and thrive in their own community
 - Provide a gathering place that creates a real community "center" and gives residents "somewhere to go"
- **Sustainable "green" community**
 - Incorporate green building practices and an environmentally-sound, healthy and resource-efficient community
 - Provide lots of parks, open space and community facilities
 - Plan for and properly-phase utility infrastructure
 - Reduce automobile dependency by creating a compact community with a mix of land uses
 - Preserve views to Diamond Head and surrounding mountains

The Ho'opili Community Task Force's vision and values manifested itself in the following proposed land uses for a mixed-use community:

Variety of Parks and Open Space. Various large and small parks are planned throughout Ho'opili. These include:

- A District Park with active playfields
- Canyon Park (a unique "wilderness"-type park)
- Civic Plaza - a community gathering space for outdoor concerts, farmer's markets, et cetera.
- "Mini" parks, located throughout the project to be within walking distance of most residences
- Linear parks and open space that encircle Ho'opili with walking/biking paths

HO'OPILI

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Various Community Gathering Spaces. Ho'opili is planned to provide a number of gathering places including the Civic Plaza, the various parks, a community center, houses of worship and new public school cafeteriums that can be used for community meetings, et cetera.

Wide Range of Educational Facilities. A range of educational facilities are planned for Ho'opili residents, either on-site or nearby. Possible schools include daycare and/or pre-school facilities, public elementary schools, a public middle school, and a public high school, and possibly private schools. Ho'opili will also be designed to connect with the new UH West O'ahu campus. Providing such facilities in Ho'opili will help reduce trips outside of 'Ewa.

Diverse Career Opportunities. Through 2025, it is expected that more than 40,000 new jobs will be created in the 'Ewa region and Kapolei. While many of its residents might fill these jobs, Ho'opili is designed to be a well-balanced community, hoping to allow residents the opportunity to integrate their personal and professional lives by offering a number of new employment alternatives. The Petitioner hopes to help attract new employers to the area in its goal to achieve a jobs-housing balance to help reduce the need for commuting outside of 'Ewa. At full build out, Petition Area employment is expected to account for approximately 1,550 jobs. Possible jobs-creation areas include research and development parks associated with UH West O'ahu, medical offices that will complement Hawai'i Medical Center West and Kahi Mohala, schools, offices, restaurants and retail. As at Mehana, in the City of Kapolei, Ho'opili will include "live-work" units where residents can own homes that also serve as business locations. Off-site, but within 'Ewa, career-type opportunities include those at the City of Kapolei, Ko 'Olina and UH West O'ahu.

Various Home Choices. Ho'opili is planned to feature a variety of housing options, including: low-density residential, including single-family homes; medium-density (including "live-work" housing featuring townhouses and semi-attached homes); and higher-density residential condominiums and apartments.

Shopping, Dining and Entertainment Choices. Ho'opili is planned to include shopping, dining and entertainment establishments concentrated within walking distances of the Civic Plaza, medium and higher density residential areas, offices and the planned high-capacity transit stop. These establishments should add to the social opportunities within 'Ewa and reduce the need to drive to "town" for shopping, dining and movies.

Multi-Modal Transportation. Ho'opili is designed to be bus/high-capacity transit-ready with a vast, interconnected internal street grid that provides numerous ways of getting around by bus/high-capacity transit, on foot, by bicycle, and by car (See Figure 2.8: Proposed Circulation Plan).

HO'OPILI

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Pedestrian-Friendly Environment. Ho'opili is planned to include a comprehensive pedestrian/bicycle system that connects homes to schools, gathering places, community facilities, parks and open spaces. Also, Ho'opili's proposed mix of land uses should mean that jobs, goods and services that residents need (including day care), will be either just "steps away" or a "couple of doors down." Reducing automobile dependency can lead to an enhanced lifestyle that encourages healthy living.

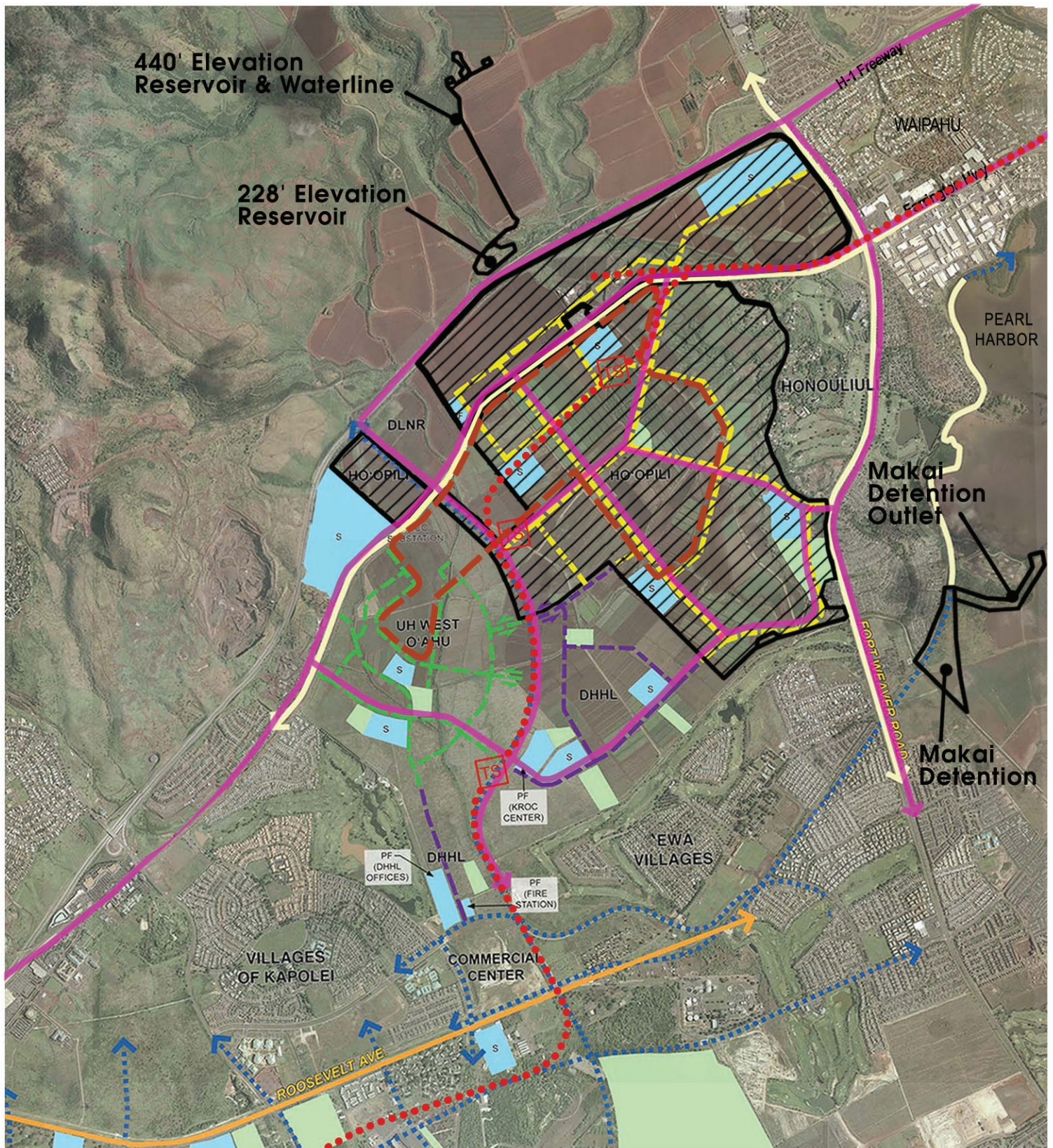
2.5 THE HO'OPILI COMMUNITY

2.5.1 Ho'opili Conceptual Land Use Plan

The Proposed Action involves the reclassification of approximately 1,553.844 acres from the Agricultural District to the Urban District. Urbanization of the petition area will enable the Petitioner to develop the proposed Conceptual Land Use Plan (See Figure 2.9: Conceptual Land Use Plan). The proposed Ho'opili Conceptual Land Use Plan will be a community where residents can live, work, learn, play, and shop.

To achieve the communities' vision for Ho'opili, a Conceptual Land Use Plan has been formulated that illustrates a mixed-use community that would complete and connect 'Ewa with the surrounding communities. Originating from the common vision and values of a community-driven planning effort, the conceptual plan contains a series of neighborhoods with a mix of uses including residential, retail, office and light industrial. Included in this mix are a series of parks, schools, public buildings and community centers which act as a focus and help define the identity of each neighborhood.

Ho'opili is planned to be connected to the surrounding 'Ewa District (and neighboring DHHL, UHWO and HCDA properties) by a network of streets and bicycle paths which should allow a variety of circulation options for residents and visitors. Wider tree-lined boulevards are intended to create a distinct axis running north-south and east-west across the site. Ho'opili is being designed to be transit-ready, and the land use plan, while subject to change, has been designed to accommodate a high-capacity transit corridor either along Farrington Highway or diagonally through the project site, with either one or two transit station locations. Also possible is a transit maintenance and storage facility. While the proposed residential unit count should not materially change, it will need to be adjusted depending on the final alignment of the high-capacity transit corridor, as ridership generation, "capture" of transit-oriented development potential and the potential for noise impact from an elevated high-capacity transit alignment would likely require taller, higher density residential or industrial uses along the alignment. The final siting of the transit station location(s) will concentrate higher intensity development (and density) around the transit station(s). A site for a transit maintenance and storage facility is also possible. (As of this writing, the City and County of Honolulu has begun work on the Draft EIS for the Honolulu High-Capacity Transit Corridor (HHCTC) project, with a target publication date in the second quarter of 2008. By the time the HHCTC Draft EIS is

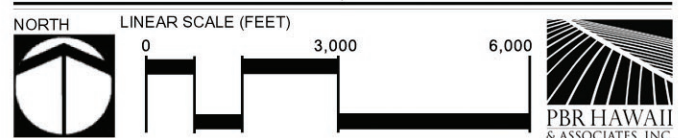


- | | |
|---|------------------------------|
| Project Site Boundary | Express and Local Bus Routes |
| Petition Area | Proposed HHCTC Corridor |
| Proposed UH West O'ahu Bikeway | Proposed Transit Stop |
| Proposed Ho'opili Bikeway | Circulator Shuttle |
| Proposed DHHL Bikeway | Proposed Parks |
| Proposed Bikeway by Others | Proposed Schools |
| Existing State Bike Plan | Proposed Public Facility |
| Pearl Harbor Historic Trail and Leeward Bikeway | Right-in / Right-out |
| | Right-in / Right-out |

Figure 2.8: Proposed Circulation Plan

HO'OPILI

O'ahu, Hawai'i



Source: State of Hawaii Department of Transportation Bicycle Plan 2000; Draft Ewa Connectivity Study 2007.
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LAND USE	Approx. Gross Acres	Approx. # of Units
Project Site Boundary		
Petition Area		
Low-Medium Density Residential / Live-Work*	535	5,100
Mixed Use / Medium Density Residential*	340	5,200
Mixed Use / High Density Residential*	50	1,450
Business / Commercial	145	
Light Industrial / Business	50	
Open Space / Buffers*	150	
Parks*	60	
Neighborhood Parks*	*	
Public Facilities	100	
Major Roads* (as shown)	124	
TOTAL: (Approx.)	1,555	11,750

*Neighborhood parks and secondary roadways included in residential areas

Figure 2.9: Conceptual Land Use Plan

HO'OPILI

Oahu, Hawaii

D-R HORTON
America's Builder
SCHULER DIVISION

PBR HAWAII & ASSOCIATES, INC.
Charlier Associates, Inc.

VAN METER WILLIAMS POLLACK



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published, the final alignment of the high-capacity transit corridor, the location of transit stations, and the location of the transit maintenance and storage facility will be known).

In the geographical center of the site there is a public square or Civic Plaza that is surrounded by higher density housing development and mixed-use buildings. Housing intensity transitions to lower-density small-lot single-family homes along the eastern and southern peripheries of the site. A significant open space and pedestrian/bicycle trail network provides a wide variety of recreational opportunities for residents and other members of the 'Ewa community. Ho'opili will incorporate traditional Hawaiian building styles with a modern, contemporary aesthetic and will reflect the landscape and climate.

The general land use allocation illustrated on the Conceptual Land Use Plan is summarized in Table 2.2 and described below:

Low-Medium Density Residential/Live-Work

Ranging from traditional single-family detached homes on varying lot sizes to multi-family dwellings with a variety of live-work opportunities, there are approximately 535 gross acres (which includes secondary roads and mini-"neighborhood" parks) planned to accommodate approximately 5,100 residential units at densities of 5 to 14 units per acre. These areas would include mini-parks located as focal points and activity centers of the community.

Mixed-Use/Medium Density Residential

Planned to be oriented along future high-capacity transit and major roadway alignments, these medium density mixed use districts would include live-work residential units or residential uses over ground floor commercial and office uses. Within these districts that comprise approximately 340 acres (all of which will not be developed for housing because the acreage includes secondary roads, off-street parking and mini-"neighborhood" parks), there are approximately 5,200 dwelling units planned at densities of 15 to 29 units per acre along with retail and office use.

Mixed-Use/High Density Residential

Planned to be located near major transportation junctions, these higher density mixed use districts would include commercial, office space, and higher density live-work residential units or residential uses above ground floor businesses. Within these districts that comprise approximately 50 gross acres (which includes secondary roads, off-street parking and mini-"neighborhood" parks) would be approximately 40 net developable acres that would accommodate approximately 1,450 dwelling units planned at densities of 30 to 50 units per acre along with retail and office use.

Business / Commercial

To serve the neighborhoods and surrounding communities and to provide a variety of employment opportunities within Ho'opili, the business/commercial uses are located to be conveniently accessed from the major transportation corridors of the region. The

HO'OPILI

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approximately 145 gross acres illustrated (which includes secondary roads and off-street parking) are estimated to yield a net development area of approximately 130 acres that are projected to accommodate retail and office use. These areas would be significant employment generators for Ho'opili and the region.

Light Industrial / Business Mixed-Use

To meet regional demands and to provide for an additional employment center for Ho'opili, approximately 50 gross acres (which includes secondary roads and off-street parking) are planned to provide an area for larger light industrial type users and businesses. It is estimated that there would be a net development area of approximately 40 acres industrial mixed-use.

Open Spaces / Buffers

Integral to the connectivity of Ho'opili to the surrounding neighborhoods, a variety of open space buffers and drainage detention areas are planned. Some of the key open space buffers include along the H-1 Freeway, Honouliuli Gulch and along Old Fort Weaver Road.

Parks

Some of the key parks being planned include a district park along Fort Weaver Road and a downtown civic square to serve as the community gathering area.

Mini-Parks

Integral to the establishment and identity of neighborhoods, a variety of smaller parks of approximately one to two acres in size are planned. Properly planned and located, most residents will be within walking distance of one of these mini-parks.

Public Facilities

The proposed project could include as many as five public school sites. The Conceptual Land Use Plan shows the possible locations for five State Department of Education (DOE) school sites planned to be as accessible to the neighborhoods of Ho'opili as the community is developed; one high school, one middle school and three elementary schools. The plan can also accommodate private schools as the need is determined. In addition, area is set aside along the western end of Farrington Highway fronting the Petition Area for either a fire station or a police substation. In total, approximately 100 acres are allocated to meet public facility needs. The master plan will likely be adjusted prior to zoning to achieve DOE-desired public school campus site configurations.

Major Roads and the Honolulu High-Capacity Transit Corridor (HHCTC) Project

To provide for improved regional circulation and to define and serve the various neighborhoods of Ho'opili, the major boulevards planned within the community are illustrated. In addition, there will be a well planned network of local streets to provide connectivity and alternate routes throughout the community in a safe and pedestrian friendly manner. This land use category includes the portion of the property that will be

HO'OPILI

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utilized for 1) the widening of Farrington Highway fronting the Petition Area, 2) a portion of North-South Road between Farrington Highway and Kapolei Parkway, 3) portions of the intersections of North-South Road with Farrington Highway and the H-1 Freeway, and 4) the segment of the East-West Connector through the Petition Area. As previously mentioned, a portion of the project site may be taken for a segment of the HHCTC project, including a possible transit maintenance and storage facility.

Proposed land uses are shown in the Conceptual Land Use Plan (See Figure 2.9: Conceptual Land Use Plan) and generally described below. The approximate land use areas may be adjusted as the proposed Ho'opili Conceptual Land Use Plan is refined through the land use review and approval process, as well as when the HHCTC alignment is finalized within Ho'opili. During the EISPN public review period, the City and County of Honolulu's Department of Design and Construction recommended that "the developer meet with City officials from the Department of Planning and Permitting, Department of Design and Construction, and Department of Parks and Recreation (DPR) at an early stage in the development's planning process to develop a conceptual plan for overall development which is acceptable and appropriate." As such, the Petitioner will continue to coordinate with City and County of Honolulu agencies to develop a conceptual plan for overall development which is acceptable and appropriate.

HO'OPILI

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Table 2.2. Conceptual Land Use Plan – Land Use Summary for Petition Area

LAND USE	APPROX. GROSS ACREAGE	APPROX. DEVELOPABLE NET ACRES	APPROX. NUMBER OF UNITS	GENERAL LAND USE DENSITY RANGE (DWELLINGS/UNITS PER ACRE)	PROPOSED ZONING DISTRICT****
PETITION AREA					
Low-Medium Density Residential/Live-Work*	535	400-475	5,100	5-14	R-5/AMX-2
Mixed Use/Medium Density Residential*	340	250-300	5,200	15-29	AMX-3
Mixed Use/High Density Residential*	50	40	1,450	30-50	BMX-3
Business/Commercial	145	130	-	-	B1
Light Industrial/Business Mixed Use	50	40	-	-	IMX-1
Open Space/Buffers*,**	150	N/A	-	-	P-2
Parks*	60	N/A	-	-	P-2
Mini-“Neighborhood” Parks*	*	N/A	-	-	P-2
Public Facilities	100	N/A	-	-	AMX-3
Major Roads (as shown)**	124	N/A	-	-	Varies
TOTAL (approx.)	1,554***	-	11,750	-	-
* - Mini-“Neighborhood” parks and secondary roadways included in residential areas					
** - May increase as developable areas decrease in residential and commercial categories					
*** - Total acreage to be rezoned is approximately 1,555.145 acres					
**** - Zoning designation may vary depending whether a Transit-Oriented Development overlay district is adopted					
***** - If a transit maintenance yard is sited within the Petition Area, it is assumed that it would fall in the Land Use Ordinance (LUO) land use category of “Public uses and structures.” Public uses and structures are defined in the LUO as “uses conducted by or structures owned or managed by the federal government, the State of Hawaii, or the city to fulfill a governmental function, activity or service for public benefit and in accordance with public policy...Typical public uses and structures include: libraries, baseyards...). Once the HHCTC DEIS is published, the location of the transit maintenance yard will be known, and if required, the conceptual land use plan for Ho’opili will be updated.					

2.6 INFRASTRUCTURE IMPROVEMENTS

In support of the Project, infrastructure facilities to be installed, expanded or improved include access and circulation roadways, drainage systems, water and wastewater collection lines, and electrical/communication systems. All infrastructure improvements will be designed and sized to accommodate the project, and for possible future dedication and acceptance by the appropriate agencies. One or more of the proposed infrastructure and utility improvements may require the use of State and/or county road right-of-ways or other lands. Project construction will commence with development of the infrastructure upon issuance of the necessary grading permits.

HO'OPILI

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Major on-site infrastructure improvements required for the project include: facilities for water transmission and distribution; wastewater collection; traffic circulation; drainage; and electrical and communication systems. It is possible that one or more micro-utility companies may be providing a portion or all of the electrical and/or communication systems for the project. For instance, there are companies that can install solar photovoltaic panels on buildings for free in return for charging lower electrical rates than HECO. While the specific nature of each improvement is not known at this time, the EIS is intended to address all current and future instances involving the use of State and/or County lands and funds relating to the Ho'opili project, including micro-utility companies that may require the use over State and/or County lands to operate and maintain any utility lines or facilities. Per comments made by the State Department of Transportation during the Draft EIS public review period, drainage systems, other project construction plans and work affecting the highway right-of-ways require prior DOT review and approval.

It should be noted that the project has been designed to accommodate long-planned regional transportation improvements to be constructed by others including: a portion of North-South Road and its intersections, the future widening of Farrington Highway, and a portion of the HHCTC alignment).

Typically developers will set aside land for and/or build facilities that are designed to meet County standards, such as roads, water storage facilities and transmission lines, sewer collection lines and parks, schools, et cetera, and typically these are dedicated to the appropriate State or County agency to operate and maintain. At Ho'opili, it is possible that community associations, businesses, other private entities or a separate authority, will be accepting the liability, security, operations and maintenance responsibilities for some facilities such as roads, parks, transit stations, et cetera.

2.7 DEVELOPMENT TIMETABLE AND PRELIMINARY COSTS

The following Table 2.3 is a list of major permits and approvals required for the implementation of the proposed Ho'opili Conceptual Land Use Plan.

HO'OPILI

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Table 2.3. Required Permits/Approvals

PERMIT/APPROVAL	APPROVING AUTHORITY	STATUS	PROJECT SUBMITTAL DATE
State Land Use District Boundary Amendment (with EIS)	State of Hawai'i Land Use Commission	Petition has been filed; processing on hold until EIS process has been completed.	<u>First Quarter 2007</u>
Zone Change	City and County of Honolulu Department of Planning and Permitting/City Council	Application to be filed assuming successful processing of SLUDBA.	<u>Third Quarter 2009</u>
<u>Large Lot Subdivision Approval Action</u>	City and County of Honolulu Department of Planning and Permitting	Application to be submitted after change the Zone Change application is approved.	<u>Third Quarter 2010</u>
National Pollutant Discharge Elimination System (NPDES) Permit	State of Hawai'i Department of Health	Application to be submitted prior to Building/Grading Permits.	<u>2011</u>
Building/Grading Permits	City and County of Honolulu Department of Planning and Permitting	Application to be filed after the Zone Change application is approved.	<u>2011</u>
Water Use Permit	State of Hawai'i Department of Land and Natural Resources, Commission on Water Resource Management	Application to be submitted prior to Building/Grading Permits	<u>2011</u>

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

The Petitioner estimates that the development of the Ho'opili project (major off-site and on-site infrastructure improvements including grading, drainage, sewer, safe-drinking water, non-potable water, roadways, landscaping and improvements to Farrington Highway and North-South Road for access) will cost approximately \$4.6 billion (in Year 2007 dollars), spent over the project timeline of 2009 – 2030. During the public review period, both the Land Use Commission and the State Office of Planning made reference to subsection 15-15-50, Hawaii Administrative Rules (HAR). Subsection 15-15-50, HAR identifies the form and contents of a petition to the State Land Use Commission to amend the State Land Use District Boundaries, including representing "...that development of the subject property in accordance with the demonstrated need therefore will be accomplished before ten years after the date of commission approval. In the event full urban development cannot substantially be completed within such period, the petitioner shall also submit a schedule for development of the total of such project in increments together with a map identifying the location of each increment, each such increment to be completed within no more than a ten-year period." The construction of Ho'opili's development will be a challenging process that will require ongoing coordination between many fundamental parts. Infrastructure and road access, neighboring property development, demands of the commercial and housing markets, careful continued agriculture and general property management, and economic viability will all be considered throughout the construction planning process. Furthermore, the City and County of Honolulu's (City) transit project, the largest public works endeavor in Hawai'i's history, will within Ho'opili have its longest traverse through privately owned property and further expand development challenges undoubtedly in unprecedented ways. Many of these parts may involve developing different areas of the project site within the same construction timetable as discussed further below:

Several major development priorities include in no particular order:

- **Water Service from the North.** Both of Ho'opili's main potable water storage and transmission systems will reside mauka of H-1. Considerable investment will be required in the construction of tanks and transmission lines that will ultimately service two water zones within Ho'opili that roughly divide the site between northern and southern halves. (Necessary offsite utility easements have already been secured at a price.) Nonpotable water will be sourced from the reclamation operations at the Honouliuli Wastewater Treatment Plant (WWTP), meaning it will be delivered to Ho'opili from the opposite end from where its potable source will come. Preliminary budgetary construction cost estimates range from between \$35 million to \$40 million with another \$20 million possible from BWS for service connections.

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

- **Sewer Service from the South.** Unlike Ho'opili's main water system, sewer service will come from the southern end of the property. The first of what is expected to be several Joint Development Agreements (JDA) to secure and construct wastewater transmission is in place with DHHL, UHWO, DLNR and the City and funded. Indeed, the DOT has already constructed this line as part of the North-South Road Phase 1A contract. Discussions are expected to commence later this year in earnest on separate JDAs for two additional segments. Nearly \$2 million has already been invested to date, preliminary budgetary costs estimates for these two JDAs range from \$10 million to \$15 million to stub service at the property's southwestern border, \$5 million to \$10 million to route through to the mauka area and as much as another \$60 million for the City's Department of Environmental Services uses connection charges.
- **Balancing Spread out Access, Initial Infrastructure Needs and Cash Flows.** Today, Ho'opili's lands along the Farrington Highway corridor, its northernmost boundary, present Ho'opili's easiest access for construction purposes and future occupants. Once DHHL completes its section of the East-West Connector Road and the State DOT completes the North-South Road (both now under construction), Ho'opili will have construction and occupant access open at its southern and westernmost locations. This is significant because while available for development today, the Farrington Highway corridor is expected to present some of Ho'opili's greatest development challenges, predominantly the distance sewer lines will have to run through undeveloped land for service, as well as timing development to the City's planned improvements to Farrington Highway itself. Thus, the Petitioner will look to mobilize on these other areas as early as practicable. Nonetheless, there are several key commercial parcels in this Farrington Highway corridor that will need to be among the earliest to be marketed in order to generate cash flow to support needed upfront utility (such as water and sewer as detailed above) and road infrastructure throughout Ho'opili. As a result, development should be started in more than one area from the onset. Over the build-out of the project, it is expected that as much as \$50 million to \$60 million could be spent on drainage systems and hundreds of millions will be invested in roadway systems servicing the project.
- **Balancing Job Generation, Appropriate Initial Housing Deliveries and Transit.** The majority of the employment areas within Ho'opili are within the Farrington Highway corridor to the north of the property, while the residential development areas that could be most sensible to develop first – the single-family areas – are to the south. Starting housing construction there could generally preserve higher density development in the areas in and around the transit corridor to the north to be better staged with transit's completion and more appropriately address the various demands it will create.

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

- **Managing Agricultural Operations.** As lands are moved into development over time, consideration will have to be given to the significant challenges of maintaining a working agricultural water system and providing ongoing and unencumbered vehicular access to crop areas. This will be no small task, as it will be the objective of the Petitioner to keep active farms onsite as long as practicable.

As previously stated the development is expected to occur over approximately 20 years. This area of 'Ewa has long been planned for development (Kapolei Area Long Range Master Plan and Ewa Development Plan).

There are several major transportation projects that have been planned for 'Ewa. The Ho'opili project has been planned assuming that certain planned transportation projects will be constructed including a portion of North-South Road between Farrington Highway and Kapolei Parkway; a portion of the North-South Road and a new H-1 Freeway interchange; a portion of the intersection of North-South Road and Farrington Highway; the long-planned widening of Farrington Highway fronting Ho'opili; the proposed East-West Connector Road through the Petition Area; and the first segment of the proposed Honolulu High-Capacity Transit Corridor project through the Petition Area. As major off-site infrastructure (water, sewer, drainage, electrical and communications) would likely occur in most of the above major road right-of-ways, and the exact timing of the completion of these transportation improvements undetermined, it is difficult for the Petitioner to provide a map identifying the phasing of the proposed action in 10 year increments with any degree of certainty. While the phasing of development may be more relevant where there is little or no development, 'Ewa has rapidly developed in recent years and proposed transportation improvements are indicative of State and County assumptions that this portion of 'Ewa would be eventually developed.

2.8 SUSTAINABLE BUILDING DESIGN

Sustainability options are being considered for the Ho'opili project. Where feasible, project buildings, activities, and site grounds are intended to be designed with energy-saving considerations. Given the natural climate, the project may be suited for the use of renewable energy technologies including photovoltaics. During the public review period, the Office of Hawaiian Affairs wrote: "...OHA recommends the use of not only photovoltaic cells but also small wind harvesting electrical generation for peripheral uses such as parking lot lighting."

According to the American Wind Energy Association, small wind energy systems typically range from \$3,000 to \$5,000 for every kW (kilowatt) of generating capacity, or about \$40,000 for a 10 kW system (installed). According to the Hawaiian Electric Company (HECO), wind generation energy resources typically cost approximately \$.08 to \$.11/kWh per hour, however these rates apply to larger wind systems (wind farms) as opposed to individual wind systems whose rates are not readily available by HECO.

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

Photovoltaic (PV) systems range in price from \$8,250 for a one-kW system to more than \$40,000 for a five-kW system. According to HECO, internal estimates for photovoltaic (PV) energy resources typically cost approximately \$.30 to \$.40/kW per hour.

The average energy consumption by a single-family residence in Hawai'i is approximately 600 kW per hour. According to HECO, "Non-firm sources, such as wind and solar, are called "as-available" resources and must be backed up by firm generation to ensure electricity is available when customers need it -- 24 hours a day, regardless of whether the wind is blowing or the sun is shining."

"In addition to not being available 24-hours-a-day, the variability of wind, typical of the trade winds in Hawaii, can cause power problems. It can affect the quality of power produced. Today, a lot of sensitive electronic equipment can be damaged or disrupted by the variability of power produced from sources like the wind. These fluctuations can also place a big strain on the utility's fossil fuel generators if they have to kick in and meet the demand for electricity when the wind power is suddenly not available."

Even when "as-available" resources are available, HECO still needs to cut back on "as-available" renewable energy sources during off-peak periods of electricity use. This is due to scenarios where customer demand for power drops too low, generation must be turned off to cut back on power production. Otherwise, the electric system could potentially overload and become unstable. Furthermore, fossil-fuel generation can only be reduced so much. This on-and-off cycling could lead to damage and accelerated deterioration of fossil-fuel generators. It also causes the generators to burn more fuel than necessary which leads to an increased cost of electricity.

In June 2008, Governor Lingle signed SB 644 which requires that solar water heaters be required before issuance of a building permit on or after January 2010 for single-family residences.

In addition, based on the Department of Business, Economic Development & Tourism (DBEDT), Strategic Industries Division's recommendations, Ho'opili's mechanical and electrical consultants, in consultation with its sustainability consultant, will be directed to review the City and County of Honolulu's Energy Code early in the project and to consult with Hawaiian Electric Company, Inc. (HECO) on demand-side management programs that offer rebates for installation of energy-efficient technologies.

3.0

Assessment of the Natural Environment, Potential Impacts, & Mitigation Measures

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

3.0 ASSESSMENT OF THE NATURAL ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION MEASURES

This section describes the existing natural environment associated with the Petition Area and the project's potential impacts that may result from proposed development. Mitigation measures are proposed to address the project's potential project impacts.

3.1 CLIMATE

Existing Conditions

Average annual daily minimum and maximum temperatures in the Petition Area are 65 and 84 degrees Fahrenheit, respectively. The annual prevailing wind direction for this area of O'ahu is east northeast, about 40 percent of the time, at approximately 10 knots (12 miles per hour). The 'Ewa Plain experiences light rainfall, with a mean annual precipitation of about 20 inches per year, most of which occurs between the months of November and April.

Anticipated Impacts and Mitigation Measures

The project is not expected to have an impact on regional climate. With project build-out, there may be some localized increase in temperature as a result of paved surfaces and roofs. However, shade trees will be incorporated into project landscaping and necessary irrigation will help mitigate any localized temperature increases from roadways, walkways, and buildings.

3.2 TOPOGRAPHY

Existing Conditions

The island of O'ahu was built by the extrusion of basalt and basaltic lava from two shield volcanoes, Wai'anae and Ko'olau. The Petition Area is located on the southwestern flank of the Wai'anae Volcano. A sedimentary wedge, formed by eroded sediment and coral and algae, is located in the Petition Area and to the south. This wedge forms the 'Ewa Plain and serves as the "caprock" over the Southern O'ahu Basal Aquifer (SOBA).

The approximately 1,600.265-acre Project Area consists of 10 distinct parcels of land (See Figure 1.5: Parcels Map). Parcels A, B, C, D1, D2 and G are situated makai of the H-1 Freeway while Parcels E1, E2, E3 and F are situated mauka of the H-1 Freeway. The topography of each of the 10 parcels is described below.

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

The topography of Parcel A ranges from approximately 150 feet above mean sea level (MSL) at Farrington Highway to approximately 210 feet MSL at the H-1 Freeway. The slope of Parcel A is 3 percent.

The topography of Parcel B ranges from approximately 170 feet MSL at the southwestern boundary (at Farrington Highway) to approximately 205 feet MSL at its northwestern boundary (at the H-1 Freeway). The topography of Parcel B at the southeastern boundary (at Farrington Highway) is approximately 75 feet MSL and approximately 175 feet MSL at the northeastern boundary (at the H-1 Freeway). The slope of Parcel B is between 1.9 percent and 3.2 percent.

The topography of Parcel C ranges from approximately 65 feet MSL at its southern boundary to approximately 175 feet MSL at Farrington Highway. The slope of Parcel C is 1.4 percent. A ravine and steep, east-facing slope are located on the eastern boundary of the Parcel C, along Old Fort Weaver Road.

The topography of Parcel D1 ranges from approximately 10 feet MSL at its northern boundary to approximately 40 feet MSL at its northern boundary. The central portion of Parcel D1 is 25 feet MSL. The slope of Parcel D1 is 1.2 percent. Parcel D2 ranges from 0 feet at its northern boundary to 35 feet MSL at its southern boundary with a slope of 1.1 percent.

The topography of Parcels E1, E2 and E3 ranges from approximately 410 feet MSL at their southern boundaries to 415, 430 and 415, respectively at their northern boundaries. The slope of parcel E1 is 2.8 percent, the slope of E2 is 3.5 percent, and the slope of E3 is 3.9 percent.

The topography of Parcel F runs with an east-west slope with an elevation of 240 feet MSL on the western boundary and an elevation of 205 on the eastern edge. The center of the parcel is at an elevation of 220 feet. Parcel F has a slope of 3.49 percent on the east-west axis.

Parcel G is very small and located along the makai edge of Parcel C, bordering the 'Ewa Villages Golf Course. The slope of Parcel G is approximately 1.4 percent.

The entire Petition Area has been historically utilized for sugarcane cultivation and large portions are currently utilized for agricultural production. As such, the Petition Area has been extensively modified with dirt roadways, various irrigation systems, and other appurtenant agricultural structures.

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

Anticipated Impacts and Mitigation Measures

The topography of the Petition Area is mostly gently sloping (and highly accessible) and provides adequate slope for drainage. The Petition Area will be modified with infrastructure improvements and urban structures for residential, commercial, industrial, recreational and educational uses. The Petition Area will include drainage detention basins, open space buffers, parks and some undeveloped areas. Most of the developed areas will be extensively landscaped, which will minimize the potential for soil erosion. Compared to existing conditions in which the land is vacant or used for agricultural production, the proposed drainage system for the Project will provide better control and management of surface runoff during intense storms.

All grading operations will be conducted in accordance with dust, erosion control, and other requirements of the City and County of Honolulu's grading ordinance. All construction activities must comply with the relevant provisions regulating Fugitive Dust set forth under Section 11-60.1-33, HAR. A grading permit is required to modify the topography, and additionally, a National Pollutant Discharge Elimination System (NPDES) permit will be required prior to construction to address non-point source discharges.

3.3 SOILS

Existing Conditions

Three soil suitability studies have been prepared for lands in Hawai'i. The principal focus of these studies is to describe the physical attributes and relative productivity of different land types for agricultural production within the State of Hawai'i. The three studies are the U.S. Department of Agriculture (USDA) *Natural Resources Conservation Service Soil Survey*, the University of Hawai'i Land Study Bureau *Detailed Land Classification*, and the State of Hawai'i Department of Agriculture's *Agricultural Lands of Importance to the State of Hawaii* (ALISH).

Natural Resources Conservation Service Soil Survey. The Petition Area includes several different soil types, as classified by the Natural Resources Conservation Service. Table 3.1 lists these soil types and their potential for erosion.

HO‘OPILI

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Table 3.1. Soil Types and Erosion Potential

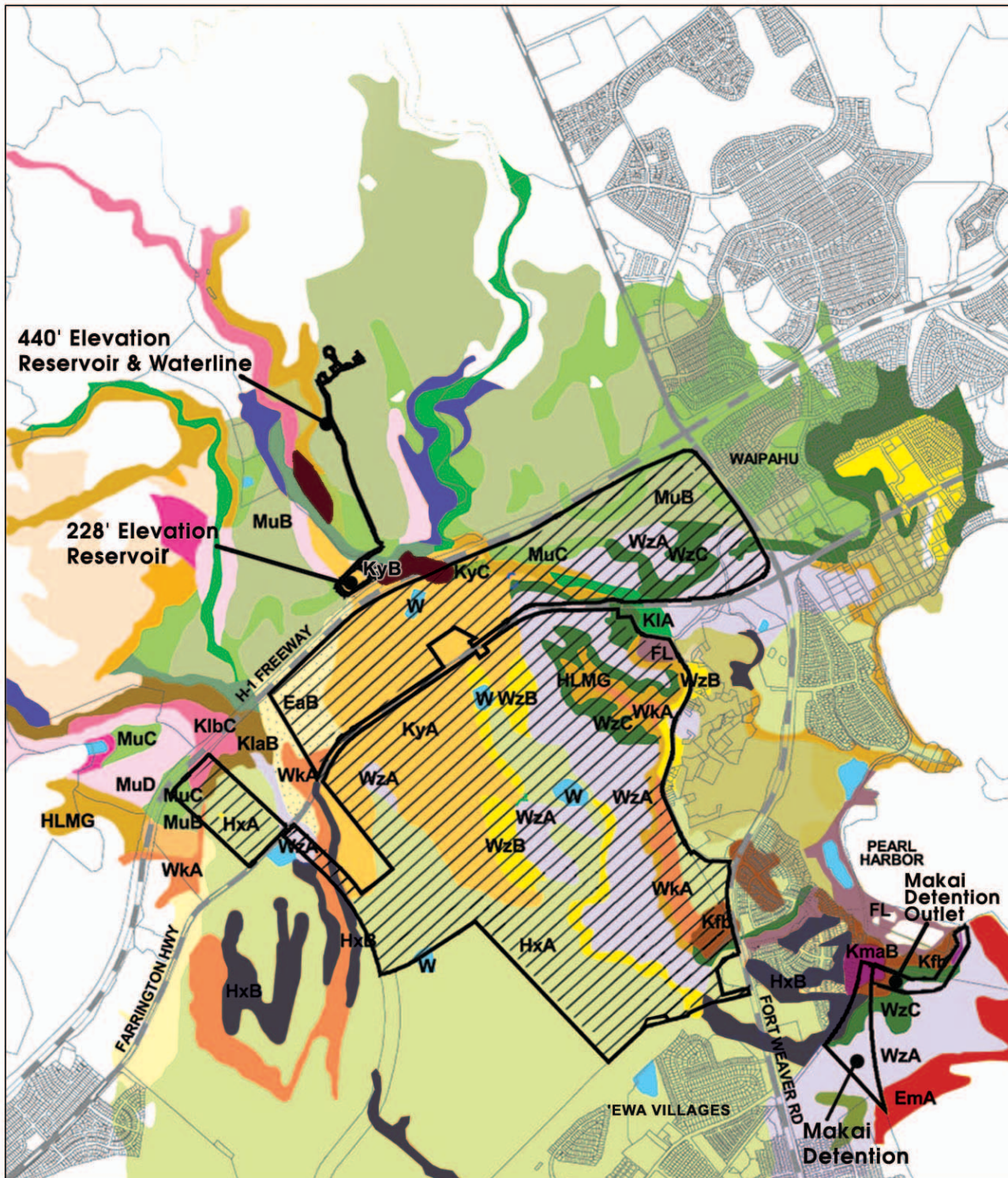
SOIL TYPE	EROSION POTENTIAL
‘Ewa Silty Clay Loam, 3-6% Slopes	Slight
Honouliuli Clay, 0-2% Slopes	No More Than Slight
Honouliuli Clay, 2-6% Slopes	Slight
Kaloko Clay, Noncalcareous Variant	None-Slight
Kawaihāpai Clay Loam, 0-2% Slopes	No More than Slight
Kolekole Silty Clay Loam 6-12% Slopes	Moderate
Kolekole Silty Clay Loam 12-25% Slopes	Moderate-Severe
Kunia Silty Clay, 0-3% Slopes	No More than Slight
Kunia Silty Clay, 3-8% Slopes	Slight
Kunia Silty Clay, 8-15% Slopes	Moderate
Moloka‘i Silty Clay Loam, 3-7% Slopes	Slight-Moderate
Moloka‘i Silty Clay Loam, 7-15% Slopes	Moderate
Waialua Silty Clay, 0-3% Slopes	No More than Slight
Waipahu Silty Clay, 0-2% Slopes	None-Slight
Waipahu Silty Clay, 2-6% Slopes	Slight
Waipahu Silty Clay, 6-12% Slopes	Moderate
Wahiawā Silty Clay Loam 0-3% Slopes	Slight

Figure 3.1: Natural Resources Conservation Service Soil Survey shows the distribution of soils within the Petition Area.

Land Study Bureau Detailed Land Classification. The *Detailed Land Classification* (1965 through 1972) series was produced for each island by the Land Study Bureau (LSB) of the University of Hawai‘i. The intent of this series of reports was to develop a land inventory and productivity evaluation based on statewide standards of crop yields and levels of management.

A five-class productivity rating is applied using the letters A, B, C, D and E, with A representing the class of highest productivity and E the lowest. Most of the soils within the Petition Area are rated B (See Figure 3.2: Land Study Bureau). Other soils are rated A, with fewer soils rated C, D and E. These soil ratings reflect the Petition Area’s past and present use for agricultural production under irrigated conditions.

Agricultural Lands of Importance to the State of Hawaii. The *Agricultural Lands of Importance to the State of Hawaii* (ALISH) (1977) system classifies lands that are important to agriculture in Hawai‘i as Prime, Unique, or Other Agricultural Land, with Prime Agricultural Land representing the class of greatest importance and Other Agricultural Land the least. Most of the Petition Area includes soils identified as Prime Agricultural Land, which is defined as “land best suited for the production of food, feed, forage, and fiber crops.” The remaining lands are identified as Other Agricultural Land (which is important to agriculture in Hawai‘i but exhibits properties that exclude it from the Prime



LEGEND

- Project Site Boundary
- Petition Area

Soil Types

- EaB: Ewa Silty Clay Loam, 3-6% Slopes
- EmA: Ewa Silty Clay Loam, Moderately Shallow, 0-2% Slopes
- FL: Fill Land Mixed
- HLMG: Helemano Silty Clay, 30-90% Slopes
- HxA: Honouliuli Clay, 0-2% Slopes
- HxB: Honouliuli Clay, 2-6% Slopes
- KfB: Kaloko Clay, noncalcareous Variant
- KIA: Kawaihapai Clay Loam, 0-2% Slopes
- KlaB: Kawaihapai Stony Clay Loam, 2-6% Slopes
- KlBc: Kawaihapai Very Stony Clay Loam, 0-15% Slopes
- KmaB: Keaau Stony Clay, 2-6% Slopes
- KyA: Kunia Silty Clay, 0-3% Slopes
- KyB: Kunia Silty Clay, 3-8% Slopes
- KyC: Kunia Silty Clay, 8-15% Slopes
- MuB: Molokai Silty Clay Loam, 3-7% Slopes
- MuC: Molokai Silty Clay Loam, 7-15% Slopes
- MuD: Molokai Silty Clay Loam, 15-25% Slopes
- rRK: Rock Land
- WkA: Waialua Silty Clay, 0-3% Slopes
- WzA: Waipahu Silty Clay, 0-2% Slopes
- WzB: Waipahu Silty Clay, 2-6% Slopes
- WzC: Waipahu Silty Clay, 6-12% Slopes
- W: Water

Source: U.S. Department of Agriculture Natural Resources Conservation Service (1995)

Disclaimer: This graphic has been prepared for general planning purposes only.

Figure 3.1: Natural Resources Conservation Service Soil Survey Map

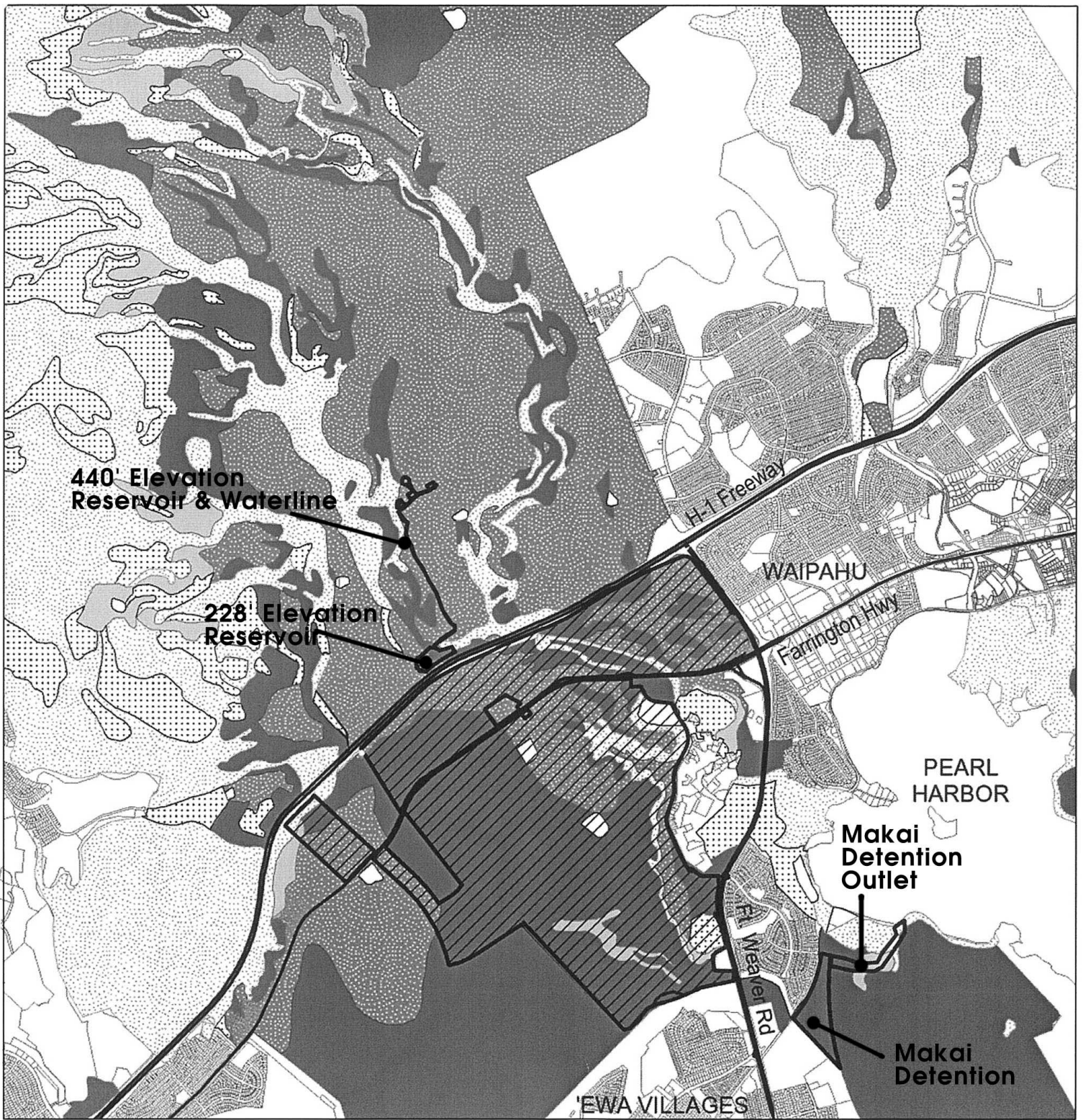
HO'OPI LI

O'ahu, Hawai'i

NORTH

LINEAR SCALE (FEET)





LEGEND




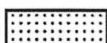




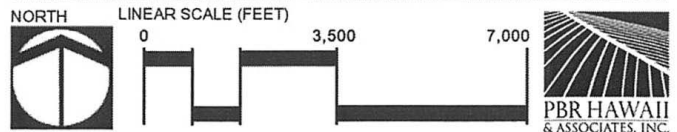
-  Project Site Boundary
 -  Petition Area
- Soil Classification**
- | | |
|--|--|
|  A (Excellent) |  D (Poor) |
|  B (Good) |  E (Very Poor) |
|  C (Fair) |  Not Classified |

Figure 3.2: Land Study Bureau Land Classification

HO'OPI LI

O'ahu, Hawai'i



Source: Land Study Bureau (1967)
 Disclaimer: This graphic has been prepared for general planning purposes only.

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

or Unique Agricultural Land classifications) or are not classified by the ALISH system (See Figure 3.3: Agricultural Lands of Importance to the State of Hawaii).

Anticipated Impacts and Mitigation Measures

During project construction, there is a potential for soil loss through the generation of dust and water-borne soil erosion as areas are graded. All grading operations will be conducted in accordance with dust and erosion control and other requirements of the City and County of Honolulu Grading Ordinance and all applicable provisions regulating Fugitive Dust set forth under Section 11-60.1-33, HAR regarding. A NPDES permit will also be required prior to construction to address construction-related runoff. Additionally, a watering program will be implemented during construction to minimize soil loss through fugitive dust emission. During the public review period, the Department of Health (DOH) Clean Air Branch (CAB) recommended that a dust control management be prepared. The DOH CAB also provided additional examples of measures that can be implemented during construction:

- where possible, for areas involving mixed land uses, buffer zones be established to alleviate potential dust nuisance problems;
- planning the different phases of construction, focusing on minimizing the amount of dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact;
- providing an adequate water resource and watering program at the site prior to start-up of construction activities;
- landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase;
- minimizing dust from shoulders and access roads;
- providing adequate dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and
- controlling dust from debris being hauled away from the project site.

In addition, during the public review period, the Office of Hawaiian Affairs wrote: OHA recommends cleaning job-site construction equipment and establishing groundcover as quickly as possible after grading with native or endemic drought tolerant species. In addition to landscaping and watering programs, other mitigation measures suggested include:

- Early construction of drainage control features;
- Construction of temporary sediment basins to trap silt, where needed;
- Use of temporary berms and cut-off ditches where needed; and
- Use of temporary silt fences (coir works well) or straw bales to trap silt.

HO'OPILI

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After construction, landscaping and drainage improvements will provide permanent post-construction pollution control measures and minimize the potential for soil erosion. Since much of the Petition Area presently consists of cultivated crops, exposed soil, and scrub vegetation, overall soil loss will likely be reduced significantly after development compared to previous and current conditions in which the land is used for agricultural production.

3.4 AGRICULTURAL IMPACT

Existing Conditions

The approximately 1,553.844 acre Petition Area was cultivated in sugarcane from the late 1800s to 1995. Currently, the majority of the Petition Area is leased or subleased to Aloun Farm, Inc., Fat Law's Farm, Sugarland Farm, Inc. and Syngenta Seeds, Inc. (See Figure 2.3: Current Lessees). These existing leases are listed in Table 2.1 of Section 2.1.4.

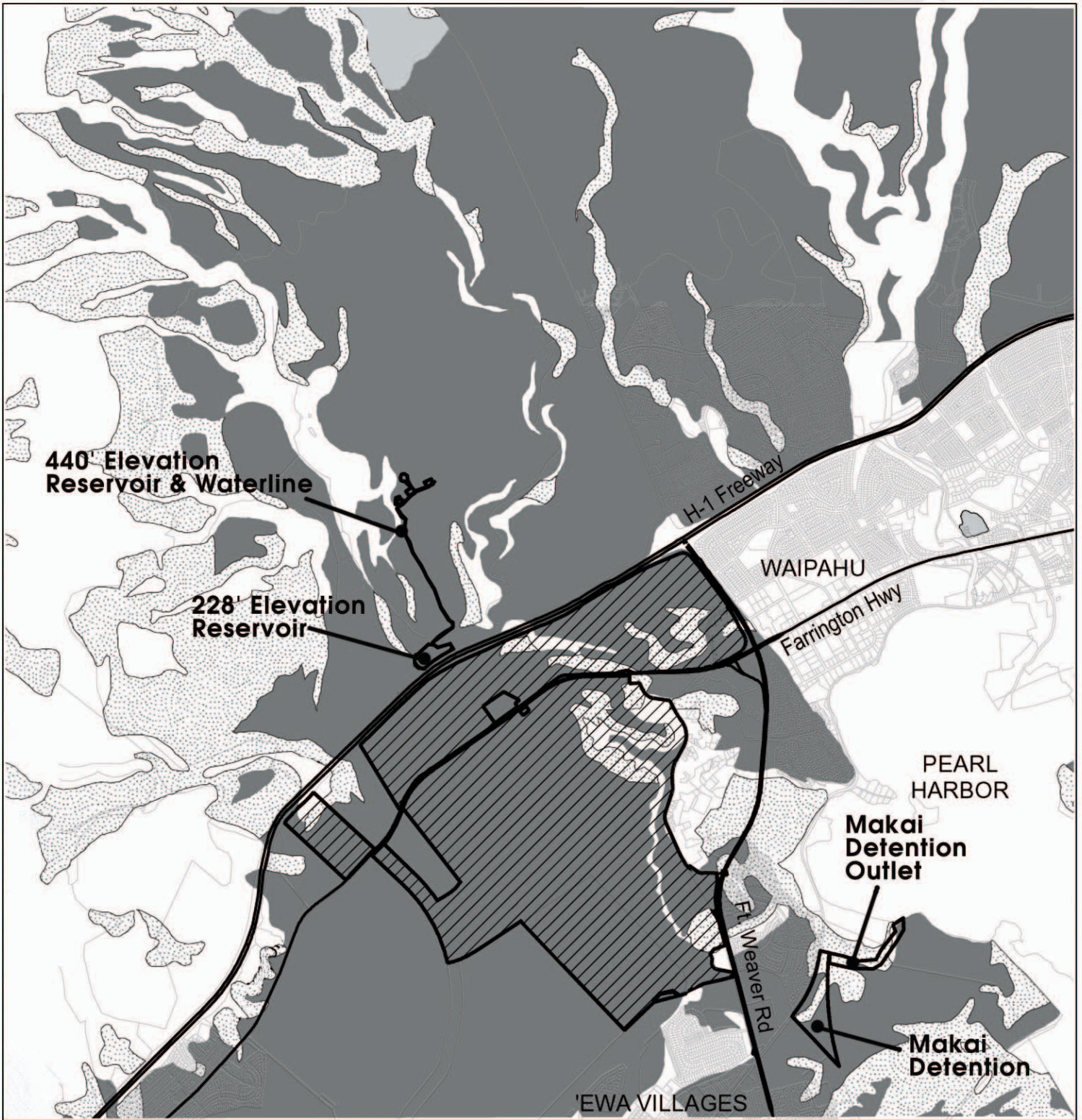
An Agricultural Impact Analysis had been prepared by Decision Analysts Hawaii, Inc. and is included as Appendix A. A summary of the studies findings are listed below.

Anticipated Impacts and Mitigation Measures

The creation of the Ho'opili project will require that the approximately 1,553.844 acre Petition Area be withdrawn from agricultural use. The project will result in a direct loss of approximately 1,497 acres of agricultural land being leased for various agricultural operations. This amounts to less than one percent of the approximately 160,000 acres of agricultural land that remain available throughout the State of Hawai'i. On the island of O'ahu, approximately 10,900 acres of agricultural land would remain available in Kunia and the North Shore. During the Draft EIS public review period, the State Department of Agriculture commented that the 1,497 acres of leased agricultural land in the project site is 13.7% of the 10,900 acres of farm land reported to be available on Oahu (3,150 acres in Kunia and 7,750 acres in the North Shore).

The Petition Area is currently in the State Agricultural District (See Figure 2.4: State Land Use District). However, the *Ewa Development Plan* designates the Petition Area as Low and Medium Density Residential, High Density Residential, Agricultural Land Preservation, Parks, and Transit Node (High Density Residential and Commercial) and Future Intermediate School (See Figure 2.5: Ewa Development Plan). D.R. Horton filed a petition (AO6-771) with the State Land Use Commission to reclassify the Petition Area to the Urban District. The petition to reclassify the Petition Area is consistent with the standards for determining boundaries of the Urban District pursuant to Section 15-15-18, HAR.

The Ewa DP and *Kapolei Long Range Master Plan* (See Figure 3.4: Kapolei Area Long Range Master Plan) have long planned for new development in the Petition Area,



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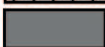

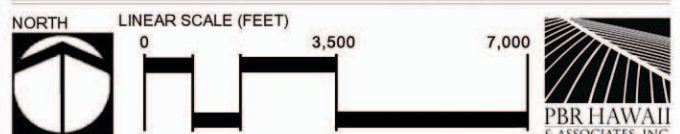
-  Project Site Boundary
-  Petition Area
-  Prime Agricultural Lands
-  Unique Agricultural Lands
-  Other Agricultural Lands
-  Unclassified Agricultural Lands

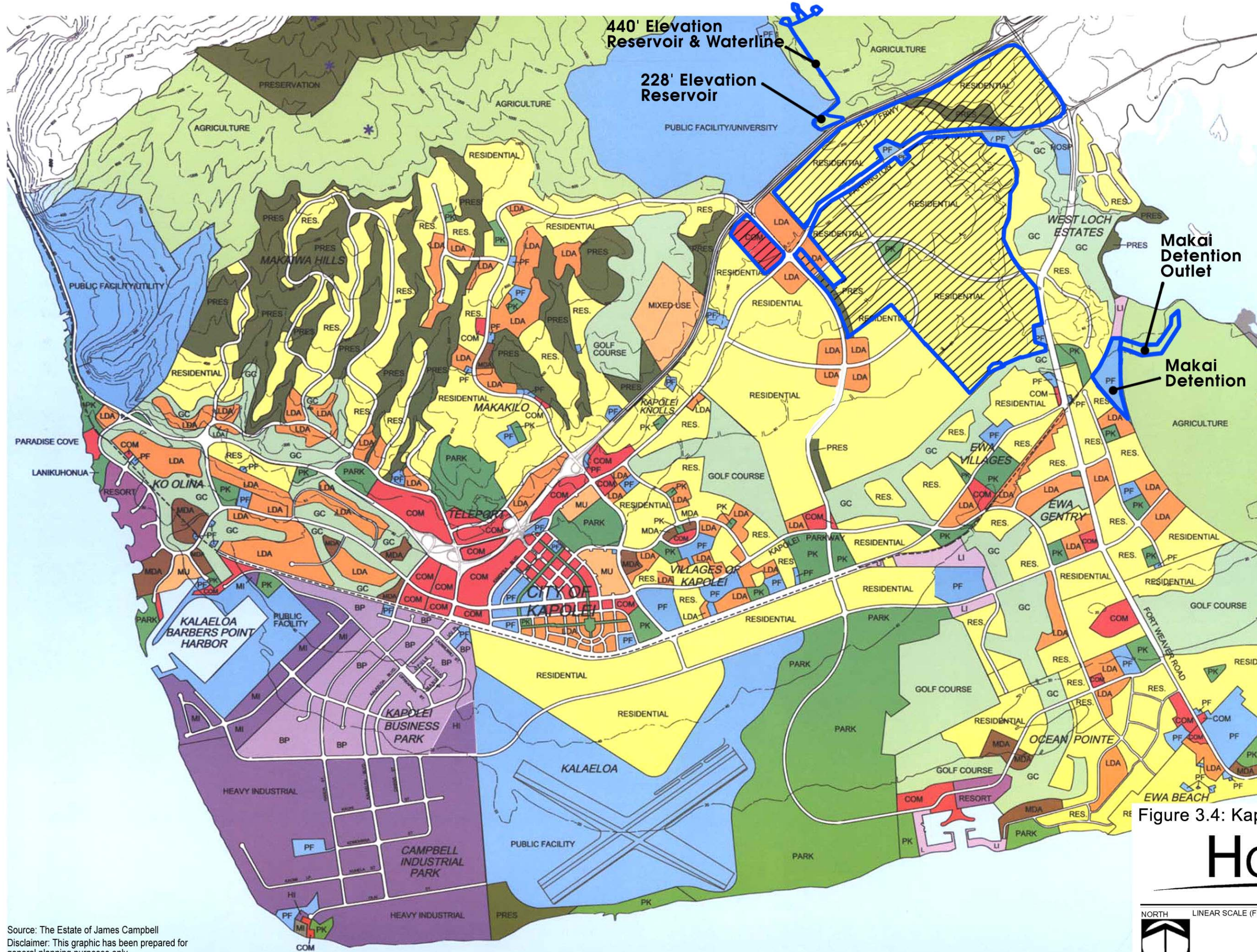
Figure 3.3: Agricultural Lands of Importance to the State of Hawaii (ALISH)

HO'OPILI

O'ahu, Hawai'i



Source: State Dept. of Agriculture (1977).
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Land Use Classification

- RES Residential
- LDA Low Density Apartment
- MDA Medium Density Apartment
- COM Medium Density Apartment
- BP Business Park
- LI Light Industrial
- HMI Heavy Industrial/Maritime Industrial
- RES Resort
- PK Park
- MU Mixed Use
- PF Public Facility/Utility
- GC Golf Course
- PRES Preservation
- AG Agriculture
- MI Military
- * Palehua Telecommunications
- Project Site Boundary
- Petition Area

Circulation

- Railroad
- Transit

Figure 3.4: Kapolei Long Range Master Plan

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O'ahu, Hawai'i

NORTH LINEAR SCALE (FEET)



Not to Scale



Source: The Estate of James Campbell
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HO'OPILI

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including transit, and as such, tenants have been fully aware, for quite some time, that the proposed Petition Area would be used to accommodate future development in the region. The current tenants entered into lease agreements acknowledging the Petitioner's plans for future development. In return, the Petitioner set lease rents and water rates favorable for agricultural operations. In addition, the Petitioner continues to work on the eventual relocation of the largest tenant, Aloun Farm, Inc., to other farm areas in Central O'ahu and the North Shore, even though construction is not expected to start until the final quarter of 2009 at the earliest, with an estimated completion date of 2030.

Since the Petitioner intends to develop the project in phases, it will only withdraw land from the leases on an as-needed basis for construction and development and as provided for in agreements with the individual lessees. Within the Petition Area, lands will gradually be withdrawn from agricultural production for residential, commercial, and educational uses.

Potential temporary nuisance issues related to agricultural cultivation in close proximity to newly built homes could arise as portions of the Ho'opili project are developed. To mitigate these potential impacts, mitigation measures include:

- To the extent possible – and subject to transit alignment, water and other infrastructure improvements – phase the development of homes and coordinate agricultural leases to provide wide separations between homes and upwind agricultural activities.
- For each development phase of Ho'opili and projects on adjoining State land, require agricultural tenants to provide a buffer of fallow fields and berms upwind of the homes before the homes are occupied.
- As necessary, limit agricultural activities (restricted hours of operation, restricted plowing and use of chemicals on windy days, etc.) so as to avoid or minimize nuisance problems.
- Inform home buyers in the area that they will be living near agricultural activities, as long as agricultural activity continues in the area.

Upon full build-out of the Ho'opili project, approximately \$6 million per year in revenues, an average of about 80 jobs and \$1.7 million per payroll will be displaced from the Petition Area. According to comments received from the State Department of Agriculture during the Draft EIS public review period, "the \$6 million in farmgate revenues is about 4.4% of Oahu revenue from sales of all crops (2005 Statistics of Hawaii Agriculture, page 12), or 15.4% of the farmgate value of vegetables and melons produced on Oahu (ibid., page 11). The farm worker employment of 77 people represents about 3.7% of all the farm workers on Oahu (ibid, page 87)." Affected lessees are anticipated to be able to secure replacement lands, therefore, enabling them to maintain prior levels of production, sales revenues, employment and payroll. Should sufficient replacement land not be available on the island of O'ahu, then other options include the relocation of agricultural businesses to Neighbor Islands with available agricultural land.

HO'OPILI

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Agricultural operations may have to adjust for different agronomic conditions in the replacement lands, preparing soils and irrigation systems for specific crops, and moving offices and cooling and packing facilities. Since the affected diversified crop operations can be flexible with regard to their sizes, it is anticipated that they will survive regardless of the amount of replacement land they lease in the future.

The loss of agricultural production from the project and other projects throughout the State of Hawai'i are expected to be offset by:

- Agricultural businesses maintaining their current levels of operation and production by leasing replacement lands in Kunia and/or the North Shore, and possibly cultivating their remaining lands more intensively.
- Agricultural operations relocating all or portions of their operations to a Neighbor Island.
- Other agricultural operations on O'ahu and the Neighbor Islands increasing their production.
- A combination of the three.

As such, statewide agricultural production, revenues, employment or payroll are not anticipated to be adversely affected.

Various mitigation measures recommended to contribute to the successful relocation of affected businesses by the proposed project include: addressing water issues that limit crop production on the North Shore where most available cultivable land lands on O'ahu are located and providing sufficient time to make necessary improvements and arrangements for the relocations. The recommended mitigation measures include:

- Upgrading the Wahiawā Wastewater Treatment Plant (WWTP) to treat wastewater to the State's R-1 standard, or eliminate discharging wastewater into the Wahiawā Reservoir.
- Repair of the Wahiawā Irrigation System (WIS)
- Phase future development projects to maintain agricultural operations in 'Ewa for as long as possible.
- Continue supporting current tenants by providing lands for cultivation at below market rates.
- Continue supporting current tenants by phasing construction to allow agricultural operations as long as possible and to minimize nuisance complaints.

HO'OPILI

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3.5 GROUNDWATER RESOURCES/HYDROLOGY

Existing Conditions

The 'Ewa region of O'ahu overlies the Southern O'ahu Basin Aquifer (SOBA), a designated Sole Source Aquifer. Drinking water supply is drawn from this aquifer in the volcanic formation at depth. According to Tom Nance Water Resource Engineering, the piezometric head of this aquifer, which is inland and directly beneath the Ho'opili site, is about 18 feet above sea level.

The gently sloping topography of the 'Ewa Plain is comprised of terrestrial alluvium, which is made up of clay and mud eroded from volcanic rock. The terrestrial alluvium is inter-layered with coral limestone deposited during periods when the area was covered by the ocean. This geologic feature is commonly referred to as "caprock." The caprock overlies these volcanics to the near vicinity of Farrington Highway. In cross section, the caprock is wedge-shaped. It is about 1,000 feet thick at the shoreline and tapers to just a few tens of feet thick in the vicinity of Farrington Highway. It is comprised primarily of limestone and marl on its seaward half (makai of OR&L Railroad right-of-way) and primarily terrestrial alluvium inland of the OR&L Railroad right-of-way. The caprock is located makai of the H-1 Freeway and is approximately 1,000 feet thick near the shoreline.

Brackish to saline basal groundwater exists in the upper limestone layer of the caprock. According to Tom Nance Water Resource Engineering, its water level is 1.0 to 1.5 feet above sea level. It is referred to as the caprock aquifer, but it is not present through the entire caprock formation. It is limited to the upper limestone layer. All water in the caprock formation below the thin lens in the upper limestone layer is saltwater. Water in the caprock is too saline to be used for safe drinking water.

Leakage upward from the higher head, volcanic aquifer into the caprock formation does occur, but according to Tom Nance Water Resource Engineering, it is limited to the inland margin of the caprock. This rate of upward leakage is a function of geology and the piezometric head in the volcanics. It is not influenced by the much lower water level in the upper limestone layer of the caprock.

The current irrigation allocation for the Petition Area is 8.0 million gallons per day (MGD). The average irrigation use is approximately 2.0 to 3.0 million gallons per day (MGD), depending on the time of the year.

The potential for surface water contamination under the caprock is low due to artesian conditions and the relatively impermeable caprock. Infiltration of surface water mauka of the caprock could cause contamination to the safe drinking ground water resource since the caprock is no longer present to function as a barrier in this area. Hydrological modeling predicts that the salinity of the caprock aquifer will increase as fresh water recharge declines with the reduction in sugarcane irrigation.

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

DOH has established the Underground Injection Control (UIC) line at North Hanson Road (south of the Petition Area). The primary purpose of the UIC line is to protect potential sources of safe drinking water by not allowing wastewater injection wells or cesspools mauka of the line. The Petition Area is situated mauka of the UIC line.

A well-defined stream channel is the only existing hydrological feature within the Petition Area. Honouliuli Stream channel acts as the primary channel for runoff from part of the Petition Area and drainage of the watershed upstream. Runoff waters and discharge waters from the BWS tanks upstream pass through the site in this stream channel. Within the Petition Area, surface water in the channel does not appear to be connected to the groundwater.

The Honouliuli Stream discharges into the Pacific Ocean at West Loch, Pearl Harbor. The mouth of the stream is located at the western border of the West Loch Golf Course. Fishponds, small feeder channels, and tidal flats were observed near the mouth of the stream.

Anticipated Impacts and Mitigation Measures

The total average daily source requirement for ultimate build-out is estimated at 3.9 MGD. The present agricultural use of the Petition Area provides recharge to the alluvial portion of the caprock from excess applied irrigation water. This irrigation return eventually moves into the aquifer in the upper limestone layer of the caprock, becoming a portion of its recharge, albeit a relatively small portion. According to Tom Nance Water Resource Engineering, development of the Ho'opili project will diminish this small component of the recharge to some extent, but will have an immeasurable impact on water level in the upper limestone layer.

The project is not expected to impact groundwater resources, as the caprock acts as a barrier to the drinking water in the Petition Area. The caprock in 'Ewa, around Pearl Harbor, and in Honolulu, does function to retard seawater intrusion into the drinking water aquifer in the volcanics. According to Tom Nance Water Resource Engineering, it is an incredibly important contribution to the availability of drinking water which comes about due to the mostly impermeable contact surface between the volcanics and the overlying caprock. It is not due to the water level in the caprock.

Both the drinking water aquifer in the volcanics and the brackish to saline aquifer in the caprock's upper limestone layer are in hydraulic contact with seawater nearshore and offshore. Sea level changes, whether weeks or months long due to large scale whether phenomena in the Pacific or a longer term sea level rise, does cause both aquifers to rise or fall accordingly. According to Tom Nance Water Resource Engineering, the Ho'opili project will have no impact on sea level changes.

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

Although the Petition Area is situated mauka of the UIC line, no injection wells or cesspools will be installed (since the project's wastewater collection system will eventually connect to the Honouliuli Wastewater Treatment Facility), and any runoff or wastewater disposal required for the project will be managed in full compliance with State Department of Health (DOH) regulations. Irrigation for landscaping will utilize brackish water from the 'Ewa caprock and/or treated effluent (R-1 quality) from the City and County of Honolulu's Honouliuli Wastewater Treatment Facility (if available) to facilitate the recharge of caprock water and to reduce the demand for safe drinking water from the BWS system.

Probably like any other region where a directed growth policy is in place. O'ahu has a finite supply of potable quality groundwater, meaning development using additional groundwater will eventually result in the need for desalination. The proposed project is not unique in this regard. BWS has long range plans to develop a desalination plant at the makai end of Campbell Industrial Park to ultimately meet the island's needs.

Regional drainage plans call for storm runoff from Kalo'i Gulch mauka of the H-1 Freeway to be diverted to the east side of North-South Road (planned for completion in 2008), within a portion of the North-South Road right-of-way. Proposed drainage improvements within the Petition Area include on-site detention and retention basins, which will promote on-site infiltration of surface water and facilitate groundwater recharge. Parcel D1 will also be used for off-site drainage. The project will meet storm water quality requirements of the Rules Relating to Storm Drainage Standards through the use of detention basins and structural methods including Stormceptor® type drain manholes.

There are presently no plans for uses within Honouliuli Stream that are expected to require a permit from the U.S. Army Corps of Engineers. Additionally, there are presently no proposed uses expected to obstruct flows within Honouliuli Stream flood hazard zones.

3.6 NATURAL HAZARDS

Existing Conditions

Natural hazards include events such as tsunami, earthquakes, floods, hurricanes, soil slippage, and volcanic hazards. Of these natural hazards, the Petition Area may be subject to hurricanes and earthquakes in the future. However, the Petition Area is not naturally more prone to hurricanes and earthquakes than any other areas on O'ahu.

The Federal Emergency Management Agency (FEMA) classifies flood hazard zones as part of the Flood Insurance Program for the City and County of Honolulu. According to the Flood Insurance Rate Map (FIRM), the majority of lands within the Petition Area are in Zone D (See Figure 3.5: Flood Insurance Rate Map). A very small portion of Parcel C near

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

Honouliuli Stream is located in Zone AE and Zone X. A portion of Parcel B around Honouliuli Stream is located in Zone A and Zone X. These flood zones are described in Table 3.2 below.

Table 3.2. FIRM Designations

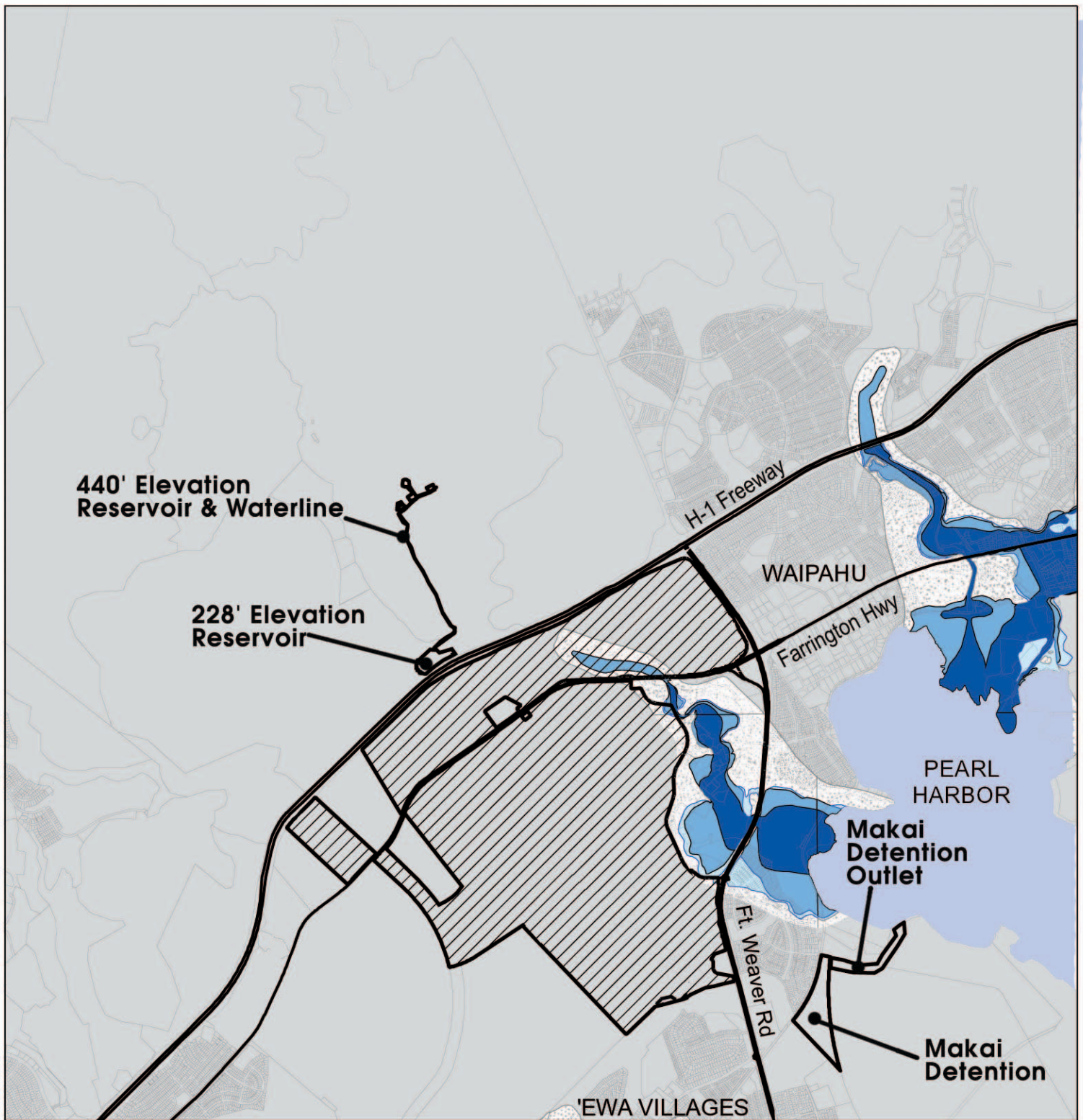
ZONE	DESCRIPTION
A	Areas inundated by 1 percent annual chance flooding, for which no base flood elevations have been determined
AE	Areas inundated by 1 percent annual chance flooding, for which base flood elevations have been determined
X	Areas outside of the 0.2 percent annual chance floodplain
D	Areas of undetermined, but possible, flood hazards

During the public review period, the State Department of Land and Natural Resources Engineering Division confirmed the flood zone designations affecting the Petition Area and wrote that: "The National Flood Insurance Program does not have any regulations for developments within Zone X, however, it does regulate developments within Zone A and AE...Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken...Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:...Mr. Robert Sumitomo at (808) 768-8096 or Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting..." While it is highly unlikely that any development will be proposed on lands designated Zone A or AE, the Petitioner will continue to coordinate with the Department of Planning and Permitting to discuss project-related issues, including the City's local flood ordinance."

Anticipated Impacts and Mitigation Measures

The project is not expected to exacerbate any natural hazards. Potential damage from hurricanes and earthquakes will be mitigated by compliance with the Uniform Building Code adopted by the City and County of Honolulu. All structures will be constructed for protection from earthquakes and tropical hurricanes. The potential for soil slippage will be mitigated by over-excavation and other construction methods.

During the public review period of the Draft EIS, the State Civil Defense (SCD) commented that "the developer install at least three outdoor warning sirens... At the present time SCD personnel recommends that the minimum-size siren have a sound rating



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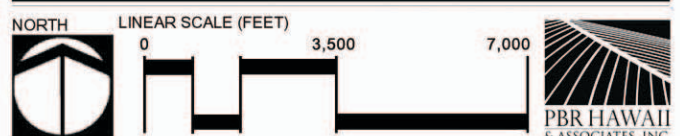
	Project Site Boundary		Petition Area
	Waterbody		
	Zone AE: Floodway		
	Zone A: 100-Year Floodplain		
	Zone X500: 500-Year Floodplain		
	Zone X: Outside Floodplain/Minimal Flooding Area		
	Zone D: Undetermined Flood Hazards		

Source: Federal Emergency Management Agency
 Flood Insurance Rate Maps (Panels 220 & 310, 2005)
 Disclaimer: This graphic has been prepared for general planning purposes only.

Figure 3.5: Flood Insurance Rate Map

HO'OPILI

O'ahu, Hawai'i



HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

of 121-decibels @ 100 feet, omni-directional and solar powered.” SCD also noted that “As the development plans are finalized, State Civil Defense (SCD) will be better able to define the placement and size of the sirens.” The Petitioner will continue to coordinate with the SCD as development plans are finalized to be better able to define the placement and size of the sirens.

3.7 FLORA

Existing Conditions

The Project Area consists of 10 distinct parcels of land (See Figure 1.5: Parcels Map). Parcels A, B, C, D1, D2 and G are situated makai of the H-1 Freeway while Parcels E1, E2, E3 and F are situated mauka of the H-1 Freeway. Botanical resources surveys of the Project Area were conducted by LeGrande Biological Surveys, Inc., in January, May and August 2006. The primary objectives of these studies were to: 1) prepare a general description of the vegetation on the Project Area; 2) provide an inventory the flora; and 3) search for and identify threatened and endangered species as well as species of concern. This report is included in Appendix B.

According to the botanical survey reports, most of the Project Area is currently plowed and devoid of trees and brush. Other lands within the Project Area are uncultivated brushland/or pastureland. The vegetation is typical of agriculturally cultivated cropland/or highly disturbed weedy areas. Little of the original native vegetation remains after over a century of intensive sugarcane agriculture and periodic burning. Native species have been replaced by aggressive non-native plant species. No federally listed endangered or threatened native plants, or candidate endangered species, were encountered on the property. Additionally, no wetlands occur on the property. Findings of the botanical resources surveys are summarized below.

Main Parcels (Parcels A, B, C and G)

Parcel A

Located between H-1 Freeway and Farrington Highway west of Palehua Road, the majority of the parcel is either in cleared land/or active corn (*Zea mays*) cultivation. The edges of Parcel A are dominated by weedy species such as castor bean (*Ricinus communis*), lion's ear (*Leonotis nepetifolia*), partridge pea (*Chamaecrista nictitans*), and kikania (*Xanthium strumarium* var. *canadense*). In addition, a small distribution of kiawe (*Prosopis pallida*) and opiuma (*Pithecelobium dulce*) trees are scattered along the top of Hunehune Gulch.

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

Parcel B

Located between H-1 Freeway and Farrington Highway with Fort Weaver Road bordering the parcel to the east, the majority of Parcel B is in active corn cultivation. Edges of fields are largely dominated by weedy shrubs such as koa haole (*Leucaena leucocephala*), Christmas berry (*Schinus terebinthifolius*), sourbush (*Pluchea carolinensis*), castor bean, and guinea grass (*Panicum maximum*). Honouliuli Gulch, which runs northwest-southeast through Parcel B, is largely dominated by koa haole, guinea grass, kukui (*Aleurites moluccana*), kiawe, pride of India (*Melia azedarach*), and autograph tree (*Clusia rosea*). At the bottom of Honouliuli Gulch, koali ai (*Ipomoea cairica*), little bell (*Ipomoea triloba*), primrose willow (*Ludwigia octovalvis*), love-in-a-mist (*Passiflora foetida*), and comb hyptis (*Hyptis pectinata*) were observed.

An Aloun Farm, Inc.'s baseyard is also located within Parcel B. Various crops were observed on the site including citrus (*Citrus sp.*), noni (*Morinda citrifolia*), kalo (*Colocasia esculenta*), yellow Poinciana (*Peltophorum pterocarpum*), sugarcane (*Saccharum officinarum*), and lemon grass (*Cymbopogon citrates*). Along Farrington Highway, the vegetation is largely dominated by kiawe and monkeypod (*Samanea saman*) trees and bougainvillea (*Bougainvillea sp.*) scattered throughout the length of Parcel B.

Parcels C and G

Parcels C and G are bordered by Farrington Highway to the north, Old Fort Weaver Road to the east, Mango Tree Road to the south, and the planned North-South Road to the west. A large portion of the property is currently under cultivation of corn, melons (*Cucumis sp.*), basil (*Ocimum sp.*), and bananas. Three indigenous plant species were observed on the property: 'ilima (*Sida fallax*), 'uhaloa (*Waltheria indica*) and pōpolo (*Solanum americanum*).

A cliff of approximately 20-30 feet high runs along the eastern boundary of Parcel C. The majority of the cliff area is dominated by kiawe and guinea grass. Indigenous plant species such as 'ilima, 'uhaloa and pōpolo can be found along the top of cliff.

The southern section of site between Old Fort Weaver Road and the cliff contains areas that are in active agricultural cultivation. Basil, cucumber (*Cucumis sativus*) and horseradish tree (*Moringa oleifera*) can be found growing at this particular operation. Coconut trees (*Cocos nucifera*), papaya (*Carica papaya*) and bamboo (*Bambusa sp.*) can also be observed growing around this lessee's facilities.

New 440 Tank, Transmission Line, & New 228 Tank Site (Parcels E2, E3, and F)

The majority of the property, located north of H-1 Freeway and proposed for the Reservoir and Waterline, consists of either a dirt roadway or uncultivated fields.

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

At the lower elevation (220 feet) site, an additional water tank is proposed to be constructed west of an existing water tank. The graded areas are dominated by weed plant species including buffelgrass, guinea grass, beggar tick, sourbush (*Pluchea carolinensis*), castor bean (*Ricinus communis*), and koa haole.

A dirt roadway, where the proposed waterline is to be constructed along, connecting the lower water tank site to the upper tank site is dominated by weedy plant species such as castor bean, koa haole, boerhavia (*Boerhavia coccinea*), Australian saltbush (*Atriplex semibaccata*), spiny amaranth, khaki weed (*Alternanthera pungens*), and Mexican poppy (*Argemone mexicana*). One indigenous plant species, 'uhaloa, was observed along the dirt roadway.

The upper elevation (440 feet) site is proposed for the construction of two water tanks. The property, located adjacent to an existing HECO substation, is an uncultivated pineapple field largely dominated by pineapple (*Ananas comosus*) and balsam pear (*Momordica charantia*) vines. African tulip, Christmas berry (*Schinus terebinthifolius*), and dogtail (*Buddleia asiatica*) were also spotted throughout the field. Autograph trees (*Clusia rosea*) and tropical coral trees (*Erythrina variegata*) were observed along the HECO substation perimeter fence. One indigenous plant species, pōpolo, was observed within the upper elevation site.

Makai Detention Site (Parcels D1 and D2)

The majority of the property is either in active cultivation or uncultivated fields. The uncultivated lands are largely dominated by weedy plant species such as koa haole, guinea grass, and other weedy plant species. Two indigenous plant species, 'ilima and 'uhaloa were observed at the property.

Due to access issues that prevented the botanical consultants from surveying the detention parcel that terminates in Pearl Harbor (Parcel D2), the property was observed from a nearby footpath and appears to be dominated by kiawe.

Anticipated Impacts and Mitigation Measures

None of the plant species which occurred on the Petition Area are considered a threatened ~~and~~ or endangered species or a species of concern. During the public review period, the State Department of Land and Natural Resources, Division of Forestry and Wildlife wrote that it had no objections to the proposed project.

The Hawaii Biodiversity and Mapping Program (HBMP) supplied historical and present locations of known threatened and endangered plant species within the Petition Area for review. The only rare plant mapped near the Petition Area was the ko'olua'ula (*Abutilon menziesii*) population at the southern end of North-South Road. There were no threatened or endangered plants mapped within the Petition Area itself. *A. menziesii* is protected by

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

both the federal Endangered Species Act of 1973, as amended, and Chapter 195D, HRS, as amended. *A. menziesii* is a shrub of the mallow family, growing six to eight feet tall, with coarsely toothed, silvery, heart-shaped leaves that are about one to three inches long. Flowers are medium red to dark red and less than an inch in diameter. It has been sold as an ornamental plant at local nurseries in the past under the name "Red 'ilima." Other extant populations of ko'oloa'ula currently exist on Lāna'i and Maui.

As part of the environmental planning for North-South Road and a portion of Kapolei Parkway, a *Habitat Conservation Plan for Abutilon menziesii at Kapolei* was finalized in March 2004. Mitigation measures have already been specified for these populations of *A. menziesii* related to construction of North-South Road. Although a concerted effort was made in surveying for ko'oloa'ula, no plants were observed on the property. As such, the proposed project is not expected to have a significant negative impact on the botanical resources in this part of O'ahu.

Native and indigenous vegetation will be considered in the selection of plant materials when a landscaping master plan is prepared.

3.8 FAUNA

Existing Conditions

The Project Area consists of 10 distinct parcels of land (See Figure 1.5: Parcels Map). Parcels A, B, C, D1, D2 and G are situated makai of the H-1 Freeway while Parcels E1, E2, E3 and F are situated mauka of the H-1 Freeway. Faunal resources surveys of the Project Area were conducted by Rana Productions, Ltd., in July, August and September 2006 (See Appendix C). The primary objectives of these studies were to: 1) prepare a general description of the Project Area; 2) to determine if there were any avian or mammalian species currently listed as endangered, threatened or proposed for listing under either Federal or State of Hawai'i endangered species statutes; and 3) provide information on the relative abundance of avian species within the various parcels.

Main Parcels (Parcels A, B, C and G)

Parcel A is located between H-1 Freeway and Farrington Highway west of Palehua Road. Parcel B is located between H-1 Freeway and Farrington Highway with Fort Weaver Road bordering the parcel to the east. Honouliuli Gulch runs northwest-southeast through Parcel B. Parcel C is bordered by Farrington Highway to the north, Old Fort Weaver Road to the east, Mango Tree Road to the south, and the planned North-South Road to the west. A cliff of approximately 20-30 feet high runs along the eastern boundary of Parcel C. Parcel G is surrounded by Parcel C and abuts Mango Tree Road.

The majority of the "Main Parcels" are made up of former sugar cane land, some of which is barren and some of which is under active cultivation with crops such as corn and

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

bananas. The habitat on all of the parcels is almost completely dominated by alien plant species. Mammalian surveys using both direct visual or auditory and detection of indirect of evidence (tracks, scat or sign) revealed only alien species, including house mouse (*Mus musculus domesticus*), dog (*Canis f. familiaris*), mongoose (*Herpestes a. auropunctatus*), horse (*Equus c. caballus*) and cat (*Felis catus*). The lone listed terrestrial mammalian species, Hawaiian hoary bat (*Lasiurus cinereus semotus*) was not detected during the course of the faunal surveys.

Twenty-four avian species were recorded during the survey of the main parcels, including two indigenous migratory shorebird species, the Pacific Golden Plover (*Pluvialis fulva*) and Ruddy Turnstone (*Arenaria interpres*). The remaining 22 species are alien and include pheasants, partridges, herons, pigeons and doves, bulbuls, larks, starlings, sparrows, mockingbirds and finches. While not observed during the survey, the Short-eared Owl, or Pueo (*Asio flammeus sandwichensis*) is known to exist in the 'Ewa region, and may be present in the area. The State of Hawai'i lists the O'ahu population of the Pueo as an endangered species, while the federal statute does not.

The site does not contain any unique habitat, and modification of any or all of the habitat present will have no deleterious effect on any mammalian or avian species currently listed as endangered or threatened, or proposed for listing under either the federal or state endangered species statutes.

New 440 Tank, Transmission Line, & New 228 Tank Site (Parcels E2, E3 and F)

The majority of the property, located north of H-1 Freeway and proposed for the Reservoir and Waterline, consists of either a dirt roadway or uncultivated fields. The upper elevation (440 feet) site is proposed for the construction of two water tanks and 5,600 feet of transmission lines. The property is located adjacent to an existing HECO substation and contains two existing BWS water tanks and a transmission line. The proposed location of the 440 tank is a former pineapple field, now fallow. The entire site is dominated by alien plant species.

Three alien mammalian species were found: dogs, cats and mongooses. The endangered Hawaiian Hoary Bat was not observed.

Thirteen different avian species were observed, including the indigenous migratory shorebird species, Pacific Golden Plover. While not observed, the Pueo may be present in the area. The remaining 12 species are alien species, including: finches, pheasants, partridges, herons, pigeons and doves, bulbuls, starlings, mynas, cardinals and finches. The Common Waxbill (*Estrilda astrid*), Zebra Dove (*Geopelia striata*) and Japanese White-eye (*Zosterops japonicus*) accounted for about 40% of the total number of avian species recorded. Diversity and density were relatively low, not surprising given the severely diminished habitat on most of the site.

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

Among mammalian species, it is likely that the house mouse and rats are present, although not observed. Rats and mice are deleterious to native ecosystems and to the faunal species that depend on them for their survival.

The site does not contain any unique habitat. Modification along the dirt road or in the area designated for the reservoirs and accessory facilities will have no deleterious effect on any mammalian or avian species currently listed as endangered or threatened, or proposed for listing under either the federal or state endangered species statutes.

Makai Detention Site (Parcels D1 and D2)

This site is east of Fort Weaver Road and south of the Honouliuli Unit of the Pearl Harbor National Wildlife Refuge. It is transected by the former OR&L railway line. A storm water detention basin is proposed to be located on the northern third of the site. The southern third is in active cultivation with corn and tomatoes. Vegetation on the site is almost completely dominated by alien species.

There were three alien mammalian species found: dog, cat and mongoose.

Twenty different avian species were recorded, 17 of which are alien. The Common Waxbill, Zebra Dove and Spotted Dove (*Streptopelia chinensis*) accounted for nearly half of the birds sighted. Other alien species included pheasants, partridges, herons, pigeons and doves, bulbuls, starlings, sparrows and mockingbirds.

The three indigenous species include the Black-crowned Night-Heron (*Nycticorax nycticorax hoactli*), a resident indigenous breeding species, and the Pacific Golden-Plover and Ruddy Turnstone, indigenous migratory shorebirds that breed in the Arctic. While not observed during this survey, the Pueo has been observed in the past in the nearby National Wildlife Refuge and may be present in the area.

Four waterbird species are currently listed as endangered under both the State and Federal statutes. The endangered water bird species consist of the Hawaiian Duck x Mallard hybrids (*Anas wyvilliana x platyrhynchos*), Common Moorhen (*Gallinula choropus sandvicensis*), Hawaiian Coot (*Fulica alai*) and Black-necked Stilt (*Himantopus mexicanus knudseni*). These species breed in the Honouliuli Unit of the National Wildlife Refuge, less than a sixth of a mile (250 meters) north of Parcels D1 and D2, and are regularly encountered on the golf course to the northwest. While the planned detention basin is located near the Refuge, there is no suitable habitat for these waterbirds. According to Bills Engineering, the project civil engineer, the makai drainage will rarely contain standing water.

During the public review period, the Land Use Commission requested an assessment of arthropods on the Petition Area. A survey of arthropods on the Petition Area was conducted on May 9, 2008 by Dr. Gregory Brenner of Pacific Analytics, L.L.C. The

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

primary objectives of the survey were to: provide a general description of the arthropod fauna of the Petition Area; evaluate the habitats (if any); and search and assess the potential for threatened or endangered arthropod species as well as species of concern. According to Dr. Brenner, the arthropod species that were collected during the study would be considered typical of what would be found in lowland sites with little or no native vegetation and disturbed by agricultural operations. No species were found that are locally unique to the site. A copy of the assessment is attached to this EIS as Appendix R.

There is no expected deleterious effect on faunal species from the proposed project development. The site does not contain any unique habitat, and any modification will have no deleterious impact on any species currently listed as endangered or threatened, or proposed for listing under either the federal or state endangered species statutes.

Anticipated Impacts and Mitigation Measures

The mammalian and avian species currently found within the Project Area are by and large alien species. All of the mammalian species identified are alien and only three of the avian species present are indigenous. A variety of rats and mice are present in some locations, and are strongly suspected to be present in other areas. The endangered Hawaiian Hoary bat was not detected during the course of the faunal surveys.

The majority of the sites surveyed within the Project Area are lands formerly cultivated in sugarcane or pineapple, having led to high degrees of disturbance or destruction of native habitat. Current habitats are deemed “depauperate” (severely diminished) by the biological consultant. Some of the sites are currently under partial cultivation, but those habitats likewise have been severely degraded. During the public review period, the State Department of Land and Natural Resources, Division of Forestry and Wildlife wrote that it had no objections to the proposed project.

The notable exceptions to the above are the four endangered waterbird species which currently inhabit the National Wildlife Refuge located north of Parcels D1 and D2. These birds may utilize the proposed detention basin if sufficient water collects to allow ponding. There may be periodic disturbance to the waterbird species if temporary construction occurs within the proposed detention basin (to enlarge it) or if an outlet is allowed. As previously noted, the waterbirds breed in the Honouliuli Unit of the National Wildlife Refuge, less than a sixth of a mile (250 meters) north of Parcels D1 and D2. While the planned detention basin is located near the Refuge, there is no suitable habitat for these waterbirds. According to Bills Engineering, the project civil engineer, the makai drainage will rarely contain standing water.

At the present time there is no federal nexus associated with this project, because it does not appear that the U.S. Navy will permit access or grant an easement for an outlet from the proposed makai drainage retention basin. If and when this component of the

HO'OPILI

~~DRAFT~~ FINAL ENVIRONMENTAL IMPACT STATEMENT

proposed development moves forward, the Petitioner will consult with both the U.S. Fish and Wildlife Service and the State of Hawai'i Division of Forestry and Wildlife to ensure that the construction and operation of the detention basin does not result in deleterious impacts to any species currently listed as endangered, threatened or proposed for listing under either federal or State of Hawai'i endangered species statutes.

Otherwise, impacts to the other existing mammalian and avian species and their habitats are expected to be minimal. Disturbance and displacement of individual alien species is likely to occur as construction and development infill takes place. The disturbance will be of a temporary nature. No mitigation measures are proposed for any faunal species detected during the course of the faunal surveys.

The results of the arthropod survey at the Petition Area (See Appendix R) indicate that there are no special concerns or legal constraints related to invertebrate resources in the Petition Area. No invertebrate species listed as endangered, threatened or that are currently proposed for listing under either federal or State of Hawai'i endangered species statutes are known to exist on the project site.

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

4.0 ASSESSMENT OF THE HUMAN ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION MEASURES

This section describes the existing human environment associated with the Petition Area and the project's potential impacts that may result from proposed development. Mitigation measures are proposed to address the project's potential project impacts.

4.1 ARCHAEOLOGICAL AND HISTORIC RESOURCES

Existing Conditions

An archaeological inventory survey report for the Project Area was conducted in February 2006 by Cultural Surveys Hawai'i Inc. (CSH). This report is included in Appendix D.

Five historic properties (SIHP Nos. 50-80-12-4344, 4345, 4346, 4347, and 4348) were documented during Cultural Surveys Hawai'i's archaeological inventory survey of the Petition Area. All five historic properties have been assessed as eligible for the State Register of Historic Places under Criteria C and D, except for Site 4344, which is only eligible under criterion D. The State Historic Preservation Division (SHPD) concurs with these significance assessments. All five historic properties are located in the vicinity of Old Fort Weaver Road) (See Figure 4.1: Historical Sites).

SIHP Nos. 50-80-12-4344. A survey conducted by CSH in 1990 identified three iron pipe features, including a tall metal post and two welded pipe constructions, located in the vicinity of the Drivers/Stable Villages. The age and function of these features elucidate out record of plantation life in 'Ewa. A more recent inventory study conducted by CSH in 2005 could not locate the previously identified features as the area had been bulldozed and the features destroyed. However, four additional plantation infrastructure features adjacent to Honouliuli Gulch were identified. These features were added to the site description, and will not affect the significance and recommendation for this site ("no preservation").

SIHP Nos. 50-80-12-4345 (Ewa Plantation Railroad Berm). The Ewa Plantation Company operated an approximately 30-mile private railroad from 1890 – 1947 for the primary purpose of the transport of sugar cane. While the railroad runs throughout the Petition Area, a particularly good section of railroad can be found in the northeastern portion of the Petition Area in the mouth of a dry stream valley. A railroad berm runs on both sides of the valley access road with well-preserved facings approximately 2 meters in height. The archaeological consultant recommended that the railroad berm be preserved through incorporating the feature into the development of the project where feasible.

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

SIHP Nos. 50-80-12-4346 (Northern Pumping Station). A survey conducted by CSH in 1990 previously determined the site's significance under Criteria C and D. The site consists of a pumping station with a deep rectangular basalt block, faced wall. The site is believed to pre-date 1928. An adjacent single pump house, which has an exterior or corrugated sheet metal panel construction, is located nearby. The archaeological consultant recommended that the well be preserved and that issues of significance and proper historic documentation be resolved with the SHPD office in advance of any development in the area to avoid adverse impacts. A preservation plan has been drafted and will be submitted to SHPD for review and comments.

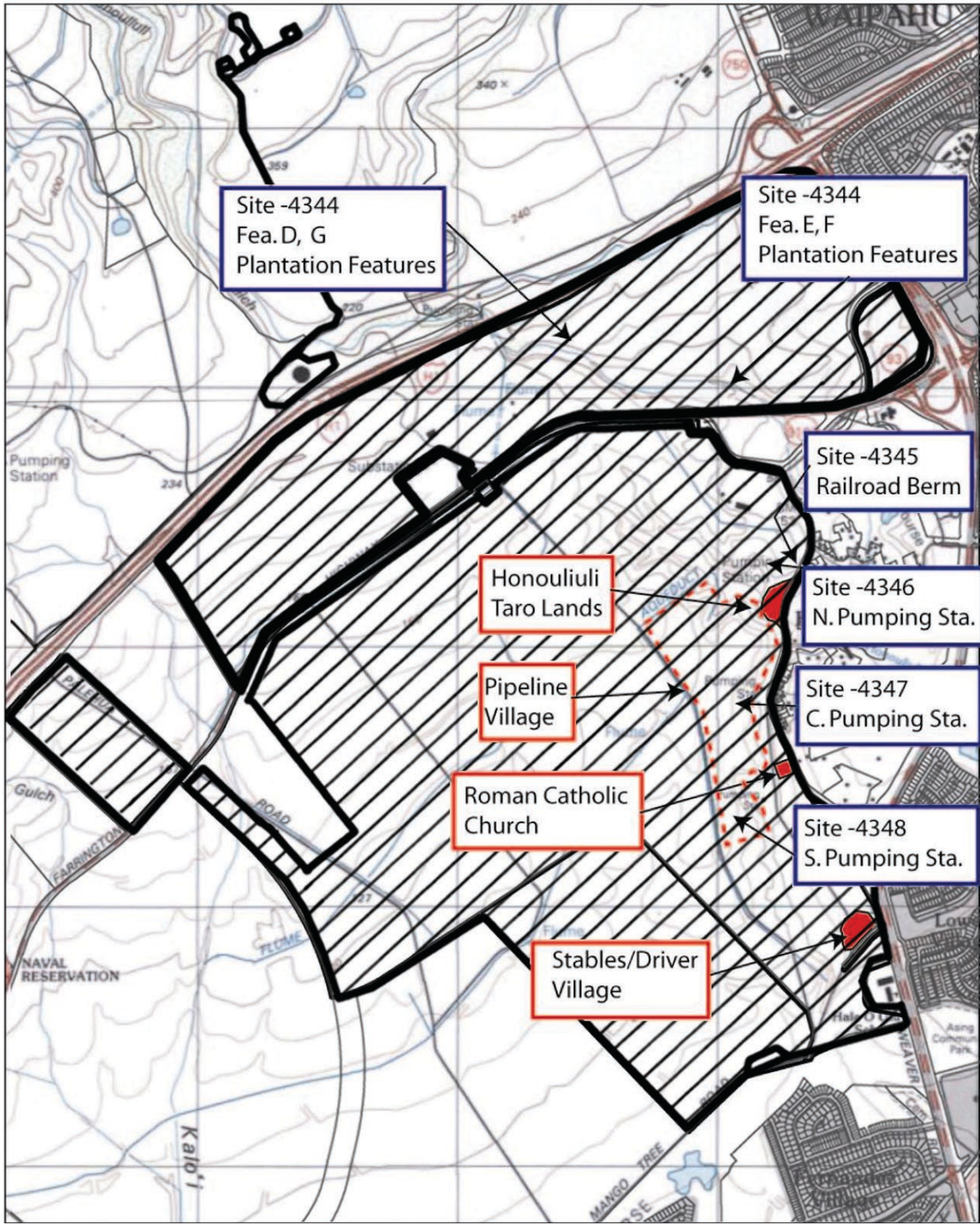
SIHP Nos. 50-80-12-4347 (Central Pumping Station). A survey conducted by CSH in 1990 previously determined the site's significance under Criteria C and D. The site consists of a pumping station with a deep rectangular basalt block, faced wall. The site is believed to pre-date 1928. Eight features related to and in the immediate vicinity of the well include a number of small architectural and/or industrial features. The archaeological consultant recommended that the well and portions of the site be preserved. The significance of the site would be evaluated after an assessment of the significance of the architectural features and the assessment of the significance of the 'Ewa Village area. A preservation plan has been drafted and will be submitted to SHPD for review and comments.

SIHP Nos. 50-80-12-4348 (Southern Pumping Station). A survey conducted by CSH in 1990 previously determined the site's significance under Criteria C and D. The site consists of a pumping station with a deep rectangular basalt block, faced wall. The site is believed to be constructed shortly after 1928. An adjacent single pump house, which has an exterior or corrugated sheet metal panel construction, is located nearby. The archaeological consultant recommended that the well be preserved and that issues of significance and proper historic documentation be resolved with SHPD in advance of any development in the area to avoid adverse impacts. A preservation plan has been drafted and will be submitted to SHPD for review and comments.

Research of earlier maps indicates four areas of interest: the Honouliuli taro lands, Kapalani Church, Pipe Line Village and Drivers/Stable Villages. All are located in the vicinity of Old Fort Weaver Road, well below from the main development area.

The Honouliuli taro lands were probably nineteenth century (and earlier) Hawaiian habitation and agricultural area. However, no surface or subsurface remains were found during the 2005 inventory survey. CSH has determined that no additional testing is necessary. However, CSH is recommending on-call/on-site archaeological monitoring during any future development in this area. SHPD concurs with this recommendation.

The Kapalani Church was a nineteenth century Hawaiian Catholic Church, schoolhouse and possible cemetery area. Pipeline Village and the Drivers/Stable Villages were early twentieth century immigrant plantation habitation camps. No surface or subsurface



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 Petition Area

Figure 4.1: Historical Sites

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O'ahu, Hawai'i



Not to Scale



HO'OPILI

~~DRAFT~~ FINAL ENVIRONMENTAL IMPACT STATEMENT

remains were found during the 2005 inventory survey. CSH has determined that no additional inventory survey is necessary. However, CSH is recommending on-call/on-site archaeological monitoring during any future development in this area. SHPD concurs with this recommendation.

In summary, SHPD concurs with the consulting archaeologist's (Cultural Surveys Hawai'i Inc.) mitigation recommendations, which include: (1) no further archaeological work at Site 4344, (2) preservation of Sites 4345, 4346, 4347, and 4348, and (3) archaeological monitoring in the vicinity of the four areas of historic habitation (Honouliuli taro lands, Kapalani Catholic Church, Pipeline Village, and Drivers/Stable Village).

Anticipated Impacts and Mitigation Measures

According to SHPD, the archaeological inventory survey report is now accepted in fulfillment of Sections 13-284 and 13-276, HAR (See Appendix E). A preservation plan and archaeological monitoring plan will be prepared and submitted to SHPD for their review and approval. All five sites are located near Old Fort Weaver Road and well away (and below the bluff) from the main Petition Area. Should any archaeologically significant artifacts, bones, or other indicators of previous on-site activity be uncovered during construction, work will stop immediately and the Department of Land and Natural Resources, Historic Preservation Division (SHPD) will be notified in accordance with applicable regulations.

4.2 CULTURAL RESOURCES

Existing Conditions

A cultural impact assessment for the Project Area was conducted in December 2006 by Cultural Surveys Hawai'i Inc. (CSH). This report is included in full in Appendix F. A summary is presented below.

The Petition Area is located in the ahupua'a of Honouliuli, in the 'Ewa district on the island of O'ahu. Honouliuli, translated as "dark water" or "blue harbor," is the largest ahupua'a in the moku (district) of 'Ewa. Honouliuli consists of lands stretching from the western boundary of Pu'uloa (Pearl Harbor) to the 'Ewa/Wai'anae district boundary.

Honouliuli is associated with a number of legendary accounts. Many of these concern the actions of gods or demi-gods such as Kāne, Kanaloa, Māui, Kamapua'a, the reptile deity (mo'o) Maunauna, the shark deity Ka'ahupāhau, and the demigod hero Palila. While there are several references to chiefly lineages and references to the ruling chiefs Hilo-a-Lakapu and Kūali'i, there is no clear reference to powerful chiefs living permanently in Honouliuli.

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

The accessibility of Honouliuli lands, including the proposed Project Area, to the Hawaiians for gathering or other cultural purposes was radically curtailed during the second half of the nineteenth century. By the 1870s, herds of cattle grazing across the 'Ewa Plain probably denuded the landscape of much of the native vegetation. Subsequently, during the last decade of the nineteenth century, the traditional Hawaiian landscape was further distorted by the introduction and rapid development of commercial sugar cane cultivation. Throughout the twentieth century, sugar cane cultivation was the dominating land use activity within the Petition Area and surrounding areas. Sugar cane cultivation, and the sense that most of the Ewa plain was private property, restricted access inside the Petition Area and surrounding areas to employees of 'Ewa Plantation.

Previous Settlements

There are three areas of early settlement in the Honouliuli ahupua'a: the extensive limestone plain with recurrent use as habitation for fishermen and gatherers and sometime gardeners; the uplands around Pu'uku'ua associated with kauwā (slave or servant) residences but probably used for agriculture and forest resources; and the rich cultivated lands of the Honouliuli 'ili (subdivision of an ahupua'a) for extensive wetland taro and clearly the ahupua'a population center. These irrigated lands are centered around the west side of Pearl Harbor at Honouliuli Stream and its broad outlet into West Loch.

Consultation

Hawaiian organizations, government agencies, community members, and cultural and lineal descendants with ties to 'Ewa were contacted to: (1) identify potentially knowledgeable individuals with cultural expertise and knowledge of the Petition Area and its surroundings, and (2) identify cultural concerns and potential impacts within the Petition Area. An effort was made to locate informants with ties to 'Ewa and neighboring ahupua'a who live, or had lived in the region or who, in the past, used the area for traditional and cultural purposes. For this assessment, Arline Eaton, Richard Hirata, Richard Oshiro, Kenneth Soma, Charles Nakamatsu and other kūpuna were interviewed. They mentioned that in the past there was traditional gathering of taro and salt, along with fish such as pāpio, mullet, as well as oysters, clams and a variety of crab along the banks of Pearl Harbor. They all referred to this area of rich marine resources as Chocolate Beach and Three Stones (along Pearl Harbor). The people contacted were not aware of any on-going cultural practices, archaeological sites, trails, or burials within the Petition Area. Most of the people contacted mentioned that the Petition Area was heavily altered by plantation activities.

HO'OPILI

~~DRAFT~~ FINAL ENVIRONMENTAL IMPACT STATEMENT

Conclusion

While Honouliuli is associated with a number of legendary accounts involving gods, demi-gods and chiefly lineages, there is no clear reference to powerful chiefs living permanently in Honouliuli. Access to Honouliuli lands, including the Petition Area, by Hawaiians for gathering or other cultural purposes was radically curtailed during the second half of the nineteenth century. Herds of cattle grazing across the 'Ewa Plain likely denuded the landscape, which was subsequently further distorted by the introduction and rapid development of commercial sugar cane cultivation. Throughout the twentieth century, sugar cane cultivation was the dominating land use activity. These two factors give evidence of the area's decline as a population center, and the disappearance of reasons to access it.

Based on results of the consultation process, the evidence from Land Court Awards (LCAs) and lack of resources, the vast majority of the Petition Area was utilized less intensively during traditional times. Based on this evidence, no contemporary or continuing cultural practices occur within the Petition Area at present.

Anticipated Impacts and Mitigation Measures

The Petition Area was used for ranching and the production of commercial sugar, and portions of the property continue to be used for agricultural purposes under short-term agreements. Ranching and sugar cane production would have most likely destroyed any cultural resources on the property. Subsurface historic properties associated with former traditional Hawaiian activities in the project area, such as artifacts, cultural layers or burials, may be present despite the decades of destructive modern activities. The Project Area is approximately 600m (approximately 2,000 feet) back from the coast. Therefore, access to marine resources will not be affected.

As a precautionary measure, personnel involved in construction or development activities will be informed of the possibility of inadvertent cultural or skeletal finds, and will cease work immediately, secure the area and notify the proper authorities in the event of such discoveries.

Currently, no contemporary or continuing cultural or traditional practices occur within the proposed Petition Area. Therefore, no impacts are expected and no mitigation measures are planned.

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

4.3 NOISE

Existing Conditions

An environmental noise assessment report for the Petition Area was conducted in February 2008 by D.L. Adams Associates, Ltd. This report is included in Appendix G.

The Ho'opili project is currently exposed to varying daytime ambient noise levels, depending on the proximity to major roadways. The areas adjacent to H-1 Freeway and Farrington Highway experience high ambient noise levels during peak traffic hours. Ambient noise levels range from 59 to 72 dBA adjacent to the H-1 Freeway and 44 to 59 dBA adjacent to Farrington Highway. The ambient noise environment is relatively low in areas that are far from the major roadways, where ambient noise levels range from 37 to 60 dBA. The dominant noise sources are traffic, birds, wind, occasional distant aircraft flyovers and farm equipment.

Aircraft activity in the vicinity of the 'Ewa area generated from the Kalaeloa Airport and Honolulu International Airport may be audible at the Ho'opili project. In its comments on the Draft EISP, the State DOT wrote that single-event noise may occur from potential overflights of aircraft or under certain weather/atmospheric conditions, particularly from aircraft approaching or departing Kalaeloa Airport. However, the overflights of aircraft are infrequent and the Ho'opili project is located well outside of the 55 dBA noise contour for both airports. Even when no aircraft is flying near the Petition Area, noise is generated by traffic on adjacent roadways, including the H-1 Freeway, Farrington Highway, Kunia Road and Fort Weaver Road. Wind through vegetation and birds also generate noise within the Petition Area.

Anticipated Impacts and Mitigation Measures

Construction Noise

Noise will be generated by construction and earth-moving equipment during the project's development. However, over the life of the project, depending where development will occur, construction noise will be relatively short-term, occur only during daytime hours, and comply with ~~DOH noise regulations~~ Chapter 11-46, HAR (Community Noise Control). Noise impacts will only be heard on margins of the Petition Area that border sensitive land uses, such as existing residential uses on the eastern boundary (minimal development is currently contemplated along Old Fort Weaver Road) and the southern boundary (buffered by the 'Ewa Villages Golf Course) of the Petition Area. In general, the Petition Area is surrounded by roads or open space; thus there are relatively few current residents that would be impacted by construction noise. There are no adjacent schools or hospitals to the Petition Area.

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

If construction noise is expected to exceed DOH's maximum permissible property line noise levels, a permit will be obtained from the DOH to allow the operation of vehicles, construction equipment, power tools, et cetera. Additionally, construction equipment, vehicles or devices will be equipped with mufflers, as necessary.

Operational Noise

Over the long-term operation of the project, several new noise generating activities (such as new land uses, additional traffic) will be introduced, which are not currently present; and introduced new residents to ongoing noise generating activities (such as aircraft noise, future traffic without the project on surrounding roads, transit).

The proposed land uses may include noise generating activities which could impact future residents. The proposed land use plan was designed to acknowledge that the only neighboring residential areas are located along Old Fort Weaver Road below a bluff where most of the Petition Area is located. Thus, no new residential is currently being proposed in this area. Proposed land uses closest to Honouliuli include a natural park area and medical-related office use.

The project is designed to have higher densities than the existing Villages of Kapolei, and as such, will present similar ambient noise conditions as might be expected where a mix of multi-family residential and commercial uses occur. Noise mitigation measures will be incorporated into the project design to prevent such impacts, such as installing landscaping, and installing mufflers and/or erecting barriers around noisy mechanical equipment (such as air conditioning). Consideration will be given to the layout of the commercial areas to meet State Department of Health noise regulations and reduce the noise impact. It is expected that the Petitioner will likely include restrictions on hours of operations on commercial uses in order to minimize the impact of potential noise producing uses such as bars and nightclubs or indoor recreational land uses. Project activities will comply with Chapter 11-46, HAR (Community Noise Control).

Increases in peak hour traffic noise along Fort Weaver Road due to the project are estimated to be less than 1 dB. Increases in peak hour traffic noise along Old Fort Weaver Road due to the project are estimated to be between 3 and 8 dB. This is acknowledged to be a significant increase for homes currently located along Old Fort Weaver Road impacting approximately 35 homes.

Vehicular traffic noise from the H-1 Freeway and from Farrington Highway and Fort Weaver Road may significantly impact the proposed development. The developer will take appropriate measures in the design, layout and construction facilities in these areas to minimize or mitigate such that exterior noise. These steps may include but are not limited to: air conditioning facilities to reduce ambient noise levels, and traffic noise mitigation measures, such as an earthen berm or noise barrier wall. The developer proposes to notify

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

all buyers within 120 feet of the H-1 Freeway, Farrington Highway and Fort Weaver Road that they may experience exterior noise levels of 67 dBA or greater.

Aircraft noise due to operations at nearby Kalaheo Airport and the Honolulu International Airport may be audible at the project site. However, flights directly above the site are infrequent and the project site is outside of the Ldn 55 noise contour for both airports. Therefore, a significant noise impact due to aircraft noise is not expected. However, per the comments made by the State Department of Transportation during the Draft EIS public review period, prospective occupants will be made aware of the potential for such occurrences.

The proposed alignments of the future Honolulu rail transit system run along Farrington Highway and North-South Road (or possibly diagonally through the Petition Area) and may include two transit stations. The developer proposes to notify all buyers along the proposed transit alignment and nearby the transit stations that they can expect to experience noise from the transit guideway and/or transit stations during the hours the transit system will be in operation.

Exterior noise levels at two school sites (H-1 Freeway/Kunia Road and Farrington Highway) will exceed the Hawaii State Board of Education (BOE) Policy 6700 noise limit of L10 = 65 dBA (before mitigation). During the Draft EIS public review period, the DOE commented that schools should not be located at sites where noise levels exceed 65 dBA. Policy 6700 requires that air conditioning be provided to schools that are exposed to exterior noise levels in excess of the noise limit. The layout and construction of the school should be carefully designed such that exterior noise will not disturb learning activities and interfere with speech intelligibility. To reduce ambient noise levels at the school site, traffic noise mitigation measures may also be necessary, such as an earthen berm or noise barrier wall, or siting the buildings along high noise-generating roadways to essentially serve as noise barriers.

4.4 AIR QUALITY

An Air Quality Study for the Petition Area was conducted in February 2008 by B.D. Neal & Associates to describe the existing air quality in the Petition Area and to assess the potential short- and long-term direct and indirect air quality impacts that could result from construction and use of the proposed project. The study also discussed proposed measures to mitigate impacts by the project. This report is included in Appendix H.

Existing Conditions

Air Quality Standards. Both Federal and State standards have been established to maintain ambient air quality. At the present time, seven parameters are regulated including: particulate matter, sulfur dioxide, hydrogen sulfide, nitrogen dioxide, carbon monoxide, ozone and lead. State air quality standards are comparable to the Federal

HO'OPILI

DRAFT FINAL ENVIRONMENTAL IMPACT STATEMENT

standards, except those for nitrogen dioxide and carbon monoxide, which are more stringent than the Federal standards.

Climate. Regional and local climate together with the amount and type of human activity generally dictate the air quality of a given location. The climate of the 'Ewa area is very much affected by its leeward and coastal situation. Winds are predominantly trade winds from the east-northeast except for occasional periods when Kona storms may generate strong winds from the south or when the trade winds are weak and landbreeze-seabreeze circulation may develop. Wind speeds typically vary between about 5 to 15 miles per hour providing relatively good ventilation much of the time. Temperatures in the leeward O'ahu area are generally very moderate with average daily temperatures ranging from about 65 degrees Fahrenheit (F) to 84 degrees F.

The extreme minimum temperature recorded at the nearby (former) 'Ewa Plantation is 47 degrees F, while the extreme maximum temperature is 93 degrees F. This area of O'ahu is one of the drier locations in the state with rainfall often highly variable from one year to the next. Monthly rainfall has been measured to vary from as little as a trace to as much as 15 inches. Average annual rainfall amounts to about 21 inches with summer months being the driest.

Existing Pollution Sources. Air quality in the Petition Area is mostly affected by air pollutants from motor vehicles, industrial sources, agricultural operations and to a lesser extent natural sources. Much of the particulate emissions on O'ahu originate from area sources, such as the mineral products industry and agriculture. Sulfur oxides are emitted almost exclusively by point sources, such as power plants and refineries. Nitrogen oxides emissions emanate predominantly from industrial point sources, although area sources (mostly motor vehicle traffic) also contribute a significant share. The majority of carbon monoxide emissions occur from area sources (motor vehicle traffic), while hydrocarbons are emitted mainly from point sources. Based on previous emission inventories that have been reported for O'ahu, emissions of particulate and nitrogen oxides may have increased during the past ten years, while emissions of sulfur oxides, carbon monoxide, and hydrocarbons have probably declined.

The H-1 Freeway is a major arterial roadway that presently carries moderate to heavy levels of vehicle traffic during peak traffic hours. Emissions from motor vehicles using this roadway, primarily nitrogen oxides and carbon monoxide, will tend to be carried away from the Petition Area by the prevailing winds.

Several sources of industrial air pollution are located in the Campbell Industrial Park, which is located six miles from the Petition Area toward the southwest. Industries currently operating at Campbell Industrial Park include the Chevron and BHP refineries, the Honolulu Program of Waste Energy Recovery (H-POWER) facility, Kalaeloa Partners, Applied Energy Services, Hawaiian Cement and others. The Hawaiian Electric Company, Inc. (HECO) Waiiau Generating Station is located a few miles to the south at Pearl City.