KAPOLEI HARBORSIDE CENTER

Final Environmental Impact Statement

Kapolei Property Development LLC

GROUP 70 INTERNATIONAL

November 2006

KAPOLEI HARBORSIDE CENTER

TMK: (1) 9-1-14:33 (por), 34; (1) 9-1-14:35 and (1) 9-1-15:20 (por)
Honouliuli, ʻEwa District, Kapolei, Oʻahu

Final Environmental Impact Statement

This document is prepared pursuant to Hawaiʻi Revised Statutes, Chapter 343, Environmental Impact Statement Law and Chapter 200 of Title 11, Administrative Rules, Department of Health, Environmental Impact Statement Rules. This document and all ancillary documents were prepared under signatory's direction or supervision.

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October 25, 2006
Date

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For submittal to:
State of Hawaiʻi Land Use Commission
in support of a District Boundary Amendment

November 2006

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GLOSSARY OF ACRONYMS

ANC	Aina Nui Corporation
BMPs	Best Management Practices
BTEX	benzene, toluene, ethylbenzene, and total xylenes
BWS	Honolulu Board of Water Supply
cfs	cubic feet per second
County	City and County of Honolulu
CWA	Clean Water Act
CWRM	State of Hawai'i Commission on Water Resource Management
dBA	decibels A-weighted[2]
DEIS	Draft Environmental Impact Statement
DLNR	State of Hawai'i Department of Land and Natural Resources
DOA	State of Hawai'i Department of Agriculture
DOH	State of Hawai'i Department of Health
DP	Development Plan
DPP	City and County of Honolulu Department of Planning and Permitting
EALs	environmental action levels
EPA	United States Environmental Protection Agency
The Estate	The Estate of James Campbell
FIRM	Flood Insurance Rate Map
FY	Fiscal Year
GP	General Plan
GPD	Gallons Per Day
HFD	Honolulu Fire Department
HPD	Honolulu Police Department
HRS	Hawai'i Revised Statutes
HWS	Hawaiian Western Steel
KPD	Kapolei Property Development, LLC
JCC	James Campbell Company, LLC
JCIP	James Campbell Industrial Park
LEL	lower explosive limit
LFR	Levine Fricke
LNAPL	light nonaqueous phase layer
LOS	Level of Service
MGD	Millions of Gallon Per Day
msl	mean sea level
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRCS	U.S. Department of Agriculture Natural Resources Conservation Service

OR&L	O'ahu Railway and Land Company
OVA	Organic Vapor Analyzer
OWMP	O'ahu Water Management Plan
PAHs	polynuclear aromatic hydrocarbons
P/E	precipitation/evaporation
RCRA	Resource Conservation and Recovery Act
SCP	Sustainable Communities Plan
SHPD	State Historic Preservation Division
SIHP	State Inventory of Historic Properties
SPH	separate-phase hydrocarbon
SY	Sustainable Yield
UIC	State Department of Health Underground Injection Control
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WMA	Watershed Management Area
WMP	Watershed Management Plan
WQP	Water Quality Plan
WRPP	Water Resources Protection Plan
WUZ	Water Use Zone
WWTP	Honouliuli Wastewater Treatment Plant

1.0 Summary

1.0 SUMMARY

1.1 PROJECT INFORMATION SUMMARY

Project Name:	Kapolei Harborside Center
Proposed Action:	Reclassification of approximately 345 acres of land from the Agricultural District to the Urban District.
Petitioner:	Kapolei Property Development, LLC 1001 Kamokila Blvd., Suite 250 Kapolei, Hawai'i 96707 Contact: Steve Kelly, AICP, Manager Phone: (808) 674-3289
EIS Accepting Authority	State of Hawai'i Land Use Commission
Planning/Environmental Consultant:	Group 70 International, Inc. 925 Bethel Street, 5th Floor Honolulu, Hawai'i 96813 Contact: Jeff Overton, AICP Phone: (808) 523-5866
Area:	344.519 acres (approximately 345 acres)
Location:	Honouliuli, 'Ewa District, Kapolei, Island of O'ahu *(Figure 1-1)*
Tax Map Key:	(1) 9-1-014:33 (por) (137.529 acres) (1) 9-1-014:34 (19.947 acres) (1) 9-1-014:35 (12.845 acres) (1) 9-1-015:20 (por) (174.198 acres) *(Figure 1-2)*
Landowners:	Kapolei Property Development, LLC Aina Nui Corporation James Campbell Company, LLC ~~The Estate of James Campbell~~ 1001 Kamokila Blvd., Suite 250 Kapolei, Hawai'i 96707
Existing Uses:	Field stock tree nursery, greenwaste collection and compost processing, coral mining, fill material stockpiling, and coal conveyance

Proposed Uses:	Industrial, warehousing, related business uses
State Land Use District:	Agricultural *(Figure 1-3)*
City & County Zoning:	174 acres (approximate): AG-1 Restricted Agriculture 171 acres (approximate): AG-2 General Agriculture *(Figure 1-4)*
City & County of Honolulu 'Ewa Development Plan:	Industrial *(Figure 1-5)*
Special Management Area:	Not in SMA
Permits Required:	State Land Use Boundary Amendment (~~S~~LUC), County Rezoning (DPP), Wastewater Pump Station and Irrigation (DOH), Grading, Building and Construction related permits (DPP)
Flood Zone:	Flood Insurance Rate Map Zone D (undetermined flood hazard)
Proposed Project:	Kapolei Property Development, LLC proposes to develop Kapolei Harborside Center, a new industrial park with supporting infrastructure including improvements to drainage, roadways, water distribution, a wastewater pumping station, and other utilities.

1.2 PROJECT SITE

The Kapolei Harborside Center project site consists of approximately 345 acres of primarily vacant land on the Island of O'ahu. The site is located in the 'Ewa District adjacent and north of the James Campbell Industrial Park. The property is privately owned by Kapolei Property Development, LLC, Aina Nui Corporation, and the James Campbell Company ~~the Estate of James Campbell (the Estate)~~. Kapolei Property Development, LLC is the property manager and developer. The project area is designated as Industrial in the 'Ewa Development Plan and the Estate of James Campbell Kapolei Area Long-Range Master Plan *(Figure 1-6)*.

Figure 1-1. Location Map

0 1,250 2,500 5,000 Feet NORTH

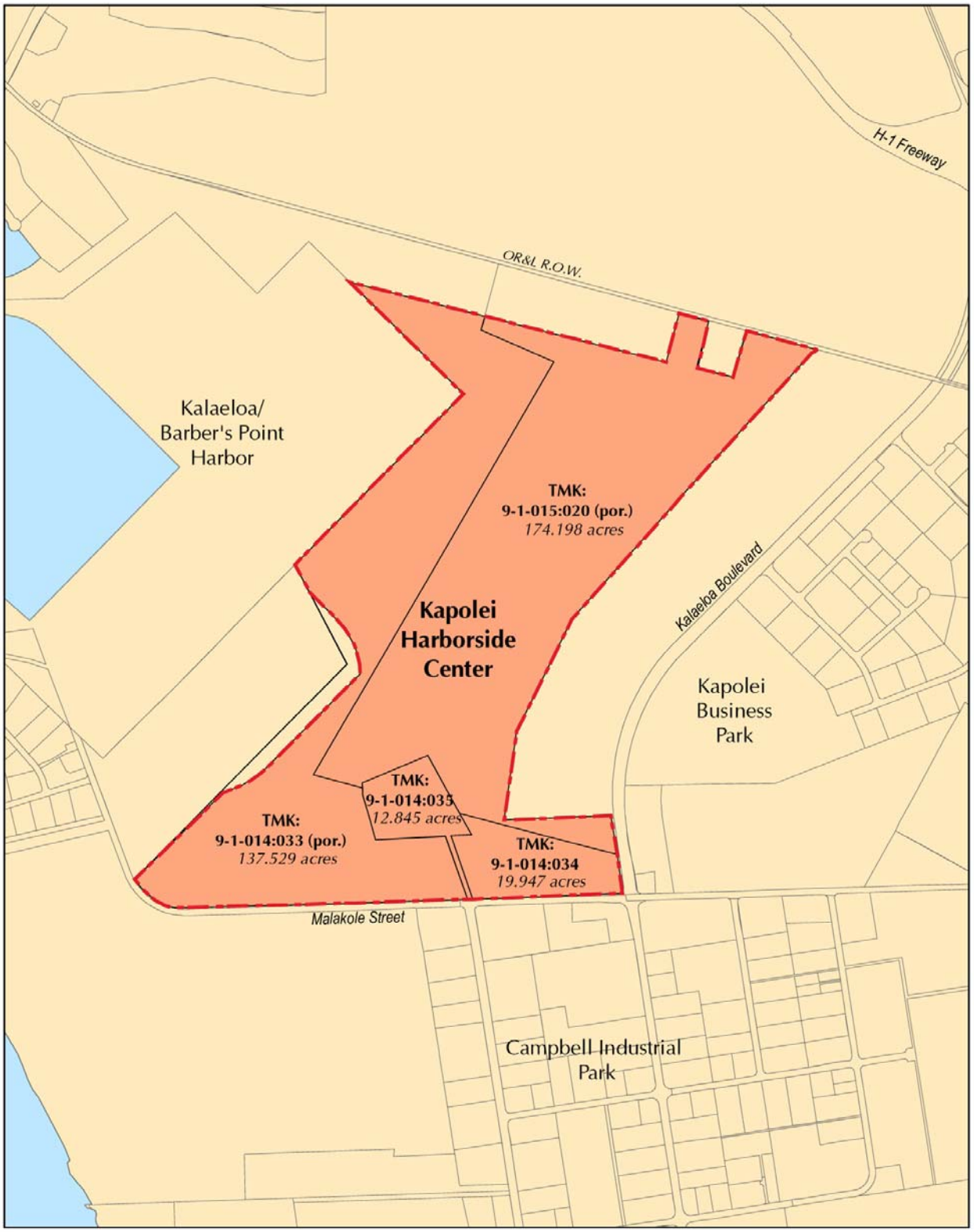


Figure 1-2. Tax Map Key Parcel References

0 600 1,200 2,400 Feet NORTH

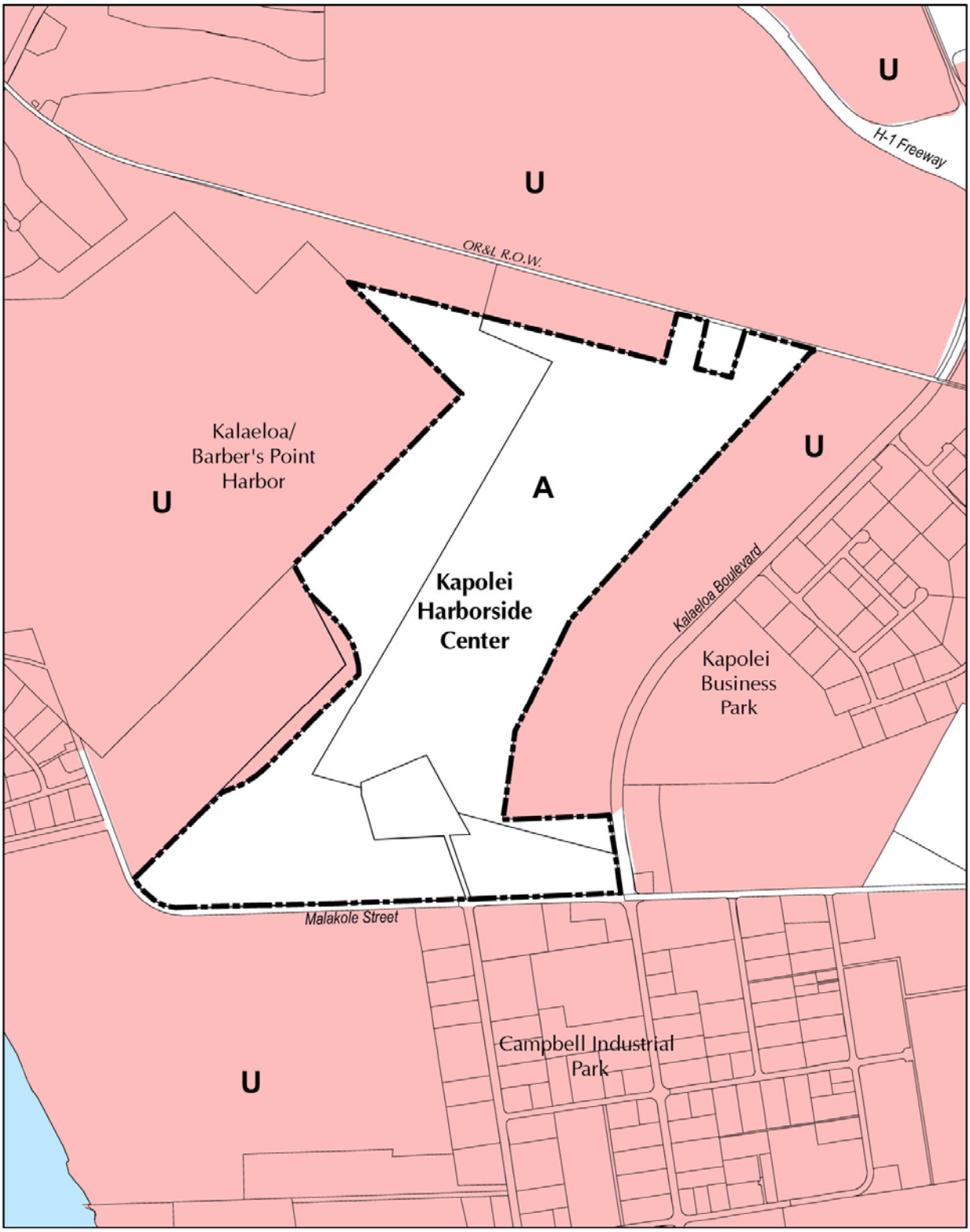


Figure 1-3. State Land Use District Classifications

0 600 1,200 2,400 Feet NORTH

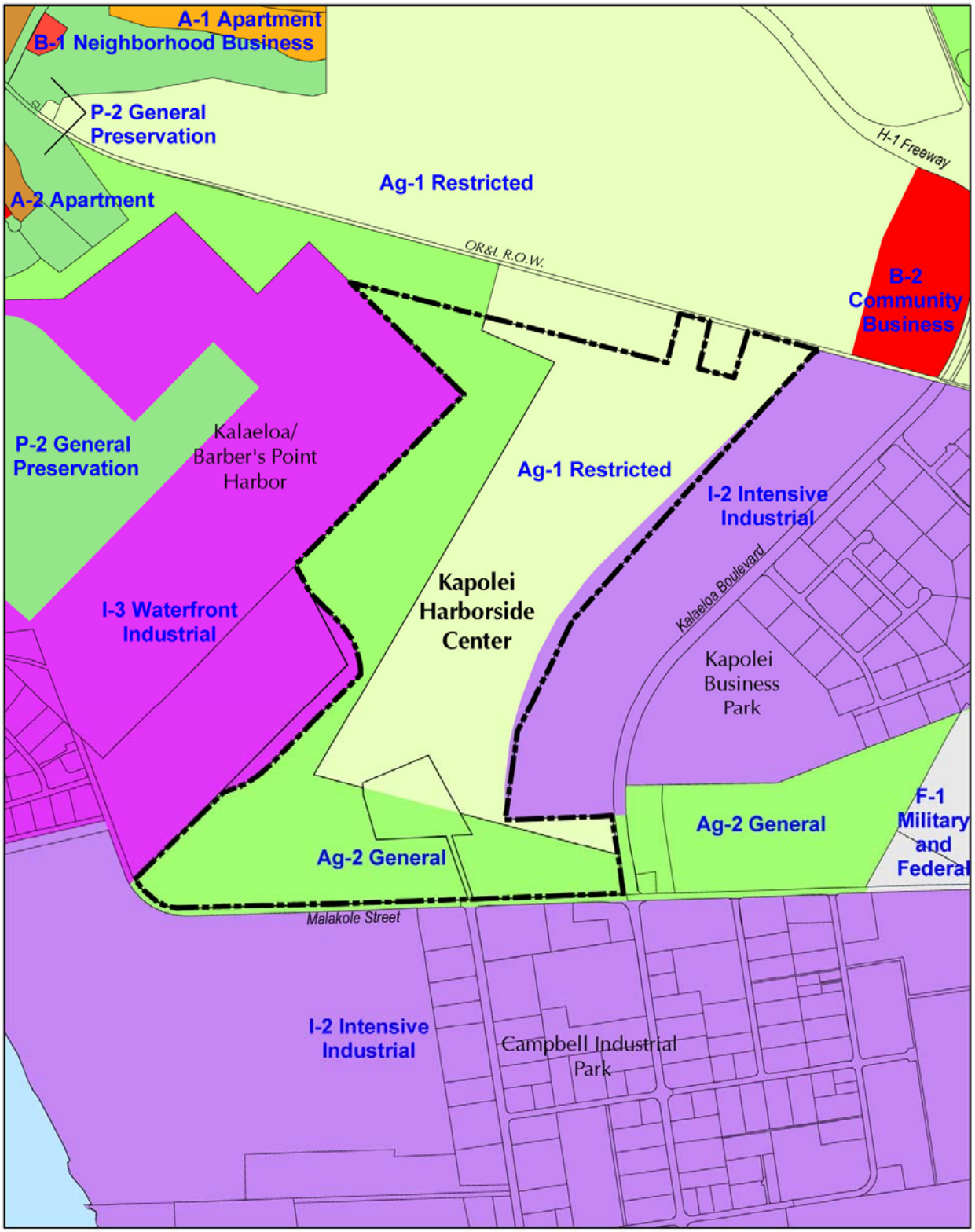


Figure 1-4. City and County of Honolulu Zoning

0 600 1,200 2,400 Feet NORTH

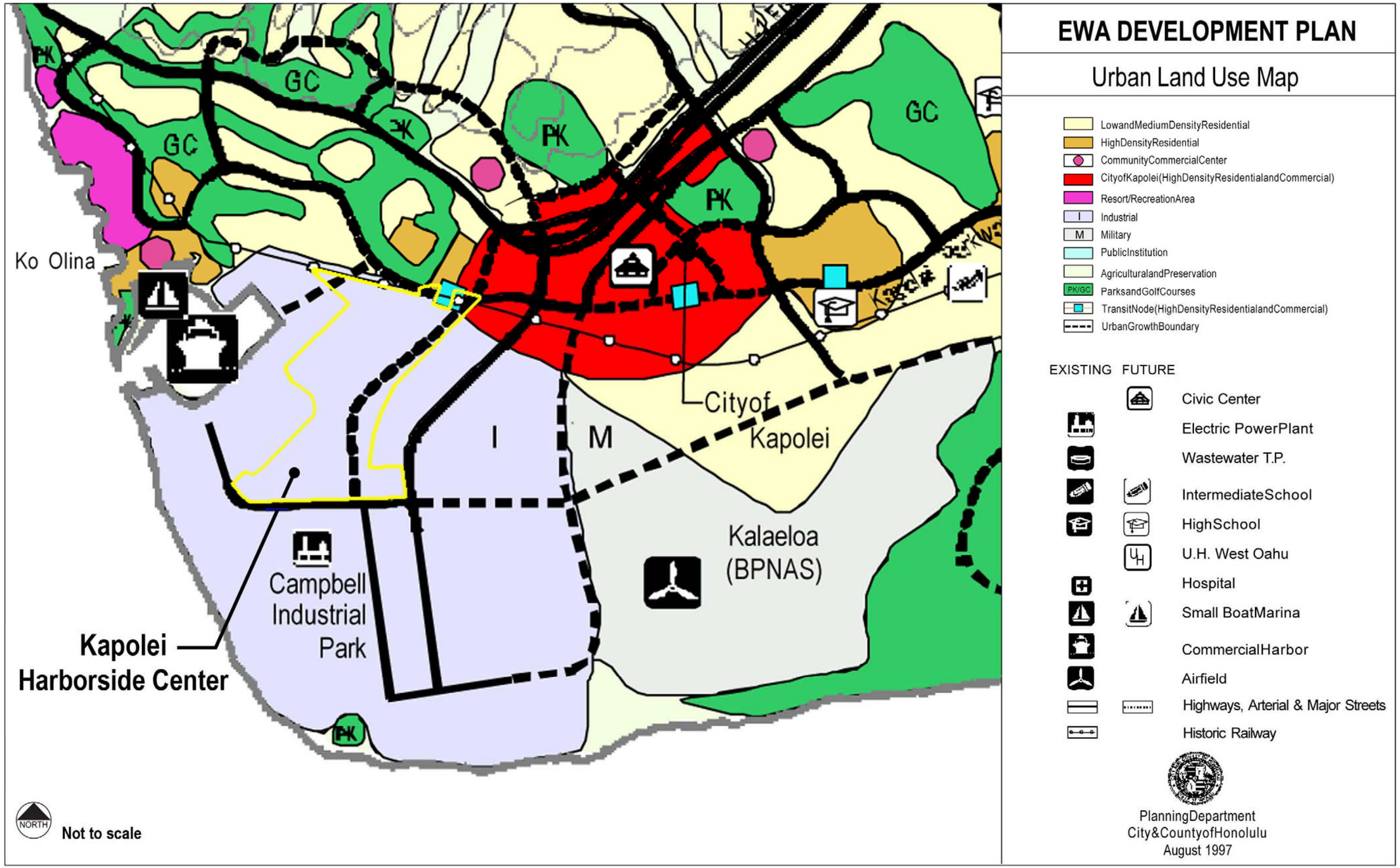


Figure 1-5. City and County of Honolulu 'Ewa Development Plan

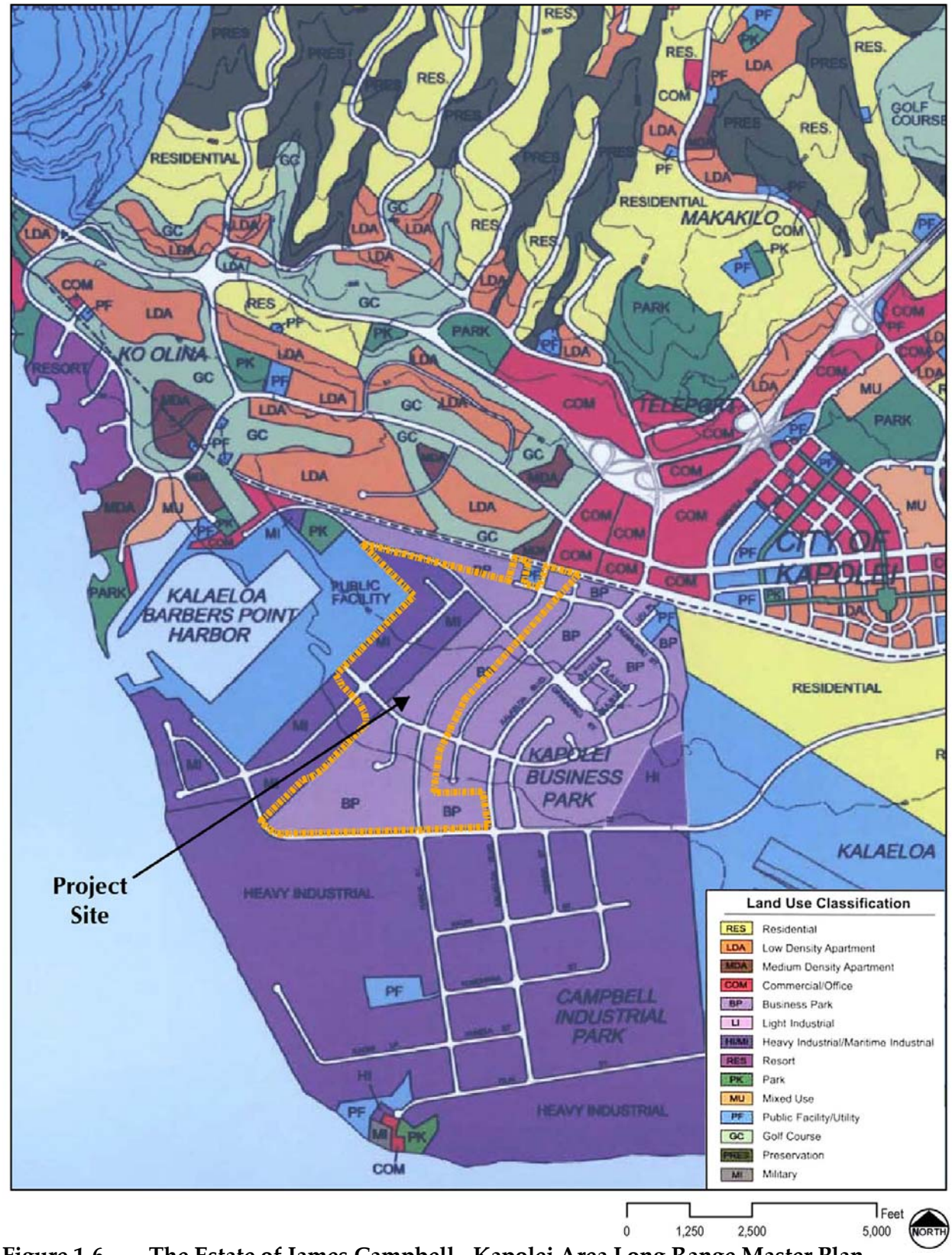


Figure 1-6. The Estate of James Campbell - Kapolei Area Long Range Master Plan

1.3 PROPOSED ACTIONS

Kapolei Property Development, LLC, an affiliate of the James Campbell Company is proposing to develop approximately 345 acres of land in Honouliuli, ʻEwa District, Kapolei, Oʻahu as an industrial-business park. The project area, including the surrounding Campbell Industrial Park and Kapolei Business Park, was first proposed as an industrial area in the Estate's Master Plan prepared more than 50 years ago. The area was chosen for urban and industrial uses because of its proximity to Kalaeloa/Barbers Point Harbor and the City of Kapolei. The project is consistent with published City and County of Honolulu (the County) and the Estate's goals to create more jobs and a Secondary Urban Center in the Kapolei area.

A range of industrial uses is proposed at Kapolei Harborside Center, but tenants have not been identified. In addition to the industrial-business uses, there will be supporting infrastructure (e.g., roads, storm drain systems, utilities), a hazardous materials area and an area set aside for preservation. *Section 2.0* provides a detailed project description.

The Kapolei Harborside Center requires changes in State land use and County zoning designations.

1.4 REASONS FOR PREPARING THIS ENVIRONMENTAL IMPACT STATEMENT

The Kapolei Harborside Center involves the connection to State facilities (i.e., planned roadways, water, sewer, utility and drainage facilities, etc.) and historic site impacts, which triggers the State Environmental Impact Statement (EIS) requirement. In addition, the EIS is required to support petitions to the State Land Use Commission for State Land Use Boundary Amendment from ~~Agriculture~~ Agricultural District to Urban District and the County for a change in County zoning from agriculture to industrial categories. The changes in project scope, as well as the identification of two historical sites – a plantation era drainage ditch and a staked stone mounds - within or near the site, warranted preparation of a new EIS prepared and processed in accordance with Hawaiʻi Revised Statutes (HRS), Chapter 343, the Environmental Impact Statement Law and Chapter 200 of Title 11, Hawaiʻi Administrative Rules (HAR), State of Hawaiʻi Department of Health (DOH), the Environmental Impact Statement Rules. The Petitioner also intends to use this Final EIS to satisfy the City and County of Honolulu's "significant" zone change requirement in Section 5.4.1 on pages 5-9 to 5-11 of the ʻEwa Development Plan. However, the Petitioner recognizes that the Department of Planning and Permitting may require the provision of additional and more detailed information in the Change of Zone application.

An EIS Preparation Notice was published in the State of Hawaiʻi's Office of Environmental Quality Control (OEQC) Environmental Notice on April 23, 2006. Subsequently, a Draft EIS was published in the State of Hawaiʻi's Office of Environmental Quality Control (OEQC) Environmental Notice on August 8, 2006. This Final EIS (FEIS) was filed with OEQC and copies have been distributed to interested parties (Section 9). Briefly, the purpose of the EIS is to disclose the probable environmental effects of the proposed development; describe measures to minimize adverse effects; and discuss alternatives to the proposed development.

Development of the project area was addressed in a 1990 EIS. A Final EIS was accepted in 1990, under the project title, Kapolei Business-Industrial Park (William E. Wanket, Inc.). The 1990 EIS addressed development of a 533-acre project, which included the proposed Kapolei Harborside Center area. The Final EIS was accepted by the County in April 1990 in support of a petition for Development Plan Amendment from Agricultural to Industrial ~~zoning~~, which was approved in 1991. The 1997 'Ewa Development Plan reflects the Industrial designation *(Figure 1-5)*. Kapolei Business-Industrial Park development plans were suspended since the 1991 approval. In the interim, adjoining properties east, west and south of the project site were developed for industrial use. The subject property represents one of the last phases of industrial development in the Kapolei area.

This document is organized in ten sections.

Section 1 contains a summary.
Section 2 describes the site attributes, the proposed project and its market demand.
Section 3 describes the purpose and need for the proposed project.
Section 4 describes existing environmental, physical and socio-economical conditions, analyzes probable impacts and identifies mitigative measures.
Section 5 identifies the relationship to land use plans, polices, and controls.
Section 6 considers alternatives to the proposed actions.
Section 7 is a summary of unresolved issues.
Section 8 identifies the references used for this report.
Section 9 identifies the agencies and communities members consulted for this report.
Section 10 identifies the preparers of this report.

The following technical appendices are provided to support this Final EIS.

Appendix A Industrial Market Feasibility
Appendix B Preliminary Engineering Report
Appendix C Traffic Impact Assessment Report
Appendix D Impact on Agricultural
Appendix E Economic and Fiscal Impacts
Appendix F Cultural Impact Assessment
Appendix G Archaeological Inventory Survey
Appendix H Survey of Botanical, Avian, and Mammalian Resources
Appendix I Air Quality Assessment
Appendix J Acoustical Study
Appendix K Hazardous Materials Summary
Appendix L Arthropod Inventory and Assessment
Appendix M Affordable Housing Study

1.5 SIGNIFICANT BENEFICIAL AND ADVERSE IMPACTS

Anticipated beneficial and adverse impacts of the proposed project are briefly discussed below. Detailed analysis of beneficial and adverse impacts is provided in *Section 4* of this document.

1.5.1 Beneficial Impacts

Economic Factors: In the short-term, the Kapolei Harborside Center will boost the economy by providing design and construction-related employment.

In the long term, the Kapolei Harborside Center will support diversified business opportunities in the State and provide employment options for the expanding residential communities of Kapolei, ʻEwa, Central Oʻahu and the Waiʻanae Coast consistent with the County policy of directing growth to this region. Proposed for industrial-business uses, Kapolei Harborside Center will support new or expanded Hawaiʻi businesses, markets and services. The new industrial business locations will encourage labor intensive activities, and help increase the State's capacity to adjust to and capitalize upon economic changes and opportunities occurring outside the State. In the long-term, the project is anticipated to provide 3,800 permanent jobs at full buildout and occupancy. As result of the project, indirect employment is expected to increase by another 2,300 jobs. Thus, total direct-plus-indirect employment associated with the industrial operations at full development is expected to exceed 6,000 jobs. Over 4,500 of these jobs are expected to be in the Kapolei/ʻEwa region.

There will be substantial net revenue benefits to the state and county through excise tax, income tax, and property tax revenues. Availability of industrial lands at the proposed location will contribute to an improved competitive position for Hawaiʻi-based businesses and would stimulate economic activity through a multiplier effect. Providing designated areas for industrial land and maritime support activities will foster a favorable business climate in Hawaiʻi.

Land Use: Completion of the project is consistent with the goals, objectives, and policies stated in State and County long-range planning documents. These plans are supportive of urban and industrial growth in the project area.

Natural Resources: Historic sites in the project area have been identified in several archaeological studies. A significant number of historically relevant sinkholes exist in a ~~7.46~~-acre area within the project area. The close concentration of sinkholes has scientific value, and the area around the sinkholes will be preserved. Measures will be implemented at significant sites to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.

1.5.2 Potential Adverse Impacts

Topography and Soils: The project area has been subject to continual excavation and site disturbances due to existing quarrying uses by Grace Pacific and Hawaiian Cement. Grading and grubbing will occur during site development and cut and fill quantities will generally balance within the site as construction progresses. The existing topography will be altered only to the extent necessary for construction of the proposed improvements. The short-term impact of the proposed action on soils is limited to small potential for erosion during construction.

Flora and Fauna: The vegetation on site will be removed during grading and grubbing activities. There are not unique flora/fauna habitats on the project site. There is no important habitat for listed species identified on Oʻahu. No populations of significance were identified in a 2006 survey of the property. Species observed on the project site are dominated almost

exclusively by exotic (introduced) species. No ~~avian~~, mammalian or botanical species found on this site were identified as threatened, endangered or endemic to Hawai'i. No mitigation is required.

Agriculture: The current and planned land uses surrounding the project area are regulated as State Urban District, with no adjacent or nearby agricultural activities. Poor quality soils present limited economic agricultural viability for the land. The project area is an agricultural remnant. Urbanization of this land forecloses the land's future use for agriculture, however, this urbanization for industrial uses supports existing growth policies of the General Plan of the County that calls for continued development of a Secondary Urban Center. Industrial use is consistent with the Petition Area's 'Ewa Development Plan designation. The majority of the soils in the project area (83%) are considered poor by the U.S. Soil Conservation Service's Agricultural Lands of Importance to the State of Hawai'i (ALISH) map series. Only one percent of the project area was designated as Prime soils for agricultural use. No mitigation is proposed.

Visual Resources: Increased urbanization reduces open spaces and views of the natural landscape. The addition of structures to the landscape will impact some existing viewplanes from mauka locations. As the majority of the site is currently open space, there are broad panoramic views from high points across the site and from mauka locations. However, views of the site from makai locations are limited by surrounding industrial development in Campbell Industrial Park and Kapolei Business Park. Existing on-site mounding and uneven terrain limit views across the entire site at ground level. No mitigation is proposed.

Roadways and Traffic: Construction activities will create some short-term effects primarily from trucks, heavy equipment and other vehicles that will use existing roads – primarily Kalaeloa Boulevard and Malakole Street – to access construction areas for the purpose of delivering construction materials and hauling away demolition debris. While construction vehicles are relatively slow and difficult to maneuver, it is anticipated that they will only marginally affect overall traffic flow. Commuting construction workers will slightly increase traffic levels, although their effect is anticipated to be negligible. The project will have long-term impacts on surrounding areas resulting from increases in traffic volumes.

Air Quality: Short-term direct and indirect impacts on air quality will occur during project construction. For a project of this nature there are two types of air pollution emissions that will result in short-term air quality impacts during project construction: (1) fugitive dust from vehicle movement and soil excavation; and (2) exhaust emissions from on-site construction equipment. Indirectly, there will be short-term impacts offsite from slow-moving construction equipment and construction worker traffic to and from the site, and from the disruption of normal traffic flow caused by lane closures of adjacent roadways. After construction of the proposed project is completed and it is fully occupied, carbon monoxide concentrations in the project area will likely increase due to emissions from project-related motor vehicle traffic, but worst-case concentrations will remain within both the State and the national ambient air quality standards. Implementing any air quality mitigation measures for long-term traffic-related impacts is unnecessary and unwarranted.

Noise: Construction activities at the project site will generate noise impacts that are temporary in nature. Anticipated construction noise will be at 80 to 90+ dB at a distance of 50 feet from

heavy construction equipment. Other than the construction workers, who must abide by occupational health and safety standards for hearing protection, the nearest receptors would be more than 50 feet from the property boundary and working or residing within buildings that attenuate sound. The noise generated during construction would not be a health risk but could be a nuisance. Construction activities will be in adherence to DOH guidelines.

Drainage: The project area is designated as Zone D, an area of undetermined, but possible flood hazards on the Flood Insurance Rate Map (FIRM). Because of the elevation and distance from the shore, the project area is not subject to coastal flooding hazards such as storm waves and tsunami inundation. There are no existing stormwater drainage improvements in the project area. Stormwater runoff generated on the site and from adjacent areas drain overland via sheet flow and small ditches to the depressions on the site. With the exception of major storms, very little runoff is generated under existing conditions due to the infiltration characteristics of the soil.

Water Resources: Drinking water is sourced from the Hōʻaeʻae Wells, Kunia Wells 1 and II, as well as Waipahu Wells. Transmission of water from the wells to Kapolei/ʻEwa is via 30-inch and 36-inch transmission mains along Farrington Highway. Additional demands through the Board of Water Supply (BWS) system will be generated by the proposed development. Existing infrastructure - the 20-inch and 24-inch potable water main lines in Kalaeloa Boulevard - will be able to accommodate demands from the proposed project. These mains were installed by the Estate of James Campbell and dedicated to the BWS. The two mains extend down Kalaeloa Boulevard to Malakole Road where the two alignments diverge. The 20-inch main extends to the harbor and the 16-inch main runs toward Kalaeloa. The existing water mains in Kalaeloa Boulevard are intended to supply the drinking water for the expansion areas. An onsite water distribution system will be developed. The proposed project has been provided for in the planning of the regional water systems, resulting in minimal impact to the existing system.

Wastewater: There are no existing wastewater facilities currently within the project site. Individual wastewater treatment systems such as cesspools and septic tanks are used by tenants in the neighboring James Campbell Industrial Park. The project includes a new sewage collection system and pump station onsite. Wastewater from the project area will be conveyed from a new pump station to the existing Honouliuli Wastewater Treatment Plant (WWTP). Currently, the Honouliuli WWTP has a primary treatment capacity of 38 million-gallons per day (mgd) for liquid streams, however, the solids handling capacity is limited to 27 to 29 mgd. The City is planning expansion of the capacity to 51 mgd. The treated effluent is either reclaimed for non-potable reuse in the ʻEwa region or discharges via a deep ocean outfall with a design capacity of 112 mgd.

Solid Waste: Currently, the site generates minimal solid waste. Solid waste will increase during the construction and operation phases. No significant short-term or long-term impacts on the County's existing solid waste collection and disposal system are anticipated as a result of the proposed development. Solid wastes typically generated by construction activities include wood, drywall, cardboard, metals, and other materials. After buildout, solid waste generated during the operational life of the industrial park includes paper, plastic, glass, metals, green wastes and other organics, and other solid wastes.

Power and Communication: The proposed development will result in increased use of electrical energy and utility services. The project area is currently not served by Hawaiian Electric Company (HECO) or Hawaiian Telecom, though they do provide service to the surrounding areas of Kapolei, Ko ʻŌlina, Kalaeloa, and other existing industrial parks. An existing HECO substation is located adjacent to the petition area, makai of the railroad right-of-way and west of Kalaeloa Boulevard. HECO also has various easements along Malakole Road and easements for existing and future 138kV and 12kV overhead lines within the project area. The plan for future uses of this property is within future development plans of HECO and Hawaiian Telecom.

1.6 PROPOSED MITIGATIVE MEASURES

Topography and Soils: All grading operations will be conducted in compliance with the dust and erosion control requirements of the County. During ~~G~~grading ~~P~~permit review and approval, the grading plans for the site will be reviewed by the DPP and specific conditions may be attached.

Roadways and Traffic: On and off site roadway improvements are proposed as part of the project to accommodate traffic needs at full buildout of the project in 2018. The actions proposed to mitigate project impacts include the addition of roadway lanes, turning lanes and traffic controls at various points in and around the project site. Areas of proposed mitigation include:

- Kalaeloa Boulevard-Kapolei Parkway Intersection - add two right-turn lanes at eastbound approach
- Kalaeloa Boulevard-Malakole Street Intersection - add westbound left-turn lane, add eastbound double left-turn lane, and add northbound right-turn lane. (*note: Malakole Street east of Kalaeloa Boulevard is a privately owned roadway by parties other than the Petitioner)
- Hanua Street-Kapolei Parkway Intersection - add right-turn lane on eastbound Kapolei Parkway approach and convert right-turn lane on makai-bound approach to shared through/right-turn lane to increase capacity for through traffic
- Hanua Street-Malakole Street Intersection - provide second (double) left-turn lane on makai-bound approach and widen Malakole Street east of intersection to provide two eastbound lanes to receive double left-turn lanes
- Signal Controls at Intersections - install conduit and pull boxes for potential future signal control at: Hanua Street and Areas 1 & 2 Access Roads, Hanua Street and Opakapaka Street, Hanua Street and Area 5 Access Road/I-2 Access Road, Hanua Street and Lauwiliwili Street Makai, Hanua Street and Area 6/7 Access Road, Hanua Street and Malakole Street.

In addition to specific roadway improvements the project will encourage the use of bicycles for transportation purposes as well as for recreation by adding bicycle lanes or a bicycle path along either Kalaeloa Boulevard or Hanua Street. Also, once Hanua Street is extended through to connect to Malakole Street, one or more TheBus routes will likely be added along Hanua Street, which would provide public transportation access to the project area.

Air Quality: The impact of construction activities on air quality will be mitigated by conformance to State and Federal dust control measures. An effective dust control plan will be implemented to ensure compliance with State regulations. Fugitive dust emissions can be controlled to a large extent by watering active work areas, using wind screens, keeping adjacent paved roads clean, limiting the time that an area can be disturbed, mulching or mechanically stabilizing inactive areas, and be covering open-bodied trucks. Paving and landscaping of project areas early in the construction schedule will also reduce dust emissions. Exhaust emissions will be mitigated by moving construction equipment and workers to and from the project site during off-peak traffic hours.

Noise: Construction activities will meet State DOH standards for noise. Equipment mufflers and construction curfew periods will mitigate noise impacts.

Drainage: To alleviate potential flooding problems from the proposed development and surrounding developments, drainage improvements are planned for the project area. These improvements will include an underground onsite drainage system of catch basins/manholes and pipe culverts, with conveyance to a drainage swale bisecting the site. Integration of non-impervious surfaces within lots will be encouraged to minimize runoff.

Wastewater: The project area will be served by a new sewage collection system and new pump station. Wastewater from the project areas will be conveyed from the new pump station to the Honouliuli Wastewater Treatment Plant (WWTP). The development is expected to generate average wastewater flows of 2.9 mgd, with peak design flows possibly reaching 7.4 mgd.

Solid Waste: A solid waste management plan will be developed that will identify efforts to minimize waste generated at Kapolei Harborside Center during construction and operation. The plan would include a recycling program for tenants as well as construction contractors. ~~Grounds maintenance crews will separate green waste for appropriate disposal to one of the composting companies on O'ahu. Chipping and composting will be utilized to the extent practicable; especially during the operational phase. These activities will reduce the amount of green waste that needs to be transported off site.~~ Measures will be incorporated to reduce green waste by directing appropriate disposal to one of the composting companies on O'ahu. To the extent practical, the construction and design of the project will incorporate the use of recycled-content and encourage recycling practices and other landfill diversion practices. The project will develop a job-site recycling plan for the construction phase of the project and recycle or otherwise provide for beneficial use as much construction or demolition waste as possible. The contractor and lessees will be encouraged to implement a recycling plan.

1.7 ALTERNATIVES

The potential benefits and impacts of three alternative development schemes were evaluated along with a no-action alternative. These analyses and summaries are provided in *Section 7* of this document.

1.7.1 No-Action Alternative

The no-action alternative would involve no changes to the existing site or land use. This alternative would assume the development of the land in accordance with the current zoning on the property, which is agriculture. Under this alternative, the land would probably remain undeveloped. The existing character would remain and any adverse or beneficial impacts from the proposed project would not be generated. If the project is not implemented at this time, it is probable that the land would remain in its present condition until other urban alternatives, were pursued. No new employment opportunities would be created.

1.7.2 Residential Alternative

The 345-acre petition area could be developed as a new residential community. There would be challenges due to adjoining industrial uses as James Campbell Industrial Park and Kalaeloa/Barbers Point Harbor. This project would help satisfy a portion of the needs for both market and affordable housing in the region, but it would also be in conflict with the County's General Plan. No long-term jobs would be created by this development.

1.7.3 Residential/Commercial Mixed Use Alternative

The petition area could also be considered for a new residential/commercial mixed-use development. However, a residential/commercial mixed-use development would not conform to adjacent area uses, the County's General Plan, or the 'Ewa Development Plan. The current and planned industrial uses of neighboring parcels would present a conflict to residents. Commercial demand in the area is expected to be met by development within the City of Kapolei. There would be some job creation under this alternative.

1.8 UNRESOLVED ISSUES

The primary ~~There is one primary~~ unresolved issue remaining at this time~~, namely~~ is the future use and management of an approximate 4-acre remediated hazardous material site. The site is part of a larger area, 10-acres, being discussed with the County for development and dedication as a recreational sports complex. Details are provided in *Section* 7~~8~~.

1.9 COMPATIBILITY WITH LAND USE POLICIES AND PLANS

The proposed action is compatible with existing State policy documents (i.e. Hawai'i State Plan and Functional Plans). The proposed action is also compatible with County policy documents such as the County General Plan and the 'Ewa Development Plan.

1.10 NECESSARY PERMITS AND APPROVALS

Development of the proposed project would require a number of permits and approvals from State and County agencies. A summary of possible required approvals is provided below. Permits and approvals required for the Proposed Action would be pursued following approval of the Land Use District Boundary Amendment Petition. All permits and approvals, including ministerial permits, such as grading and building, will be obtained prior to construction. Due to

the early stage of the development process and the conceptual nature of the proposed development, exact submittal dates of the applications and plans are unavailable at this time. As the proposed project progresses further in development phases, the timing of approvals and permits will become clearer.

Permit or Approval Required (anticipate application dates)	**Authority**
Final EIS (2006)	State of Hawai'i, Land Use Commission
State Land Use Boundary District Amendment (2007)	State of Hawai'i, Land Use Commission
Change in Zone (2007-2008)	Honolulu City Council
Roadway Construction Plan Approval (2008)	State of Hawai'i, Department of Transportation
Construction and Use/Occupancy Permits (2010+)	State of Hawai'i, Department of Transportation
Roadway Master Plan (2008)	City and County of Honolulu, Department of Transportation Services
Subdivision Approvals (varies 2008+)	City and County of Honolulu, Department of Planning and Permitting
Grading Permits (2009) Building Permits (2009) Driveway and Sidewalk Permits (2009)	City and County of Honolulu, Department of Planning and Permitting
National Pollutant Discharge Elimination System Permit (2009)	State of Hawai'i, Department of Health
Water Use Permits (2009)	State of Hawai'i, Department of Land and Natural Resources, Commission on Water Resources Management
Water Master Plan (2009)	City and County of Honolulu, Board of Water Supply
Drainage Master Plan (2009)	City and County of Honolulu, Department of Planning and Permitting
Wastewater Pump Station (2009)	City and County of Honolulu, Department of Environmental Services
Wastewater Master Plan (2009)	City and County of Honolulu, Department of Planning and Permitting
Sewer Connection Permit (2009)	City and County of Honolulu, Department of Environmental Services

2.0 Project Description

2.0 PROJECT DESCRIPTION

Kapolei Property Development, LLC, is planning the development of approximately 345 acres of primarily vacant land for industrial use in the Secondary Urban Center. The project, Kapolei Harborside Center, will offer about 250 acres for industrial, warehouse and related business uses. The remaining acreage will be used for drainage, roadways, a wastewater pumping station, and a preservation area to protect sinkholes having scientific value.

Generally, the project area is located south of the O'ahu Land and Railway Company (OR&L) right of way (ROW), north of Malakole Road, west of Kalaeloa Boulevard and east of the Kalaeloa/Barbers Point Harbor (*Figure 1-1)*. The proposed Kapolei West master planned community borders the area to the north. The adjoining uses to the east, south and west of the proposed project are all existing or planned industrial uses. To the north is a portion of the planned golf course within the Kapolei West community, which serves as a major buffer between the industrial uses and future residential areas. The project roadway connection along Opakapaka Street should restrict heavy commercial traffic to ensure more compatible vehicle traffic.

The project area is owned by Kapolei Property Development, LLC (KPD), Aina Nui Corporation (ANC), and the ~~Estate~~ James Campbell Company (JCC) ~~Estate~~ and is proposed for development by KPD. The project area encompasses several parcels as listed in *Table 2-1*, which lists the acreage by parcel.

Table 2-1
Parcel Tax Map Keys and Areas

TMK	Land Court	Area (acres)	Ownership
9-1-14: 33 (por.)	Lot 14082 (por)	137.529	KPD/ANC
9-1-14: 34	Lot 16914 (por)	19.947	KPD/ANC
9-1-14: 35	Lot 14085	12.845	JCC ~~EJC~~
9-1-15: 20 (por.)	Lot 16914 (por)	174.198	KPD/ANC~~/ EJC~~
Total Petition/Project Area		**344.519**	

2.1 HISTORICAL PERSPECTIVE

The historical and cultural context of the subject property and surrounding region is an important consideration in designing the project for this planned industrial-business project. The following summaries are based on traditional and historical literature review and the ethnographic data and analyses (Cultural Surveys Hawaii, 2006) *(Appendix F)*.

Various legends and early historical accounts indicate that pre-contact Hawaiians once heavily populated the ahupua'a of Honouliuli. This substantial settlement is attributable primarily to the plentiful marine and estuarine resources available at the coast, forest resources along the slopes of the Wai'anae Range, as well as lowlands suitable for wetland cultivation.

Subsequent to western contact in the area, the landscape of the 'Ewa plains and Wai'anae slopes was changed by the over-harvesting of the sandalwood forest, and the introduction of

domesticated animals and exotic plant species. Domesticated animals including goats, sheep and cattle were brought to the Hawaiian Islands by Capt. George Vancouver in the early 1790s, and allowed to graze freely about the land for some time after. A longhorn cattle ranch existed in Waiʻanae by at least 1840. During this same time, and perhaps as early as 1790, exotic vegetation species were introduced to and flourished in the area.

Following the Mahele of 1848, the project area was part of a 43,250-acre land grant, which, from 1871 to 1877, was leased for cattle grazing. In 1877, James Campbell purchased most of the property (including the project area) for cattle ranching - an activity that lasted until 1899. In 1889, Campbell leased his property to Benjamin Dillingham, who subsequently formed the Oʻahu Railway and Land Company (OR&L) as the result of a franchise granted by King Kalākaua in 1886. In 1889, Dillingham opened the first nine miles of narrow gauge track on the King's birthday. To attract business to his new railroad system, Dillingham subleased all land below 200 feet to William Castle who in turn sublet the area to the ʻEwa Plantation Company for sugar cane cultivation.

The ʻEwa Plantation Company grew quickly and continued operating until 1970 when the Oʻahu Sugar Company took over operations. As a means to generate soil deposition on the coral plain and increase arable land in the lowlands, the ʻEwa Plantation Co. installed ditches running from the lower slopes of the mountain range to the lowlands and then plowed the slopes vertically just before the rainy season to induce erosion. Sugarcane cultivation was continued until 1995 when Oʻahu Sugar Company closed. About 167 acres (49%) of the project area were used for growing sugarcane. The remaining acreage was unsuitable for cultivation. Over 200 acres of the site was previously utilized for coral mining operations for the manufacture of cement and concrete products.

2.1.1 Land Use History

The following information provides a brief chronological land use history of the project area from the mid-1800s to present time.

1848: Following the Mahele, 99 individual land claims in the *ahupuaʻa* of Honouliuli were registered and awarded by King Kamehameha III. The present project area appears to have been included in the largest award granted. In January 1848, Miriam Keʻahi-Kuni Kekauʻānohi acquired a deed to all unclaimed land within the *ahupuaʻa*, totaling 43,250 acres. The property later passed to various family members.

1871: The property is leased to James Dowsett and John Meek in 1871 for stock running and grazing.

1877: James Campbell purchased most of Honouliuli Ahupuaʻa - including the present project area - for a total of $95,000 and continues cattle ranching on the land.

1889: Campbell leased his property to Benjamin Dillingham who develops a railroad and formed the Oʻahu Railway and Land Company. To attract business to the new railroad system, Dillingham subleased all land below 200 feet to William Castle who in turn sublet the area to the ʻEwa Plantation Company for sugar cane cultivation, which continues until 1970.

1960: Hawaiian Cement Co. begins operations of quarrying and stockpiling for the production of cement.

1970: O'ahu Sugar Company took over operations from 'Ewa Plantation Company and continues sugar cultivation on a portion of the site.

1982: The Army Corps of Engineers begins dredging of O'ahu's second deep draft harbor at Barbers Point.

1986: The Army Corps of Engineers completes dredging of Barbers Point Harbor and turns over control to the State. The harbor officially opens in 1990 with the completion of a 1,600-foot pier and 30-acre cargo-handling yard.

1990: The Estate of James Campbell submits a Final Environmental Impact Statement to the City and County of Honolulu for a 'Ewa Development Plan Amendment to rezone the project area to urban for industrial uses.

1991: The Development Plan Amendment from the Agricultural to Industrial designations was approved.

1995: Sugarcane cultivation on a portion of the site ends with the closure of O'ahu Sugar Company.

Current: The following operations lease land within the project area:

Milo Nursery & Landscape Maintenance, Inc. (MN)
MN leases approximately 32 acres for nursery operations. The company is a wholesale nursery that sells to various landowners, companies, landscapers, and contractors. Services include landscaping of building grounds, landscape maintenance, and street sweeping. MN employs about 10 employees.

Menehune Green, LLC (MG)
MG leases about 52 acres for composting green waste. MG is a new company that purchased the State's largest composting operation in late 2005. It is affiliated with other Hawai'i companies involved in commercial waste disposal, and with a mainland company that operates the largest yard-waste composting site in the United States.

Grace Pacific (GP)
GP leases approximately 6 acres for sporadic quarrying, processing of limestone, and stockpiling. Most of these uses are limited at this time. The quarrying activities have supplied basalt aggregate to the construction industry for highway construction, bridges, airports, and commercial & residential projects. GP's primary activity on site is overseeing and maintaining the existing stockpiles. GP does not have permanent employees on site.

Hawaiian Cement (HC)
HC leases approximately 67 acres for limestone extraction to produce concrete, aggregate and cement products. HC has been a user on the site for over 30 years, though current operations have been minimal in recent years. HC retains no permanent employees on site. HC's current operations at this site are limited to periodic material extraction.

2.2 KAPOLEI HARBORSIDE CENTER LAND USE PLAN

The Kapolei Harborside Center conceptual land use plan is shown in *Figure 2.1*. The project area will be developed with four primary land use components including: (1) a range of industrial uses (251 ~~250~~ acres), (2) infrastructure (74 acres), (3) preservation area (6 ~~8~~ acres), and (4) a capped hazardous materials area and buffer areas (13 acres).

2.2.1 Industrial Business Uses

Kapolei Harborside Center is planned as a industrial-business park to serve O'ahu's growing need for this type of commercial space. It will be similar in character to the existing Kapolei Business Park that is located across Kalaeloa Boulevard from the project. Projected tenants will include: light manufacturing and warehousing in proportions similar to other industrial parks on O'ahu. These industrial service businesses will support the growing population in the 'Ewa region. Industrially zoned lands may be used for a wide range of land uses under the County Land Use Ordinance parameters.

Kapolei Harborside Center will provide opportunity for a range of new or expanded Hawai'i businesses, markets, products and services, and employment. Though, specific tenants at Kapolei Harborside Center have not yet been identified, potential uses include businesses that are related to construction and building, automotive or other repair establishments, storage and warehousing, wholesaling and distribution, food manufacturing and processing, maritime related activities, salvage and scrap storage and processing, parcel and package handling facilities, film and television production, publishing facilities, equipment sales and rentals, and general manufacturing, processing and packaging. Heavy Industrial uses are allowed upon industrial rezoning, but these types of uses are more appropriate for sites in the James Campbell Industrial Park.

Lots within Kapolei Harborside Center are expected to range between 1 to 3 acres in size based on comparable existing projects in the area. However, the project could be developed with up to as many as 2,000 lots based on several potential industrial zoning designations. The actual number of lots, lot sizes, types of lots, and selling range are conceptual and subject to further planning and market conditions. ~~Lot sizes will be relatively large, ranging from 1 to 3 acres.~~ Many uses anticipated for the project area would require large spaces to operate, such as warehousing and storage activities. The layout provides the most convenient access to transportation routes for the majority of tenants and the most efficient configuration given existing site constraints. The industrial business use area also includes internal service roadways and other utility functions.

The proposed industrial use is consistent with the State's goals to provide economic vitality, stability and growth for present and future generations. The requested changes from the ~~Agriculture~~ Agricultural District to Urban District will further grow the Secondary Urban Center at Kapolei. The proposed project will provide diversified economic and employment options for a growing population in the Kapolei/'Ewa area. A major consideration in public policy is to provide alternative employment centers to Kapolei outside of the existing urban core and Honolulu primary urban center, thereby redirecting traffic flow to centers in 'Ewa.

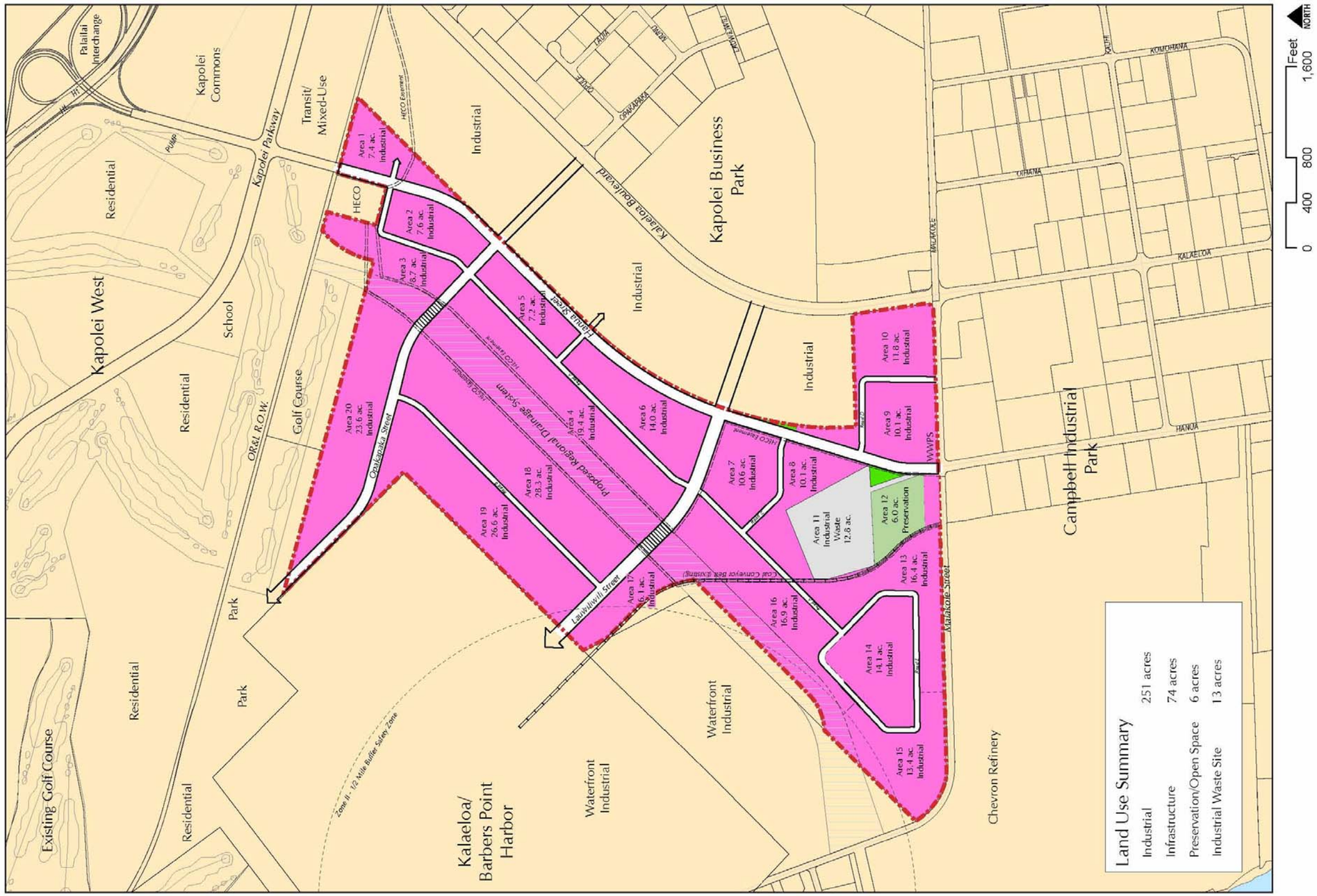


Figure 2-1. Kapolei Harborside Center Land Use Plan

2.2.2 Infrastructure

Roadways and Circulation: Presently, Kalaeloa Boulevard, a divided four-lane highway, aligned in a north-south direction, serves as the roadway access into the existing James Campbell Industrial Park and Kalaeloa/Barbers Point Harbor. The two-lane Malakole Road intersects Kalaeloa Boulevard in a stoplight-controlled cross intersection and serves as the access into the Kalaeloa/Barbers Point Harbor area (*Figure 2-2)*.

The project would include the construction of ʻŌpakapaka Street as well as provide land for other major regional roadways (portions of Hanua Street and Lauwiliwili Street Makai extension) that would serve both the project and regional traffic. ʻŌpakapaka Street would be extended as a two-lane roadway from Hanua Street Extension to the western boundary of the project site. In an effort to address connectivity in the conceptual land plan for Kapolei Harborside Center, Opakapaka Street is shown as planning to connect to Kapolei West. It is the Petitioner's intent, however, that heavy commercial traffic should be restricted from this route to avoid potential conflicts with the adjoining residential community traffic.

Hanua Street, a second major road serving Kalaeloa/Barbers Point Harbor is planned to serve as the major arterial connection to the harbor. The 2030 Oʻahu Regional Transportation Plan (ORTP) describes Hanua Street Extension from Malakole to Farrington as a new four-lane roadway, and the constructions of new on- and off-ramps (two lanes/ramp) at the Interstate Route H-1 Palailai Interchange for the Hanua Street Extension, as project numbers 85 and 111, respectively. ~~Hanua Street, a second major road serving Kalaeloa/Barbers Point Harbor is planned between H-1 and Malakole to serve as the major arterial connection to the harbor. It is listed as project number 84.111 on the Transportation Improvement Program (TIP) on the 2006-2008 Oʻahu Regional Transportation Program (ORTP).~~ Additional planned regional roadway improvements include constructing a new road, Lauwiliwili Street, between Kapolei Business Park and Kalaeloa/Barbers Point Harbor, which will serve as the primary State access to the Harbor. Minor roads will be developed as part of the project for internal site circulation. Phased improvements, such as signalizing intersections and adding lanes to existing roadways, will be constructed over time to accommodate the anticipated increase in industrial-related traffic. The project will promote connectivity to adjacent areas. Specific issues regarding connectivity will be addressed as project planning and design advances for the change of zone process. The project will meet street lighting standards in accordance with the future anticipated roadway classifications.

In addition to specific roadway improvements the project will encourage the use of bicycles for transportation purposes as well as for recreation by adding bicycle lanes or a bicycle path along either Kalaeloa Boulevard or Hanua Street. Also, once Hanua Street is extended through to connect to Malakole Street, one or more TheBus routes will likely be added along Hanua Street, which would provide public transportation access to the project area.

Drainage: The major element of the proposed drainage improvements is a large regional drainage swale running through the project site *(Figure 2.1)*. It will be sized to accommodate peak runoff from the entire watershed, based on County Storm Drainage Standards. Preliminary analysis of the drainage requirements indicates that a trapezoidal swale with a bottom width of approximately 240-feet and 10-feet deep will be needed to convey runoff

through the site to an off-site outfall. Industrial parcels will include drainage facilities serving the specific parcel use. It is anticipated that this will be handled by the installation of an underground onsite drainage system of catch basins/manholes and pipe or box culverts.

Wastewater: Wastewater generated from the Kapolei Harborside Center is expected to be mainly of domestic composition. Industrial discharges will require on-site pretreatment before release to the City system. A new regional wastewater pump station (WWPS) is planned at the intersection of Malakole and Hanua Streets. Wastewater generated from the proposed development will be collected by a series of gravity sewers and conveyed to a centralized wastewater pumping station. The wastewater would then be pumped via force main to a main trunk sewer running along the railroad ROW for transport to the Honouliuli (WWTP), which has adequate capacity to accommodate the proposed industrial uses. Certain types of Industrial wastewater will require pretreatment prior to release into the city collection system per County and DOH rules. It is intended that the collection system, pump station and force main be dedicated to the County. Implementation of the wastewater facilities will be done in phases, according to the development schedule of the project.

Water Supply: Review of the 'Ewa Water Master Plan and a preliminary hydraulic analysis, indicates that the existing 24-inch and 20-inch mains in Kalaeloa Boulevard will accommodate demands from the planned industrial users at Kapolei Harborside Center.

New water distribution lines will be installed in the interior roadways to service the industrial lots. A dual water system is anticipated, which will use drinking water for domestic uses and non-potable water for irrigation and other non-consumptive uses. According to BWS's design criterion for dual systems in industrial areas, the dual water system will reduce the potable water requirements by approximately 65%. The project will install 12- and 16-inch water lines that will meet the drinking water and fire suppression requirements.

Utilities: Electrical systems will be installed to serve the new industrial operations. The Petitioner ~~Estate~~ supports the State energy conservation goals and will incorporate energy saving design practices and technologies in the design phase. Energy efficiency design guidelines will be developed as part of the Conditions, Covenants and Restrictions that will apply to the development of the project site. These "guidelines" will be submitted to the Energy Branch, State Department of Business, Economic Development and Tourism for its review and input. Energy conservation measures are discussed in *Section 4.15*.

Based on information provided by HECO, the projected load requirements are estimated at 43.5 to 65.2 MVA for the project area. Preliminary consultations with HECO and HawTel indicate that service can be provided to the project. HECO has further advised that easements may be required in those cases where the proposed roads are not aligned in such a manner to accommodate overhead lines. These easements will need to align with the drainage channel and Hanua Road and could serve as pedestrian access on the site.

Communications: Communication services (telephone and cable) will be extended into the site to serve the tenants.

2.2.3 Preservation Component

~~More than 40 sinkholes, eligible for listing National/Hawai'i Register of Historic Places, are located within an 7.4 acre archaeological/paleontological Preserve Area at the southwest corner of the site. The preserve was created in the 1990s and is bound by a chain link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. The close concentration of sinkholes has scientific value, and the 7.4-acre area surrounding the sinkholes will be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.~~

Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

The preserve area was formed in the early 1990s, with the guidance of Bishop Museum zoologist Dr. Alan Ziegler, who conducted substantial investigations of the sinkhole resources. In December 1992, Dr. Ziegler walked the site with representatives of the Estate of James Campbell, to delineate the position for a boundary fence to protect the significant sinkhole resources. The area was subsequently fenced by the Estate. At the time the fence was erected, the area of the preserve was estimated to be between 7 and 8 acres, but was never formally surveyed. In the Draft EIS, the approximate land area for the sinkhole preserve was erroneously estimated to be 7.4 acres. As a follow-up to inquiries regarding the sinkhole preserve, Kapolei Property Development commenced a land survey of the fenced area in October 2006. The survey indicates an actual area of approximately 6 acres enclosed by the boundary of the fenced sinkhole preserve. Sinkhole resources of significance lie within this approximate 6-acre area, as bounded by the AES coal conveyor to the west, the HWS waste pile to the north, existing Hanua Road to the east, and an existing access road off Hanua Road serving the compost business tenant. The land between Malakole Street and the fence is not included in the sinkhole preserve area, as it includes an easement for pipelines and the roadway access to the adjoining compost business tenant.

The close concentration of sinkholes has significant scientific value, and the approximate 6-acre area will continue to be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The existing fence has gaps in two portions that will be closed, and locked gates will be added. The sinkhole preserve will continue to be accessible for future research and education.

Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

2.2.4 Hazardous Material Areas

Beginning in 1959, Hawaiian Western Steel (HWS) built and operated a secondary steel mill in the Campbell Industrial Park to convert scrap metal into steel reinforcement bar (rebar). In approximately 1970, HWS began using the Waste Pile area for the disposal of plant-generated waste (e.g. wet scrubber material, mill scale [iron oxide], slag, scrap steel, electrode remnants, baghouse dust, and furnace bricks). HWS discontinued disposal operations at the Waste Pile in 1986; plant operations ceased in 1991. A total of approximately 100,800 cubic yards of material had been disposed at the Waste Pile during its operation.

The waste material is encapsulated in a 2 to 3 foot thick engineered containment, consisting of compacted coral, a geomembrane, a geotextile and a 2.5 to 3.0 inch asphaltic concrete cap. The portion of the waste pile that is transected by the existing Hanua Street extension is lined with concrete bollards to prevent vehicular entrance to the site. The facility is inspected on a semiannual basis and repairs are made as needed. The facility is currently in its tenth year of post closure- care of a thirty-year period required by the Resource Conservation and Recovery Act (RCRA) program. EPA approved cessation of monitoring between 1999 to 2005, at which time EPA approved termination of groundwater monitoring. An application for a RCRA Post Closure Permit has been prepared and will be submitted to the Hawai'i Department of Health in 2006.

An area of petroleum affected soil and groundwater adjacent to the Chevron refinery represents the northern fringe of a large plume of separate-phase hydrocarbon (SPH) underlying the storage tank farm and adjacent areas of the refinery. The SPH plume was believed to be caused by historical releases of various petroleum products leaking through the bottom of the above-ground bulk fuel storage tanks before they were retrofitted with double-walled construction in the 1980's and early '90s. In the mid 1990s, Chevron conducted an risk assessment investigation of the area north of Malakole road to define the boundary of the SPH plume and collect information required to design a remediation system for the portion of the plume that was not on Chevron property. An active skimming remediation system was installed and operated until the yield of SPH declined to levels that indicated skimming was no longer effective. The remediation effort was conducted with oversight from the EPA Region 9, and the DOH. Results from a 2005 monitoring and testing indicated that the remediation was quite successful in reducing the amount of petroleum in the groundwater and soil. The results also indicate that natural bioattenuation is occurring at the site and the area of impacted soil and the dissolved plume are stable and slowly receding. EPA and DOH accepted the risk assessment and signed off on the site in 1998.

The former HWS waste pile and the area north of Malakole Street adjacent to the Chevron refinery are both areas where past releases of hazardous chemicals were addressed through a combination of institutional controls, containment, and remediation. In both areas residual chemical concentrations require that the institutional controls and containment systems be maintained in perpetuity. The Waste Pile area will remain in its current state. The Petitioner is in discussion with the City and County of Honolulu regarding transferal of approximately 10 acres, of which the petroleum affected area is a part, for use as a recreational sports complex. Other potential uses of this site include capping the area and converting it to a parking lot. These sites are located in *Figure 2.2*.

Figure 2-2. Hazardous Materials Sites

2.3 DEVELOPMENT SCHEDULE AND PROCESS

Project development and implementation is scheduled to begin immediately following approvals of necessary land use amendments, zoning, and permits.

Full buildout for the Kapolei Harborside Center project is intended to be implemented by 2018. Construction of roads, industrial pads, along with support infrastructure and utilities would be phased over a ten-year period. Full build-out of the industrial pad developments is estimated at ten years, dependant upon parcel sales and absorption. Detailed development phasing is not yet available at this point in the process. Construction of the regional drainage system, a portion of which crosses the project area and will receive flows from mauka lands, ~~is expected to be completed prior to full development of Kapolei Harborside Center~~ will be completed in conjunction with the timing of development of Kapolei Harborside Center and the mauka lands. The on-site swale portion of the regional drainage system will be completed as part of the subject project.

3.0 Purpose and Need for the Proposed Land Use Boundary Classification Amendment

3.0 PURPOSE AND NEED FOR THE PROPOSED LAND USE BOUNDARY CLASSIFICATION AMENDMENT

3.1 LOCATIONAL ATTRIBUTES

The Kapolei Harborside Center project area consists of 345 acres of predominantly vacant land in Honouliuli, 'Ewa District, Kapolei *(Figure 1-1)*. The site is strategically located between Kalaeloa/Barbers Point Harbor and the existing industrial areas of Campbell Industrial Park and Kapolei Business Park, on the periphery of the rapidly expanding City of Kapolei. The project area is bounded on the east, west and south by existing industrial areas and on the north by vacant land proposed for the master planned community of Kapolei West. The property is privately owned by Kapolei Property Development, LLC, Aina Nui Corporation and the ~~Estate~~ James Campbell Company, LLC and proposed for development by Kapolei Property Development, LLC.

All of the current and planned land uses surrounding the project area are urban, with no adjacent or nearby agricultural activities. Thus, the project area is an agricultural remnant. Reclassification of the Petition Area to the Urban District and the subsequent County Zone Change Application would permit the Petition Area to conform to the surrounding land uses. Consistency with the Land Use Commission's requirements for reclassifying land from ~~Agriculture~~ the Agricultural District to Urban District is discussed further in *Section 5.0 Conformity of the Project to Applicable Plans.*

3.2 PURPOSE AND NEED FOR DEVELOPMENT

The project site, including the surrounding Campbell Industrial Park and Kapolei Business Park, was first proposed as an industrial area in the Estate~~'s~~ of James Campbell's Master Plan developed over 50 years ago. The area was chosen for urban and industrial uses because of its proximity to Kalaeloa/Barbers Point Harbor and the City of Kapolei. The stated goal of the County and the ~~Estate~~ Petitioner is to create more jobs and a secondary urban center in the Kapolei area. The project represents the one of the last phases of industrial development in the Kapolei area.

Growth in Kapolei and the 'Ewa region has created a critical mass for employment opportunities and increased the need for dedicated public services. Since the mid-1990s, over $1 billion in commercial investments have been made and almost 800 businesses have been established providing over 25,000 jobs in the Kapolei region. Since 1997, forty-three major development projects have been completed. Over the next 20 years, 'Ewa is expected to grow three times faster than the Primary Urban Center. Population growth is expected to translate into job growth, which in turn generates a demand for additional industrial land in the region. Development of Kapolei Harborside Center satisfies some of this demand and presents new employment opportunities to residents of this growing region.

Kapolei Harborside Center will accommodate future industrial growth by providing additional industrial, including maritime-related lease space. The project will also accommodate existing

businesses that are being displaced from Honolulu. Extremely low vacancies and the potential conversion of existing industrial areas to alternative uses have put the O'ahu industrial market in a "frenzied" state, with industrial developers unable to meet demand (RCL, 2005). Industrial demand in the County is based on pent-up demand, annual employment-driven demand, and transient demand.

3.2.1 Market Analysis

A market feasibility study was conducted by Robert Charles Lesser and Co., LLC (2005). Kapolei Harborside Center is expected to capture a significant share of Honolulu County's growing industrial demand. Full build-out is anticipated over a period of ten years (2009-2018). This short timeframe is due to pent-up demand, annual employment-driven demand, and transient demand from transitioning markets, and industrial tenants with expiring ground leases.

The lack of available industrial land is an island-wide problem. Hawai'i's robust economy makes Honolulu's industrial real estate market one of the tightest in the nation, according to a 2005 report by commercial real estate firm Colliers Monroe Friedlander.

More than 600,000 square feet of new industrial space is scheduled to become available by 2007 in West O'ahu, yet this may not be adequate to satisfy demand from the expanding labor market. Honolulu's low 1.8 percent vacancy rate is creating difficulties for industrial tenants who want to lease warehouse or industrial space. Colliers Monroe Friedlander correctly predicted industrial space rents would rise 8 to 12 percent higher in 2006 than the previous year. An economic assessment study of the 'Ewa region by Decision Analysts Hawai'i, Inc. (2005), estimates the need for an additional 16 million square feet of light and heavy industrial space in the 'Ewa region by 2025. The proposed project will help meet the demand for industrial land by increasing the regional and island-wide supply of industrial land.

The market feasibility study determined that, in 2005, O'ahu had a supply of undeveloped industrial land of about 729 acres, of which about 485 acres are likely to be developed for industrial users. By the beginning of 2009, this supply is expected to decrease to about 582 acres, of which about 349 acres are likely to be developed for industrial users. The decrease in available industrial land reflects:

a. about 73 acres to supply pent-up demand (i.e., development that will restore vacancy rates to about 5%) and,
b. about 74 acres to supply demand associated with economic growth (about 25 acres per year over a 3-year period, based on over 5,000 new jobs per year, a low estimate of 80 square feet per worker, and a FAR of 40%).

At the beginning of 2009, this projected supply of about 349 acres will be comprised of the following: approximately 250 acres (updated from 240 acres in the Market Feasibility Study) for the Project, about 54 acres elsewhere in West O'ahu, and about 44 acres for the remainder of the island. Thus, the Project accounts for about 85% of the West O'ahu supply of undeveloped industrial land that is likely to be developed for industrial users, and about 72% of the island-wide supply.

Over the 10-year life of the Project, about 250 acres of industrial land will be developed on O'ahu - about 74% of the available supply, with development based on about 25 acres per year over a period of 10 years. The Project is expected to capture about 157 acres (about 63%) of the total development, based on an absorption rate of about 17 acres per year for a period of slightly more than 9 years.

In addition, about 110 additional acres will be developed in West O'ahu for tenants relocating from other industrial areas on O'ahu, based on about 11 acres per year for a period of 10 years. The Project is expected to capture about 83 acres (about 76%) of the additional 110 acres, based on an absorption rate of about 9 acres per year for a period of slightly more than 9 years. Thus, the Project is expected to be absorbed at a rate of about 26 acres per year.

3.2.2 Economic Benefits

The proposed Kapolei Harborside Center is consistent with the State's goals to provide economic vitality, stability and growth for present and future generations. The requested reclassification from ~~Agriculture~~ the Agricultural District to Urban District will further urbanize the area and strengthen the concept of the secondary urban center at Kapolei. The proposed project will provide diversified economic and employment options for a growing population in the Kapolei/'Ewa area. Availability of industrial lands at the proposed location will contribute to an improved competitive position for Hawai'i-based businesses and will stimulate economic activity through a multiplier effect. Providing designated areas for industrial land and maritime support activities will help foster a favorable business climate in Hawai'i.

Construction expenditures for infrastructure and building space are estimated at about $590 million, or an average of about $59 million per year over 10 years. In addition to construction expenditures, development activities will generate indirect sales associated with supplying goods and services to construction companies and to the families of the employees of these companies. In turn, the companies supplying goods and services, and the families of the employees of these companies will purchase goods and services from other companies, and so on. Based on State economic multipliers, these indirect sales are expected to average about $63 million per year. Although not estimated, additional development costs include planning, permitting, design, financing, City and State exactions, and marketing and sales.

Lot sales, construction expenditures and indirect sales related to development activities are expected to total about $146 million per year during the 10-year development period. About $113 million per year will be subject to the 4.5% excise tax on final sales, while about $33 million per year will be subject to the 0.5% excise tax on intermediate sales. Profits on these sales are estimated at about $16 million per year.

At full occupancy, tenants at Kapolei Harborside Center are projected to generate sales revenues of about $675 million per year. In turn, the tenants' purchases of goods and services from other companies, along with purchases by the families of their employees, will generate additional sales amounting to about $473 million per year. Thus, direct-plus-indirect sales by the industrial operations at full development are expected to reach about $1.15 billion per year at full development of the Project. Most of the onsite sales will be subject to the 0.5% excise tax on intermediate sales.

Revenue to the County will result in about $6 million in highway impact fees and excise taxes for transportation improvements generated by the 10 years of development activities and net revenues of about $8 million per year derived from the industrial operations after full development of the project. A net of about $45 million in revenues will be generated for the State by the 10 years of development activities. Based on revenues generated from highway impact fees, an additional $8 million for highway improvements will be generated for the State. Additional net revenue of at least $8.4 million per year will be derived from the industrial operations after full development of the project for the State. These increases in net revenues will allow the County and State to help fund various government facilities and services that will benefit communities throughout O'ahu and the State.

3.2.3 Jobs and Employment

The development of industrial sites at Kapolei Harborside Center will provide new job opportunities for the expanding communities of Kapolei, 'Ewa, Central O'ahu and the Wai'anae Coast. Currently over 25,000 jobs are in the Kapolei/'Ewa region. James Campbell Industrial Park is the area's largest job center, providing approximately 4,600 jobs. By 2025, 65,000 jobs are expected to be located in the Kapolei/'Ewa region. Public policy is to redirect traffic currently flowing into Honolulu Primary Urban Center by providing a second urban core at the City of Kapolei outside of the existing urban core.

In the short-term, the project would be consistent with this public policy by providing added employment for construction workers, and professionals involved in project design and permitting. Kapolei Harborside Center will provide employment for about 450 construction workers during the 10-year development period, with a payroll of about $29 million per year during development activities. Average employment of about 640 additional workers dependent on construction activities will be supported, with a payroll of about $24 million per year. Approximately 710 direct and indirect jobs in the Kapolei/'Ewa region will be generated by the project's construction.

At full occupancy, the project is anticipated to provide almost 3,800 permanent new industrial jobs, with a payroll of about $176 million per year (versus about 40 jobs for current activities on the property). About 2,300 additional jobs are dependent on the industrial operations; along with a payroll of about $88 million per year will result from the project's development. Thus, total direct-plus-indirect employment associated with the industrial operations at full development is expected to exceed 6,000 jobs. Over 4,600 of these jobs are expected to be in the Kapolei/'Ewa region. The new jobs provided by the project will result in less commuting by Kapolei/'Ewa residents to jobs outside the region.

4.0 Existing Conditions, Probable Impacts and Mitigative Measures

4.0 EXISTING CONDITIONS, PROBABLE IMPACTS AND MITIGATIVE MEASURES

Existing conditions and potential impacts associated with the construction and operation of the Kapolei Harborside Center project are discussed in this section. Also described are mitigative measures that are proposed to minimize anticipated adverse impacts.

4.1 EXISTING USES AND ACTIVITIES

Existing Conditions

The project area is approximately 345 acres of land in Honouliuli, ʻEwa District, Honolulu. The site, in general, is bounded by vacant industrially-zoned land, Kalealoa Boulevard and Kapolei Business Park to the east, Malakole Road and Campbell Industrial Park to the south, Barbers Point/Kalaeloa Harbor and supporting industrial areas to the west and the proposed Kapolei West master planned development to the north. The project area encompasses several parcels including Tax Map Key (TMK) (1) 9-1-14: por. 33, 34, 35 and (1) 9-1-15: por. 20.

Uses on the project site include a plant nursery, a greenwaste collection and processing operation, fill material stockpiling, a coal conveyor belt that transports coal from the harbor to power stations to the south of the site, a capped waste pile, and sinkhole preservation.

Full-time agricultural uses on the site ended in 1995 after Oʻahu Sugar Company ceased cultivation of approximately 145 acres in sugar cane cultivation. Over 200 acres of the site was previously utilized for coral mining operations for the manufacture of cement and concrete products. The project area *(Table 4-1)* has the following State and County land use designations *(Figures 1-3, 1-4, 1-5)*:

Table 4-1
State and County Land Use Designations

Jurisdiction	Existing Designation	Proposed Designation
State Land Use	Agricultural District	Urban District
County Zoning	AG-1 Restricted Agriculture, AG-2 General Agriculture	Industrial
City & County of Honolulu ʻEwa Development Plan	Industrial	No change ~~Same~~

Probable Impacts

Existing leases for use of the project area will expire prior to construction. The lessees ~~leasees~~ may experience short-term impacts associated with identifying suitable areas to relocate, but they have been given advance notice of redevelopment. The agricultural impacts of the loss of leases are addressed in *Section 4.8*. No short- or long-term adverse impacts are anticipated to existing uses.

The proposed development is consistent with the State and County goals, but is not consistent with current State and County land regulation. The change from agricultural designations to Urban and Industrial would have beneficial long-term impacts on socio-economics as described in *Section 4.167*, and no adverse long-term impacts on State agriculture as described in *Section 4.8*.

Mitigative Measures

The sinkhole preserve will remain protected within a fenced enclosure. The EPA approved capped waste pile and buffer area will remain undisturbed.

4.2 TOPOGRAPHY/GEOLOGY

Existing Conditions

The natural topography of the project area is generally level with mounds and depressions scattered across the site *(Figure 4-1)*. Ground surface elevations at the project area range from 5 mean sea level (msl) near the intersection of Kalaeloa Boulevard and Malakole Street to approximately 75 feet msl near the northwest corner of the petition area. Slopes of less than 0.5 percent to 5 percent are found on the site. In general the area slopes from the OR&L ROW to Malakole Road, with an average slope of approximately 1 percent.

A large stockpile of coralline material from the excavation of Barbers Point Harbor occupies approximately 50 acres in the southwest portion of the project area. The geologic substrate beneath the site is comprised of relatively homogeneous coral deposits. There are no known structural discontinuities (i.e., faults) in the area. A number of sinkholes and depressions exist within the Petition Area and surrounding areas. These will be discussed in more detail in *Section 4.6 Archeological and Historic Resources*. A portion of the project area has been subject to continual excavation and site disturbances due to existing quarrying uses by Grace Pacific and Hawaiian Cement. See *Figure 4-1* for site topography.

Probable Impacts

While the site will be graded almost in its entirety to form the necessary building pads, roadbeds, and drainage the same low slope will generally remain after the grading is completed. The major physical landmark is the large stockpile of coralline material left from the excavation of Kalaeloa/Barbers Point Harbor. The stockpile will be distributed throughout the region to other Kapolei projects, and some may be used for fill for the project, and thus, this artificial feature will not exist upon completion of the project.

Mitigative Measures

Mitigation will consist of implementing construction period erosion control best management practices, discussed in *Section 4.8*.

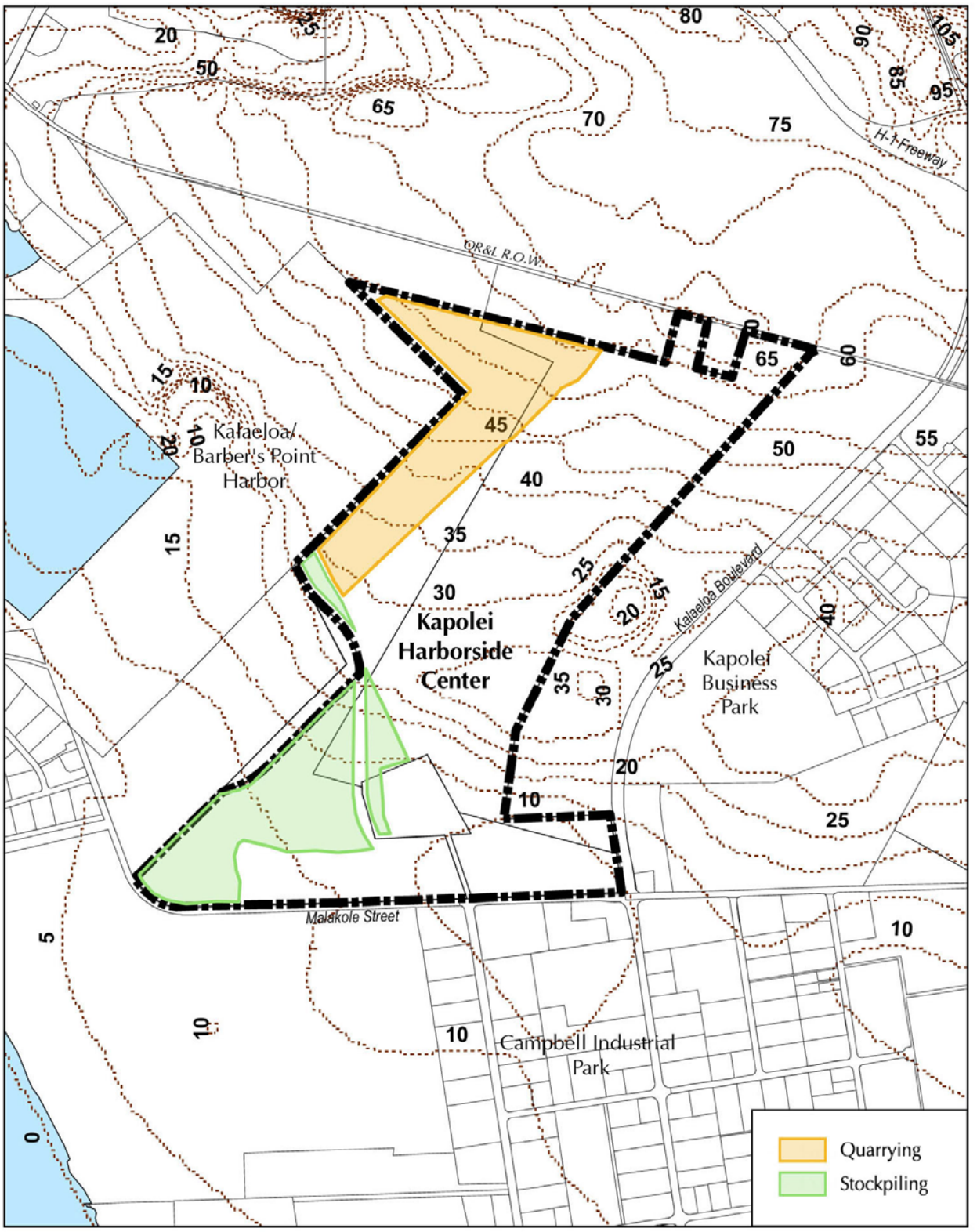


Figure 4-1. Site Topography

4.3 HYDROLOGY

Existing Conditions

Climate
The project is located in the semi-arid 'Ewa region, which is one of the sunniest areas on O'ahu. Rainfall is light, averaging approximately 21 inches per year. Most of the total annual precipitation occurs during the winter season, between October and April, while the summer months are hot and dry. Average low temperatures range from about 61 degrees Fahrenheit (ºF) in winter to about 70 ºF. in the summer. Average high temperatures range from about 80 º F in the winter to about 88 º F in the summer.

Steady northeast tradewinds prevail during the spring and summer months; during the fall, the tradewinds tend to give way to light and variable winds throughout the winter. Storms are infrequent and generally occur during the winter months, although tropical storms and hurricanes occasionally approach the island between June and November.

Surface Water
The nearest surface water is the Pacific Ocean located 0.37 miles west-southwest of the site. The project is located at the lower elevations of a watershed that encompasses approximately 2,400 acres and extends approximately six miles inland from the coast. There are no streams in the vicinity of the project area, but there is a stormwater drainage ditch on site that collects up-gradient stormwater runoff during the occasional storm event. The stormwater collects mauka of H-1 Freeway in three typically dry gulches: Awainui Gulch, Palailai Gulch, and an unnamed gulch. These gulches converge just mauka of H-1 freeway into an unnamed natural drainage ditch aligned under H-1 Freeway and OR&L railroad right-of-way, and terminates on the project site. Stormwater runoff from the site and adjacent areas drains overland via sheet flow and small ditches to the depressions scattered throughout the site.

Due to the moderate to high permeability of the soils and low rainfall (average 18 inches annually), very little runoff is generated from the site, except during major storms. Runoff at the site tends to collect in a depression near the Kalaeloa Boulevard/Malakole Road intersection, and occasionally overflows and ponds in the surrounding low-lying area. Stormwater that reaches Kalaeloa Boulevard, Malakole Road, and the roadways in the adjoining industrial park is collected in underground drainage systems that ultimately discharge into the Kalaeloa/Barbers Point Harbor.

Runoff from the project area as well as the entire watershed was estimated for 10-, 50-, and 100-year storms under existing conditions. One-hour rainfall intensities used in the analysis were 1.9 inches per hour for the 10-year storm, 2.4 inches per hour for the 50-year storm, and 2.7 inches per hour for the 100-year storm. Under existing conditions, estimated run-off for the site ranges from 393 cubic feet per second (cfs) for a 10-year, 1-hour storm to 559 cfs for a 100-year, 1-hour storm.

Groundwater
The Kapolei Harborside Center project area is located within the 'Ewa (Limestone) Caprock Aquifer of the Pearl Harbor Aquifer Sector. Groundwater is recharged through local rainfall

(averaging 24 inches per year) and infiltration from surface water drainage. Based on proximity to the ocean and geology, the water beneath the site is tidally influenced and likely to have moderate to high salinity. Groundwater beneath the site does not meet ~~potability~~ drinking water standards due in part to high salinity, and has been used primarily as irrigation water. The project area is seaward of the State Department of Health Underground Injection Control (UIC) line. The UIC line is 0.5 miles north and inland from the site; therefore, the groundwater beneath the site is assumed to not be a potential drinking water source. Groundwater flow beneath the site is presumed to be perpendicular and west-southwest to the nearest coastline.

The nearest drinking water well is located approximately 2.2 miles northeast and hydraulically upgradient of the project area. The area is within the designated groundwater management area regulated by the State Commission on Water Resource Management (CWRM), however, there are no plans to develop new wells in conjunction with this project. Drinking ~~Potable~~ water will be provided to Kapolei Harborside Center by BWS, as discussed below in *Section 4.13~~4~~*.

Probable Impacts

The grading and grubbing at the site will increase the potential for soil erosion into stormwater flow during the construction phase. The potential for soil erosion impacts will be short-term. Because ground surface disturbance would be greater than or equal to one acre of land area, a Notice of Intent (NOI) to be covered under National Pollutant Discharge Elimination System (NPDES) general permit for construction activities will be required from State Department ~~department~~ of Health, Clean Water Branch, prior to commencement of construction activities.

Once the construction phase has been completed, the soil will either be covered with impervious surfaces or landscaped resulting in minimal potential for soil erosion by stormwater. The proposed development will alter the character of the site by replacing existing vegetative cover with buildings, pavement, landscaped areas, and other improvements normally associated with industrial developments. Consequently, peak runoff generated onsite is expected to increase. Estimated runoff for the area under developed conditions ranges from 701 cfs for a 10-year, 1-hour storm to 1,250 cfs for a 100-year, 1-hour storm. Without proper mitigative measures, major flooding problems will result due to the flat slopes found within the project site. Mitigative measures proposed for the Kapolei Harborside Center must also consider the overall increase in runoff for the entire watershed.

Mitigative Measures

During construction, soil erosion will be minimized by compliance with the County's grading ordinance, and the applicable provisions of the Department of Health's Water Quality Standards (Title 11, Chapter 54, HAR) and Water Pollution Control requirements (Title 11, Chapter 55, HAR). Additionally, standard Best Management Practices (BMPs) will be employed to minimize impacts. These BMPs will be detailed in subsequent construction plans, and may include limiting site grading to increments of not more than 15 consecutive acres at a time, the use of temporary sprinklers in non-active construction areas, stationing water trucks onsite during construction to provide immediate sprinkling in active construction zones, use of temporary berms and cut-off ditches, use of temporary silt fencing and screens, thorough

watering of graded areas after construction activity has ceased for the day and on weekends, and sodding or planting slopes immediately after grading work has been completed.

More detailed soils analyses will be performed as planning of the project proceeds. Additional BMPs, if required, may be recommended by the project's soils engineers as building types and locations are further defined. Measures may also include removal of unsuitable soils under foundations and/or special foundation designs. End users will be encouraged to develop lots with less impervious surfaces than traditional industrial developments to increase infiltration. Additionally, requirements of Title 11, Chapter 26, Paragraph 35 (Rodents; demolishing of structure and clearing of vacant sites and vacant lots) will also be followed.

During operation of Kapolei Harborside Center, the leasees will be required to operate in accordance with State and federal regulations, including compliance with hazardous and regulated materials handling, storage, transport and waste disposal. Adherence to these regulations would safeguard soils, stormwater and groundwater at the project site from adverse impacts. Industrial activities will require an NOI to be covered under the State's NPDES general permit for storm water associated with industrial activities. The majority of the site will be converted to impervious surfaces, which facilitates management of stormwater flow and minimizes infiltration to groundwater. There will be no stormwater impacts to adjacent property. There are pre-existing impacts to groundwater at the site due to releases of hazardous and regulated materials as described in *Section 4.14*.

Implementation of an underground onsite drainage system of catchbasins/manholes and pipe culverts, with conveyance to a major drainage swale running through the site, is proposed to alleviate current flooding problems and prevent flooding resulting from runoff from the proposed development. The drainage swale will be sized to accommodate runoff from the entire watershed based on County Storm Drainage Standards. Additional detail on site drainage and the drainage channel are provided in *Section 4.13.1 Drainage Facilities*.

4.4 NATURAL HAZARDS

Existing Conditions

The seismic risk classification for the island of O'ahu is Seismic Zone 2A ~~Zone 1~~, which suggests the entire island is subject to minor earthquake damage. The project area is not subject to coastal hazards, such as storm waves or tsunami inundation, due to the site's elevation and distance from shore. However, the site is designated as Zone D, an area of "undetermined, but possible flood hazards" on the Flood Insurance Rate Map (FIRM).

Probable Impacts

No potential for stormwaves or tsunami were identified for the site. The development would not increase the potential for seismic or flood hazards. Structures built on-site will conform to the Uniform Building Code to mitigate any expected earthquake damage.

The area has the lowest annual rainfall on O'ahu, but there are occasional storm events. Regional stormwater is collected upgradient of and directed onto the site into a ditches.

Typically the ditch is dry. The drainage channel will be unlined and an underground on-site drainage system of catch basins/manholes and pipe culverts, with conveyance to a proposed regional drainage channel bisecting the site. As the development plans are finalized, specifications for any required civil defense outdoor warning systems (warning sirens) will be coordinated with the O'ahu Civil Defense Agency. The project will have beneficial long-term impact on potential flood hazards and will handle upstream flows for the region. There would be no increase in the seismic hazard.

Mitigative Measures

No mitigation is necessary.

4.5 FLORA AND FAUNA

The project area was surveyed by Rana Productions, Ltd, in May 2006 and the report is included as *Appendix H*. A primary goal of the survey was to determine if there were any Federal or State of Hawai'i listed endangered, threatened, proposed, or candidate mammalian, avian or botanical resources on or in the immediate vicinity of the project site.

4.5.1 Flora

Existing Conditions

A pedestrian botanical survey was conducted on May 4, 2006 noting the occurrence and relative abundance of all species of plants observed. The transects surveyed were distinct from those of a previous survey undertaken in August 2005 (David & Guinther) to maximize survey area coverage across the Kapolei Harborside Center project site. The southeast corner of the Kapolei Harborside Center area was not surveyed, because it is developed as a nursery with minimal undisturbed vegetation. The botanical survey was done during the dry season. It is unusual to conduct surveys twice a year, they are typically done when the study is commissioned. However, when the site was surveyed in May 2006, it followed a wet period and most of the annual species that one would expect from the site were recorded. If another survey were to be conducted between November and January, typically the wetter months, additional species would be recorded, though the majority of these would likely be weedy alien species.

The project area has three distinct vegetation areas: 1) quarry and dredged material tailings, 2) abandoned former sugarcane fields, and 3) *kiawe* (*Prosopis pallida*) and buffelgrass (*Cenchrus ciliaris*) lowland forest and savannah. Quarry and dredged spoil areas are characterized by extensive bare calcareous soil and sediment deposits, with isolated pockets of weedy vegetation and pioneer species growing in less recently disturbed parts. This environment type covers nearly the entire western half of the project area. Numerous weedy species are observed. There is evidence of ephemeral flooding and ponding, creating special habitats that support many plants (such as California grass, *Urochloa mutica*, and sprangletop, *Leptochloa uninervia*) that otherwise would not occur in this typically dry area. Conspicuous plants characteristic of this wasteland environment are tree tobacco (*Nicotiana glauca*) and Russian thistle or tumbleweed (*Salsola tragus*). The abandoned former sugarcane fields (Char & Associates, 1989) were subsequently used to produce truck crops (i.e., melons, corn). This area is characterized by numerous ruderal weeds.

The remainder of the project site, primarily located in the northwestern corner and between the former agriculture fields and the Milo Nursery in the southeast corner, is occupied by an open to closed *kiawe (Prosopis pallida)* forest with a dense undergrowth of buffelgrass. In some areas, koa haole (*Leucaena leucocephala*) is prominent as scrub growth. There is evidence of recent fires in the *kiawe* forest at the north end.

No ferns or fern allies were observed during the plant survey. The dry climate and reasonably well-drained calcareous soils are not conducive to supporting most fern species found in Hawai'i. The flora of the project area is comprised of flowering plants and overwhelmingly dominated by alien plant species. A total of 121 species of plants were identified. Of these, 73 were recorded during the survey on May 4, 2006 and another 48 species, while not observed in May, were previously recorded at the site by either David and Guinther (2005; 19 species) or from the same general area by Char & Associates (1989; 40 species).

Fourteen of the species recorded were known to occur in the Hawaiian Islands before the arrival of James Cook in 1778. Four of these are considered to be introductions made by the earlier Polynesian settlers, leaving 10 species (8.3%) as plants native to the Hawaiian Islands. Of these 10, only one is an endemic, and the remaining nine are indigenous species.

The one endemic species recorded, *kūpala* (*Sicyos pachycarpus*), is a vine that is a seasonal annual and fairly common in leeward coastal areas. The nine indigenous native species recorded are also common lowland plants found in the dry leeward and coastal sites throughout the Pacific Islands. When the abundance estimates for these native species are considered, all but *kūpala* and *'ilima* (*Sida fallax*) are rare or uncommon within the survey area. These two were mostly observed in the Kiawe/Buffelgrass vegetation area, which comprised only about 10% of the project area. Thus, in terms of biomass as well as number of species, native plants are a minor component of the vegetation observed onsite.

Probable Impacts

The results of the botanical survey indicate there are no special concerns or legal constraints related to botanical resources in the project area. Although, the 'Ewa plain is known to harbor several rare and, in some cases, federally listed species of Hawaiian native plants, these species are not present in the highly disturbed quarry and dredged spoil disposal areas around Kalaeloa/Barbers Point Harbor and former agriculture lands further inland that comprise the Kapolei Harborside Center project site. No plant 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 at the project site (Federal Register, 1999, 2005).

Some of the sinkholes in the preserve contain Polynesian cultigens (*noni, Morinda citrifolia*, and *Ti Taetsia fructosa*). The area will continue to be protected by security fencing No plant species identified at the site was listed as endangered, threatened, or is proposed for listing under either federal or State of Hawai'i endangered species statutes. No adverse short-term or long-term impacts to flora are anticipated and no new mitigation measures are proposed.

Mitigative Measures

Existing mitigation, security fencing, will continue to protect the cultigens in the sinkholes.

4.5.2 Fauna

Existing Conditions

All observations of mammalian species were of an incidental nature; no fauna-specific transects were surveyed and all surveys were conducted during the day. With the exception of the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), or 'Ope'ape'a as it is known locally, all terrestrial mammals currently found on the Island of O'ahu are alien species, and most are ubiquitous. The survey of mammals was limited to visual and auditory detection, coupled with visual observation of scat, tracks, and other animal signs. A running tally was kept of all vertebrate species observed and heard within the study area.

Three mammalian species were detected while on the site: domestic dog *(Canis f. familiaris)*, small Indian mongoose *(Herpestes a. auropunctatus)*, and cat *(Felis catus)*. One mongoose was seen, as well as tracks and sign of dog, mongoose and cats at numerous locations within the project site. All three of these are introduced species that are considered deleterious to native avian species and Hawaiian ecosystems.

Although no rodents were detected during the course of this survey, it is likely that roof rats *(Rattus r. rattus)*, Norway rats *(Rattus norvegicus)*, European house mice *(Mus domesticus)* and possibly Polynesian rats *(Rattus exulans hawaiiensis)* use resources within the general project area. All of these introduced rodents are deleterious to remaining native ecosystems and the native floral and faunal species that are dependant on them for their survival.

One six-minute avian count was conducted at each of fourteen avian count stations throughout the site on May 4, 2006 between 0730 and 1030. A total of 441 individual birds of 18 different avian species, representing 15 separate families were recorded, as detailed in *Appendix H*. In the past, the site was apparently inhabited by a variety of endemic birds given fossil evidence recovered from the sink-holes located in the preserve area on the makai portions of the property.

Four of the species recorded in the present survey, Black-crowned Night-Heron *(Nycticorax nycticorax hoactli)*, Pacific Golden-Plover *(Pluvialis fulva)*, Black-necked Stilt *(Himantopus mexicanus knudseni)*, and Ruddy Turnstone *(Arenaria interpres)* are native to the Hawaiian Islands. The Black-necked Stilt is listed as an endangered sub-species under Federal and State statutes. The Black-crowned Night-Heron is an indigenous resident species, and the Pacific Golden-Plover and Ruddy Turnstone are both indigenous migratory waterbird species. The remaining 15 species detected during the course of this survey are considered to be alien to the Hawaiian Islands.

Hawaiian waterbirds require wetlands for their survival, including freshwater marshes, coastal ponds, taro patches, and irrigation ditches. The project site does not contain wetlands or suitable nesting habitat for the Hawaiian Stilt. The areas in question are low spots with

transient water creating the possibility of temporary ponding at the edge of the site. The site is constantly being modified from coral stockpile excavation activities. Typically, there is no water in the same area on the site where these birds were observed.

While four stilt were encountered and flushed when approached during the survey of the site, flushing does not necessarily mean that the birds were involved in breeding behavior. Stilts are extremely vocal birds and easily flush when disturbed. In an effort to detect active stilt nests, an extensive search was conducted of the three mining scrapes present on the site. None were found, nor were chicks, sub-adult birds, or nests found during the 2006 survey. Additionally, no chicks, sub-adult birds, or nests were found during the course of earlier surveys of the same area. The bulk of stilts nest between February and mid-August, thus if active nesting was occurring on the site, it is probable that the 2005 or the 2006 survey would have detected such activity. The Petitioner will consult with the U.S. Fish and Wildlife Service and, if applicable, will comply with the Endangered Species Act of 1973.

Avian diversity was relatively low, though densities of several species were relatively high. The Common Waxbill *(Estrilda astrild)*, Common Myna *(Acridotheres tristis)*, and Red-vented Bulbul *(Pycnonotus cafer)* accounted for slightly more than 45% of the total number of individual birds recorded. Common Waxbills were the most frequently recorded species, accounting for slightly more than 20% of the total number of individual birds recorded during station counts. An average of 32 birds was recorded per station count.

The findings of the mammalian and avian surveys are consistent with the findings of two other surveys conducted on portions of the proposed project site (Bruner 1989, Guinther and David 2005) and with several other faunal surveys conducted on lands in the general vicinity of the subject property in the recent past.

Probable Impacts

From a faunal perspective there is nothing unique about the habitat present on the subject property, and none of the habitat present on the site is important habitat for any listed avian or mammalian species currently known from the Island of O'ahu. It is not expected that the modification of the habitat currently found on the site or the construction of the proposed industrial park will have a negative impact on any avian or mammalian species currently listed as endangered, threatened, or that are currently proposed for listing under either Federal or State endangered species statutes.

Mitigative Measures

No mitigation is necessary.

4.5.3 Invertebrates

Existing Conditions

~~An invertebrate survey was not conducted on the subject property as there is only one listed invertebrate species historically known from O'ahu, namely the Blackburn's sphinx moth~~

~~*(Manduca blacburni)*. This species has not been recorded from the island since the 1940's despite significant efforts to relocate the species on the island (Federal Register 2003). In consultation with biologists familiar with this species and with this area, the likelihood that this species is present on the subject property or within the 'Ewa plains area, which has been extensively studied over the past 20 years, is highly unlikely. Based on the discussions with biologists, it was determined that a number of native, though unprotected invertebrate species are likely present within the project site and the greater 'Ewa area. The presence of non-listed native species on the property would not result in any additional regulatory requirements being placed on the project.~~

A survey of arthropods on the Kapolei Harborside Center project site was conducted by Pacific Analytics September 22 through September 29, 2006, see *Appendix L*. Nine sampling methods were used to detect arthropods to ensure a thorough coverage of the existing fauna (Pacific Analytics, 2006). The occurrence and relative abundance of all observed species of arthropods was recorded. Special attention was given to searching for Blackburn's Sphinx moth larvae (*Manduca blackburni*) on tree tobacco (*Nicotiana glauca*), a known host plant that occurs on the site. Special searches were also conducted for *'Ōpae'ula* (*Halocaridina rubra*) in a sinkhole with stagnant water, and for native snail species, especially in the sinkhole reserve. Some areas of the Kapolei Harborside Center project site were not sampled because they were occupied by commercial businesses. The southeast corner of the Kapolei Harborside Center area is developed as a nursery. Green waste composting occurs in the southwest corner and near the central of the project site. These areas were not sampled because they are largely devoid of naturalized vegetation.

One hundred and ninety-five species of insects representing sixteen orders were collected at the site. An additional nineteen species of spiders, three species of other arthropods, and five species of fossilized snail shells were also collected. The most productive sampling methods were aerial netting and foliage beating. Night sampling with UV lights was disappointing, probably due to the time of year of the sampling. Nearly two hundred tree tobacco plants were searched for caterpillars of Blackburn's Sphinx moth and none were found. Despite repeated searching of the sinkhole with water, no *'Ōpae'ula* (*Halocaridina rubra*) were found. Fossilized snail shells were found below the litter layer and there was no evidence of extant species.

About thirty-five percent of the arthropod species in Hawaii are non-indigenous (Nishida, 1997). More than ninety percent of the species collected in the Kapolei Harborside Center project site survey were non-indigenous. Many are cosmopolitan, weedy species found throughout the Pacific and the World. The large proportion of non-indigenous species is an indication of the amount of habitat degradation that resulted from the various agricultural and mining operations that have occurred at the site.

The Blackburn's sphinx moth *(Manduca blacburni)* is only listed invertebrate species historically known from O'ahu. While caterpillars of other species of sphinx moths were observed in May 2006 during the botanical and avian surveys (Rana Productions, 2006), no caterpillars or adults of Blackburn's sphinx moth have been observed on the Kapolei Harborside Center project site. This species has not been recorded from the island since the 1940's despite significant efforts to relocate the species on the island (Federal Register, 2003). In consultation with biologists familiar with this species and with this area, the likelihood that this species is present on the

subject property or within the 'Ewa plains area, which has been extensively studied over the past 20-years, is highly unlikely.

The median annual rainfall in the Barbers Point region is 50 cm (20 inches). Most of the rain falls in the winter months. From May through September the median monthly rainfall is 1.25 cm (0.5 inches) (Christensen and Kirch, 1986). Because the arthropod survey was conducted near the end of the dry season, the list of species may not include all species that occur on the site. The pollen- and nectar-feeding species may be underrepresented because of the lack of abundant flowering at the time of the survey. Foliage-feeding species such as caterpillars and true bugs may also be underrepresented on the list. Only one Noctuid moth came to the UV lights during four nights of sampling and no plant bugs (Miridae) were found on foliage during the day. Both could be expected in greater abundance and species diversity earlier in the year. For example, during an arthropod study conducted at the Lualualei Naval Base fourteen plant bugs and nineteen noctuid moths were observed during a full year of sampling (Evenhuis 1997).

Probable Impacts

~~No impacts are anticipated.~~

The results of the arthropod survey indicate there are no special concerns related to invertebrate resources in the project area. Although several species of Hawaiian endemic arthropods may occur on the 'Ewa plain, these species are not likely to be abundant in the highly disturbed quarry and dredged spoil disposal areas around Kalaeloa/Barbers Point Harbor or on the former agriculture lands further inland that comprise the Kapolei Harborside Center project site. 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 at the project site (Federal Register, 1999, 2005).

Mitigative Measures

No mitigation is necessary.

4.6 ARCHAEOLOGICAL AND HISTORIC RESOURCES

Existing Conditions

A Archaeological Inventory Survey report was prepared for the project by Cultural Surveys Hawaii, Inc. (2006), and this report is included as *Appendix G*. This report synthesized the abundant background historical and archaeological information that already existed for the project area and its vicinity. This synthesis revealed that large portions of the project area were surveyed as part of previous archaeological investigations over the last 35 years. The portions of the project area that were not previously inspected for cultural resources were deemed to have low potential for archaeological deposits, because of extensive ground disturbance during commercial sugarcane cultivation.

The extensive past archaeological investigations of the project area and its vicinity have documented the area's cultural resources; however, historic and modern intensive agriculture,

modern quarrying and materials stockpiling, and modern green waste processing have greatly disturbed the vast majority of the project area. These activities have largely removed the historic resources that were once extant. No further resource management work is recommended for the majority of the project area. However, historic period archaeological sites exist within or near the project area. These sites will be treated in accordance with State Inventory of Historic Properties (SIHP) recommendations for either data recovery or preservation.

1. A historic plantation-era drainage channel (SIHP# 50-80-12-6679), includes a portion that traverses the project site and has been determined eligible under the Hawai'i Register of Historic Places under HAR § 13-198-8 Criterion D[1]. The alignment of this feature through the project area is shown on Figures 12 and 13 of the Archaeological Inventory Survey report.

2. Sinkhole Preserve Area ~~More than 50 sinkholes, eligible under National/Hawai'i Register of Historic Places HAR § 13-198-8 Criterion D, and, because of the potential for human burials, Criterion E (Hawai'i Register only). The sinkholes are located within a 7.4 acre archaeological/paleontological Preserve Area at the southwest corner of the site (Figures 12, 13, and 14 of the Archaeological Inventory Survey). The preserve was created in the 1990s and is bound by a chain-link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens *(noni, Morinda citrifolia* and *Ti Taetsia fructosa)* growing in them.~~

   Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

   The preserve area was formed in the early 1990s, with the guidance of Bishop Museum zoologist Dr. Alan Ziegler, who conducted substantial investigations of the sinkhole resources. In December 1992, Dr. Ziegler walked the site with representatives of the Estate of James Campbell, to delineate the position for a boundary fence to protect the significant sinkhole resources. The area was subsequently fenced by the Estate. At the time the fence was erected, the area of the

[1] HAR § 13-198-8: The quality of significance in Hawaiian history, architecture, archaeology, and culture, which is present in districts, sites, buildings, structures, and objects of State and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and (A) That are associated with events that have made a significant contribution to broad patterns of our American or Hawaiian history; (B) That are associated with the lives of persons significant in our past; (C) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic value, or that represent a significant and distinguishable entity whose components may lack individual distinction; (D) that have yielded, or may be likely to yield, information important in prehistory or history).

preserve was estimated to be between 7 and 8 acres, but was never formally surveyed. In the Draft EIS, the approximate land area for the sinkhole preserve was erroneously estimated to be 7.4 acres. As a follow-up to inquiries regarding the sinkhole preserve, Kapolei Property Development commenced a land survey of the fenced area in October 2006. The survey indicates an actual area of approximately 6 acres enclosed by the boundary of the fenced sinkhole preserve. Sinkhole resources of significance lie within this approximate 6-acre area, as bounded by the AES coal conveyor to the west, the HWS waste pile to the north, existing Hanua Road to the east, and an existing access road off Hanua Road serving the compost business tenant. The land between Malakole Street and the fence is not included in the sinkhole preserve area, as it includes an easement for pipelines and the roadway access to the adjoining compost business tenant.

3. Stacked stone enclosures Two stacked stone prehistoric or early historic enclosures and mounds, likely eligible to the National/Hawai'i Registers under HAR § 13-198-8 Criterion D. The first enclosure is rectangular measuring 4.2 meter (m) by 3.8 m and has a maximum height of 0.8 m. There is evidence of bulldozing just to the southeast of the enclosure, though the feature is in good condition with essentially intact walls. The second structure is a C-shaped enclosure approximately 3.2 m by 4.2 m with a maximum height of 0.5 m. This enclosure is in fair condition, with much of the wall construction suffering from collapse.

   These two enclosures and the more ephemeral mound and alignment features around them appear to be typical examples of the types of surface traditional Hawaiian archaeological features that have been documented at Barber's Point in the past. The enclosures date to the pre-contact or possibly early historic period, based on construction type and lack of historic artifacts in the vicinity. They were likely utilized as temporary shelters associated with the procurement of nearby marine resources. These features do not appear to have been previously identified, although this portion of the project area was previously surveyed, recent fires may have removed vegetation that shielded these features from discovery during previous investigations.

4. Barber's Point Harbor Archaeological District (SIHP # 50-80-12-2888) is listed on the National Register. The boundaries of this archaeological district are shown in Figure 11 of the Archaeological Inventory Survey report in relation to the project area's boundaries. The portions of the archaeological preserve within the current project area appear to have already been completely disturbed by historic and modern land use. It is likely that the previously documented surface archaeological features within this portion of the project area have been completely removed.

5. O'ahu Railway and Land Company ROW (SIHP #50-80-12-9714) is adjacent and north of the project area, as noted in Figures 12 and 13 of the Archaeological Inventory Survey report, and is currently listed on the National Register of Historic Places under HAR §13-198-8 Criteria A[1], B[1], and C[1].

Probable Impacts

Following an archaeological inventory survey and documentation of the project site, the historic plantation-era drainage channel (SIHP # 50-80-12-6679) will be removed. There are no short or long-term impacts anticipated to the sinkhole preserve area, as development will avoid this area and retain the preserve area intact. The stacked stone enclosures are within or immediately adjacent to the proposed project and with mitigation will not be impacted. As surveys indicate previous and complete disturbance of the Barber's Point Harbor Archaeological District within the project area, the proposed project is not regarded as having an impact on this feature. The project master plan proposes a northern extension of Hanua Street that will cross the OR&L. ROW. (SIHP #50-80-12-9714), which abuts the project area to the north. This crossing will likely involve modification of the railroad bed and ROW, including modifications to the track and the installation of vehicular traffic crossing signals and/or gates.

Mitigative Measures

An earlier report for the Kapolei Harborside Center EISPN, the Cultural Resource Literature Review and Field Inspection, recommended a more detailed archaeological inventory survey prior to development. For the DEIS, an intensive archaeological inventory survey of relatively undisturbed lands and documentation of historic properties within the project area was completed by Cultural Surveys Hawai'i in consultation with State Historic Preservation Division of the Department of Land and Natural Resources (SHPD) *(Appendix G)*.

Historic Drainage Channel: The study describes the portion of the historic drainage channel that traverses the present project areas and provides further documentation in the form of descriptions, photographs, and cross-section drawings. The study suggests that this documentation is sufficient and appropriate for this site that appears to have no particular aesthetic merit or historic importance. No further work is recommended for this feature. Sufficient information regarding the location, function, age, and construction methods of the feature have been generated by the current study.

Sinkhole Preserve Area: ~~The sinkhole preserve will remain protected by a fence enclosure. The site will be accessible for future research and education, but the existing security fencing will continue to protect the resources from vandalism and/or destruction from unauthorized entry. Because there are no plans for development in this area at this time and the area is under passive preservation no further mitigation is proposed. However, it may be noted from the distribution of sinkholes within the preserve area that they tend to be somewhat clumped particularly on the east side and northwest corner.~~

The Petitioner is committed to the preservation of the existing coral sinkholes found in a 6-acre area of the proposed Kapolei Harborside Center. Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, the work of Dr. Alan Ziegler is recognized, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. The close concentration of sinkholes has significant scientific value, and the approximate 6-acre area will continue to be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The

existing fence has gaps in two portions that will be closed, and locked gates will be added. The sinkhole preserve will continue to be accessible for future research and education.

Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

Stacked Stone Enclosures: The stone enclosures were newly identified by the current inventory survey investigation. Each feature was documented with written descriptions, scale drawings, and photographs, and accurately located with GPS survey technology. Limited subsurface testing was also conducted within each feature. No further work is recommended for these features, as sufficient information regarding the location, function, age, and construction methods of the features has been generated by the current study. These sites lie very close if not within designated project area. Passive preservation of these sites within the project area is proposed and may be possible, given their location, that such preservation would cause minimal inconvenience to the development of the Kapolei Harborside Center.

Barber's Point Harbor Archaeological District: The portions of the archaeological district within the current project area appear to have already been completely disturbed by historic and modern land use. It is likely that the previously documented surface archaeological features within this portion of the project area have been completely removed. Accordingly, the proposed project is not regarded as having an impact on this feature and no mitigation is necessary.

O'ahu Railway and Land Company ROW: Similar past road crossings of the OR&L. in the vicinity of the current project area have required the development of appropriate mitigation measures among SHPD, the State of Hawaii Department of Transportation (DOT) (understood as the land owner of the right-of-way), and the Hawaiian Railway Society (HRA). It is recommended that appropriate treatment of this National Register-listed historic property include, to the extent possible, preservation in place of existing track and railway ties and installation of necessary crossing features (signals and/or gates) that are in keeping with the railway's historic appearance. The project will maintain the existing 40-foot setback on either side of the OR&L ROW, with exception of planned roadway crossing. This action would require review and approval by the DOT. With mitigation agreeable to these parties it is suggested that a determination of "No adverse effect" may be possible.

Before construction of the Hanua Street. crossing of the OR&L. ROW, an agreement should be made on detailing the type of crossing that will be made, and any reconstruction or mitigation that may be necessary. The MOA would stipulate the obligations and time frames for any work to be undertaken. All surface and subsurface work impacting the OR&L ROW will be closely coordinated with the HRA, SHPD, and SDOT. Proposed mitigation measures, including the scheduling of construction activities and the construction of automated crossing guards at major road crossings of the OR&L ROW, will be discussed with SDOT, SHPD, and HRA.

As a standard contracting procedure, contractors working in the project area will be advised that, should any significant cultural features be uncovered during construction, work in the immediate vicinity will stop and the SHPD shall be promptly notified to determine the appropriate course of action.

4.7 CULTURAL RESOURCES

Existing Conditions

In order to address the effects the proposed development activity may have on Native Hawaiian practices, culture and traditions, Cultural Surveys Hawaii, Inc. prepared a Cultural Impact Assessment in 2006 for the Kapolei Harborside Center project *(Appendix F)*. Methodology for the cultural impact assessment consisted of:

1. Examination of historical documents;
2. Review of the archaeological documents; and
3. Interviews with Hawaiian cultural organizations, government agencies and individuals who might have knowledge of or concerns about traditional cultural practices specifically related to the development area were consulted.

Cultural History

Honouliuli is the largest ahupuaʻa in the moku (district) of ʻEwa. One translation of the name for this district is given as "unequal." Others translate the word as "strayed" and associate it with the legends of the gods, Kāne and Kanaloa. Honouliuli means "dark water," "dark bay," or "blue harbor" and was named for the waters of Pearl Harbor, which marks the eastern boundary of the ahupuaʻa. The Hawaiians called Pearl Harbor, Puʻuloa (long hill). It is likely the boundaries of the western-most ahupuaʻa of ʻEwa were often contested with Waiʼanae people. The ʻEwa people could cite divine sanction that the dividing point was between two hills at Pili o Kahe.

The coastal area of Honouliuli is a triangular area that stretches from Pili o Kahe on the northwestern corner that marks the boundary with the Waiʼanae District to Kalaeloa (now Barbers Point) on the southwestern corner, to Keahi Point on the southeastern corner at the mouth of Pearl Harbor. There were likely Hawaiian settlements at Ko ʻŌlina on the west side, at Kualakaʻi on the south, at the royal residence in Puʻuloa near the mouth of the harbor, and at Honouliuli town at the upper end of West Loch, surrounding Kapapapūhi Point, northeast of the current study area.

Kalaeloa literally means "the long point." Other translations, though, suggest the name of the point is Kalaiekao, meaning "sky rocket cape," because it was on this point that signal fires were set to signal canoes to go out to meet European boats during the early historic period. Kalaeloa Point was the home of Uhu makaikai, a kupua (supernatural being) who could take the form of a man or a giant parrotfish (uhu).

Between Pili o Kahe and Kalaeloa there is Kahe Point, which was formerly marked by two drainage ditches called Keoneʻōʻio and Limaloa, which may explain the name Kahe, which means "flow." Keoneʻōʻio means "the ʻōʻio sand; this area once had large schools of ʻōʻio (bonefish; Albulidae), a fish usually found on sandy-bottom areas. Kalaeloa, meaning "the long point," got its present name Barbers Point from Captain Henry Barber of the brig Arthur, who ran his ship aground on October 31, 1796 on a shoal west of the entrance to Pearl Harbor.

Hawaiians, under the command of Kamehameha I, salvaged the cannon from the ship and used them to man a new fort on Lāhainā, Maui.

Based on Honouliuli settlement patterns, archaeological investigations of the ahupuaʻa, and poor land cultivation conditions, the project area and vicinity is unlikely to have been a permanent habitation, even in pre-contact times. The project area is situated between uplands of relatively high rainfall and makai resources. The site and vicinity may have been traversed in traditional Hawaiian times and provided temporary habitation for gatherers and fisherman traveling to the coast. Subsequent commercial and military development uses throughout the twentieth century would have eliminated much of the surface sites related to traditional Hawaiian culture that may have been extant. These activities would have also restricted access to the project area for any ongoing cultural practices.

Ethnographic accounts and past archaeological investigations in the project area and its vicinity indicate the limestone sinkholes on the ʻEwa Plain were used for agriculture and burial interment, with the largest shelters used for temporary shelter. With the spread of Western land use in the 19th century, the project area was used for ranching first, then intensive commercial agriculture.

Based on personal consultations and examination of historic documents and existing archaeological information, the cultural impact assessment concludes that the project area is not associated with traditional cultural practices for subsistence and religious purposes, and does not provide access to other areas used to exercise those practices (i.e. gathering of plant and marine resources; presence of burials, historic properties and storied places; documentation of trails, etc.). There is no specific documentation of plant gathering within the project area during traditional Hawaiian times and no ongoing practices related to traditional gathering were identified during the assessment.

Probable Impacts

The proposed project will not adversely affect rights customarily and traditionally exercised for subsistence, cultural and religious purposes due to the lack of former, contemporary or continuing cultural practices within the project area. The proposed project would have no short-term or long-term impacts on Hawaiian culture, its practices and traditions.

Mitigative Measures

The project will consider incorporating the traditional place names of the surrounding area into the proposed development to sustain a connection to the past.

4.8 AGRICULTURE AND SOILS

Existing Conditions

The project area is currently in the State Agricultural Land Use District and is zoned Ag-1 and Ag-2 Agriculture by the County. The site has been isolated from other agricultural lands as surrounding lands were developed, or are planned for development, in accordance with the

City and County policy of directed growth in ʻEwa. Sugar cultivation on the property ceased in 1995 with the closure of the Oʻahu Sugar Plantation.

As detailed in *Section 2*, the property has seen little agricultural use over the past 10 years with the exception of intermittent, though now terminated, planting of a portion of the site with corn and watermelon crops, an existing nursery operation on 32 acres at the southeast corner of the property, and a greenwaste composting operation on 39 acres of the project site. The remaining two operations hold short-term land leases provided by the property owner.

The impact analysis also notes that a vast amount of land (island-wide) has been released from plantation agriculture on Oʻahu and the Neighbor Islands, and most of this land remains available for diversified crops. By 2009, about 15,300 acres of farmland will be available on Oʻahu. This includes about 9,600 acres on the North Shore plus about 5,700 acres in Kunia that will be available following the closure of the Del Monte pineapple plantation, but it excludes any adjustment for the farm land in 'Ewa and Kunia land that is already leased for diversified crops but is not farmed intensively. Statewide, an estimated 160,000+ acres remain available for diversified crops.

Several soil types are found within the project area based on the U.S. Department of Agriculture Natural Resource Conservation Service's descriptions (*Figure 4-2)*:

Coral Outcrop (CR) is the predominant soil type and comprises approximately 82% (278 acres) of the project area. This soil type is characterized by coral or cemented calcareous sand with a layer of friable red soil material in cracks, crevices and depressions. This soil type is poorly suited for agriculture, although sugarcane was once grown on a portion of the site, which had been covered with topsoil. The coral outcrop is highly permeable with hydraulic conductivities ranging between 2,000 and 10,000 feet per day (LFR Inc 2006).

Mamala stony silty clay loam, 0 to 12 percent slopes (MnC) comprises approximately 16% (55 acres) of the project area. It is a dark reddish-brown stony silty clay loam with a surface layer of about 6 inches thick. The subsoil is a dark reddish-brown silty clay loam about 11 inches thick.

ʻEwa silty clay loam, moderately shallow, 0 to 2 percent slopes (EmA) comprises approximately 4% (6 acres) of the project area. This soil type is found on alluvial fans and terraces. Its surface layer is dark reddish-brown silty clay loam about 18 inches thick. Subsoil is about 42 inches thick and is dark reddish-brown and dark red silty clay loam. Substratum is coral limestone, sand or gravelly alluvium. The soil is natural with moderate permeability. Runoff is slow and the erosion hazard is slight.

Soils on the site are generally not well suited for agricultural use. The agricultural utility of land in Hawaiʻi was assessed and mapped in the 1970s by the former U.S. Soil Conservation Service in the Agricultural Lands of Importance to the State of Hawaiʻi (ALISH) map series. Three categories of agricultural land were identified in the mapping: Prime, Unique and Other. In the subject project area, most of the native soils (83%) are poor and, therefore, are not rated in the ALISH classification system. However, fill material was added during previous sugarcane

operations to provide for crop cultivation; accordingly, by some accounts the percentage of "poor soils" has was been reduced to 51%.

Sixteen percent of the project area is ALISH-designated as Other and only 1% is Prime. Land designated as Other are important to agriculture in Hawai'i despite properties such as seasonal wetness, erodibility, limited rooting zone, slope, flooding or drought that exclude them from either the Prime or Unique categories. The ALISH designations for the project area are shown in *Figure 4-3.*

The Land Study Bureau (LSB) of the University of Hawai'i evaluated all lands in the State except those in the Urban District and classified the land types. Within the project area, the LSB system rates 19% as Category "B" or good, 31% as Category "C" or fair, and the remaining 50% is classified as Category "E" or very poorly suited for agriculture. The LSB ratings are shown in *Figure 4.4*.

Probable Impacts

A report on the impact of the proposed Kapolei Harborside Center on agriculture was prepared by Decision Analysts Hawaii, Inc in 2006 *(Appendix D)*. The project would eliminate 344.5 acres of agricultural land, of which about 59 to 167 acres are good or suitable for farming. The higher figure reflects the fill material that was added in the past to augment existing poor soils and facilitate cultivation of sugarcane. The remaining acres are poorly suited for farming, largely due to soils characterized as coral outcrop. The elimination of agricultural land will also result in the displacement of current lessees. The Petitioner has kept its existing lessees informed prior to and since announcing plans to develop the Kapolei Harborside Center. Of the four existing tenants, only two – Milo Nursery and Menehune Green – are intensive users of the site. Neither of these enterprises is engaged in farming. These lessees are already planning for the eventual relocation of their operations. All tenants will continue to be kept informed of the development plans as they progress. The current and planned land uses surrounding the project area are regulated as State Urban District, with no adjacent or nearby agricultural activities. The project area is an agricultural remnant.

Ample land is available on O'ahu to accommodate the growth of diversified crops, whether demand is based on potential or recent trends. In other words, the limiting factor to the growth of diversified crops is *not* the *land supply*, but rather the *size of the market* for crops that can be grown *profitably* in Hawai'i. If the 59 to 167 acres of the project area that are suitable for were used to grow a typical vegetable or fruit crop, it could support about 21 jobs. The industrial development of this agricultural land would not significantly adversely impact (1) the availability of land to farmers in Hawai'i, (2) agricultural land rents, (3) the growth of diversified crops, or (4) potential agricultural employment. The site is designated as Industrial on the 'Ewa DP and has not been actively used for food production for years due to its poor soils. Kapolei Harborside Center meets some of this industrial demand and keeps industrial uses within predescribed areas.

Mitigative Measures

No mitigation is necessary regarding the loss of agricultural lands. The minor adverse impacts due to the loss of agricultural land will be offset by socio-economic benefits described in *Section 5.17*. Grading and erosion control plans shall be performed in accordance with Chapter 14 (Public Works Infrastructure Requirements Including Fees and Services) of the Revised Ordinances of Honolulu (ROH). Soddings and plantings "shall be established on disturbed areas, which are at the final grade or will not be worked longer than 14 days" per DPP Rules Relating to Soil Erosion Standards and Guidelines.

4.9 VISUAL RESOURCES

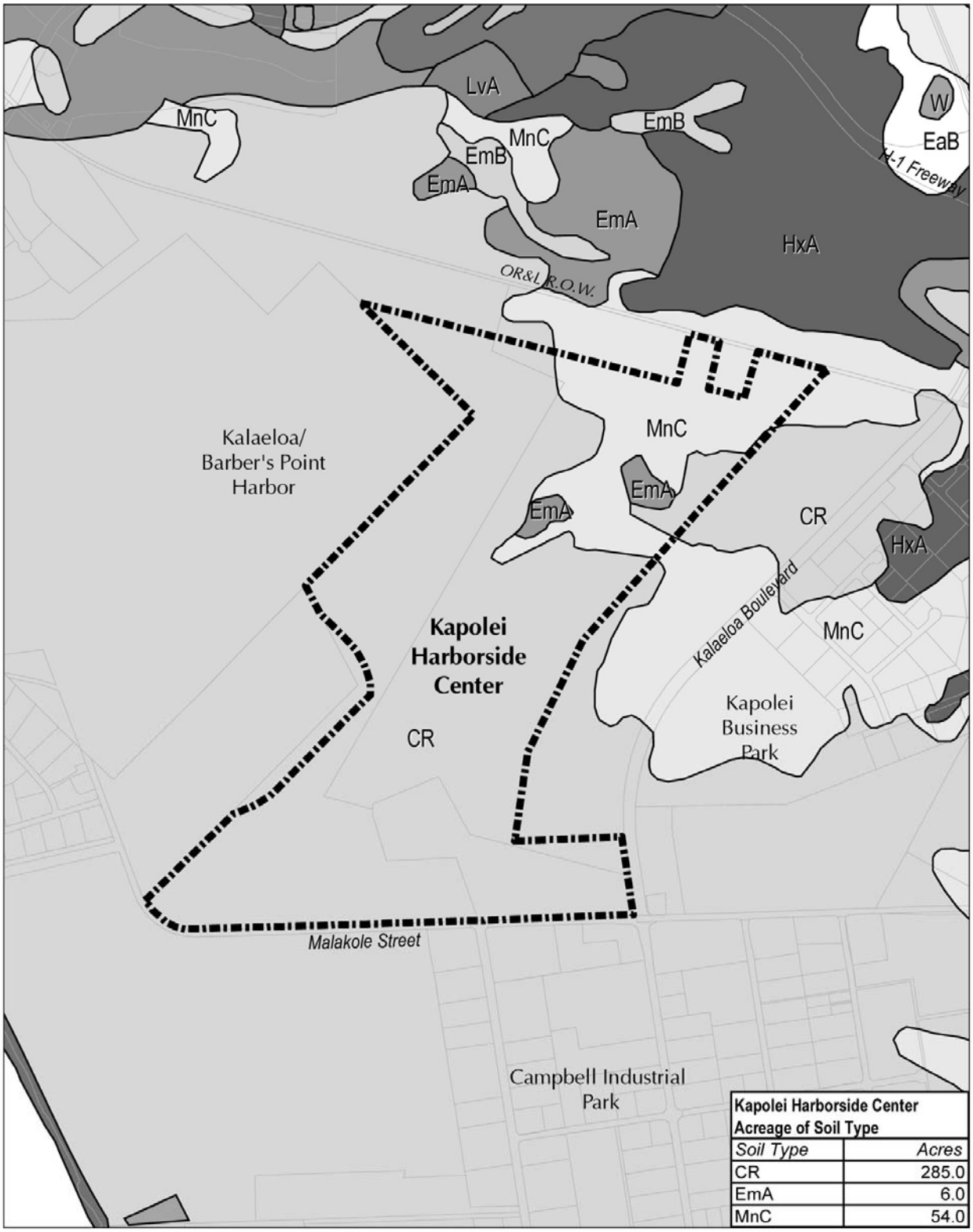
Existing Conditions

The project area is currently vacant with the exception of a plant nursery, green waste processing, fill material stockpiling, and a coal conveyor belt. As the majority of the site is open space, there are broad panoramic views from high points within the site to areas mauka. However, makai views from within the site are limited by surrounding industrial development in James Campbell Industrial Park (JCIP) and Kapolei Business Park. On-site mounding, uneven terrain, and scrub vegetation limit views within and across the site at ground level. The quarry and dredged spoil/stockpiles cover nearly half of the project area with bare calcareous soil and isolated pockets of dryland grasses, weeds and scrub vegetation. Much of the remainder of the site is abandoned agricultural fields.

While the site is primarily open space, JCIP obstructs coastal viewplanes from Farrington Highway and the proposed Kapolei West development. *Figure 4-5* provides recent site photographs.

Probable Impacts

The broad, panoramic views and sense of open space from certain portions of the H-1 Freeway and future residential communities located north of the project area may be adversely affected during construction and operation of industrial buildings. The visual impact is consistent with surrounding industrial uses makai of H-1 Freeway. Makai views are already limited due to JCIP.



Kapolei Harborside Center Acreage of Soil Type	
Soil Type	*Acres*
CR	285.0
EmA	6.0
MnC	54.0

Figure 4-2. Soils Map

0 600 1,200 2,400 Feet NORTH

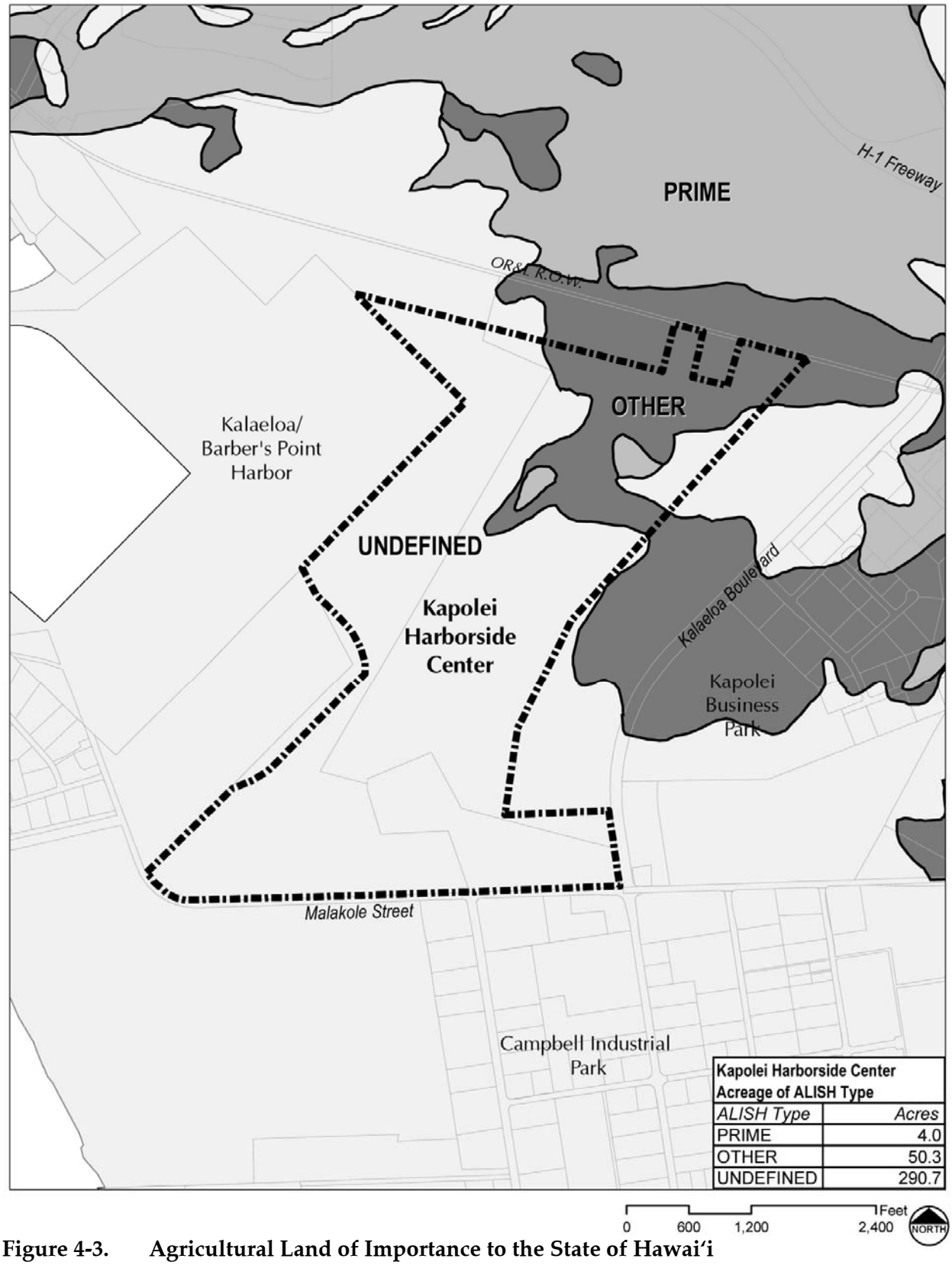


Figure 4-3. Agricultural Land of Importance to the State of Hawai'i

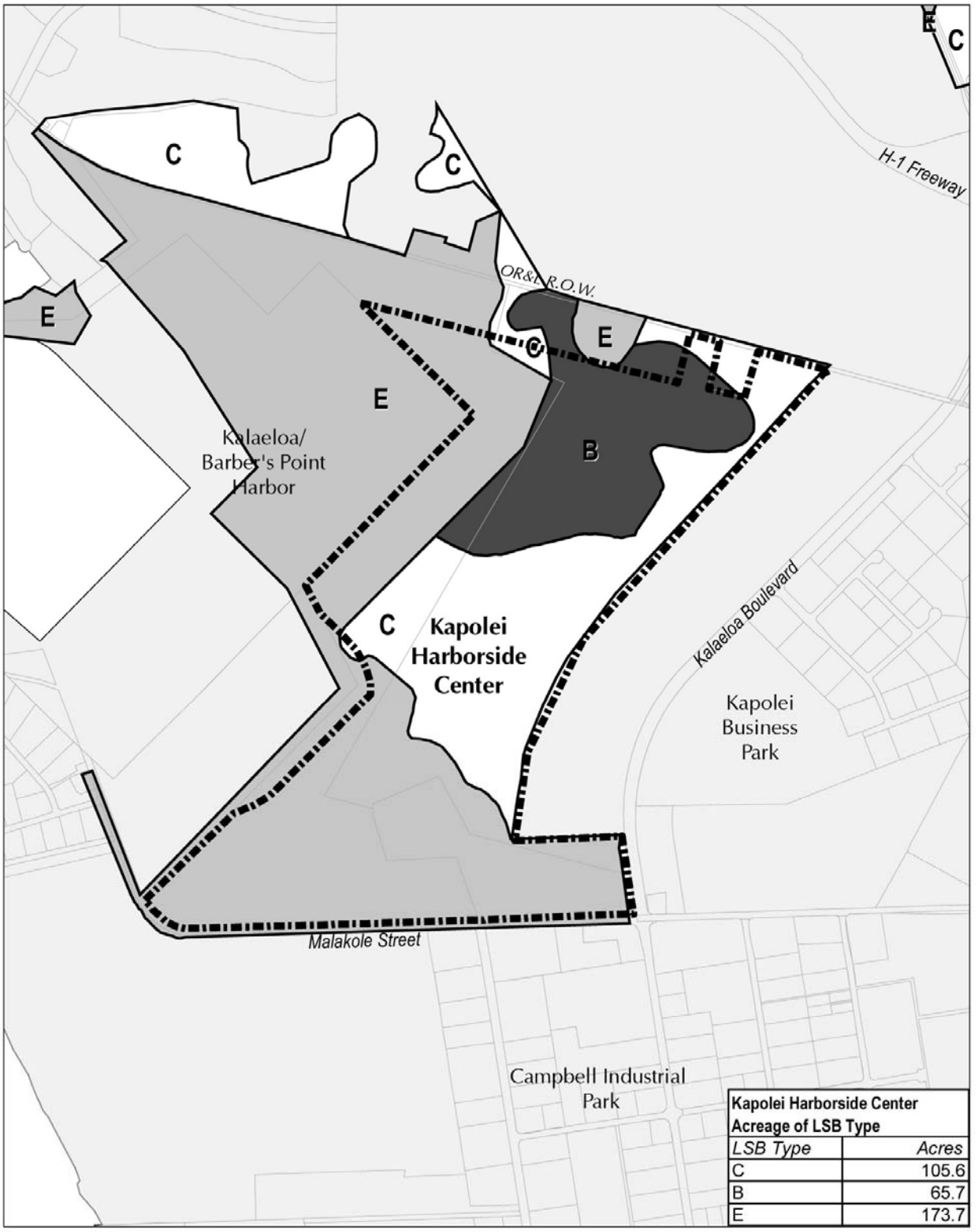


Figure 4-4. Land Study Bureau Productivity Ratings

0 600 1,200 2,400 Feet NORTH

Mitigative Measures

To mitigate the visual impact of urbanization of the project area, the design of the project will be consistent with the 'Ewa Development Plan and current County standards. Subsequent detailed design phases of the project area will consider the placement and clustering of structures (particularly any possible smoke stacks and storage tanks) based on the present industrial skyline configuration, with preference towards consolidating any structural penetration through the horizon line. KPD will coordinate with the Airports Division as the project progresses to examine appropriate height considerations as it relates to aviation and airport operations at Kalaeloa Airport.

Western view from northwest portion of the project area.

Eastern view from southern portion the project area.

Western view from within the project area.

Hawaiian Western Steel capped waste pile site.

Figure 4-5. Site Photographs

4.10 TRAFFIC

Existing Conditions

Kapolei Harborside Center Traffic Impact Assessment Report (Wilbur Smith Associates 2006) (*Appendix C)* focuses on the key intersections located within and near the project and the H-1 Freeway ramps that would provide the primary project access. The report examines existing traffic conditions and forecasts expected conditions in 2018, with and without the project. This DEIS section summarizes the existing conditions in the general region of the project.

Existing Roadway System

The major roadway system near the Kapolei Harborside Center is depicted in *Figure 4-6*.

- **H-1 Freeway** - This freeway is the major east-west roadway in the ʻEwa District and connects the ʻEwa area to central Honolulu and other areas of Oʻahu. City of Kapolei traffic access to the freeway is via the Makakilo (Makakilo Drive-Fort Barrette Road) and Palailai (Kalaeloa Boulevard) interchanges H-1 Freeway has six travel lanes east of the Palailai Interchange and four lanes west of the interchange where it becomes Farrington Highway.

- **Kalaeloa Boulevard** – This major roadway provides access from the H-1 Freeway at the Palailai Interchange to the Kapolei Business Park, James Campbell Industrial Park (JCIP), and Kalaeloa/Barbers Point Harbor. The roadway also provides access to the City of Kapolei area via the Kapolei Parkway connection to Kamokila Boulevard. Kalaeloa Boulevard is a four-lane divided roadway from the H-1 Freeway to Malakole Road, and is a two-lane street within the JCIP area makai of Malakole Street. Traffic signal controls are provided at the intersection with the Kapolei Parkway and with Malakole Street. This roadway is currently privately owned by the Estate.

- **Kapolei Parkway** - This major roadway is planned to be a major traffic artery connecting the City of Kapolei to the Ko ʻŌlina area to the west and to the Villages of Kapolei and other communities to the east. Within the Kapolei area, the only completed portions of the roadway are the one-block segment between Kalaeloa and Kamokila Boulevards and a section on the Honolulu side of Fort Barrette Road that provides access to the Kapolei Middle and High Schools, and the Villages of Kapolei. These segments have a median-divided roadway with two or more traffic lanes and a bicycle lane in each direction.

- **Malakole Street** – This two-lane roadway provides access to the Kalaelao/Barbers Point Harbor and the heavy industrial area west of Kalaeloa Boulevard. East of Kalaeloa Boulevard, the street is privately owned by parties other than the Petitioner and provides access to mauka-makai streets serving the eastern portion of the JCIP and the Hawaiʻi Raceway Park located on the mauka side of the street. Malakole Street ends west of the drainage channel separating the JCIP from the Kalaeloa Redevelopment Area (former Barbers Point NAS). Future plans are to extend Malakole Street across the existing unsurfaced and gated causeway across the drainage channel to connect to the roadway network within the Kalaeloa Redevelopment Area. West of Hanua Street, Malakole Street is privately owned by the Estate. Forty-foot setbacks for utility and fuel

line easements along the mauka side of Malakole Street run from the Kalaeloa/Barbers Point Harbor to Kalaeloa Boulevard.

- **Lauwiliwili Street** – The mauka portion of this two-lane collector street was constructed to serve the Phase 1 area of the Kapolei Business Park. The street will be extended makai through the Kapolei Business Park Phase 2 area to connect with and extend west of Kalaeloa Boulevard. Separate left- and right-turn lanes are provided at the STOP sign-controlled intersection with Kalaeloa Boulevard. KPD will coordinate with the State DOT Highways and Harbors Divisions regarding the right-of-way and alignment for Lauwiliwili Street as the project progresses. The project is currently in the State Land Use Boundary Amendment phase of approvals with a conceptual master plan level of detail. Further detail will be established as development plans progress, at which time roadway plans will be evaluated more closely with DOT representatives.

- **'Ōpakapaka Street** – This four-lane collector street extends from Kalaeloa Boulevard to the Lauwiliwili Street loop roadway. The street has a landscaped median for the block adjacent to Kalaeloa Boulevard, with the two lanes marked as separate right- and left-turn lanes at the STOP sign-controlled intersection.

- **Farrington Highway** - This State highway parallels the H-1 Freeway and serves east-west travel through the 'Ewa District from the Waipahu area to the Palailai Interchange. Farrington Highway also serves as the major regional route westward from the terminus of the H-1 Freeway east of the Honokai Hale residential area. The section between Kamokila Boulevard and Kalaeloa Boulevard is a two-lane roadway. Farrington Highway continues west of the terminus of the H-1 Freeway as a four-lane divided highway to connect to the Ko 'Ōlina and Wai'anae coast areas.

- **Kamokila Boulevard** - This major roadway connects Farrington Highway to the Kapolei Parkway and Kalaeloa Boulevard and provides access to the center of the City of Kapolei. Kamokila Boulevard provides two lanes in each direction. The roadway has a landscaped median area for most of its length and has left-turn lanes at the intersections with cross streets and driveways.

At the time of the traffic surveys in May 2005 and January 2006, the Honolulu Advertiser building was the only development west of Kalaeloa Boulevard in the City of Kapolei area. East of Kalaeloa Boulevard, Home Depot, Ace Hardware, and Outback Steakhouse are located along Kamokila Boulevard near the Kalaeloa Boulevard intersection with the Kapolei Parkway. Construction was underway on three new facilities within the Kapolei Business Park Phase 1 development along Lauwiliwili and 'Ōpakapaka Streets.

Key Intersection and Existing Traffic Conditions

Traffic conditions were analyzed for the weekday morning and afternoon peak one-hour traffic volumes at seven intersections near the project site. The results of traffic analyses are presented using the "level of service" concept that estimates average delays based on intersection configuration, traffic volumes, traffic characteristics and other factors. Six level of service, ranging from "A" to "F" are used: Level of Service (LOS) A describes free flow with no congestion or delay, while LOS F describes congested conditions and excessive delays. LOS B describes a condition that is not free flow, but delays or restrictions to maneuvering are

minimal. Some restriction to flow and reasonable delays at intersections are described by LOS C. LOS D describes conditions in which long delays occur at intersections and travel on roadway segments appear congested, but flow is stable. LOS E describes near-capacity conditions, with very long delays at intersections and flow on roadways are heavy and approach instability. LOS F represents excessive delays at intersections. LOS D or better are considered acceptable in urban areas, such as the project location.

The overall traffic conditions at each of the key intersections are summarized in *Table 4-2* for the weekday morning and weekday afternoon peak traffic hours. Weekday morning peak hour conditions at the seven intersections and ramps were recorded as acceptable, with four of the intersections at the lowest acceptable level, LOS D. These four LOS D intersections degraded to unacceptable, LOS E and F, in the afternoon peak hour, and traffic at the remaining three were acceptable, LOS B.

Table 4-2
Existing Traffic Conditions at Key Intersections

Intersections	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
	V/C	ADPV	LOS	V/C	ADPV	LOS
Kalaeloa Blvd. - Farrington Hwy Mauka-bound Left Turn	0.42	30.6	D	1.30	185.4	F
Kalaeloa Blvd. - EB Off-ramp Eastbound Left Turn	0.02	23.0	C	0.01	12.7	B
Kalaeloa Blvd. - Kapolei Pkwy	0.74	35.0	D	0.94	73.2	E
Kalaeloa Blvd. - Lauwiliwili St. (Mauka) WB Left-turn	0.02	29.4	D	0.05	58.8	F
Kalaeloa Blvd. - Opakapaka St. Westbound Left Turn	0.03	27.7	D	0.07	54.7	F
Kalaeloa Blvd. - Malakole St.	0.48	9.2	A	0.71	15.9	B
Hanua St. - Malakole St. Mauka-bound Left Turn	0.05	16.5	C	0.01	11.3	B

V/C = Ratio of the traffic volume to the theoretical capacity of the intersection.
ADPV = Average delay per vehicle, in seconds.
LOS = Level of service.

Wilbur Smith Associates; March 27, 2006.

Traffic at the Kalaeloa Boulevard/Farrington Highway onramp intersection tends to experience long delays during the weekday afternoon peak hour. The traffic analysis indicates an average delay of about 3 minutes per vehicle, while field observations noted the occasional formation of queues of up to 10 to 12 vehicles during this time.

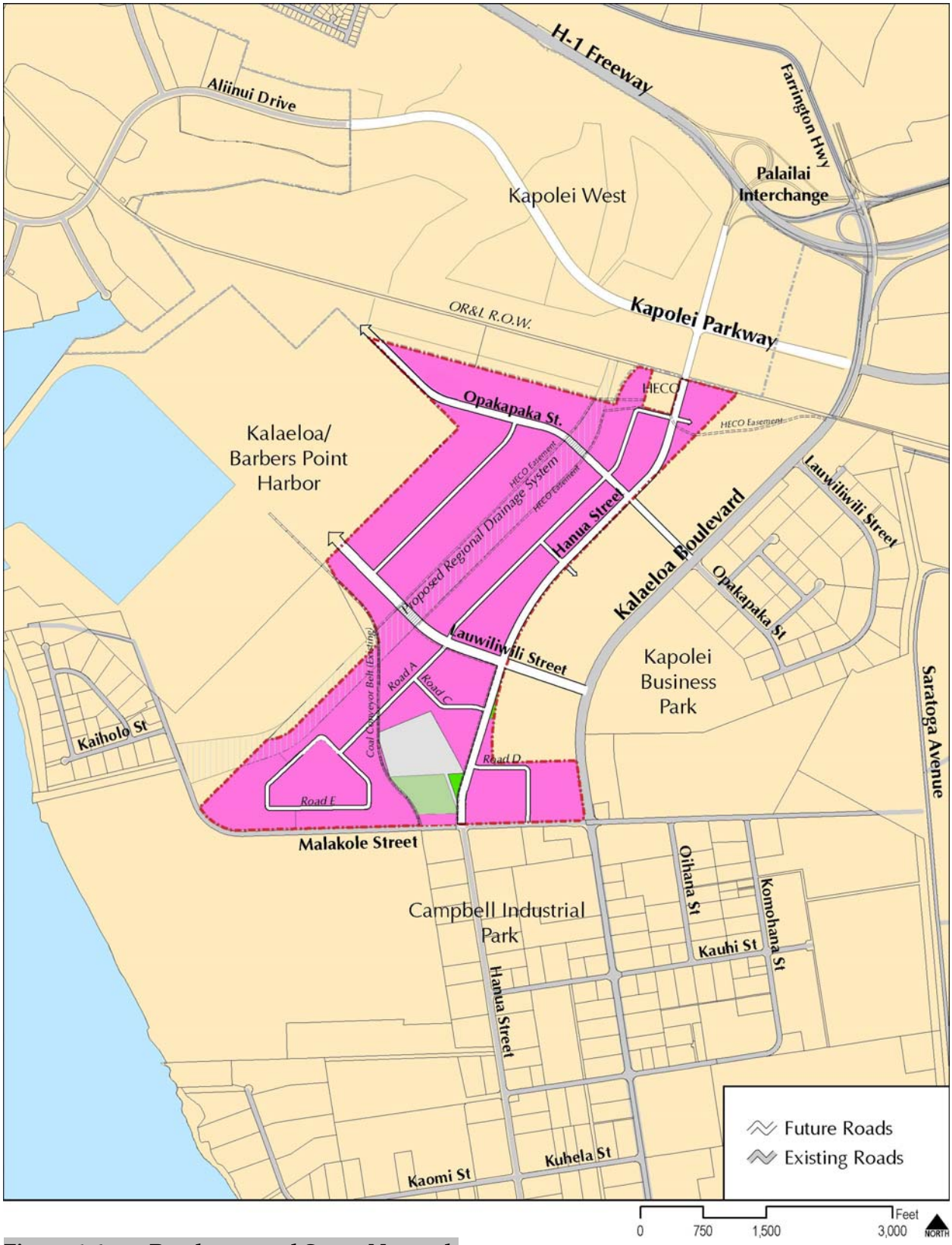


Figure 4-6. Roadways and Street Network

The overall traffic conditions at the signal-controlled Kalaeloa Boulevard intersection with Kapolei Parkway were at very acceptable overall levels during the weekday morning peak hour. Afternoon peak hour volumes experienced near capacity for the intersection capacity with long queues of mauka-bound traffic observed on Kalaeloa Boulevard for short periods just after 4:00 PM, with the queue extending to ʻŌpakapaka Street.

Traffic turning left from both Lauwiliwili and ʻŌpakapaka Streets experience long delays while waiting for a gap in the through traffic along Kalaeloa Boulevard. However, the low volume of vehicles turning left would not satisfy the warrants for consideration of a traffic signal at either location.

Public Transportation

The County provides public transportation services to the areas adjacent to the Kapolei West development area. These include a number of TheBus fixed route bus service that pass near the project site. TheHandiVan provides door-to-door service for persons who have difficulty in accessing the fixed route service.

TheBus Routes – The existing bus routes that provide service near the Kapolei Harborside Center project site include the following:

Route C Country Express – Route C provides an express/limited stop service through the City of Kapolei area, with the route extending to the Honolulu Downtown area and Ala Moana Center to the east and along the Waiʻanae Coast to Makaha to the west. The service operates seven days a week from about 4:30 AM to 11:00 PM. Route C uses Kalaeloa Boulevard between the H-1 Freeway and the Kapolei Parkway.

Route 40 Honolulu-Makaha – This trunk route provides regular bus service along the same general route as Route C. Within the City of Kapolei, it provides service along surface streets between the Makakilo and Palailai Interchanges, with the route using Makakilo Drive, Farrington Highway, Kamokila Boulevard, Kapolei Parkway, and Kalaeloa Boulevard. Service is provided seven days a week from about 5:00 AM to 9:30 PM.

Route 413 Campbell Industrial Park – This local route provides service from the Kapolei Transit Center to the Campbell Industrial Park and Barbers Point Harbor areas, with the route using the Kapolei Parkway and Kalaeloa Boulevard. The route operates from 5:30 AM to 8:00 AM and from 3:00 PM to 6:00 PM.

Bicycles and Pedestrians

Bicycle lanes are provided along the block of Kapolei Parkway between Kamokila and Kalaeloa Boulevards. Along the other major roadways, bicycles either use paved shoulder areas, wide outside lanes, or travel within the regular traffic lane.

Sidewalk facilities are provided along both sides of the Kapolei Parkway, and along Lauwiliwili and ʻŌpakapaka Streets. No sidewalks are provided along Kalaeloa Boulevard between

Malakole Street and the freeway, nor the section of Malakole Street near the Kalaeloa Boulevard intersection.

Planned Regional Transportation Improvements

A number of major regional roadway improvements are proposed in and around the project area. These roads are identified by three major planning documents, the O'ahu Metropolitan Planning Organization's (OMPO) Oahu Regional Transportation Plan (ORTP), the O'ahu Transportation Improvement Program (TIP) and the 'Ewa Highway Masterplan (HMP) as implemented through City and County of Honolulu Ordinance 02-52.

The 2030 ORTP is a long-term vision document that outlines transportation goals, objectives, and policies for O'ahu. The 20-year horizon of the plan guides future development of the major surface transportation facilities and programs. Based upon projected transportation needs, financial resources, and community input, the ORTP identifies short-range and long-range strategies and actions to promote the development of an integrated intermodal surface transportation system that facilitates the safe, efficient, and economic movement of people and goods. The ORTP is updated every five years.

The TIP is a short-term, three-year implementation program for federally-assisted surface transportation projects that will be undertaken by the State and City. Projects in the TIP must be consistent with the ORTP. The TIP describes and prioritizes approved federally-assisted and major locally-funded transportation programs and projects. The TIP identifies funding amounts by source of funding, jurisdictional responsibility, type of project, and year of funding for these projects. The TIP undergoes an annual review and a major biennial update.

The ~~'Ewa Highway Masterplan~~ HMP addresses the travel needs through 2010 and establishes a developer-funded source to pay for twenty percent of the regional roadways needed in the 'Ewa District. The 'Ewa HMP is implemented through Ordinance 02-52, which was passed in 2002 and relates to impact fees for traffic and roadway improvements in 'Ewa.

Planned regional improvements include:

- Construction of Hanua Street Extension from Malakole to Farrington as a new four-lane roadway, and the constructions of new on- and off-ramps (two lanes/ramp) at the Interstate Route H-1 Palailai Interchange for the Hanua Street Extension (ORTP project #s 84 and 111, respectively). Land for the Hanua Street ROW will be provided as part of the project;

- ~~Construction of Hanua Street Extension from Malakole Street to Palailai Interchange (ORTP# 84,111) – land for Hanua Street ROW will be provided as part of the project;~~

- ~~Construction of additional ramps at Palailai Interchange to accommodate Hanua Street connection to freeway (ORTP# 84,111);~~

- Construction of Kapolei Parkway as six-lane roadway from Hanua Street Extension to Kamokila Boulevard (ORTP #s 265 and 266, TIP #s 11B/C21 and 11C/C22, 'Ewa HMP);

- Extend Malakole Street eastward to connect to the roadway network within the Kalaeloa Redevelopment Area (ORTP# 502, Hawai'i Community Development Authority Master plan);

- Construct the extension of the makai end of Lauwiliwili Street westward to access the Kalaeloa (Barbers Point) Harbor (planned DOT access to Kalaeloa/Barbers Point Harbor) - land for Lauwiliwili Street ROW will be provided as part of the project;

- Construct 'Ōpakapaka Street between Kalaeloa Boulevard and Hanua Street (adjacent development);

- Construct 'Ōpakapaka Street between Hanua Street and the Harbor (this roadway will be constructed as part of the project); and

- Install traffic signals at Kalaeloa Boulevard intersections with 'Ōpakapaka and Lauwiliwili (Makai) Streets, and at Hanua Street intersections with Malakole and Lauwiliwili (Makai) Streets (adjacent development).

Probable Impacts

At full build-out, the land uses within Kapolei Harborside Center are estimated to generate a total of about 15,750 vehicle trips to and from the site on a typical weekday. The project is estimated to generate 2,135 and 2,207 vehicle trips in the weekday morning and afternoon peak hours, respectively.

2018 Traffic Conditions Without the Project

The 2018 forecasts without the project included the build-out of the Kapolei Business Park Phases 1 and 2 areas; the completion of the Kapolei Commons mixed-use development as well as the Costco and Kapolei Spectrum retail developments; and completion of the 100-acre I-2 zoned area between Kalaeloa Boulevard and Hanua Street. The forecasts reflected build-out of the City of Kapolei area east of Kalaeloa Boulevard and the occupancy of approximately 2,000 residential units within the Kapolei West development.

The major roadway projects planned assumed to be in place by yearend 2018 include:

- Completion of the Kapolei Parkway, to include the planned widening of the existing four-lane section between Kalaeloa and Kamokila Boulevards to six lanes

- Widening of Kalaeloa Boulevard to six lanes between the Palailai Interchange ramps and the OR&L track line

- Completion of the improvements at the Makakilo, Kapolei, and Palailai interchanges

- Construction of Hanua Street from the Palailai Interchange makai to Malakole Street

- Extension of Malakole Street eastward to connect to the Kalaeloa Redevelopment Area roadways

- Extension of Kamokila Boulevard and Wakea Street into the Kalaeloa Redevelopment Area

Traffic along Kalaeloa Boulevard in the morning peak hour is projected to increase from the existing 1,900 vehicles to 2,600 in 2018; the increase in the afternoon peak hour is projected to increase from 1,850 to 2,650 vehicles. With the connection to the Kalaeloa Redevelopment Area roadway system, traffic volumes in each peak hour along Malakole Street east of Kalaeloa Boulevard are forecast to increase from about 400 vehicles at present to about 1,000 vehicles in 2018.

Analyses indicate that the planned roadways should accommodate the forecast 2018 peak hour traffic volumes without the Harborside Center project at acceptable levels of capacity usage and average vehicle delays at most intersections. Long delays were indicated for side street traffic at several of the intersections assumed to have STOP sign control in 2018:

- The Malakole Street approaches to Hanua Street, with LOS F conditions and extremely long delays due to inadequate gaps in Hanua Street traffic in both afternoon and morning peak hours.

- The westbound approach of the mauka intersection of Lauwiliwili Street with Kalaeloa Boulevard in both peak hours, which would affect few vehicles.

- The westbound approach of the ʻŌpakapaka Street connection to Hanua Street in the morning peak hour, which would affect few vehicles.

The Malakole Street intersection would merit installation of traffic signal control, which would operate at acceptable conditions with the planned lanes. The traffic volumes and conditions at the other two intersections would not satisfy traffic warrants for consideration of traffic signal controls.

2018 Traffic Conditions with Project Buildout

The full development of the project, with the completion of the section of Hanua Street between Lauwiliwili Street Makai and Malakole Street is estimated to increase the traffic volumes along Hanua Street on the makai side of the Kapolei Parkway to about 3,000 vehicles in the morning peak hour, versus 1,160 without the project. In the afternoon peak hour, the volumes on this section are projected to increase from 1,030 vehicles without the project to 3,040 with the project and completion of Hanua Street.

Traffic volumes along Kalaeloa Boulevard just makai of the Kapolei Parkway are estimated to decrease by about 200 and 400 vehicles in the morning peak hour and afternoon peak hours, respectively, from those without the project and completion of Hanua Street.

Key Intersection Conditions

The peak hour traffic conditions at the key intersections in the vicinity of the project are summarized in *Table 4-3*. The Without (No) Project conditions in the table reflect the planned roadway projects by 2018 plus the installation of traffic signal controls at the Malakole street intersection with Hanua Street.

Table 4-3
Existing and 2018 Traffic Conditions at Key Intersections

Intersection	Scenario	Morning Peak Hour			Afternoon Peak Hour		
		V/C	ADPV	LOS	V/C	ADPV	LOS
Kalaeloa Blvd.- Farrington Hwy.	Existing	0.42	30.6	D	1.30	185.4	F
	No Project	0.49	8.7	A	0.62	16.5	B
	Project Buildout	0.49	8.8	A	0.63	16.8	B
Kalaeloa Blvd.- Kapolei Pkwy.	Existing	0.74	35.0	D	0.94	73.2	E
	No Project	0.85	39.0	D	0.93	33.5	C
	Project Buildout	0.93	53.8	D	1.08	63.7	E
	Mitigated	0.88	37.2	D	0.97	47.6	D
Kalaeloa Blvd.- Lauwiliwili St. Makai	No Project	0.47	7.6	A	0.61	10.3	B
	Project Buildout	0.53	9.2	A	0.62	16.2	B
Kalaeloa Blvd.- Malakole St.	Existing	0.48	9.2	A	0.71	15.9	B
	No Project	0.63	18.2	B	0.77	21.3	C
	Project Buildout	1.12	133.1	F	2.35	241.7	F
	Mitigated	0.64	45.1	D	0.86	36.6	D
Hanua St.- Kapolei Pkwy.	No Project	0.65	20.1	C	0.78	23.5	C
	Project Buildout	1.14	69.8	E	0.94	62.5	E
	Mitigated	0.83	4.5	D	0.93	45.3	D
Hanua St.- Opakapaka St.	No Project	0.08	53.2	F	0.29	47.9	E
	Project Buildout	*	*	F	*	*	F
	Mitigated	0.73	8.0	A	0.86	15.6	B
Hanua St.- Lauwiliwili Makai	No Project	0.03	23.9	C	0.22	24.1	C
	Project Buildout	0.67	17.3	B	0.81	21.0	C
Hanua St.- Malakole St.	Existing	0.05	16.5	C	0.01	11.3	B
	No Project	0.44	8.8	A	0.51	9.2	A
	Project Buildout	0.88	54.4	D	1.12	94.2	F
	Mitigated	0.79	40.9	D	0.92	49.1	D
Kapolei Pkwy.- Kamokila Blvd.	No Project	0.69	13.9	B	0.83	19.8	B
	Project Buildout	0.76	14.6	A	0.83	21.9	B

V/C = Ratio of the traffic volume to the theoretical capacity of the intersection.
ADPV = Average delay per vehicle, in seconds.
LOS = Level of service.
* = Delay not calculated since unreliable where traffic substantially exceeds capacity.
Wilbur Smith Associates; May 2006.

The addition of the project traffic would adversely impact several of the key intersections as described below:

- The projected traffic would exceed capacity of the Kapolei Parkway-Kalaeloa Boulevard intersection by 8% in the afternoon peak hour, with average traffic delays at LOS E.

- The increased project traffic along Malakole Street would result in traffic congestion and delays at the Kalaeloa Boulevard-Malakole Street intersection with the traffic volumes in both peak hours exceeding the estimated intersection capacity.

- The forecast morning peak hour traffic would exceed estimated capacity at the Hanua Street intersection with the Kapolei Parkway by 14%.

- Traffic on the ʻŌpakapaka Street approaches to Hanua Street would experience extremely long delays with STOP sign controls. The estimated peak hour volumes and delays satisfy warrants to allow consideration for installation of a traffic signal. The intersection would operate at acceptable conditions with the installation of a traffic signal.

- Traffic on the westbound approach of Lauwiliwili Street at the mauka intersection with Kalaeloa Boulevard would experience extremely long delays with STOP sign controls. The estimated peak hour volumes and delays do not satisfy warrants to allow consideration for installation of a traffic signal.

The forecast traffic at the Malakole Street intersection with Hanua Street would exceed the estimated capacity for both peak traffic hours with traffic experiencing very long delays (LOS F) and with the volumes and delays meriting additional modifications.

Although not included in *Table 4-3*, the traffic conditions on the proposed Areas 1 & 2 Access Road, Area 5 Access Road, and Area 6/7 Access Road connections to Hanua Street would experience very long delays, with the projected volumes and delays satisfying warrants to allow consideration of traffic signal control. All three intersections would operate at very acceptable conditions with traffic signal control and the forecast traffic volumes.

Mitigative Measures

Kapolei Harborside Center will need appropriate access to the major circulation roadways throughout the project area to serve the planned industrial center uses and to address regional connectivity. Kapolei Property Development will help facilitate improvements by providing the necessary land area, which holds significant value in the overall cost to develop these roadways, and by continuing to work with the State DOT to construct roadways necessary to serve State and private lands. The following paragraphs identify potential roadway improvements to mitigate the impacts at those intersections substantially affected by the projected Kapolei Harborside Center traffic in 2018.

Kalaeloa Boulevard-Kapolei Parkway – The project would primarily add traffic to the eastbound and westbound approaches of the Kapolei Parkway at this intersection. The addition

of a separate right-turn lane on the eastbound approach of the Kapolei Parkway would improve capacity use, but the forecast volumes would exceed the capacity by 4% in the afternoon peak hour. The average delays would be improved to acceptable conditions as summarized in *Table 4-4*.

Table 4-4
Improved Conditions with Addition of Right-Turn Lane for Eastbound Approach

Peak Hour	Volume-to-Capacity Ratio	Ave. Delay Per Vehicle (sec.)	Level of Service
Morning	0.88	37.2	D
Afternoon	1.04	51.1	D

The intersection capacity use could also be improved by the construction of a second (double) right-turn lane to accommodate the high volume of traffic projected to turn right from the westbound approach to access the H-1 Freeway and the Makaiwa Hills area. With the addition of the right-turn lanes on both approaches, the forecast afternoon peak hour traffic would amount to about 97% of capacity as shown in *Table 4-5*.

Table 4-5
Improved Conditions with Addition of Right-Turn Lanes for East & Westbound Approaches

Peak Hour	Volume-to-Capacity Ratio	Ave. Delay Per Vehicle (sec.)	Level of Service
Morning	0.88	36.3	D
Afternoon	0.97	47.6	D

These mitigative actions may be unnecessary if additional capacity were to be provided from the Kalaeloa Boulevard corridor to and through the Kalaeloa Redevelopment area to provide alternative routes for corridor traffic use in traveling to/from the Villages of Kapolei, East Kapolei, and Fort Weaver Road areas. The increased capacity connections could be provided by either of the following:

1. Widen Malakole Street between Kalaeloa Boulevard and the Kalaeloa Redevelopment Area roadways to a four-lane roadway; or

2. Provide the planned new roadway connection between Lauwiliwili Street and the Kalaeloa Redevelopment Area roadways in the Kapolei Business Park area, which would require a new crossing of the drainage channel separating the two areas.

Either of the above improvements should allow and encourage more travel by project and non-project traffic through the Redevelopment Area roadways and reduce the traffic volumes passing through the Kapolei Parkway intersections with both Hanua Street and Kalaeloa Boulevard.

Kalaeloa Boulevard-Malakole Street – Traffic conditions at this intersection are projected to worsen in the afternoon peak hour with the addition of the project traffic, based on the existing numbers of lanes at the intersection. The forecast volumes would exceed the intersection capacity by an estimated 26% with average overall delays at LOS E, as a result of the project traffic using Malakole Street to travel through the Kalaeloa Redevelopment Area to/from the Fort Weaver Road corridor and the City of Kapolei/East Kapolei area.

Several alternative modifications were considered for the intersection, with the effect on 2018 afternoon peak hour conditions summarized in the *Table 4-6*.

Table 4-6
Alternatives for Kalaeloa Boulevard-Malakole Street Intersection Mitigation

Potential Modification	Volume-to-Capacity Ratio	Ave. Delay Per Vehicle (sec.)	Level of Service
1. Add WB Left-turn lane	1.08	66.6	E
2. Item 1 + stripe second EB through lane	0.94	48.0	D
3. Item 1 + add EB (double) left-turn lane	1.01	65.5	E
4. Item 1 + add NB right-turn lane	0.98	56.2	E
5. Item 3 + Item 4	0.96	55.1	E
6. Item 1 + add SB second left turn lane	0.92	46.1	D

- Adding a left-turn lane on eastbound Malakole Street would offset much of the project impacts, although the projected traffic would exceed the intersection capacity by 8% with average overall delay at LOS E.

- Adding a left-turn lane on eastbound Malakole Street plus re-striping the right-turn lane on eastbound Malakole Street as a second through lane (Item 2) would result in estimated traffic at 94% of capacity with average overall delay at LOS D. Malakole Street would have to be widened on the east side of the intersection to provide two eastbound lanes for at least 400 feet from the intersection to receive the two through lanes.

- The adding of either a second (double) left-turn lane on eastbound Malakole Street (Item 3) or a right-turn lane on mauka-bound Kalaeloa Boulevard (Item 4) at the intersection would increase capacity to approximate the estimated traffic volumes, but with average delay remaining at LOS E. The combination of these two lanes with the westbound left turn lane would improve to 96% of capacity with traffic delay just above the borderline (55 seconds) between LOS D and E.

- Adding a left-turn lane on eastbound Malakole Street plus adding a second (double) left turn lane on the makai-bound Kalaeloa Boulevard approach (Item 6) would improve the volume-to-capacity ratio to 0.92, with average overall delay at LOS D. Malakole Street would have to be widened on the east side of the intersection to provide two eastbound

lanes for at least 400 feet from the intersection to receive the two lanes of traffic turning left.

The addition of a second (double) left-turn lane on the makai-bound Kalaeloa Boulevard approach (Option 6) would be the most effective improvement option, with the provision of two westbound through lanes on Malakole Street (Option 2) slightly less effective. However, the implementation of either of these is affected by right-of-way ownership at the intersection:

- A related party (The Estate of James Campbell) of the Kapolei Harborside Center property owner controls the section of Kalaeloa Boulevard north of the intersection, as well as the intersection area and a small parcel on the northeast corner.

- The City and County of Honolulu owns the south leg of Kalaeloa Boulevard and the west leg of Malakole Street.

- Private landowner groups unrelated to the Harborside Center owner own both the roadway right-of-way and the adjacent properties along the east leg of Malakole Street, with the exception of about the first 100 feet of property along the north side of the street at the intersection, owned by the Campbell Estate.

A short left-turn lane (75-foot storage) on the westbound approach of Malakole Street in Option 1 could be implemented using the Campbell property in the northeast corner. Options 3, 4, and could be implemented using Campbell and/or City right-of-way. However, Options 2 and 6, the two most effective improvement approaches would require use of right-of-way owned by unrelated private parties.

Therefore, the preferred improvement approach would be Option 6 if the independent property owners of the east leg of Malakole Street would agree to the widening of this section to receive the two lanes of makai-bound traffic that would be turning left onto Malakole Street. This improvement would also likely be needed for access to any future redevelopment of the Hawaii Raceway property. If an agreement cannot be reached with the owners of the east leg of Malakole Street, then Option 5 is proposed as the mitigative action. This mitigative action would only be needed if and when Malakole Street is connected to the Kalaeloa Redevelopment Area roadway network, which would allow use by project traffic as an alternative to the Kapolei Parkway.

Kapolei Parkway-Hanua Street Extension – The forecast project traffic would exceed intersection capacity by 14% in the morning peak hour. The addition of a right-turn lane to the eastbound approach of the Kapolei Parkway and/or the conversion of the planned right-turn lane on makai-bound Kapolei Parkway to a shared through/right-turn lane in order to allow through traffic in three lanes were evaluated to mitigate the project impacts during the morning peak hour as shown in *Table 4-7*.

Table 4-7 Mitigative Measures for Kapolei Parkway-Hanua Street Extension			
Potential Modification	**Volume-to-Capacity Ratio**	**Ave. Delay Per Vehicle (sec.)**	**Level of Service**
1. Add Right-turn lane to EB Kapolei Pkwy.	0.96	73.7	E
2. Convert Makai-bound Right-turn lane to shared Through Lane	0.96	59.7	E
3. Item 1 + Item 2	0.83	44.5	D

The analysis of the 2018 morning peak hour traffic with the potential mitigative modifications indicates:

- The increased capacity of the added right-turn lane on the eastbound approach would in the morning peak traffic at 96% of capacity, although the average overall delay per vehicle would be at LOS E.

- The projected morning peak hour traffic can also be accommodated by the conversion of the planned right-turn-only lane on the makai-bound approach to a shared through/right turn lane, which also results in a volume-to-capacity ratio of 0.96 and LOS E conditions. The outside lane would have to be extended makai of the intersection for 500 feet or more to allow the outside lane traffic to merge into the two continuing through lanes.

- The combination of the two modifications would improve average delay to LOS D, with traffic amounting to 83% of capacity.

The afternoon traffic conditions would be improved to 93% of capacity with average delay at LOS D by the combined eastbound right-turn lane and the third makai-bound through lane.

Hanua Street-Malakole Street – The installation of traffic signal control at this intersection would require additional lanes to accommodate the forecast afternoon peak hour traffic with the project. The critical movement contributing to the deficiency would be the left-turn from makai bound Hanua Street which is estimated at over 500 vehicles in the afternoon peak hour, as well as about 240 in the morning peak hour. Double left-turn lanes are usually needed to efficiently accommodate traffic when left-turn volumes reach 250 to 300 vehicles per hour. The peak hour conditions with this modification are shown in *Table 4-8*:

Table 4-8 Peak Hour Conditions with Hanua Street-Malakole Street Mitigation			
Peak Hour	**Volume-to-Capacity Ratio**	**Ave. Delay Per Vehicle (sec.)**	**Level of Service**
Morning	0.79	40.9	D
Afternoon	0.92	49.1	D

The provision of double left-turn lanes would require widening eastbound Malakole Street for about 400 or more feet east of the intersection to receive the two lanes of traffic turning left.

Provision for Traffic Signal Installation at Intersections – As indicated in the analyses of 2018 traffic conditions; several intersections along Hanua Street may merit the installation of traffic signals as traffic volumes increase. It is proposed that any underground detection loops, conduit, and pull-boxes be provided at the following intersections as part of the roadway construction to minimize any future disruption of traffic when the traffic signals are warranted by future conditions:

- Hanua Street and Areas 1 & 2 Access Roads
- Hanua Street and ʻŌpakapaka Street
- Hanua Street and Area 5 Access Road/I-2 Access Road
- Hanua Street and Lauwiliwili Street Makai
- Hanua Street and Area 6/7 Access Road
- Hanua Street and Malakole Street.

The conditions with these roadway improvements are indicated in *Table 4-3* as the "Mitigated" scenario.

Development and Timing of Roadway Projects
The Hanua Street extension is addressed within the Kapolei West docket (LUC A04-753), where Aina Nui Corporation agreed to provide the land necessary for the right-of-way. This contribution holds significant value in the overall cost of the roadway and can be used for local "soft match" funds needed to secure Federal funding as has been done for projects in the area such as the Kapolei Interchange Complex. Because of this road's importance to serve the Kalaeloa Barber's Point Harbor, this project is a strong candidate for State and Federal funding. Kapolei Property Development will continue discussions with DOT on the roadway planning process.

As with other significant projects in the region, this project will be required to provide multiple updated traffic studies as the project's design and development progresses. These updated studies will provide a better understanding of Federal and State funding priorities and a more accurate estimate of the schedule for planned highway improvements. The traffic study in this Final EIS is based on a preliminary design stage, preliminary land plan, projected types of uses, and projected roadway types, without detailed development phasing schedules. As the project progresses through the Change of Zone process, more detailed traffic data will become available.

Public Transit and Bicycle Travel
The Kapolei Parkway is planned to include bicycle lanes to encourage use of bicycles for transportation purposes as well as for recreation. Bicycle lanes or a bicycle path should also be included along either Kalaeloa Boulevard or Hanua Street. As the project develops and as appropriate, there will be consideration of measures to accommodate pedestrian and bicycle commuters.

Once Hanua Street is extended through to connect to Malakole Street, one or more TheBus routes will likely be added along Hanua Street, which would provide public transportation access to the project area.

Actions that could encourage use of these travel modes for access to the project include:

Public Transit

- Coordinate the potential location of bus stops with the City DTS and TheBus staffs and provide bus shelters at the stop locations.
- The project should be designed to provide convenient and safe pedestrian linkages to the bus stop locations through a system of raised sidewalks and walkways.

Bicycles

- The collector streets within the project site should be planned to accommodate bicycle use, and should provide a network of continuous street connections to allow use for bicycle travel by those who prefer not to travel along the major streets.

4.11 AIR QUALITY

Existing Conditions

An air quality study for the development was completed by B.D. Neal & Associates in May 2006 *(Appendix I)*. The study includes impacts associated with vehicular emissions, construction activities, electrical generation, solid waste disposal and agricultural activities.

The present air quality of the project area appears to be reasonably good based on nearby air quality monitoring data. Air quality data from the nearest monitoring stations operated by the State Hawai'i Department of Health suggest that all national air quality standards are currently being met, although occasional exceedances of the more stringent state standards for carbon monoxide may occur near congested roadway intersections.

Present air quality in the project area is mostly affected by air pollutants from motor vehicles, industrial sources and to a lesser extent by natural sources. The study references a 1993 air pollutant emission summary for the island of O'ahu that suggests 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 probably have declined.

The H-1 Freeway north of the project site, 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 over portions the project site by the prevailing winds.

Several sources of industrial air pollution are located in the Campbell Industrial Park, which is located adjacent to the project site on the south at Barbers Point. Industries currently operating there include the Chevron and BHP refineries, H-Power, Kalaeloa Partners, Applied Energy Services, Hawaiian Cement and others. Hawaiian Electric Company's Kahe Generating Station is located a few miles to the northwest at Kahe Point. These industries emit large amounts of sulfur dioxide, nitrogen oxides, particulate matter, carbon monoxide and other air pollutants. Prevailing winds from the east or northeast will carry these emissions away from the site most of the time.

Natural sources of air pollution emissions that also could affect the project area but cannot be quantified very accurately include the ocean (sea spray), plants (aero-allergens), wind-blown dust, and perhaps distant volcanoes on the island of Hawai'i.

Probable Impacts

Short Term Impacts
Short-term direct and indirect impacts on air quality could potentially occur due to project construction. For a project of this nature, there are two potential types of air pollution emissions that could directly result in short-term air quality impacts during project construction: (1) fugitive dust from vehicle movement and soil excavation; and (2) exhaust emissions from on-site construction equipment. Indirectly, there also could be short-term impacts from slow-moving construction equipment traveling to and from the project site, from a temporary increase in local traffic caused by commuting construction workers, and from the disruption of normal traffic flow caused by lane closures of adjacent roadways.

Fugitive dust emissions may arise from the grading and dirt-moving activities associated with site clearing and preparation work. The emission rate for fugitive dust emissions from construction activities is difficult to estimate accurately. This is because of its elusive nature of emission and because the potential for its generation varies greatly depending upon the type of soil at the construction site, the amount and type of dirt-disturbing activity taking place, the moisture content of exposed soil in work areas, and the wind speed. The EPA has provided a rough estimate for uncontrolled fugitive dust emissions from construction activity of 1.2 tons per acre per month under conditions of "medium" activity, moderate soil silt content (30%), and precipitation/evaporation (P/E) index of 50. Uncontrolled fugitive dust emissions at the project site would likely be somewhere near that level, depending on the amount of rainfall that occurs. In any case, State of Hawaii air pollution control regulations prohibit visible emissions of fugitive dust from construction activities at the property line. Thus, an effective dust control plan for the project construction phase is essential.

On-site mobile and stationary construction equipment also will emit air pollutants from engine exhausts (primarily consisting of carbon monoxide and nitrogen oxides). The largest of this equipment is usually diesel-powered. Nitrogen oxides emissions from diesel engines can be relatively high compared to gasoline powered equipment, but the standard for nitrogen dioxide

is set on an annual basis and is not likely to be violated by short-term construction equipment emissions. Carbon monoxide emissions from diesel engines, on the other hand, are low and should be relatively insignificant compared to vehicular emissions on nearby roadways.

Long Term Impacts
During operation of the Kapolei Harborside Center, carbon monoxide concentrations in the project area will likely increase due to emissions from project-related motor vehicle traffic, but worst-case concentrations should remain within both the state and the national ambient air quality standards. No significant ling-term adverse impacts are anticipated.

Mitigative Measures

To control dust, active work areas and any temporary unpaved work roads during the construction phase should be watered at least twice daily on days without rainfall. Use of wind screens and/or limiting the area that is disturbed at any given time will also help to contain fugitive dust emissions. Wind erosion of inactive areas of the site that have been disturbed could be controlled by mulching or by the use of chemical soil stabilizers.

Dirt-hauling trucks should be covered when traveling on roadways to prevent windage. A routine road cleaning program and/or tire washing program will also help to reduce fugitive dust emissions that may occur as a result of trucks tracking dirt onto paved roadways in the project area. Paving of parking areas and establishment of landscaping early in the construction schedule will also help to control dust. Monitoring dust at the project boundary during the period of construction could be considered as a means to evaluate the effectiveness of the project dust control program and to adjust the program if necessary.

Increased vehicular emissions due to disruption of traffic by construction equipment and/or commuting construction workers can be alleviated by moving equipment and personnel to the site during off-peak traffic hours.

No mitigation is proposed for the potential impacts to air quality during operational phase of the proposed development. Development activities will comply with the provisions of HAR 11-60.1-33 on Fugitive Dust.

4.12 NOISE

Existing Conditions

An Environmental Noise Assessment Report for the proposed development was prepared by D. L. Adams Associates in 2006 *(Appendix J)*. Noise is defined as "unwanted sound". Two types of noise measurements were conducted to assess the existing acoustical environment in the vicinity of the project location. The first noise measurement type consisted of continuous long-term ambient noise level measurements. The second type of noise measurement was short-term and included traffic counts to calibrate a traffic noise prediction model.

The existing sound levels in the project area are dynamic and depend significantly on the vehicular traffic patterns and industrial activities. The hourly equivalent sound level (Leq)

generally range from 48 decibels A-weighted (dBA) during the low traffic times to approximately 62 dBA during peak hour traffic at the long term measurement locations. The average calculated day-night level, Ldn, was 56 dBA at the southern end of the project site and 58 dBA near the eastern edge of the project site.

The traffic noise analysis shows that existing noise levels are below the Federal Highway Administration/Department of Transportation (FHWA/DOT) maximum noise limit of 72 dBA at the commercial areas adjacent to Kalaeloa Boulevard during peak traffic hours. Further, the project site is outside of the 55 Ldn noise contour of the Kalaeloa Airport and Honolulu International Airport. Therefore, the site is not affected by significant aircraft noise levels.

Probable Impacts

Short Term Impacts
Development of project areas will involve excavation, grading, and other typical construction activities during construction. The various construction phases of the project may generate significant amounts of noise. The actual noise levels produced during construction will be a function of the methods employed during each stage of the construction process. Earthmoving equipment, e.g., bulldozers and diesel powered trucks, will probably be the loudest equipment used during construction.

Mitigative Measures

In cases where construction noise exceeds, or is expected to exceed the State's "maximum permissible" property line noise levels, a permit must be obtained from the DOH to allow the operation of vehicles, cranes, construction equipment, power tools, etc., that emit noise levels in excess of the "maximum permissible" levels. The DOH generally requires the contractor to use reasonable and standard practices to mitigate noise, such as using mufflers on diesel and gasoline engines, using properly tuned and balanced machines, etc. Further, the DOH may require additional noise mitigation, such as temporary noise barriers, or time of day usage limits for certain kinds of construction activities and issues permit restrictions.

The DOH noise permit does not limit the noise level generated at the construction site, but rather the times at which noisy construction can take place. Therefore, noise mitigation for construction activities should be addressed using project management, such that the time restrictions within the DOH permit are followed.

Long Term Impacts
The completed development will incorporate stationary and non-stationary mechanical equipment that is typical for commercial buildings and industrial areas. Noise from this equipment must meet the State noise rules, which stipulate maximum permissible noise limits at the property line. For industrial areas adjacent to other industrial, commercial, and residential areas, the noise limits are 70 dBA during the day and night. Mitigation of mechanical noise to meet the DOH noise rules will be incorporated into the project design as noted below.

A vehicular traffic noise analysis was completed for the existing conditions, future year 2018 projections without the Kapolei Harborside Center project, and future year 2018 projections with the project. This analysis shows that existing and future noise levels are below the FHWA/DOT maximum noise limit of 72 dBA at the commercial areas adjacent to Kalaeloa Boulevard during peak traffic hours. Traffic noise levels within the project site near the proposed Hanua Street are also predicted to be within the maximum noise limit of 72 dBA. Vehicular traffic noise levels are expected to increase by 3 dB or less in the future due to the Kapolei Harborside Center project, but will still comply with the maximum noise limit.

The Kapolei Harborside Center project site is outside of the 55 Ldn noise contour of the Kalaeloa Airport. Therefore, the project will not be impacted by aircraft noise.

Mitigative Measures

The design of the new industrial development should give consideration to controlling the noise emanating from mechanical equipment so as to comply with the State Department of Health *Community Noise Control* rules. An acoustical wall that surrounds the industrial facility may be required to reduce noise levels at adjoining properties. In addition, buildings that are enclosed and include air-conditioning may emit less noise than buildings that are naturally ventilated.

The most effective noise mitigation is to properly plan the project site by creating a buffer zone between noisy industrial activities and noise sensitive areas. Accordingly, light or low noise industrial activities should be planned for the parcels that border the north and northwest property lines and should only occur during the day so there will be a minimal noise impact on the neighboring residential developments. Light industrial activities include warehousing, light manufacturing or processing, and packaging or repair establishments.

Industrial parcels on within the project area are expected to experience noise levels within the FHWA/DOT maximum noise level limit of 72 dBA during peak traffic hours, therefore, mitigation of traffic noise is not necessary at the project site. Additionally, light or low noise industrial activities will be planned for the parcels that border the north and northwest property lines and should only occur during the day so there will be minimal noise impact on neighboring residential developments. Light industrial activities include warehousing, light manufacturing or processing, and packaging or repair establishments. Other possible mitigation measures include construction of noise barriers (i.e., earth berms, walls, etc.) and air conditioning the affected residences. The Kapolei West development to the north has proposed utilizing its planned golf course as a buffer between the residential community and the industrial-business park to further mitigate noise impacts.

The Kapolei Harborside Center project site is outside the Ldn 55 dBA noise contour of the Kalaeloa Airport; therefore noise mitigation to attenuate aircraft noise is not necessary. However, the landowner will notify prospective purchasers of properties in the Petition Area of the possibility of single-noise events due to aircraft overflights from Kalaeloa Airport. The disclosure will be made through a disclosure document, which shall be signed by the purchaser as an affirmative acknowledgement of potential impacts.

4.13 DRAINAGE, WATER, WASTEWATER, AND SOLID WASTES

4.13.1 Drainage Facilities

Existing Conditions

The watershed in which the petition area is located encompasses approximately 2,400 acres, reaching almost six miles inland. Runoff from the area above the freeway is collected by three gulches: Awainui Gulch, Palailai Gulch, and an unnamed gulch. The three gulches converge just mauka of the freeway before crossing H-1 Freeway. The drainage way, a former irrigation ditch, continues parallel to the freeway for a short distance before heading makai through abandoned cane fields. The drainage way crosses under the OR&L ROW into the proposed project site, winding its way down towards Malakole Street. The defined drainage way ends approximately halfway between the railroad tracks and Malakole Street, at an existing service road used by Hawaiian Cement.

Runoff generated on the site and from adjacent areas drains overland via sheet flow and small ditches to the depressions on the site. With the exception of major storms, very little runoff is generated under existing conditions due to the former agricultural use and infiltration characteristics of the soil. Runoff from major storms flows to a depression area near the Kalaeloa Boulevard/Malakole Street intersection, flooding the low-lying area and flows to the Kalaeloa/Barbers Point Harbor. Small culverts along Malakole Street aid to relieve the ponding of runoff. Estimated runoff for the petition area under existing conditions ranges from 393 cfc for a 10-year, 1-hour storm to 559 cfs for a 100-year, 1-hour storm. Existing runoff was based on a one-hour duration for comparative purposes between areas both larger and smaller than 100 acres.

Kalaeloa Boulevard, Malakole Street, and roadways in the existing JCIP contain underground drainage systems that collect and convey runoff to drainage ditches and channels, ultimately discharging into the ocean.

Probable Impacts

During construction, storm water will be contained onsite and will dissipate through evaporation and percolation. A Notice of Intent (NOI) to be covered under the State's National Pollutant Discharge Elimination System (NPDES) general permit for construction activities will be required from DOH, Clean Water Branch prior to commencement of construction activities. The proposed development will alter the character of the site. The vegetative cover currently found onsite will be replaced by buildings, paved areas, formal landscaped areas, and other improvements normally associated with industrial developments. Consequently, peak runoff generated onsite will increase. The approved 1991 Final EIS for the regional drainage channel has addressed erosion and water quality considerations. Not all of the runoff from the area is currently discharged to Kalaeloa/Barbers Point Harbor. A large portion of the area runs off to Malakole Street to the existing drainageway adjacent to Chevron U.S.A. Prior to construction of the existing coal conveyor, most of this runoff from the area made its way to Malakole Street and the drainageway. Diversion of runoff away from the harbor will follow the more historic path of previous runoff. With the implementation of water quality improvements by the

individual developments within the watershed, sediment discharge and resulting impacts to coastal waters should be minimized.

Peak runoff rates under developed conditions were estimated for the 10-, 50-, and 100-year storms with a duration of one-hour. The 10- and 50-year runoff was estimated using the Soil Conservation Service's TR-20 hydrology program, while the 100-year runoff was based on Plate 6 of the City's "Rules Relating to Storm Drainage Standards". Actual design of drainage systems will be based on future developed conditions and will be based on the drainage areas served in accordance with the City's "Rules Relating to Storm Drainage Standards". Estimated runoff for the petition area under developed conditions ranges from 701 cfs for a 10-year, 1-hour storm to 1,250 for a 100-year, 1-hour storm. Without proper mitigative measures, major flooding problems will result due to the flat slopes found within the project site. Flooding may not be limited to the proposed project area but may also reach the existing industrial areas makai of the site. Mitigative measures proposed for the Kapolei Harborside Center must also consider the overall increase in runoff for the entire watershed. Future development of the watershed offsite may significantly increase the runoff passing through the site from mauka areas.

Mitigative Measures

The major element of the proposed drainage improvements is a large drainage swale running through the project site. The swale will be sized to accommodate peak runoff from the entire watershed, based on County Storm Drainage Standards. Planning and initial design of the ultimate drainage improvements for the region have begun. Also, the permitting process necessary for the offsite ultimate drainage outlet is underway. Preliminary analysis of the drainage requirements indicates that a trapezoidal swale with a bottom width of approximately 240-feet and 10-feet deep will be needed to convey runoff through the site. The drainage channel transitions from a trapezoidal unlined channel to a rectangular lined channel at Malakole Street. The channel below Malakole Street will continue the rectangular lined configuration to the shoreline. The channel makai of Malakole will also be tidal. Initial hydraulic analysis assumes the channel will be ledge coral or limestone in accordance with the City's "Rules Relating to Storm Drainage Standards". Concrete or rip-rap lining will be used in areas of excessive velocities or high erosion potential. Initial calculations for the project indicate that the planned on-site controls will be adequate to serve the planned industrial center, including short-term construction phase runoff and runoff will not be directed toward Kalaeloa Barbers Point Harbor. Temporary drainage improvements are also being investigated to help alleviate the drainage problems in the area for the interim period prior to construction of the ultimate regional drainage system.

It is anticipated that the onsite runoff will be handled by the installation of an underground onsite drainage system of catch basins/manholes and pipe or box culverts. Runoff will be collected and conveyed to the regional drainage channel for ultimate discharge into the ocean. A 150-foot wide strip of land to the southwest the project site has been set aside for a concrete lined discharge channel that will accept flows from the swale running through the project area. Construction of this portion of the channel is not part of this project. The development of the regional drainage channel was addressed in a 1991 EIS (Campbell Drainage Channel, Engineering Concepts, Inc. 1991) and will be permitted in a separate process.

Implementation of the regional drainage system and onsite drainage system will alleviate flooding problems currently experienced in the area as well as prevent flooding as a result of runoff from the proposed project. Runoff will be diverted away from the Kalaeloa/Barbers Point Harbor and the corner of Kalaeloa Boulevard and Malakole Street and be directed to the drainage channel. Per Hawaii Administrative Rules (HAR), Section 11-55-38, NPDES new NOIs or NPDES permits will be reviewed by DLNR and relevant correspondence will be included with submittal to DOH, Clean Water Branch. The project elements will comply with State Water Quality Standards per HAR, Chapter 11-54. It is anticipated, however, that water quality requirements will be the responsibility of the individual projects within the development rather than one large, common facility. The proposed drainage improvements represent a beneficial impact to storm water drainage at the site and the region. During future phases of the development process a Drainage Master Plan will be developed and submitted to Department of Planning and Permitting. The Petitioner will coordinate development of the Drainage Master Plan with the State Department of Transportation as it relates to the Harbors Division.

4.13.2 Water Supply

Existing Conditions

The source for drinking ~~potable~~ water is found near Waipahu in the vicinity of the Kunia Interchange. The Hōʻaeʻae Wells, Kunia Wells 1 and II, as well as Waipahu Wells, feed the water system serving the Kapolei/ʻEwa region. Transmission of water from the wells to Kapolei/ʻEwa is via 30-inch and 36-inch transmission mains along Farrington Highway.

The existing industrial developments are currently served by 24-inch and 20-inch Board of Water Supply (BWS) mains in Kalaeloa Boulevard and Malakole Street. Within Malakole Street a 20-inch main runs towards the harbor, with a 16-inch main heading toward Barbers Point Naval Air Station. It is estimated that the existing JCIP has an average daily water demand of approximately 5.3 MGD, with maximum daily demands and peak hour demands of 7.1 and 12.2 MGD respectively.

Drinking ~~Potable~~ water storage for the area is handled by the Kapolei 215 reservoir located mauka of the freeway below the Makakilo development, and the 3.0 MG, 4.0 MG and 5.0 MG Barbers Point Reservoirs, located above the project site in the southeast corner of the proposed Makaiwa Hills development.

The ʻEwa Water Master Plan identifies the required infrastructure to serve the development. According to the BWS, the transmission mains servicing the JCIP were sized according to generalized demands and site locations as indicated in the ʻEwa Water Master Plan, which primarily serves as a planning document.

The BWS provides non-potable water for the Kapolei area through the use of recycled effluent from the Honouliuli Wastewater Treatment Plant. A 16-inch R1 water line extends along the railroad right-of-way from the treatment plant to the City of Kapolei. Plans have been prepared for the continuation of the R1 line to storage tanks mauka of the freeway west of Puʻu Palailai, and for the installation of transmission lines down into the project area.

Probable Impacts

Additional demands through the BWS system will be generated by the proposed development. The anticipated water demands for the Kapolei Harborside Center are shown below. Review of the 'Ewa Water Master Plan and a preliminary hydraulic analysis using data from the Master Plan as the basis, indicates that the 20-inch and 24-inch potable water main lines in Kalaeloa Boulevard will be able to accommodate demands from the proposed project.

	Drinking Water Demand (MGD)			Non-potable Water Demand (MGD)		
	Average	Max.	Peak	Average	Max.	Peak
Kapolei Harborside Center	1.17	1.76	3.52	0.49	0.74	1.48

The offsite drinking ~~potable~~ water system will be adequate to service the initial development of the industrial-business park, as well as the other planned developments in the Kapolei area. Development of the project will be coordinated with existing and potential water supply, and will be supportive of water conservation programs and practices in private industry to help meet long-term needs. In general, the proposed project has been provided for in the planning of the regional water systems, resulting in minimal impact to the existing system.

Mitigative Measures

Development of the former O'ahu Sugar Co. wells EP-15 and -16 is currently underway by the BWS. Development of this source will benefit the entire Kapolei region, including the Kapolei Harborside Center. The onsite drinking ~~potable~~ water system for the project will connect to the mains in Kalaeloa Boulevard and will be designed in accordance with BWS standards. Preliminary analysis indicates 12- and 16-inch water lines will be needed to serve the drinking ~~potable~~ water and fire protection requirements for the industrial-business park, including the petition area.

To conserve valuable freshwater resources, a dual water system is proposed that will use drinking water for domestic uses and non-potable water for irrigation and other non-consumptive uses. The Estate is incorporating dual water systems in the City of Kapolei and the Kapolei Business Park. The non-potable water system will be extended from the City of Kapolei, which has the B~~G~~WS recycled effluent line as a source, and is connected to the existing and proposed non-potable water systems in the industrial area. The two systems will be carefully designed and clearly labeled to prevent cross-connections, backflow conditions and contamination of drinking water supply. As development plans progress into design phases, specifics regarding the planned dual-water system that will provide non-potable water will be elaborated on. According to BWS design criterion for industrial areas, the drinking ~~potable~~ water requirements are reduced by approximately 65% when such dual systems are employed. An updated drinking ~~potable~~ and non-potable master plan will be prepared and submitted to the BWS for their review and approval.

KPD and their civil engineers will address water use requirements and available resources with the Board of Water Supply and, as appropriate, the State Commission on Water Resource

Management (CWRM). There is no indication of a problem with supply for the project based on the engineering report and agency comment letters received to date. During future phases of development, the Petitioner will coordinate with the County regarding the feasibility of incorporating the Kapolei Harborside Center project into the County's Water Use and Development Plan that is now being updated. Kapolei Property Development will also coordinate with the BWS to address the necessary water improvements to serve the proposed project. Prior to installation, the construction drawings will be submitted for to the BWS for review and approval. Finally, the Petitioner will work, to the extent possible, with new tenants and businesses to help ensure the application of water conservation programs.

4.13.3 Wastewater

Existing Conditions

At the present, there are no existing wastewater facilities within the project site. Individual wastewater treatment systems such as cesspools and septic tanks are currently used by tenants in the neighboring JCIP to dispose of wastewater. The nearest municipal treatment facility, the Honouliuli Wastewater Treatment Plant (WWTP) is located approximately 2.6 miles east of the proposed project. ~~Currently, the Honouliuli WWTP has a primary treatment capacity of 38 million gallons per day (mgd) and could be expanded to 51 mgd.~~ Discussions were held with the Department of Environmental Services (DES) regarding the treatment capacity at the Honouliuli WWTP. The treatment plant was expanded to handle a liquid stream of 38 millions gallons per day (mgd), however, the solids handling capacity is limited to 27 to 29 mgd. According to DES, there is still a limited amount of capacity in the solids handling stream, but is not sufficient to handle a large increase in flows that could be generated by a project of this size. The City is currently in negotiations with a contractor to implement improvements to increase the solids handling capacity. The improvements are estimated to take two years to complete. The subject project is within the O'ahu Wastewater Advisory Committee Critical Wastewater Disposal Area, which prohibits the use of cesspools. The primary means of treated effluent disposal are reclaimed water reuse in the 'Ewa region and deep ocean outfall discharge with a design capacity of 112 mgd.

An existing force main/gravity interceptor sewer (Ko 'Ōlina Interceptor Sewer, Segment 1) runs parallel to the OR&L ROW above the site to serve the Ko 'Ōlina development. A private sewer pump station located near the intersection of Kalaeloa Boulevard and Malakole Street and a force main along Kalaeloa Boulevard currently services the existing Kapolei Business Park.

Probable Impacts

The proposed industrial park will generate wastewater flows that currently did not exist. The development is expected to generate average wastewater flows of 2.9 mgd, with peak design flows possibly reaching 7.4 mgd. Management of the wastewater flows from the proposed project will be necessary to prevent negative health and environmental impacts. Wastewater generated from the Kapolei Harborside Center is expected to be mainly of domestic composition, with some industrial discharges that would require on-site pre-treatment before release to the municipal sewer system.

Mitigative Measures

The Kapolei Harborside Center will be served by a new sewer collection system and new pump station built as part of the proposed development. Wastewater generated from the proposed development will be collected by a series of gravity sewers and conveyed to a centralized wastewater pumping station. The wastewater would then be pumped via force main to a main trunk sewer running along the railroad ROW for transport to the Honouliuli (WWTP). The onsite collection system, pump station, and force main will be designed in accordance with the standards of the County's Division of Wastewater Management. It is intended that the collection system, pump station and force main be dedicated to the County. Implementation of the wastewater facilities will be done in phases, according to the development schedule of the project.

This timing of the planned Honouliuli improvements fits well with the planned buildout of the Kapolei Harborside Center in 2018. It is likely that the development of the project site will begin after the completion of the improvements at the Honouliuli WWTP since additional entitlements are required. In the event that the Honouliuli WWTP improvements are not completed as scheduled, temporary means of wastewater disposal could be investigated for the initial developments with the approval of the DES. The Petitioner will continue to coordinate efforts with the DES and the DPP on this issue.

The existing Ko 'Ōlina Interceptor Sewer was oversized in the design phase to accommodate additional flows from Estate projects, mainly the flows from the City of Kapolei. At the time, it was not anticipated that the proposed industrial-business park are would be required to collect and transport its sewage to the Honouliuli WWTP. Consequently, the existing segment 1 of the Ko 'Ōlina Interceptor Sewer does not have the capacity to accommodate both the industrial uses and the City of Kapolei projects. A parallel sewer line, the Ko 'Olina Relief Interceptor Sewer, will be developed as the region's sewage capacity warrants. The date of construction for the parallel sewer will depend on the rate of development of the projects in the area. Construction timetables will be coordinated with the DPP as additional information on development schedules becomes available. As the project proceeds to more detailed study, the project engineers will prepare a Wastewater Master Plan in an application submitted to DPP.

The existing Ko 'Ōlina Interceptor Sewer currently ties in to the Makakilo Interceptor Sewer and the recently completed Kapolei Interceptor Sewer at Barbers Point Access Road. The Kapolei Interceptor Sewer runs parallel to the Makakilo Interceptor Sewer from Barbers Point Access Road to Honouliuli WWTP and is planned to accommodate almost all of the proposed developments in the Kapolei area below the H-1 Freeway, including the petition area. Detailed wastewater plans will be provided to DOH for review and input as the development progresses to future phases. The project will comply with the requirements of the Clean Water Act, including the rules under HAR, Sections 11-54, 11-55-04, 11-55-34.05, 11-55-38 for submission of application for general permit coverage authorized under the National Pollutant Discharge Elimination System (NPDES). The Petitioner will comply with applicable discharge requirements. As the project and roadway plans are advanced, KPD will coordinate with DOT Harbors Division in the planning for future sewer routes through Kapolei Harborside Center.

4.13.4 Solid and Hazardous Waste

Existing Conditions

The project site does not currently generate solid wastes and, thus, refuse collection service does not presently serve the project site. Currently, the site is undeveloped and does not generate solid wastes. The County is currently operating a landfill site in Waimanalo Gulch and the H-POWER waste energy recovery facility on the leeward side of O'ahu. The County is currently exploring alternative means of handling solid waste as an ongoing County-wide concern. Other programs being implemented include recycling and the reuse of green waste.

Probable Impacts

The proposed project will generate solid waste during construction and operation. Construction wastes would be minimal since there is little development onsite. Upon full build-out, solid waste generation from the proposed development is estimated to be 17 tons/day based on an average generation of 9 pounds per employee of industrial sites. Municipal solid waste disposal facilities have adequate capacity to meet project requirements. The H-Power Plant and Waimanalo Gulch landfill are the two disposal options, and H-Power Plant is preferred. Private refuse collectors will be contracted. Under the Industrial classification, certain uses of the site may have the potential to generate hazardous or regulated waste.

Mitigative Measures

The project will develop a job-site recycling plan for the construction phase of the project and recycle or otherwise provide for beneficial use as much construction or demolition waste as possible. As appropriate, there will be consideration of establishing a recycling collection system and space for bins to collect glass, plastic, cardboard, cans, as well as recyclable construction materials. ~~To the extent practical, the construction and design of the project will incorporate the use of recycled content and encourage recycling practices and other landfill diversion practices (i.e., H-power). The project will develop a job-site recycling plan for the construction phase of the project and recycle or otherwise provide for beneficial use as much construction or demolition waste as possible. Provisions will be incorporated into the project for a recycling collection system and space for bins to collect glass, plastic, cardboard, cans, as well as recyclable construction materials.~~ Where possible and appropriate, the project will specify and use products with recycled content such as steel, concrete aggregate fill, drywall, carpet and glass tile. The project will also, where possible and appropriate, specify and use locally produced projects such as plastic lumber, hydro-mulch, soil amendment, and glass tile. The individual site contractor and lessees will be encouraged to implement their own recycling plans. Non-recycled solid waste generated at the site would be directed to H-power for energy generation. ~~Recyclables will be collected by private waste haulers to private recycling companies.~~

All tenants will be required to adhere to State and Federal laws regulating the handling, storage, management, treatment, transport, and disposal of hazardous wastes. In addition, there are reporting requirements for inadvertent releases of these materials to the environment. The future tenants have not been identified and the amount of hazardous waste generation could

not be estimated. However, the intent is that heavy industrial uses, which generally handle large volumes of hazardous and regulated materials, would be directed to Campbell Industrial Park and Kapolei Harborside Center would be limited to light industrial-business uses.

4.14 HAZARDOUS AND REGULATED SITES

There are two areas of hazardous materials on the project area; however they pose no risks to human health. LFR Inc prepared an Environmental Summary Report for the proposed project (2006), included as *Appendix K*. Based on historical land use, two regulated and hazardous material impacted sites within the project area were identified as follows:

1. Former Hawaiian Western Steel (HWS) hazardous waste pile located north of Malakole Road and bisected by the Hanua Street extension (TMK 9-1-014:035); and
2. Hydrocarbon (petroleum components) -impacted soil and groundwater north of Malakole Road and adjacent to Chevron Refinery

4.14.1 HWS Waste Pile

Existing Conditions

Between 1959 and 1991 HWS operated a secondary steel mill at Campbell Industrial Park converting scrap metal into steel reinforcement bar (rebar). The industrial landfill associated with the former HWS operations is a monofill comprised of scrap steel, wet scrubber material, mill scale [iron oxide], slag, electrode remnants, furnace bricks and inorganic baghouse dust containing iron, zinc, lead and cadmium. Between 1970 and 1986 HWS disposed of plant-generated waste within the Kapolei Harborside Center project area in the area of the Hanua Street Extension, which was constructed subsequent to the disposal activities. ~~Between 1970 and 1986 HWS disposed of plant-generated waste (e.g., wet scrubber material, iron oxide, scrap steel, electrode remnants and furnace bricks, furnace baghouse dust) within the Kapolei Harborside Center project area in the area of the Hanua Street Extension, which was constructed subsequent to the disposal activities.~~ Additional waste generated from the post-operation clean-up activities at HWS plant were disposed at the waste pile. The total volume of waste is estimated at 100,800 cubic yards. The chemicals of concern are heavy metals, specifically lead and cadmium, which were detected in groundwater.

There were no records or evidence of any petroleum products or any appreciable amount of organic material being disposed of in the landfill. The design of the landfill cap was not required to incorporate provisions for the collection or venting of landfill gasses. With the exception of one area on the south slope of the west lobe of the waste pile where a buried tree stump was discovered and removed in 1995, there has been no evidence (such as bubbles or heaving of the asphalt) that gas has been generated in the landfill.

Investigative, cleanup and closure activities under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) and Resource Conservation and Recovery Act (RCRA) were initiated in 1989 and post-closure activities are ongoing. In 1992, a cap was constructed over the waste pile and initial RCRA closure activities were completed in 1993. Subsequent investigations indicated the cap did not cover the entire waste pile resulting in the

cap's extension. The waste material is now encapsulated in a 2 to 3 feet-thick asphalt cap underlain by 6-inches of corraline material and a polypropylene geotextile fabric. A Waste Pile Post-closure Plan approved by Environmental Protection Agency (EPA) required periodic groundwater monitoring and reporting. EPA approved cessation of monitoring between 1999 to 2005, at which time EPA approved termination of groundwater monitoring.

Probable Impacts

Initially adverse soil and groundwater impacts were identified at the site related to the hazardous waste disposal area. In 1999, groundwater studies indicated there was no evidence of lead or cadmium migration from the wastepile into the groundwater and no indication that the low levels of lead previously identified in the groundwater were migrating from the site.

Mitigative Measures

Semi-annual waste pile cap inspections and scheduled maintenance activities are required as described in the 30-year Post-closure Plan. 2006 is the tenth year of the post-closure period. Future use of the site is deed restricted per EPA regulation. Development of the site would exclude the waste disposal area and groundwater monitoring wells may need to be protected for future use.

4.14.2 Malakole Street Hydrocarbon Plume

Existing Conditions

The area of petroleum affected soil and groundwater adjacent to the Chevron Refinery represents the northern edge of a large plume of separate-phase hydrocarbon (SPH) underlying the storage tank farm and adjacent areas of the refinery. The area located on the north side of Malakole Road on a parcel that is leased by Grace Pacific for use as a sand and gravel storage areas. The extent of a hydrocarbon plume was delineated in the 1990s and attributed to historical releases of various petroleum products at the Chevron Refinery tank farm and potentially from petroleum pipelines aligned along the northern edge of Malakole Road. The northern fringe of the plume extends into the project area. Chemicals of concern identified in the soil and groundwater included benzene, chrysene and arsenic. The light nonaqueous phase layer (LNAPL) of the plume contained benzene, toluene, ethylbenzene, xylene and heavy metals.

A 1997 risk assessment concluded there were no significant completed exposure pathways from the off-refinery plume that would result in ecological risk. An active skimming remediation system was installed north of Malakole Road in 1997 and operated until May 2000 when the yield of SPH declined to levels that indicated skimming was no longer effective. 6,494 gallons of product were recovered. Subsequent soil and groundwater monitoring indicates the LNAPL in soil is reduced as is the source of petroleum compounds in the groundwater. Further, natural bioattenuation is occurring and the plume is slowly receding. The remediation effort was conducted with oversight from the EPA Region 9, and the DOH. The results also indicate that natural bioattenuation is occurring at the site and the area of impacted soil and the dissolved plume are stable and slowly receding. EPA and DOH accepted the risk assessment and signed

off on the site in 1998 Results from a 2005 monitoring and testing indicated that the remediation was quite successful in reducing the amount of petroleum in the groundwater and soil.

The hazards associated with the product plume were addressed in the Technical Memorandum, Tier II Evaluation of the Off-site Area, Kapolei, Hawaii, prepared by Dames and Moore for Chevron and dated June 13, 1997, and in subsequent correspondence between Chevron and the Estate. Chevron reported in a 1997 letter from Patricia Wagner to Susan Sublett-Graham (June 20, 1997) that U.S. Environmental Protection Agency (EPA) and DOH were currently reviewing the Tier II Evaluation.

During the review conducted in 1997, the Estate and LFR asked Chevron and Dames and Moore (letter dated July 8, 1997) if there were any ignitability or explosive hazard risks posed by volatile hydrocarbons or methane gas (which might be produced by the biological break-down of the petroleum). Chevron assured LFR and Campbell Estate that Dames and Moore had measured the concentrations of flammable gases in samples collected on site and in samples collected on the south side of Malakole Road (closer to the Chevron Refinery, where conditions would presumably be worse), and the results indicated that there were no ignitability or explosive hazard risks.

This assertion is supported by the Organic Vapor Analyzer (OVA) results listed in Table 2 of the Dames and Moore 1997 Technical Memorandum which lists the highest concentration of volatile organic vapors in gas samples collected using surface isolation flux chambers as 170 ppmv in sample number F3-A04. The lower explosive limit (LEL) for gasoline is 14,000 ppmv.

In 1997, before the remediation was conducted, there was a plume of separate phase petroleum in the ground at the site at measured thicknesses up to one foot. After the remediation was completed, Chevron installed additional soil borings and monitoring wells in December 2005 in the subject area. No measurable thickness of separate phase petroleum was detected in any of the wells during the 2005 investigation. It is likely that the vapor concentrations now are significantly lower than they were in 1997.

Additionally, the nature and magnitude of the remaining petroleum contamination was investigated in 2005 by the installation of four soil borings and monitoring wells located within 30 feet of the pipeline corridor along the southern boundary of the site. The results of the 2005 sampling indicate that no concentrations of BTEX and PAHs were detected in these wells or borings above the DOH environmental action levels (EALs). No measurable thickness of SPH was detected in any of the wells.

Probable Impacts

Adverse soil and groundwater impacts have been identified at the site related to the petroleum product release. There is potential for workers at the site, during construction and operation of the industrial park, to be exposed to affected soils or groundwater with potential for health risk. Indoor air vapor inhalation by future workers in buildings developed above the plume would not pose an unacceptable health risk, according to Chevron's risk assessment.

Construction worker exposure was identified as a potential risk pathway. Construction workers will be required to have hazardous materials training per 40 CFR 1910.120 and a health and safety plan with air monitoring prior to conducting excavation activities at depths greater than 5 feet in the area of the plume. Indoor air vapor inhalation by future workers in buildings developed above the plume would not pose an unacceptable health risk, according to the Chevron risk assessment. Development of the site will maintain access to the monitoring wells.

Mitigative Measures

As noted in LFR's July 6, 2006 report (*Appendix K*), remaining elevated petroleum hydrocarbon concentrations in a limited portion of the area north of Malakole Street will also require some on-going institutional controls. Specifically, future subsurface utility work or building construction which includes excavation to depths greater than five feet in the vicinity of boring/well F2-OBLO20A (*see figure 3, Appendix K*) will require the following precautions. First, construction workers at the site must have hazardous materials training (HAZWOPER) as required by 40 CFR 1910.120, and must prepare a health and safety plan prior to conducting excavation activities at depths greater than 5 feet in the area of the plume. The health and safety plan should include requirements to monitor the LEL in the work area and monitor for hydrocarbon concentrations in the breathing zone. Any soil that is excavated from depths greater than four (4) feet will have to be sampled and characterized for proper re-use on site or off-site disposal. Finally, any groundwater that is pumped during de-watering activities may require treatment before it is disposed on-site or off-site to avoid worker exposure or regulatory violations.

~~Construction documents and plans will clearly identify the affected areas and specify special instructions for working in these areas. To address pre-existing impacts, construction workers at the site will be required to have hazardous materials training per 40 CFR 1910.120 and a health and safety plan with air monitoring prior to conducting excavation activities at depths greater than 5 feet in the area of the plume. Mitigation measures to contain and minimize the impacts are ongoing and will continue through development of the project.~~

The site may be suitable for State Brownfields redevelopment and therefore could be eligible for Brownfields assessment and load funds. The State Office of Planning encourages this type of redevelopment and has indicated it would provide assistance with the application process.

4.15 POWER AND UTILITIES

Existing Conditions

The proposed development site is currently not served by Hawaiian Electric Company (HECO) or Hawaiian Telcom (HawTel). HECO and HawTel provide service to the neighboring industrial park as well as to the nearby development of Ko 'Ōlina and Kalaeloa (former Barbers Point Naval Air Station). An existing HECO substation is located adjacent to the project area, makai of the railroad right-of-way and west of Kalaeloa Boulevard. HECO also has fuel oil line easements along Malakole Road and existing and future 138kV and 12kV overhead lines within the project area.

Probable Impacts

The proposed development will place additional demands on the utility systems. For planning purposes, HECO has indicated that electrical unit loads for industrial developments may range from 100 KVA/acre to 150 KVA/acre. Based on information provided by HECO, the projected load requirements are estimated at 43.5 to 65.2 MVA for the project area. Preliminary consultations with HECO and HawTel indicate that service can be provided to the project. HECO has further advised that easements may be required in those cases where the proposed roads are not aligned in such a manner to accommodate overhead lines. These easements will need to align with the drainage channel and Hanua Road and could serve as pedestrian access points on the site.

Mitigative Measures

Preliminary consultations with HECO and Hawaiian Telcom indicate that service can be provided to the project. Project requirements will be coordinated with these utility providers. HECO has indicated that it has planned for cumulative developments of West O'ahu and that this project is accommodated in those plans. Kapolei Harborside Center will continue to work with HECO to develop appropriate electrical infrastructure.

Energy efficiency design guidelines will be developed as part of the Conditions, Covenants and Restrictions that will apply to the development of the project site. These "guidelines" will be submitted to the Energy Branch, State Department of Business, Economic Development and Tourism for its review and input. Some energy conserving measures that will be included in the guidelines, among others, are:

- Use of timer or occupant-sensing light and air conditioning controls.
- Use of high-efficiency air conditioners and appliances.
- Use of heat pumps and solar heating systems.
- Promotion of energy saving opportunities through innovative building design.
- Use of landscaping for dust control and to minimize heat gain in the area.

As energy efficient guidelines are developed for the project, they will be submitted to the Energy Branch, State Department of Economic Development and Tourism for review and input. As the project and roadway plans are advanced, KPD will also coordinate with DOT Harbors Division in the planning for future electrical service routes through the site.

4.16 SOCIO-ECONOMIC CONDITIONS

State and County economic and growth policies support development of the City of Kapolei as a Second City to Honolulu. Kapolei is becoming a major supplier of jobs for those who live in the region and surrounding communities, and provides a full range of goods and services (both private and public) to residents, visitors, and businesses in Kapolei and beyond.

Considerable development is planned and projected for the Kapolei/'Ewa region. The amount and variety of development reflects the ongoing transformation of Kapolei/'Ewa from its past role as largely a suburb of the Honolulu's Primary Urban Center to the Secondary Urban Center on O'ahu. Kapolei/'Ewa has provided workers who commute to jobs in the Primary Urban

Center and elsewhere, and has provided consumers who purchase many goods and services outside the 'Ewa region.

4.16.1 Population and Affordable Housing

Existing Conditions

In order to provide for a sustainable and successful new urban center, a mix of housing and jobs are needed in Kapolei. The Kapolei Harborside Center project provides much needed employment opportunities for the growing number of people residing in the Kapolei region. Many of the current and planned residential communities in Kapolei include significant affordable housing components. Kapolei is the fastest growing region in the State of Hawai'i. Kapolei's population of 84,150 is projected to grow to 129,000 by 2015 and up to 173,000 by 2025. Kapolei's population in 1990 was 43,000. The area has experienced a 60% increase in its population in just 10 years. In comparison, the population for the City and County of Honolulu as a whole increased only 4.8% from 836,231 to 876,156 between 1990 and 2000. Almost 85% of the residents of Kapolei are high school graduates and over 22% have college degrees (Campbell Estate, 2005). The median age is relatively low at 31.2 years, compared to the City's median age of 35.7 years. The median family income is $62,340.

As compared to other areas of the island, there is a very high level of affordable housing provided by private developments in the 'Ewa Development Plan region. According to a June 2005 Mikiko Corporation report (*Appendix L*), the 'Ewa DP Area recorded a higher share of affordable housing sales than did the rest of O'ahu. The region has offered approximately 7% to 10% more affordable housing units for sale than the island as a whole in recent years. There are also significantly more affordable housing units for sale in the region currently than in the past. Compared to 2000, 'Ewa homes sold recently represented 77% more units affordable to those in the 80% to 140% of the median income category. Given these factors, the 'Ewa region has been satisfying an increasing share of O'ahu's affordable housing needs, well in excess of its "fair share". The region is hosting approximately 22% of the island's affordable for-sale housing transactions. Considering the relative number of households, the region's "fair share" would have been about 6% in 2000 and 7% over the last year. Relevant data from this report are presented in *Table 4.9*.

Probable Impacts

While the proposed development does not directly contribute to population increases by providing new homes, the project does contribute to the transformation of Kapolei becoming O'ahu's second full-service urban center. Public policy is to redirect traffic currently flowing into downtown Honolulu by providing alternative employment centers outside of the existing urban core. The increase in employment opportunities in the 'Ewa area is likely to encourage more residential growth in the region, which would have beneficial economic impact on the businesses and services in the region. The proposed project is consistent with these policies.

During the 10-year development period, direct and indirect employment is estimated at 2,380 residents in 710 homes. Of these, 1,480 persons are expected to reside in 440 homes in the Kapolei/'Ewa region.

Mitigative Measures

No mitigation is necessary.

Table 4-9: 'Ewa and O'ahu Housing Statistics: 2000 and 2004/2005*

Item	Price Range		'Ewa						O'ahu			
			2000			2004/05			2000		2004/05	
	2000	2004/05	Number	Distribution	% of O'ahu	Number	Distribution	% of O'ahu	Number	Distribution	Number	Distribution
Existing Homes			20,804		7%	25,657		8%	315,988		330,141	
Number of Home Sales by Type and Price Affordable to Families Earning % of Median Income												
Multi-family Homes												
Less than 80% of median income	Below $150,000	Below $200,000	265	21%	15%	308	12%	14%	1,775	21%	2,204	17%
80% to 140% of median income	$150,000 to $320,000	$200,000 to $440,000	229	18%	13%	780	31%	19%	1,818	21%	4,119	32%
140% to 170% of median income	$320,000 to $390,000	$440,000 to $540,000	6	0%	3%	98	4%	15%	198	2%	645	5%
170% to 200% of median income	$390,000 to $470,000	$540,000 to $640,000	-	0%	0%	46	2%	14%	109	1%	319	2%
Over 200% of median income	Over $470,000	Over $640,000	-	0%	0%	83	3%	19%	259	3%	430	3%
Total mf-homes			500	40%	12%	1,315	53%	17%	4,159	49%	7,717	59%
Single-family Homes												
Less than 80% of median income	see above	see above	67	5%	18%	20	1%	14%	368	4%	144	1%
80% to 140% of median income	"	"	483	39%	22%	478	19%	30%	2,183	26%	1,606	12%
140% to 170% of median income	"	"	199	16%	29%	345	14%	32%	679	8%	1,069	8%
170% to 200% of median income	"	"	1	0%	0%	204	8%	25%	456	5%	824	6%
Over 200% of median income	"	"	1	0%	0%	119	5%	7%	705	8%	1,694	13%
Total sf-homes			751	60%	17%	1,166	47%	22%	4,391	51%	5,337	41%
All Homes												
Less than 80% of median income	see above	see above	332	27%	15%	328	13%	14%	2,143	25%	2,348	18%
80% to 140% of median income	"	"	***712***	***57%***	***18%***	***1,258***	***51%***	***22%***	***4,001***	***47%***	***5,725***	***44%***
140% to 170% of median income	"	"	205	16%	23%	443	18%	26%	877	10%	1,714	13%
170% to 200% of median income	"	"	1	0%	0%	250	10%	22%	565	7%	1,143	9%
Over 200% of median income	"	"	1	0%	0%	202	8%	10%	964	11%	2,124	16%
Total Home Sales			1,251	100%	15%	2,481	100%	19%	8,550	100%	13,054	100%
Median Sales Price												
Multi-family Homes			$125,450		74%	$284,466		107%	$170,000		$265,000	
Single-family Homes			$238,100		81%	$460,000		88%	$293,000		$525,000	
All Homes			$199,500		86%	$384,858		104%	$232,000		$369,000	
Average Sales Price												
Multi-family Homes			$144,881		72%	$328,137		103%	$201,548		$317,383	
Single-family Homes			$237,617		64%	$478,403		75%	$369,880		$634,357	
All Homes			$200,552		70%	$398,758		89%	$287,998		$446,975	

* Year 2004/05 = 8/1/04 to 7/31/05

Sources:

Mikiko Corporation. "Ewa and Oahu's Affordable For-sale Housing: Summary of Recent Market Conditions." September 29, 2005.

City & County of Honolulu, 2006.

4.16.2 Employment

Existing Conditions

As of 2005, over 25,000 jobs are in the region. Campbell Industrial Park is the area's largest job center, providing approximately 4,600 jobs. By 2020, 65,000 jobs are projected to be retained within the Kapolei/'Ewa region. There are almost 800 businesses in the region, which have made over $1 billion in commercial investments since 1995. A 2005 OmniTrack study of 'Ewa economic impacts reports approximately 80% of 'Ewa region residents work outside the area; however, 67% of residents would prefer to work in the area.

Probable Impacts

During construction, Kapolei Harborside Center will provide employment for an average of 450 construction workers in the 10-year development period, with a payroll of about $29.6 million per year during development activities. An additional $24.5 million payroll will support approximately 640 employees at construction-related businesses (e.g., construction material supply, construction equipment rental, shipping and trucking) and community businesses (e.g., fueling stations, grocery stores, restaurants). The total direct and indirect employment is estimated at 1,100 during project development, 710 of which would be in the Kapolei/'Ewa region.

At full occupancy, the project is anticipated to provide approximately 3,800 permanent new industrial jobs, with a payroll of about $176 million per year (versus about 40 jobs for current activities on the property that will relocate). An additional 2,300 indirect jobs (i.e., dependent on the industrial operations), with a payroll of about $88.4 million per year will result from the project's development. Thus, total direct-plus-indirect employment associated with the industrial operations at full development is expected to exceed 6,100 jobs. Over 4,600 of these jobs are expected to be in the Kapolei/'Ewa region. The new jobs provided by the project will result in less commuting by Kapolei/'Ewa residents to jobs outside the region.

Mitigative Measures

No mitigation is necessary.

4.16.3 Industrial Market and Economic Conditions

Existing Conditions

An Industrial Market Feasibility study for the proposed project (2006) is included as Appendix A. In 2005, the Honolulu industrial market comprised approximately 35 million square feet and has remained fairly constant amidst growing employment and maritime commerce. The ten areas of O'ahu industrial space are: Sand Island, Iwilei, Airport, Pearl City, Waipahu, Gentry Business Park, Campbell Industrial Park, Kailua, and Kaneohe.

There is an island-wide shortage of industrial land. The vacancy equilibrium is estimated at 5%, but O'ahu's industrial space vacancy has dropped to 1.5%, which results in higher lease rates.

Colliers Monroe Friedlander predicts rents will be 8 – 12% higher in 2006 than the previous year. Island-wide demand for industrial space has three components: 1) pent-up demand, which is the amount of demand that would need to be absorbed to return the market to an equilibrium of 5% vacancy; 2) employment driven demand, which represents the demand created by new job formation; and 3) transient demand, which represents existing tenants with expiring leases that are likely to relocate from their existing space. The total of these components is the total industrial demand in acres. Total pent-up demand in 2005 was estimated at 73 acres on O'ahu. Annual employment driven demand on O'ahu is projected at 25 acres per year from 2005. The transient demand for West O'ahu is projected at 11 acres per year from 2005.

Most of the undeveloped land on O'ahu available for industrial development is in West O'ahu. More than 600,000 square feet of new industrial space is scheduled to become available by 2007 in West O'ahu, yet this is not expected to be adequate to satisfy the demand from the expanding labor market. Honolulu's current 1.8 percent vacancy rate is creating difficulties for industrial tenants who want to lease warehouse or industrial space. Colliers Monroe Friedlander predicts rents will be 8 to 12% higher in 2006 than the previous year. An economic assessment study by Decision Analysts Hawaii, Inc. estimates the need for 16 million additional square feet of light and heavy industrial space in the 'Ewa region by 2025.

Probable Impacts

The shortage of industrial land is a major island-wide problem. The proposed project will help meet the need for demand for industrial land by increasing the island-wide supply of industrial land and will therefore likely create an island-wide identity, rather than being solely a regional asset. The construction and operation of Kapolei Harborside Center would have beneficial indirect and direct socio-economic impacts on employment, tax revenues, and the supply of industrial space. Refer to the Economic Impact Assessment report *(Appendix E)* for more details.

Construction expenditures for infrastructure and building space are estimated at $590 million, or an average of about $59 million per year over 10 years. In addition to construction expenditures, development activities will generate indirect sales associated with supplying goods and services to construction companies and to the families of the employees of these companies. In turn, the companies supplying goods and services, and the families of the employees of these companies will purchase goods and services from other companies, and so on. Based on State economic multipliers, these indirect sales are expected to average about $63 million per year. Although not estimated, additional development costs include planning, permitting, design, financing, City and State exactions, and marketing and sales.

During project development, approximately $6 million (County) and $8 million (State) will be generated for transportation improvements from highway impact fees. Further, a net of about $45 million in revenues will be generated for the State by the 10 years of development activities. During the operation phase of the development, County net revenues are estimated at $8 million per year and State revenues are estimated at $8.4 million.

Lot sales, construction expenditures and indirect sales related to development activities are expected to total about $146 million per year during the 10-year development period. About

$113 million per year will be subject to the 4.5% excise tax on final sales, while about $33 million per year will be subject to the 0.5% excise tax on intermediate sales. Profits on these sales are estimated at about $16 million per year.

Mitigative Measures

The proposed project will help meet the island-wide demand for industrial land by providing approximately 250 acres for industrial development, equivalent to about 5.4 million square feet of floor space at full development.

4.17 SOCIAL SERVICE FACILITIES

4.17.1 Police Protection

Existing Conditions

The project development area is within the Honolulu Police Department's (HPD) District 8, which encompasses the Leeward Coast and the 'Ewa Plain. There are approximately 100 field officers assigned to this district. Response time for the entire district fluctuates between five and seven minutes. To meet the Year 2000 'Ewa Plain service requirements, the County opened the Regional Kapolei District Station at 1100 Kamokila Boulevard. The HPD expects to expand its presence in the region as Kapolei develops into the Second City. Based on population growth estimates, the County anticipates the need for two additional substations to service the region by 2020. The proposed locations are 'Ewa Villages and Ko 'Ōlina.

Probable Impacts

Existing off-site service facilities and their planned improvements should be adequate to accommodate the needs of the development project. No short-or long-term adverse impacts to police protection are anticipated. Police services have included the proposed development in their long-term planning.

Mitigative Measures

No mitigation is necessary.

4.17.2 Fire Protection

Fire protection in Kapolei and 'Ewa is provided by the Honolulu Fire Department's (HFD) 'Ewa Beach Fire Station (an engine company), Makakilo Fire Station (an engine company), and Kapolei Fire Station (an engine and ladder company, and the Battalion 4 Headquarters). The nearest fire station is Kapolei Fire Station in Kapolei Business Park. According to the 'Ewa Development Plan, new fire stations are planned at 'Ewa Villages, Ko 'Ōlina, and Makaiwa Hills to meet 2020 anticipated growth.

Probable Impacts

Existing off-site service facilities and their planned improvements should be adequate to accommodate the needs of the development project. No short-or long-term adverse impacts to fire protection are anticipated. Fire services have included the proposed development in their long-term planning.

Mitigative Measures

The development will be constructed in accordance with fire safety standards inclusive of fire hydrants, adequate emergency access, and interior sprinkler systems.

4.17.3 Medical Services

Existing Conditions

The project area is serviced by a variety of health care facilities. There are more than 25 choices of health care providers. St. Francis Medical Center – West is the nearest hospital. Ambulance service is coordinated with the County and the hospital has a helipad. The medical center offers general hospital services including emergency care, outpatient care, and lab and imaging services. St. Francis Medical Center – West has 79 beds available and will be expanded to 84 beds. The hospital is operating at about 80% occupancy. Emergency medical and surgical services are also provided by Pali Momi Medical Center (116 beds) in ʻAiea and Wahiawā General Hospital (162 beds, of which 93 are for long-term care). Non-emergency medical services are offered at the Kaiser Permanente Punawai Clinic in Waipahu, the Kapolei Medical Park, Kapolei Park Square, and Nanaikeola Clinic.

Probable Impacts

Existing off-site service facilities and their planned improvements should be adequate to accommodate the needs of the development project. The existing medical facilities, specifically St. Francis Medical Center, Pali Momi Medical Center and Wahiawā General Hospital are full service general, emergency, and surgical medical facilities with the capabilities of treating injuries that might be expected from light industrial uses. No short-or long-term adverse impacts to medical services are anticipated.

Mitigative Measures

No mitigation is necessary.

4.17.4 Recreational Resources

Existing Conditions

There are no existing recreational sites or facilities at or adjacent to the proposed project site. Recreational facilities in the vicinity include the Makakilo Neighborhood Park, Kamokila Community Park, Kapolei Regional Park, Ko ʻŌlina Beach Park, Ko ʻŌlina Lagoon Beach right

of way, and Camp Malakole Beach right of way. The total acreage of these parks and other recreational facilities near the project area is approximately 140 acres.

Probable Impacts

There would be no impact on regional recreational uses.

Mitigative Measures

The Estate is in discussions with the County regarding a possible transfer of approximately ten (10) acres of land on Parcel 33 to be developed and dedicated as a park. The dedication would fulfill a condition in a unilateral agreement associated with a previous zone change for the City of Kapolei, approved under Ordinance 90-30 (Ref. No. 2006/PIM-2).

4.18 SUMMARY OF PROBABLE IMPACTS

4.18.1 Interrelationships and Cumulative Environmental Impacts

This project and other planned projects in the region are likely to have long-term adverse cumulative impacts, such as increased traffic and higher demand on regional infrastructure. Many of the projects are consistent with County plans to develop Kapolei as an urban center and will have cumulative long-term beneficial impacts, such as reducing commuter traffic to and from Honolulu, increasing the number of affordable housing units, and increasing employment opportunities. The economic development will provide additional tax revenue to the State and County governments to fund necessary public services. The anticipated net cumulative impact is expected to be positive.

Planning Context

The ‘Ewa Region has been identified as one of two development areas by the County, as part of its directed growth management policy. A County General Plan objective is to have the ‘Ewa region support 13% of the island-wide population (up from 7.8% in 2000), which would require a doubling of the 2000 population by 2025. This directed growth policy is important because it preserves the rural and urban fringe areas of the island by directing population growth to the existing primary urban center and the Secondary Urban Center of Kapolei.

As a matter of basic County policy, the ‘Ewa Region will experience the largest share of growth over the next 25-year period of any of the City and County’s eight planning regions. From a social perspective, the planned growth has provided expanded opportunities for homeownership within contemporary master planned communities and access to a range of new public schools, libraries and amenities.

The following listing identifies projects and other developments that could have a cumulative impact in association with the Kapolei Harborside Center project prior to the time this report was prepared.

City of Kapolei

2005-2014 Development

- *Kapolei Senior Village* – A retirement village is planned for the 40-acre area along the west side of Fort Barrette Road between the future Kama'aha Avenue and Kapolei Parkway. The main entrance would be located along an extension of Manawai Street, with a secondary access located along the future extension of Kama'aha Avenue. Complete development is expected by about 2008.
- *Island Pacific Academy* – The initial phase of a private school opened in Fall 2004 on a block on the southeast corner of Haumea and Wakea Streets. The school is planned to reach an enrollment of 760 students in 2009.
- *Kamokila Blocks between Wakea and Uluhia Streets* – These two blocks on the makai side of Kamokila Boulevard are expected to be developed with a mix of restaurant, retail and office uses in the next several years.
- *Kapolei Power Center* – The remaining portions of the site adjacent to the Home Depot store are expected to be developed by 2010 with a mix of commercial uses.
- *Kapolei Commons* – The 54-acre commercial area west of Kalaeloa Boulevard, located across the future Kapolei Parkway alignment from the Advertiser Building, is planned for development as a regional commercial center.
- *Kapolei Mauka Residential Area* – A townhouse development is planned for the area just mauka of the H-1 Freeway on the west side of Makakilo Drive. The development is anticipated to have about 350 townhouses. Access would be provided to the Mauka Frontage Road or, if this road has not been constructed, to Makakilo Drive.
- *Mehana at Kapolei Makai Residential Area* – Development of the full 130-acre project area is expected by 2014. The development would total about 1,150 residential units and a neighborhood commercial center.
- *Kapolei Rezoning Parcel 1 (Ord. No. 04-45)* – The development within this portion of the City of Kapolei is anticipated between 2010 and 2015.
- *Kapolei Rezoning Parcel 2 (Ord. No. 04-45)* – This retail development, located mauka of the Hawaiian Water Adventures Park, is expected to be completed prior to 2015.
- *Kapolei Rezoning Parcel 3 (Ord. No. 04-45)* – This commercial development is located on the northeast corner of the intersection of Farrington Highway and Makakilo Drive. The development of the parcel is expected between 2008 and 2015.

Other Developments near the Proposed Action

Additional development, or occupancy of previously completed development, is expected in several areas.

- *Kapolei West* – A 550 acre master-planned residential and golf community with approximately 2,400 housing units and commercial uses. Development is expected to begin in 2008 and be completed by 2020.
- *Makakilo* – Most of the Makakilo area should be developed by 2010. The new development is expected to add approximately 700 single-family homes and 250 apartments.

- *Villages of Kapolei and Kapolei Knolls* – Kapolei Knolls and most of the Villages areas should be developed by 2010, with some development possibly extending beyond 2010. Both areas are expected to be developed by the end of 2014. For Kapolei Knolls, the remaining 212 single-family homes would be completed. For the Villages, approximately 490 apartments, 314 single-family homes, churches and shopping facilities would be developed.
- *Kalaeloa Redevelopment Area* – Very little additional development was assumed to occur in the near term due to the availability and competition from other development areas, as well as the uncertainties regarding the potential for basing a Naval Carrier Group Airwing at the Kalaeloa airfield. It was assumed that the light industrial areas would develop at an average rate of 5 acres per year, thus yielding about 55 acres of light industrial-warehousing uses by 2014 and 85 acres by 2020. The 85 acres represent about one-half of the available development are for these uses. Because of the uncertainty regarding the potential return of Navy operations, only limited other development was assumed for the other conveyance areas by 2014. By 2014, development was assumed for a vocational school and about 150 acres of regional park facilities.
- *Barbers Point Harbor* – Development of approximately 169 acres of presently undeveloped land was assumed to continue at the rate of traffic growth experienced along Malakole Street in recent years (about 2.2% per year).
- *Makaīwa Hills* – Preliminary plans are to develop approximately 4,100 housing units, as well as commercial and other uses, with occupancy beginning around 2009 and completion projected from 2020.
- *Ko ʻŌlina Resort* – Based on available information, the following levels of new development are estimated:

  <u>2004 to 2014</u>
  - 1,290 new hotel rooms
  - 470 new timeshare units
  - 60 additional single-family homes
  - 390 additional townhouses
  - 160 additional low density houses
  - 50 additional medium density houses
  - aquarium

  <u>2015 to 2020</u>
  - 800 additional hotel rooms (to 2,580 hotel rooms)
  - 180 additional timeshare units (to projected total of 750 units)
  - 360 additional medium density houses (to 1,416 housing units).

- *Kapolei Business Park* – An average of 115,000 square feet of new warehouse and distribution floor area are expected to be developed during each year. The new building floor area would total about 1.3 million square feet (msf) by the end of 2014, and 1.9 msf between 2014 and 2020.
- *West Kalaeloa Industrial* – Development of approximately 125 acres of land zoned Industrial I-2 adjacent to Kapolei Harborside Center expected to occur between 2008 and 2015.

Adverse impacts relating to traffic, increased demand on regional infrastructure, and air quality are likely to be expected by the cumulative development of all of the proposed regional projects. Yet, at the same time, the proposed developments involve significant improvements to regional roadways, drainage, water, and sewer facilities. The majority of development in the Kapolei/'Ewa region focus on the introduction of new housing options. The Kapolei Harborside Center project, as well as other proposed development projects, compliments the future housing stock by providing new employment opportunities within the region. The project will help to relieve development pressures in urban Honolulu by allowing more 'Ewa residents to work within their community. A major consideration in public policy is to redirect traffic currently flowing into Honolulu proper by providing alternative employment centers and residences outside of the existing urban core. Finally, the cumulative development of the region's proposed projects will provide additional tax revenue and economic benefits to State and County governments to fund necessary public services.

4.18.2 Potential Secondary Effects

New developments in general, including the proposed Kapolei Harborside Center, have the potential to induce growth outside the project area. An example of such a secondary effect is the stimulation of additional development in the region as a result of the construction of public facilities, such as enhanced traffic infrastructure. The proposed project is an element of public and private master plans that aim to direct residential and commercial growth into appropriate areas, thereby allowing 'Ewa residents to live and work without traveling long distances. Such master plans reduce adverse secondary impacts from unexpected impacts of unplanned growth.

Additionally, in this particular situation with the acknowledged island-wide shortage of industrial space, the creation of this new industrial park for the private sector will likely lead to expanded business opportunities for the business enterprises that move into the facility. If those enterprises moved out of other industrial facilities, then that newly freed space will be available to allow other new and remaining businesses to expand. Such economic growth of local businesses, and the jobs created by such expansion, is generally considered a positive secondary impact.

4.18.3 Relationship between Local Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity

These relationships are described below in the context of four specific areas of potential concern:

<u>Narrowing the range of beneficial uses of the environment:</u> The proposed project would increase the range of beneficial uses by providing for a higher and more productive use of the subject land than is now possible with its Agricultural designation. Industrial-zoned land is extremely scarce on O'ahu, while sub-Prime agricultural land is very abundant. The project would not adversely affect rights customarily and traditionally exercised form for subsistence, cultural and religious purposes, nor would it have a significant impact on Hawaiian cultural or historic resources.

<u>Long-term risks to health and safety:</u> The project is not expected to pose any such risks. By complying with Federal, State and County regulations pertaining to building codes,

environmental health, natural hazard management, etc., risks to health and safety will be limited. The two identified hazardous materials sites do not pose any risks to public health and safety. The sites have been remediated and contained per EPA regulations.

Foreclosing of future options: While the proposed project would foreclose the future option of continued agricultural use of the site, such use is not practical due to the planned urbanization that has occurred around the project site. The existing operations are expected to be able to relocate to other, more feasible settings.

Trade-offs among short-term and long-term gains and losses: Potential short- and long-term environmental impacts would be offset by the proposed mitigative measures. The planned improvements at the site would lead to significant short- and long-term economic gains, with no expected economic loss.

4.18.4 Irreversible and Irretrievable Commitments of Resources

The construction and operation of the Kapolei Harborside Center would result in the irreversible and irretrievable commitment of land, capital, materials, labor and energy. This commitment, however, should be evaluated in the context of the expected benefits to the community accruing from the project.

The project would irretrievably alter the existing views of the site from the H-1 Freeway/mauka areas and from adjoining lands. These views are not identified as significant in the 'Ewa Development Plan.

The project would irreversibly transform the subject property from its present mostly fallow agricultural/open state into an urban setting, thereby foreclosing its use for agricultural pursuits. However, there is ample higher-quality agricultural land on O'ahu better suited for agricultural use. The economic and practical benefits of an industrial park in this location, adjacent to other existing industrial facilities, offset the loss of this remnant agricultural land.

4.18.5 Adverse Environmental Effects that cannot be avoided

Adverse impacts can be divided into short- and long-term effects. Short-term effects are generally associated with construction, and prevail only for the duration of the construction period. Long-term effects generally follow completion of the improvements, relate either simply to their existence or to the operation of the new facility, and are typically permanent. Effects that can be considered both adverse and unavoidable are discussed below.

Unavoidable Adverse Short-term Effects: Construction impacts to air quality are characteristically short-term and temporary. If mitigation measures are not provided, significant airborne emissions could include fugitive dust from earth-moving, cement mixing and vehicular travel in construction areas. DOH administrative rules prohibit the generation of fugitive dust without taking reasonable precautions to limit such emissions. *Section 4.11* above identifies mitigative measures that will be undertaken to reduce impacts to air quality; however, some insignificant amounts of airborne emissions may be unavoidable.

Similarly, some noise impacts generated during the construction phase may be unavoidable, even with the implementation of mitigation measures as described in *Section 5.12* above.

Unavoidable Adverse Long-term Effects: After the construction of the Kapolei Harborside Center has been completed, long-term impacts on air quality in the project area due to emission from motor vehicle traffic should be minimal. Worst case concentrations of carbon monoxide are expected to remain within both state and national ambient air quality standards.

The urbanization of the subject lands will result in the long-term loss of agricultural/open space land. As discussed in Section 4.8, the conversion of the Petition Area from agricultural land to urban uses, when considered with other planned developments in Hawai'i involves the loss of too little good agricultural land to affect (1) the availability of land to farmers in Hawai'i, (2) agricultural land rents, (3) the growth of diversified agriculture, or (4) potential agricultural employment.

The proposed action would present minimal intrusion into existing viewplanes. The landscape of the Kapolei region is changing from sugarcane fields as late as the mid 1990's to rooftops and urban, city-like forms. The existing JCIP already limits sightlines of the coast. This inevitable change associated with the directed growth policy, in part to maintain scenic and visual resources elsewhere on the island.

The proposed project would not have a significant cumulative effect on noise. It would contribute construction period noise which is by nature, short term. The proposed uses would generate noise impacts similar to neighboring uses. Operational vehicle trips would add to the overall regional growth in traffic noise associated with major roadway facilities. Typically the noise impact is confined to the major roadway corridors.

Development of the site will add to the regions traffic, though should not have a significant cumulative impact on transportation if the proposed mitigation measures are implemented. A number of transportations projects have been planned for the 'Ewa District to accommodate projected increases in traffic to and within the Kapolei area. Most of these projects have been identified and/or confirmed through the O'ahu Metropolitan Planning Organization (OMPO) transportation planning process.

5.0 Conformity of the Project to Applicable Plans and Policies

5.0 CONFORMITY OF THE PROJECT TO APPLICABLE PLANS AND POLICES

This section provides an assessment of the conformity of the Kapolei Harborside Center project, and its reclassification, to applicable goals, objectives, and policies of the Hawai'i State Plan, the Hawai'i State Functional Plans, the Coastal Zone Management Program, the City and County of Honolulu General Plan and the 'Ewa Development Plan.

S = Supportive, N/S = Not Supportive, N/A = Not Applicable

Table 5.1: Hawai'i State Plan – HRS Ch. 226 - Part 1. Overall Theme, Goals, Objectives and Policies	**S**	**N/S**	**N/A**
Section 226-1: Findings and Purpose			
Section 226-2: Definitions			
Section 226-3: Overall Theme			
Section 226-4: State Goals. In order to guarantee, for the present and future generations, those elements of choice and mobility that insure that individuals and groups may approach their desired levels of self-reliance and self-determination, it shall be the goal of the State to achieve:			
(1) A strong, viable economy, characterized by stability, diversity, and growth, that enables the fulfillment of the needs and expectations of Hawai'i's present and future generations	✓		
(2) A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people.			✓
(3) Physical, social and economic well-being, for individuals and families in Hawai'i, that nourishes a sense of community responsibility, of caring, and of participation in community life.	✓		
Discussion: The Kapolei Harborside Center project is consistent with the State's goals to provide economic vitality, stability and growth for present and future generations. The requested changes from ~~Agriculture~~ the Agricultural District ~~agriculture~~ to Urban District ~~industrial~~ will further urbanize the area, thereby strengthening the Second Urban Center and the City of Kapolei. The proposed project provides diversified economic and employment options for a growing population in the Kapolei/'Ewa area. The project will help to relieve development pressures in urban Honolulu and allow more area residents to work within their community. A major consideration in public policy is to redirect traffic currently flowing into Honolulu proper by providing alternative employment centers and residences outside of the existing urban core.			
Section 226-5: Objective and policies for population (a) It shall be the objective in planning for the State's population to guide population growth to be consistent with the achievement of physical, economic, and social objectives contained in this chapter; (b) To achieve the population objective, it shall be the policy of this State to:			
(1) Manage population growth statewide in a manner that provides increased opportunities for Hawai'i's people to pursue their physical, social and economic aspirations while recognizing the unique needs of each county.	✓		
(2) Encourage an increase in economic activities and employment opportunities on the neighbor islands consistent with community needs-and desires.			✓
(3) Promote increased opportunities for Hawai'i's people to pursue their socioeconomic aspirations throughout the islands.	✓		
(4) Encourage research activities and public awareness programs to foster and understanding of Hawai'i's limited capacity to accommodate population needs and to address concerns resulting from an increase in Hawai'i's population.			✓
(5) Encourage federal actions and coordination among major governmental agencies to promote a more balanced distribution of immigrants among states, provided that such actions do not prevent the reunion of immediate family members.			✓
(6) Pursue an increase in federal assistance for states with a greater proportion of foreign immigrants relative to their state's population			✓
(7) Plan the development and availability of land and water resources in a coordinated manner so as to provide for the desired levels of growth in each geographic area	✓		

Table 5.1: Hawai'i State Plan – HRS Ch. 226 - Part 1. Overall Theme, Goals, Objectives and Policies	S	N/S	N/A
Discussion: Kapolei Harborside Center is located within the 'Ewa Development Plan Area, which includes census tracts 83 through 86.02. The area has experienced an explosive 60% increase in its population in the past 10 years to a population of 84,150. In comparison, the population for the City and County of Honolulu as a whole increased only 4.8% from 836,231 to 876,156 between 1990 and 2000. **The City and County's General Plan targets growth for the 'Ewa Development Plan Area. 'Ewa's population is expected to grow to 96,000 by 2010 and up to 141,000 by 2025. The project provides substantial employment generation for the increased population of 'Ewa and Kapolei. The project offers job opportunities in the Second City and supports current population distribution policies.**			
Section 226-6: Objectives and policies for the economy in general. (a) Planning for the State's economy in general shall be directed toward achievement of the following objectives:			
(1) Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawai'i's people.	✓		
(2) A steadily growing and diversified economic base that is not overly dependent on a few industries, and includes the development and expansion of industries on the neighbor islands.	✓		
(b) To achieve the general economic objectives, it shall be the policy of this State to:			
(1) Expand Hawai'i's national and international marketing, communication, and organizational ties, to increase the State's capacity to adjust to and capitalize upon economic changes and opportunities occurring outside the State.	✓		
(2) Promote Hawai'i as an attractive market for environmentally and socially sound investment activities that benefit Hawai'i's people.	✓		
(3) Seek broader outlets for new or expanded Hawai'i business investments.	✓		
(4) Expand existing markets and penetrate new markets for Hawai'i's products and services.	✓		
(5) Assure that the basic economic needs of Hawai'i's people are maintained in the event of disruptions in overseas transportation.	✓		
(6) Strive to achieve a level of construction activity responsive to, and consistent with, state growth objectives.	✓		
(7) Encourage the formation of cooperatives and other favorable marketing arrangements at the local or regional level to assist Hawai'i's small scale producers, manufacturers, and distributors.	✓		
(8) Encourage labor-intensive activities that are economically satisfying and which offer opportunities for upward mobility.	✓		
(9) Foster greater cooperation and coordination between the government and private sectors in developing Hawai'i's employment and economic growth opportunities.	✓		
(10) Stimulate the development and expansion of economic activities which will benefit areas with substantial or expected employment problems.	✓		
(11) Maintain acceptable working conditions and standards for Hawai'i's workers.	✓		
(12) Provide equal employment opportunities for all segments of Hawai'i's population through affirmative action and nondiscrimination measures.	✓		
(13) Encourage businesses that have favorable financial multiplier effects within Hawai'i's economy.	✓		
(14) Promote and protect intangible resources in Hawai'i, such as scenic beauty and the aloha spirit, which are vital to a healthy economy.	✓		
(15) Increase effective communication between the educational community and the private sector to develop relevant curricula and training programs to meet future employment needs in general, and requirements of new, potential growth industries in particular.			✓
(16) Foster a business climate in Hawai'i--including attitudes, tax and regulatory policies, and financial and technical assistance programs--that is conducive to the expansion of existing enterprises and the creation and attraction of new business and industry.	✓		
Discussion: The development of industrial and commercial sites in this location will assist in providing job opportunities for the expanding communities of 'Ewa, Kapolei, Central O'ahu and the Leeward Coast. Proposed as industrial use, Kapolei Harborside Center will provide broader outlets for new or expanded Hawai'i businesses, expand existing markets and create new markets for products and services, encourage labor intensive activities, and help increase the State's capacity to adjust to and capitalize upon economic changes and opportunities occurring outside the State. Over 25,000 jobs are in the 'Ewa/Kapolei region. Campbell Industrial Park is the area's largest job center, providing over 5,500 jobs. Most other jobs are located in service sector industries. A broader choice of jobs will result from the proposed project with long-term employment estimated at almost 4,000 workers upon project buildout.			

Table 5.1: Hawai'i State Plan – HRS Ch. 226 - Part 1. Overall Theme, Goals, Objectives and Policies	S	N/S	N/A
Section 226-7 Objectives and policies for the economy - agriculture. (a) Planning for the State's economy with regard to agriculture shall be directed towards achievement of the following objectives:			
(1) Viability of Hawai'i's sugar and pineapple industries.		✓	
(2) Growth and development of diversified agriculture throughout the State.		✓	
(3) An agriculture industry that continues to constitute a dynamic and essential component of Hawai'i's strategic, economic, and social well-being.			✓
(b) To achieve the agriculture objectives, it shall be the policy of this State to:			
(1) Establish a clear direction for Hawai'i's agriculture through stakeholder commitment and advocacy.			✓
(2) Encourage agriculture by making best use of natural resources.			✓
(3) Provide the governor and the legislature with information and options needed for prudent decision making for the development of agriculture.			✓
(4) Establish strong relationships between the agricultural and visitor industries for mutual marketing benefits.			✓
(5) Foster increased public awareness and understanding of the contributions and benefits of agriculture as a major sector of Hawai'i's economy.			✓
(6) Seek the enactment and retention of federal and state legislation that benefits Hawai'i's agricultural industries.			✓
(7) Strengthen diversified agriculture by developing an effective promotion, marketing, and distribution system between Hawai'i's producers and consumer markets locally, on the continental United States, and internationally.			✓
(8) Support research and development activities that provide greater efficiency and economic productivity in agriculture.			✓
(9) Enhance agricultural growth by providing public incentives and encouraging private initiatives.			✓
(10) Assure the availability of agriculturally suitable lands with adequate water to accommodate present and future needs.			✓
(11) Increase the attractiveness and opportunities for an agricultural education and livelihood.			✓
(12) Expand Hawai'i's agricultural base by promoting growth and development of flowers, tropical fruits and plants, livestock, feed grains, forestry, food crops, aquaculture, and other potential enterprises.			✓
(13) Promote economically competitive activities that increase Hawai'i's agricultural self-sufficiency.			✓
(14) Promote and assist in the establishment of sound financial programs for diversified agriculture.			✓
(15) Institute and support programs and activities to assist the entry of displaced agricultural workers into alternative agricultural or other employment.	✓		
(16) Facilitate the transition of agricultural lands in economically non-feasible agricultural production to economically viable agricultural uses.			✓
Discussion: Much of the soil is coral outcrop. Based on various soil classification systems that rate Hawai'i soils, little of the property (from 0% to less than 25%, depending on the particular soil rating system) has good soils. The loss of the site for agricultural purposes should not adversely impact the economic vitality of agricultural production and will provide alternatives to agricultural employment.			
Section 226-8 Objective and policies for the economy--visitor industry. (a) Planning for the State's economy with regard to the visitor industry shall be directed towards the achievement of the objective of a visitor industry that constitutes a major component of steady growth for Hawai'i's economy. (b) To achieve the visitor industry objective, it shall be the policy of this State to:			
(1) Support and assist in the promotion of Hawai'i's visitor attractions and facilities.			✓
(2) Ensure that visitor industry activities are in keeping with the social, economic, and physical needs and aspirations of Hawai'i's people.			✓
(3) Improve the quality of existing visitor destination areas.			✓
(4) Encourage cooperation and coordination between the government and private sectors in developing and maintaining well-designed, adequately serviced visitor industry and related developments which are sensitive to neighboring communities and activities.			✓
(5) Develop the industry in a manner that will continue to provide new job opportunities and steady employment for Hawai'i's people.			✓
(6) Provide opportunities for Hawai'i's people to obtain job training and education that will allow for upward mobility within the visitor industry.			✓
(7) Foster a recognition of the contribution of the visitor industry to Hawai'i's economy and the need to perpetuate the aloha spirit.			✓
(8) Foster an understanding by visitors of the aloha spirit and of the unique and sensitive character of Hawai'i's			✓

Table 5.1: Hawai'i State Plan – HRS Ch. 226 - Part 1. Overall Theme, Goals, Objectives and Policies	S	N/S	N/A
cultures and values.			
Discussion: While the Petitioner supports the State's policies related to economy and the visitor industry, they are not directly applicable to the proposed project. That said, future businesses that operate in the new industrial location could facilitate growth of operations that support visitor industry activities. Close proximity to Ko 'Ōlina resort area will likely promote businesses that cater to these areas and thus help promote further development and self-sufficiency of the visitor industry.			
Section 226-9 Objective and policies for the economy--federal expenditures. (a) Planning for the State's economy with regard to federal expenditures shall be directed towards achievement of the objective of a stable federal investment base as an integral component of Hawai'i's economy. (b) To achieve the federal expenditures objective, it shall be the policy of this State to:			
(1) Encourage the sustained flow of federal expenditures in Hawai'i that generates long-term government civilian employment.			✓
(2) Promote Hawai'i's supportive role in national defense.			✓
(3) Promote the development of federally supported activities in Hawai'i that respect state-wide economic concerns, are sensitive to community needs, and minimize adverse impacts on Hawai'i's environment.			✓
(4) Increase opportunities for entry and advancement of Hawai'i's people into federal government service.			✓
(5) Promote federal use of local commodities, services, and facilities available in Hawai'i.			✓
(6) Strengthen federal-state-county communication and coordination in all federal activities that affect Hawai'i.			✓
(7) Pursue the return of federally controlled lands in Hawai'i that are not required for either the defense of the nation or for other purposes of national importance, and promote the mutually beneficial exchanges of land between federal agencies, the State, and the counties.			✓
Discussion: While the Petitioner supports the State's policies related to economy and federal expenditures, they are not directly applicable to the proposed project.			
Section 226-10 Objective and policies for the economy--potential growth activities. (a) Planning for the State's economy with regard to potential growth activities shall be directed towards achievement of the objective of development and expansion of potential growth activities that serve to increase and diversify Hawai'i's economic base. (b) To achieve the potential growth activity objective, it shall be the policy of this State to:			
(1) Facilitate investment and employment in economic activities that have the potential for growth such as diversified agriculture, aquaculture, apparel and textile manufacturing, film and television production, and energy and marine-related industries.	✓		
(2) Expand Hawai'i's capacity to attract and service international programs and activities that generate employment for Hawai'i's people.	✓		
(3) Enhance and promote Hawai'i's role as a center for international relations, trade, finance, services, technology, education, culture, and the arts.	✓		
(4) Accelerate research and development of new energy- related industries based on wind, solar, ocean, and underground resources and solid waste.	✓		
(5) Promote Hawai'i's geographic, environmental, social, and technological advantages to attract new economic activities into the State.	✓		
(6) Provide public incentives and encourage private initiative to attract new industries that best support Hawai'i's social, economic, physical, and environmental objectives.	✓		
(7) Increase research and the development of ocean-related economic activities such as mining, food production, and scientific research.	✓		
(8) Develop, promote, and support research and educational and training programs that will enhance Hawai'i's ability to attract and develop economic activities of benefit to Hawai'i.	✓		
(9) Foster a broader public recognition and understanding of the potential benefits of new, growth-oriented industry in Hawai'i.	✓		
(10) Encourage the development and implementation of joint federal and state initiatives to attract federal programs and projects that will support Hawai'i's social, economic, physical, and environmental objectives.	✓		
(11) Increase research and development of businesses and services in the telecommunications and information industries.	✓		
Discussion: The new industrial center will facilitate growth potential businesses by allowing shared amenities and compatible environments for industrial expansion. Well planned designated areas for these activities can help promote Hawai'i as a center for business.			

Table 5.1: Hawai'i State Plan – HRS Ch. 226 - Part 1. Overall Theme, Goals, Objectives and Policies	S	N/S	N/A
Section 226-10.5 Objectives and policies for the economy--information industry. (a) Planning for the State's economy with regard to the information industry shall be directed toward the achievement of the objective of positioning Hawai'i as the leading dealer in information businesses and services in the Pacific Rim. (b) To achieve the information industry objective, it shall be the policy of this State to:			
(1) Encourage the continued development and expansion of the telecommunications infrastructure serving Hawai'i to accommodate future growth in the information industry;	✓		
(2) Facilitate the development of new business and service ventures in the information industry which will provide employment opportunities for the people of Hawai'i;	✓		
(3) Encourage greater cooperation between the public and private sectors in developing and maintaining a well-designed information industry;	✓		
(4) Ensure that the development of new businesses and services in the industry are in keeping with the social, economic, and physical needs and aspirations of Hawai'i's people;	✓		
(5) Provide opportunities for Hawai'i's people to obtain job training and education that will allow for upward mobility within the information industry;			✓
(6) Foster a recognition of the contribution of the information industry to Hawai'i's economy; and	✓		
(7) Assist in the promotion of Hawai'i as a broker, creator, and processor of information in the Pacific.	✓		
Discussion: While not directly applicable to the telecommunications sector, the proposed project will incorporate the latest telecommunications infrastructure. Users may bring about new opportunities for research and development of enhanced information sector activities.			
Section 226-11 Objectives and policies for the physical environment--land-based, shoreline, and marine resources. (a) Planning for the State's physical environment with regard to land-based, shoreline and marine resources shall be directed towards achievement of the following objectives:			
(1) Prudent use of Hawai'i's land-based, shoreline, and marine resources.	✓		
(2) Effective protection of Hawai'i's unique and fragile environmental resources.			✓
(b) To achieve the land-based, shoreline, and marine resources objectives, it shall be the policy of this State to:			
(1) Exercise an overall conservation ethic in the use of Hawai'i's natural resources.	✓		
(2) Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.	✓		
(3) Take into account the physical attributes of areas when planning and designing activities and facilities.	✓		
(4) Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.	✓		
(5) Consider multiple uses in watershed areas, provided such uses do not detrimentally affect water quality and recharge functions.			✓
(6) Encourage the protection of rare or endangered plant and animal species and habitats native to Hawai'i.	✓		
(7) Provide public incentives that encourage private actions to protect significant natural resources from degradation or unnecessary depletion.			✓
(8) Pursue compatible relationships among activities, facilities and natural resources.	✓		
(9) Promote increased accessibility and prudent use of inland and shoreline areas for public recreational, educational and scientific purposes.			✓
<u>Discussion:</u> Within the project site, no endemic, endangered, or protected flora or fauna have been recorded. The present environment, a generally flat, raised coral bed terrain, provides for a limited range of habitats utilized by the typical array of introduced plants and animals found at this elevation and type of environment on O'ahu.			
Section 226-12 Objective and policies for the physical environment--scenic, natural beauty, and historic resources. (a) Planning for the State's physical environment shall be directed towards achievement of the objective of enhancement of Hawai'i's scenic assets, natural beauty, and multi-cultural/historical resources. (b) To achieve the scenic, natural beauty, and historic resources objective, it shall be the policy of this State to:			
(1) Promote the preservation and restoration of significant natural and historic resources.	✓		
(2) Provide incentives to maintain and enhance historic, cultural, and scenic amenities.	✓		
(3) Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.	✓		
(4) Protect those special areas, structures, and elements that are an integral and functional part of Hawai'i's ethnic and cultural heritage.	✓		
(5) Encourage the design of developments and activities that complement the natural beauty of the islands.	✓		

Table 5.1: Hawai'i State Plan – HRS Ch. 226 - Part 1. Overall Theme, Goals, Objectives and Policies	S	N/S	N/A
Discussion: A large part of the western portion of the project area has been altered from the construction of Kalaeloa/Barbers Point Harbor and the stockpiling of dredged material removed from the harbor basin. The project site has previously been subject to extensive archaeological and paleontological salvage and survey projects. **The height of the industrial structures will be compliant with allowable height limits of the area. Consideration will be taken to avoid structure heights causing any adverse impacts on coastal views, residential viewing corridors, or apartment areas mauka of the site. Urban design controls will consider the overall visual effects of the proposed development as seen from off-site locations.**			
Section 226-13 Objectives and policies for the physical environment--land, air, and water quality. (a) Planning for the State's physical environment with regard to land, air, and water quality shall be directed towards achievement of the following objectives:			
(1) Maintenance and pursuit of improved quality in Hawai'i's land, air, and water resources.	✓		
(2) Greater public awareness and appreciation of Hawai'i's environmental resources.			✓
(b) To achieve the land, air, and water quality objectives, it shall be the policy of this State to:			
(1) Foster educational activities that promote a better understanding of Hawai'i's limited environmental resources.			✓
(2) Promote the proper management of Hawai'i's land and water resources.			✓
(3) Promote effective measures to achieve desired quality in Hawai'i's surface, ground and coastal waters.	✓		
(4) Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawai'i's people.	✓		
(5) Reduce the threat to life and property from erosion, flooding, tsunamis, hurricanes, earthquakes, volcanic eruptions, and other natural or man-induced hazards and disasters.	✓		
(6) Encourage design and construction practices that enhance the physical qualities of Hawai'i's communities.	✓		
(7) Encourage urban developments in close proximity to existing services and facilities.	✓		
(8) Foster recognition of the importance and value of the land, air, and water resources to Hawai'i's people, their cultures and visitors.			✓
Discussion: The Petitioner will comply with applicable state, federal and county regulations relating to land, air and water resources in developing the project. Despite the large variety of industrial, agricultural, residential and military activity in the area, air quality is currently in compliance with both state and federal ambient air quality standards based on the most recent State Department of Health monitoring data from its Barbers Point monitoring station. **The impact of local noise regulations (State Department of Health and City and County of Honolulu) will be addressed, as well as OSHA noise regulations. Expected industrial users are not anticipated to have any unusual sounds resulting from their activities. Possible noise impact from the project upon noise sensitive uses will be addressed. Light industrial activities include warehousing, light manufacturing or processing, and packaging or repair establishments**			
Section 226-14 Objective and policies for facility systems--in general. (a) Planning for the State's facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal, and energy and telecommunication systems that support statewide social, economic, and physical objectives. (b) To achieve the general facility systems objective, it shall be the policy of this State to:			
(1) Accommodate the needs of Hawai'i's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.	✓		
(2) Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities.	✓		
(3) Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user.	✓		
(4) Pursue alternative methods of financing programs and projects and cost-saving techniques in the planning, construction, and maintenance of facility systems.	✓		
Discussion: The project will conform to all existing state and county plans relating to facility systems coordination and capital improvement priorities.			
§226-15 Objectives and policies for facility systems--solid and liquid wastes. (a) Planning for the State's facility systems with regard to solid and liquid wastes shall be directed towards the achievement of the following objectives:			
(1) Maintenance of basic public health and sanitation standards relating to treatment and disposal of solid and liquid wastes.	✓		
(2) Provision of adequate sewerage facilities for physical and economic activities that alleviate problems in housing,	✓		

Table 5.1: Hawai'i State Plan – HRS Ch. 226 - Part 1. Overall Theme, Goals, Objectives and Policies	S	N/S	N/A
employment, mobility, and other areas.			
(a) To achieve solid and liquid waste objectives, it shall be the policy of this State to:			
(1) Encourage the adequate development of sewerage facilities that complement planned growth.	✓		
(2) Promote re-use and recycling to reduce solid and liquid wastes and employ a conservation ethic.	✓		
(3) Promote research to develop more efficient and economical treatment and disposal of solid and liquid wastes.			✓
Discussion: Based on average daily flows, the Honouliuli WWTP has a primary treatment capacity of 38 million-gallons per day (mgd), and is currently accepting flows of about 28 mgd. The primary means of disposal is through a deep ocean outfall with a design capacity of 112 mgd. These existing facilities can accommodate the expected wastewater flows from the project area. The Petitioner will construct a wastewater pump station on the project site, as well as necessary collection system components, to enable the connection to the existing municipal wastewater system. A complementary irrigation system will recycle treated wastewater for use on landscaped areas.			
§226-16 Objective and policies for facility systems--water. (a) Planning for the State's facility systems with regard to water shall be directed towards achievement of the objective of the provision of water to adequately accommodate domestic, agricultural, commercial, industrial, recreational, and other needs within resource capacities. (b) To achieve the facility systems water objective, it shall be the policy of this State to:			
(1) Coordinate development of land use activities with existing and potential water supply.	✓		
(2) Support research and development of alternative methods to meet future water requirements well in advance of anticipated needs.			✓
(3) Reclaim and encourage the productive use of runoff water and wastewater discharges.	✓		
(4) Assist in improving the quality, efficiency, service, and storage capabilities of water systems for domestic and agricultural use.	✓		
(5) Support water supply services to areas experiencing critical water problems.	✓		
(6) Promote water conservation programs and practices in government, private industry, and the general public to help ensure adequate water to meet long-term needs.	✓		
Discussion: Development of the project will be coordinated with existing water supply, and will be supportive of water conservation programs and practices in private industry to help meet long-term needs. **The area is currently served by 24-inch and 20-inch mains in Kalaeloa Boulevard. These mains were installed by the Petitioner and dedicated to the Board of Water Supply. The two mains extend down Kalaeloa Boulevard to Malakole Road where a 20-inch main runs toward the harbor and a 16-inch main runs toward the former Barbers Point Naval Air Station. The existing water mains in Kalaeloa Boulevard are intended to supply the drinking water for the expansion areas. Distribution lines of 12- and 16-inches will be needed to serve the drinking water and fire protection requirements for the project and will be located in the interior roadways. The project will be developed with a dual water system to reduce the need for drinking water by supplying irrigation and other potential nondomestic uses with a nonpotable water source.**			
§226-17 Objectives and policies for facility systems--transportation. (a) Planning for the State's facility systems with regard to transportation shall be directed towards the achievement of the following objectives:			
(1) An integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods.	✓		
(2) A statewide transportation system that is consistent with and will accommodate planned growth objectives throughout the State.	✓		
(b) To achieve the transportation objectives, it shall be the policy of this State to:			
(1) Design, program, and develop a multi-modal system in conformance with desired growth and physical development as stated in this chapter;	✓		
(2) Coordinate state, county, federal, and private transportation activities and programs toward the achievement of statewide objectives;	✓		
(3) Encourage a reasonable distribution of financial responsibilities for transportation among participating governmental and private parties;	✓		
(4) Provide for improved accessibility to shipping, docking, and storage facilities;	✓		
(5) Promote a reasonable level and variety of mass transportation services that adequately meet statewide and community needs;	✓		
(6) Encourage transportation systems that serve to accommodate present and future development needs of communities;	✓		

Table 5.1: Hawai'i State Plan – HRS Ch. 226 - Part 1. Overall Theme, Goals, Objectives and Policies	S	N/S	N/A
(7) Encourage a variety of carriers to offer increased opportunities and advantages to inter-island movement of people and goods;			✓
(8) Increase the capacities of airport and harbor systems and support facilities to effectively accommodate transshipment and storage needs;	✓		
(9) Encourage the development of transportation systems and programs which would assist statewide economic growth and diversification;	✓		
(10) Encourage the design and development of transportation systems sensitive to the needs of affected communities and the quality of Hawai'i's natural environment;	✓		
(11) Encourage safe and convenient use of low-cost, energy- efficient, non-polluting means of transportation;	✓		
(12) Coordinate intergovernmental land use and transportation planning activities to ensure the timely delivery of supporting transportation infrastructure in order to accommodate planned growth objectives; and	✓		
(13) Encourage diversification of transportation modes and infrastructure to promote alternate fuels and energy efficiency.	✓		
Discussion: The intent of the proposed industrial project is, among other things, to provide space for storage requirements as needed by the harbor uses. The proposed development will provide opportunities for maritime businesses as well as other industrial and commercial establishments. Approval of the development will ensure that the federally and state supported harbor will be able to attract its share of the transportation-related enterprises necessary to supplement Honolulu Harbor as the State's ocean transportation center. Availability of industrial land in proximity to the Barbers Point Harbor will contribute to a reduction of overland transportation costs. A significant amount of cargo currently arriving at Honolulu Harbor is bound for the Leeward area of O'ahu. **Just north of the development area, and part of the Petitioner's Kapolei West development area, will be a transit hub designed to service the western portion of the 'Ewa area. This is in direct support of the State and County's desire to develop multi-modal transit options for O'ahu.**			
§226-18 Objectives and policies for facility systems--energy. (a) Planning for the State's facility systems with regard to energy shall be directed toward the achievement of the following objectives, giving due consideration to all:			
(1) Dependable, efficient, and economical statewide energy systems capable of supporting the needs of the people;	✓		
(2) Increased energy self-sufficiency where the ratio of indigenous to imported energy use is increased;	✓		
(3) Greater energy security in the face of threats to Hawai'i's energy supplies and systems; and	✓		
(4) Reduction, avoidance, or sequestration of greenhouse gas emissions from energy supply and use.			✓
(b) To achieve the energy objectives, it shall be the policy of this State to ensure the provision of adequate, reasonably priced, and dependable energy services to accommodate demand. (c) To further achieve the energy objectives, it shall be the policy of this State to:			
(1) Support research and development as well as promote the use of renewable energy sources;			✓
(2) Ensure that the combination of energy supplies and energy-saving systems is sufficient to support the demands of growth;	✓		
(3) Base decisions of least-cost supply-side and demand-side energy resource options on a comparison of their total costs and benefits when a least-cost is determined by a reasonably comprehensive, quantitative, and qualitative accounting of their long-term, direct and indirect economic, environmental, social, cultural, and public health costs and benefits;			✓
(4) Promote all cost-effective conservation of power and fuel supplies through measures including: (A) Development of cost-effective demand-side management programs; (B) Education; and (C) Adoption of energy-efficient practices and technologies;	✓		
(5) Ensure to the extent that new supply-side resources are needed, the development or expansion of energy systems utilizes the least-cost energy supply option and maximizes efficient technologies;	✓		
(6) Support research, development, and demonstration of energy efficiency, load management, and other demand-side management programs, practices, and technologies;	✓		
(7) Promote alternate fuels and energy efficiency by encouraging diversification of transportation modes and infrastructure;	✓		
(8) Support actions that reduce, avoid, or sequester greenhouse gases in utility, transportation, and industrial sector applications; and	✓		
(9) Support actions that reduce, avoid, or sequester Hawai'i's greenhouse gas emissions through agriculture and forestry initiatives.			✓

Table 5.1: Hawai'i State Plan – HRS Ch. 226 - Part 1. Overall Theme, Goals, Objectives and Policies	S	N/S	N/A
Discussion: The project supports the Hawai'i Revised Statute's Chapter 226 policies related to conservation of energy, energy efficiency and alternative energy sources to the extent possible. Energy efficiency guidelines will be developed, in consultation with DBEDT Energy Branch, to encourage energy conservation in the development of the project site. Some efficient energy measures that could be included in the guidelines include innovative architectural design of buildings, solar heating systems, high-efficiency air conditioners and appliances, and occupant-sensing environmental controls.			
§226-18.5 Objectives and policies for facility systems--telecommunications. (a) Planning for the State's telecommunications facility systems shall be directed towards the achievement of dependable, efficient, and economical statewide telecommunications systems capable of supporting the needs of the people. (b) To achieve the telecommunications objective, it shall be the policy of this State to ensure the provision of adequate, reasonably priced, and dependable telecommunications services to accommodate demand. (c) To further achieve the telecommunications objective, it shall be the policy of this State to:			
(1) Facilitate research and development of telecommunications systems and resources;			✓
(2) Encourage public and private sector efforts to develop means for adequate, ongoing telecommunications planning;			✓
(3) Promote efficient management and use of existing telecommunications systems and services; and	✓		
(4) Facilitate the development of education and training of telecommunications personnel.			✓
Discussion: While not entirely applicable, the proposed development will incorporate the latest technologies in telecommunications.			
§226-19 Objectives and policies for socio-cultural advancement--housing. (a) Planning for the State's socio- cultural advancement with regard to housing shall be directed toward the achievement of the following objectives:			
(1) Greater opportunities for Hawai'i's people to secure reasonably priced, safe, sanitary, and livable homes, located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals, through collaboration and cooperation between government and nonprofit and for-profit developers to ensure that more affordable housing is made available to very low-, low- and moderate-income segments of Hawai'i's population.	✓		
(2) The orderly development of residential areas sensitive to community needs and other land uses.	✓		
(3) The development and provision of affordable rental housing by the State to meet the housing needs of Hawai'i's people.	✓		
(b) To achieve the housing objectives, it shall be the policy of this State to:			
(1) Effectively accommodate the housing needs of Hawai'i's people.	✓		
(2) Stimulate and promote feasible approaches that increase housing choices for low-income, moderate-income, and gap-group households.	✓		
(3) Increase homeownership and rental opportunities and choices in terms of quality, location, cost, densities, style, and size of housing.	✓		
(4) Promote appropriate improvement, rehabilitation, and maintenance of existing housing units and residential areas.			✓
(5) Promote design and location of housing developments taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas.	✓		
(6) Facilitate the use of available vacant, developable, and underutilized urban lands for housing.	✓		
(7) Foster a variety of lifestyles traditional to Hawai'i through the design and maintenance of neighborhoods that reflect the culture and values of the community.			✓
(8) Promote research and development of methods to reduce the cost of housing construction in Hawai'i.			✓
Discussion: While the project does not propose the construction of any dwelling units, it does support the existing and planned housing developments in the 'Ewa/Kapolei region by providing a substantial employment base in close proximity to these residential areas.			
§226-20 Objectives and policies for socio-cultural advancement--health. (a) Planning for the State's socio- cultural advancement with regard to health shall be directed towards achievement of the following objectives:			
(1) Fulfillment of basic individual health needs of the general public.	✓		
(2) Maintenance of sanitary and environmentally healthful conditions in Hawai'i's communities.	✓		
(b) To achieve the health objectives, it shall be the policy of this State to:			
(1) Provide adequate and accessible services and facilities for prevention and treatment of physical and mental health problems, including substance abuse.	✓		
(2) Encourage improved cooperation among public and private sectors in the provision of health care to accommodate the total health needs of individuals throughout the State.			✓
(3) Encourage public and private efforts to develop and promote statewide and local strategies to reduce health care			✓

Table 5.1: Hawai'i State Plan – HRS Ch. 226 - Part 1. Overall Theme, Goals, Objectives and Policies	S	N/S	N/A
and related insurance costs.			
(4) Foster an awareness of the need for personal health maintenance and preventive health care through education and other measures.			✓
(5) Provide programs, services, and activities that ensure environmentally healthful and sanitary conditions.	✓		
(6) Improve the State's capabilities in preventing contamination by pesticides and other potentially hazardous substances through increased coordination, education, monitoring, and enforcement.	✓		
Discussion: The proposed project will be constructed in full compliance with DOH standards and regulations. The project includes new wastewater pumping stations that connect with the existing wastewater collection system to ensure environmentally healthful and sanitary conditions are maintained at the property. **The project area is readily assessable to a variety of health care facilities. There are more than 25 choices of health care providers. St. Francis Medical Center – West is the nearest hospital to the Kapolei Harborside Center property. Existing facilities and their planned improvements should be adequate to accommodate the needs of the development project.**			
§226-21 Objective and policies for socio-cultural advancement--education. (a) Planning for the State's socio- cultural advancement with regard to education shall be directed towards achievement of the objective of the provision of a variety of educational opportunities to enable individuals to fulfill their needs, responsibilities, and aspirations. (b) To achieve the education objective, it shall be the policy of this State to:			
(1) Support educational programs and activities that enhance personal development, physical fitness, recreation, and cultural pursuits of all groups.			✓
(2) Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs.			✓
(3) Provide appropriate educational opportunities for groups with special needs.			✓
(4) Promote educational programs which enhance understanding of Hawai'i's cultural heritage.			✓
(5) Provide higher educational opportunities that enable Hawai'i's people to adapt to changing employment demands.			✓
(6) Assist individuals, especially those experiencing critical employment problems or barriers, or undergoing employment transitions, by providing appropriate employment training programs and other related educational opportunities.			✓
(7) Promote programs and activities that facilitate the acquisition of basic skills, such as reading, writing, computing, listening, speaking, and reasoning.			✓
(8) Emphasize quality educational programs in Hawai'i's institutions to promote academic excellence.			✓
(9) Support research programs and activities that enhance the education programs of the State.			✓
Discussion: The policies for education are not directly applicable to the proposed project.			
§226-22 Objective and policies for socio-cultural advancement--social services. (a) Planning for the State's socio-cultural advancement with regard to social services shall be directed towards the achievement of the objective of improved public and private social services and activities that enable individuals, families, and groups to become more self-reliant and confident to improve their well-being. (b) To achieve the social service objective, it shall be the policy of the State to:			
(1) Assist individuals, especially those in need of attaining a minimally adequate standard of living and those confronted by social and economic hardship conditions, through social services and activities within the State's fiscal capacities.			✓
(2) Promote coordination and integrative approaches among public and private agencies and programs to jointly address social problems that will enable individuals, families, and groups to deal effectively with social problems and to enhance their participation in society.			✓
(3) Facilitate the adjustment of new residents, especially recently arrived immigrants, into Hawai'i's communities.			✓
(4) Promote alternatives to institutional care in the provision of long-term care for elder and disabled populations.			✓
(5) Support public and private efforts to prevent domestic abuse and child molestation, and assist victims of abuse and neglect.			✓
(6) Promote programs which assist people in need of family planning services to enable them to meet their needs.			✓
Discussion: While the Petitioner supports the State's policies related to socio-cultural advancement and social services, they are not directly applicable to the proposed project.			

Table 5.1: Hawai'i State Plan – HRS Ch. 226 - Part 1. Overall Theme, Goals, Objectives and Policies	S	N/S	N/A
§226-23 Objective and policies for socio-cultural advancement--leisure. (a) Planning for the State's socio- cultural advancement with regard to leisure shall be directed towards the achievement of the objective of the adequate provision of resources to accommodate diverse cultural, artistic, and recreational needs for present and future generations. (b) To achieve the leisure objective, it shall be the policy of this State to:			
(1) Foster and preserve Hawai'i's multi-cultural heritage through supportive cultural, artistic, recreational, and humanities-oriented programs and activities.			✓
(2) Provide a wide range of activities and facilities to fulfill the cultural, artistic, and recreational needs of all diverse and special groups effectively and efficiently.			✓
(3) Enhance the enjoyment of recreational experiences through safety and security measures, educational opportunities, and improved facility design and maintenance.			✓
(4) Promote the recreational and educational potential of natural resources having scenic, open space, cultural, historical, geological, or biological values while ensuring that their inherent values are preserved.			✓
(5) Ensure opportunities for everyone to use and enjoy Hawai'i's recreational resources.			✓
(6) Assure the availability of sufficient resources to provide for future cultural, artistic, and recreational needs.			✓
(7) Provide adequate and accessible physical fitness programs to promote the physical and mental well-being of Hawai'i's people.			✓
(8) Increase opportunities for appreciation and participation in the creative arts, including the literary, theatrical, visual, musical, folk, and traditional art forms.			✓
(9) Encourage the development of creative expression in the artistic disciplines to enable all segments of Hawai'i's population to participate in the creative arts.			✓
(10) Assure adequate access to significant natural and cultural resources in public ownership.			✓
Discussion: While the Petitioner supports the State's policies related to socio-cultural advancement and leisure, they are not directly applicable to the proposed project. However, KPD is in discussions with the County regarding a possible transfer of approximately ten (10) acres of land on Parcel 33 to be developed and dedicated as a recreational sports complex (Ref. No. 2006/PIM-2). The dedication would fulfill a unilateral agreement associated with a previous zone change for the City of Kapolei, approved under Ordinance 90-30.			
§226-24 Objective and policies for socio-cultural advancement--individual rights and personal well-being. (a) Planning for the State's socio-cultural advancement with regard to individual rights and personal well-being shall be directed towards achievement of the objective of increased opportunities and protection of individual rights to enable individuals to fulfill their socio-economic needs and aspirations. (b) To achieve the individual rights and personal well- being objective, it shall be the policy of this State to:			
(1) Provide effective services and activities that protect individuals from criminal acts and unfair practices and that alleviate the consequences of criminal acts in order to foster a safe and secure environment.	✓		
(2) Uphold and protect the national and state constitutional rights of every individual.	✓		
(3) Assure access to, and availability of, legal assistance, consumer protection, and other public services which strive to attain social justice.	✓		
(4) Ensure equal opportunities for individual participation in society.	✓		
Discussion: As an employer, developer, and landowner, the Petitioner fully supports the individual rights and personal well-being of its employees and the general public.			
§226-25 Objective and policies for socio-cultural advancement--culture. (a) Planning for the State's socio- cultural advancement with regard to culture shall be directed toward the achievement of the objective of enhancement of cultural identities, traditions, values, customs, and arts of Hawai'i's people. (b) To achieve the culture objective, it shall be the policy of this State to:			
(1) Foster increased knowledge and understanding of Hawai'i's ethnic and cultural heritages and the history of Hawai'i.	✓		
(2) Support activities and conditions that promote cultural values, customs, and arts that enrich the lifestyles of Hawai'i's people and which are sensitive and responsive to family and community needs.	✓		
(3) Encourage increased awareness of the effects of proposed public and private actions on the integrity and quality of cultural and community lifestyles in Hawai'i.	✓		
(4) Encourage the essence of the aloha spirit in people's daily activities to promote harmonious relationships among Hawai'i's people and visitors.			✓

Table 5.1: Hawai'i State Plan – HRS Ch. 226 - Part 1. Overall Theme, Goals, Objectives and Policies	S	N/S	N/A
<u>Discussion</u>: Based on what was gathered from the consultation process and the evidence of Land Court Awards and lack of resources, the vast majority of the project area was not intensively utilized during traditional times. Additionally, the years of sugar cane cultivation and ranching left no reason for access. Most of the resources such as salt farming and gathering of marine resources were on the coastal fringe outside of the project area. **Accordingly, the proposed project will not adversely affect rights customarily and traditionally exercised for subsistence, cultural and religious purposes due to the lack of former, contemporary or continuing cultural practices within the project area. The proposed project would have minimal or no impact on Hawaiian culture, its practices and traditions.**			
§226-26 Objectives and policies for socio-cultural advancement--public safety. (a) Planning for the State's socio- cultural advancement with regard to public safety shall be directed towards the achievement of the following objectives:			
(1) Assurance of public safety and adequate protection of life and property for all people.	✓		
(2) Optimum organizational readiness and capability in all phases of emergency management to maintain the strength, resources, and social and economic well-being of the community in the event of civil disruptions, wars, natural disasters, and other major disturbances.	✓		
(3) Promotion of a sense of community responsibility for the welfare and safety of Hawai'i's people.	✓		
(b) To achieve the public safety objectives, it shall be the policy of this State to:			
(1) Ensure that public safety programs are effective and responsive to community needs.	✓		
(2) Encourage increased community awareness and participation in public safety programs.	✓		
(c) To further achieve public safety objectives related to criminal justice, it shall be the policy of this State to:			
(1) Support criminal justice programs aimed at preventing and curtailing criminal activities.	✓		
(2) Develop a coordinated, systematic approach to criminal justice administration among all criminal justice agencies.			✓
(3) Provide a range of correctional resources which may include facilities and alternatives to traditional incarceration in order to address the varied security needs of the community and successfully reintegrate offenders into the community.			✓
(d) To further achieve public safety objectives related to emergency management, it shall be the policy of this State to:			
(1) Ensure that responsible organizations are in a proper state of readiness to respond to major war-related, natural, or technological disasters and civil disturbances at all times.	✓		
(2) Enhance the coordination between emergency management programs throughout the State.	✓		
<u>Discussion</u>: Policies related to public safety are primarily the responsibility of government agencies and are not directly applicable to the proposed project. **The project development area is within the City Police Department's District 8, which encompasses the leeward Coast and the 'Ewa Plain. There are approximately 100 field officers assigned to this district. Response time for the entire district fluctuates between five and seven minutes. In order to meet the growing needs of the 'Ewa Plain communities, in 2000, the City and County of Honolulu opened the Regional Kapolei District Station at 1100 Kamokila Boulevard. A storefront station is located at the intersection of Fort Weaver Road and Renton Road. A substation is located in Wai`anae. The HPD expects to expand its presence in the region as Kapolei develops into the Second City. Based on population estimates, the City and County of Honolulu anticipate the need for two additional substations to service the region. These are planned to be in operation by 2020 at 'Ewa Villages and Ko Olina.** **Fire protection in Kapolei and 'Ewa is provided by the City and County of Honolulu Fire Department (HFD) 'Ewa Beach Fire Station (an engine company), Makakilo Fire Station (an engine company), and Kapolei Fire Station (an engine and ladder company, and the Battalion 4 Headquarters). Located in Kapolei Business Park, the Kapolei Fire Station was completed in 1995 to serve the expanding development on the 'Ewa Plain. According to the 'Ewa Development Plan, to meet the projected population and economic growth in 'Ewa by 2020, three fire stations at 'Ewa Villages, Ko 'Ōlina, and Makaīwa Hills are planned, but service dates have not been determined.**			
§226-27 Objectives and policies for socio-cultural advancement--government. (a) Planning the State's socio- cultural advancement with regard to government shall be directed towards the achievement of the following objectives:			
(1) Efficient, effective, and responsive government services at all levels in the State.			✓
(2) Fiscal integrity, responsibility, and efficiency in the state government and county governments.			✓
(b) To achieve the government objectives, it shall be the policy of this State to:			
(1) Provide for necessary public goods and services not assumed by the private sector.			✓

Table 5.1: Hawai'i State Plan – HRS Ch. 226 - Part 1. Overall Theme, Goals, Objectives and Policies	S	N/S	N/A
(2) Pursue an openness and responsiveness in government that permits the flow of public information, interaction, and response.			✓
(3) Minimize the size of government to that necessary to be effective.			✓
(4) Stimulate the responsibility in citizens to productively participate in government for a better Hawai'i.			✓
(5) Assure that government attitudes, actions, and services are sensitive to community needs and concerns.			✓
(6) Provide for a balanced fiscal budget.			✓
(7) Improve the fiscal budgeting and management system of the State.			✓
(8) Promote the consolidation of state and county governmental functions to increase the effective and efficient delivery of government programs and services and to eliminate duplicative services wherever feasible.			✓
Discussion: Policies related to the operation of government are primarily the responsibility of government and are not directly applicable to the proposed project.			

Table 5.1: Hawai'i State Plan – HRS Ch. 226 – Part III. Priority Guideline	S	N/S	N/A
§226-101 Purpose. The purpose of this part is to establish overall priority guidelines to address areas of statewide concern.			
§226-102 Overall direction. The State shall strive to improve the quality of life for Hawai'i's present and future population through the pursuit of desirable courses of action in five major areas of statewide concern which merit priority attention: economic development, population growth and land resource management, affordable housing, crime and criminal justice, and quality education.			
§226-103 Economic priority guidelines. (a) Priority guidelines to stimulate economic growth and encourage business expansion and development to provide needed jobs for Hawai'i's people and achieve a stable and diversified economy:			
(1) Seek a variety of means to increase the availability of investment capital for new and expanding enterprises. (A) Encourage investments which:			
(i) Reflect long term commitments to the State;	✓		
(ii) Rely on economic linkages within the local economy;	✓		
(iii) Diversify the economy;	✓		
(iv) Reinvest in the local economy;	✓		
(v) Are sensitive to community needs and priorities; and	✓		
(vi) Demonstrate a commitment to provide management opportunities to Hawai'i residents.	✓		
(2) Encourage the expansion of technological research to assist industry development and support the development and commercialization of technological advancements.	✓		
(3) Improve the quality, accessibility, and range of services provided by government to business, including data and reference services and assistance in complying with governmental regulations.	✓		
(4) Seek to ensure that state business tax and labor laws and administrative policies are equitable, rational, and predictable.	✓		
(5) Streamline the building and development permit and review process, and eliminate or consolidate other burdensome or duplicative governmental requirements imposed on business, where public health, safety and welfare would not be adversely affected.			✓
(6) Encourage the formation of cooperatives and other favorable marketing or distribution arrangements at the regional or local level to assist Hawai'i's small-scale producers, manufacturers, and distributors.	✓		
(7) Continue to seek legislation to protect Hawai'i from transportation interruptions between Hawai'i and the continental United States.	✓		
(8) Provide public incentives and encourage private initiative to develop and attract industries which promise long-term growth potentials and which have the following characteristics:	✓		
(A) An industry that can take advantage of Hawai'i's unique location and available physical and human resources.	✓		
(B) A clean industry that would have minimal adverse effects on Hawai'i's environment.	✓		
(C) An industry that is willing to hire and train Hawai'i's people to meet the industry's labor needs at all levels of employment.	✓		
(D) An industry that would provide reasonable income and steady employment.	✓		
(9) Support and encourage, through educational and technical assistance programs and other means, expanded opportunities for employee ownership and participation in Hawai'i business.			✓
(10) Enhance the quality of Hawai'i's labor force and develop and maintain career opportunities for Hawai'i's people through the following actions:	✓		
(A) Expand vocational training in diversified agriculture, aquaculture, information industry, and other areas where growth is desired and feasible.	✓		
(B) Encourage more effective career counseling and guidance in high schools and post-secondary institutions to inform students of present and future career opportunities.			✓
(C) Allocate educational resources to career areas where high employment is expected and where growth of new industries is desired.			✓
(D) Promote career opportunities in all industries for Hawai'i's people by encouraging firms doing business in the State to hire residents.	✓		
(E) Promote greater public and private sector cooperation in determining industrial training needs and in developing relevant curricula and on- the-job training opportunities.	✓		
(F) Provide retraining programs and other support services to assist entry of displaced workers into alternative employment.	✓		
(b) Priority guidelines to promote the economic health and quality of the visitor industry:			
(1) Promote visitor satisfaction by fostering an environment which enhances the Aloha Spirit and minimizes			✓

Table 5.1: Hawai'i State Plan – HRS Ch. 226 – Part III. Priority Guideline	S	N/S	N/A
inconveniences to Hawai'i's residents and visitors.			
(2) Encourage the development and maintenance of well- designed, adequately serviced hotels and resort destination areas which are sensitive to neighboring communities and activities and which provide for adequate shoreline setbacks and beach access.			✓
(3) Support appropriate capital improvements to enhance the quality of existing resort destination areas and provide incentives to encourage investment in upgrading, repair, and maintenance of visitor facilities.			✓
(4) Encourage visitor industry practices and activities which respect, preserve, and enhance Hawai'i's significant natural, scenic, historic, and cultural resources.			✓
(5) Develop and maintain career opportunities in the visitor industry for Hawai'i's people, with emphasis on managerial positions.			✓
(6) Support and coordinate tourism promotion abroad to enhance Hawai'i's share of existing and potential visitor markets.			✓
(7) Maintain and encourage a more favorable resort investment climate consistent with the objectives of this chapter.			✓
(8) Support law enforcement activities that provide a safer environment for both visitors and residents alike.			✓
(9) Coordinate visitor industry activities and promotions to business visitors through the state network of advanced data communication techniques.			✓
(c) Priority guidelines to promote the continued viability of the sugar and pineapple industries:			
(1) Provide adequate agricultural lands to support the economic viability of the sugar and pineapple industries.			✓
(2) Continue efforts to maintain federal support to provide stable sugar prices high enough to allow profitable operations in Hawai'i.			✓
(3) Support research and development, as appropriate, to improve the quality and production of sugar and pineapple crops.			✓
(d) Priority guidelines to promote the growth and development of diversified agriculture and aquaculture:			
(1) Identify, conserve, and protect agricultural and aquacultural lands of importance and initiate affirmative and comprehensive programs to promote economically productive agricultural and aquacultural uses of such lands.			✓
(2) Assist in providing adequate, reasonably priced water for agricultural activities.			✓
(3) Encourage public and private investment to increase water supply and to improve transmission, storage, and irrigation facilities in support of diversified agriculture and aquaculture.			✓
(4) Assist in the formation and operation of production and marketing associations and cooperatives to reduce production and marketing costs.	✓		
(5) Encourage and assist with the development of a waterborne and airborne freight and cargo system capable of meeting the needs of Hawai'i's agricultural community.	✓		
(6) Seek favorable freight rates for Hawai'i's agricultural products from interisland and overseas transportation operators.	✓		
(7) Encourage the development and expansion of agricultural and aquacultural activities which offer long-term economic growth potential and employment opportunities.			✓
(8) Continue the development of agricultural parks and other programs to assist small independent farmers in securing agricultural lands and loans.		✓	
(9) Require agricultural uses in agricultural subdivisions and closely monitor the uses in these subdivisions.			✓
(10) Support the continuation of land currently in use for diversified agriculture.		✓	
(e) Priority guidelines for water use and development:			
(1) Maintain and improve water conservation programs to reduce the overall water consumption rate.	✓		
(2) Encourage the improvement of irrigation technology and promote the use of nonpotable water for agricultural and landscaping purposes.	✓		
(3) Increase the support for research and development of economically feasible alternative water sources.	✓		
(4) Explore alternative funding sources and approaches to support future water development programs and water system improvements.	✓		
(f) Priority guidelines for energy use and development:			
(1) Encourage the development, demonstration, and commercialization of renewable energy sources.			✓
(2) Initiate, maintain, and improve energy conservation programs aimed at reducing energy waste and increasing public awareness of the need to conserve energy.	✓		
(3) Provide incentives to encourage the use of energy conserving technology in residential, industrial, and other buildings.	✓		

Table 5.1: Hawai'i State Plan – HRS Ch. 226 – Part III. Priority Guideline	S	N/S	N/A
(4) Encourage the development and use of energy conserving and cost-efficient transportation systems.	✓		
(g) Priority guidelines to promote the development of the information industry:			
(1) Establish an information network that will serve as the catalyst for establishing a viable information industry in Hawai'i.			✓
(2) Encourage the development of services such as financial data processing, a products and services exchange, foreign language translations, telemarketing, teleconferencing, a twenty-four-hour international stock exchange, international banking, and a Pacific Rim management center.			✓
(3) Encourage the development of small businesses in the information field such as software development, the development of new information systems and peripherals, data conversion and data entry services, and home or cottage services such as computer programming, secretarial, and accounting services.			✓
(4) Encourage the development or expansion of educational and training opportunities for residents in the information and telecommunications fields.			✓
(5) Encourage research activities, including legal research in the information and telecommunications fields.			✓
(6) Support promotional activities to market Hawai'i's information industry services.			✓
Discussion: The Kapolei Harborside Center project is consistent with the State's goals to provide economic vitality, stability and growth for present and future generations. Development of Kapolei Harborside Center provides diversified and localized economic opportunities for the 'Ewa/Kapolei region. **The project should encourage investment capital for new and expanding enterprises, as well as create opportunities for favorable marketing or distribution arrangements at the regional or local level to assist Hawai'i's small-scale producers, manufacturers, and distributors. It can expand opportunities for employee ownership and participation in Hawai'i business.**			
§226-104 Population growth and land resources priority guidelines. (a) Priority guidelines to effect desired statewide growth and distribution:			
(1) Encourage planning and resource management to insure that population growth rates throughout the State are consistent with available and planned resource capacities and reflect the needs and desires of Hawai'i's people.	✓		
(2) Manage a growth rate for Hawai'i's economy that will parallel future employment needs for Hawai'i's people.	✓		
(3) Ensure that adequate support services and facilities are provided to accommodate the desired distribution of future growth throughout the State.	✓		
(4) Encourage major state and federal investments and services to promote economic development and private investment to the neighbor islands, as appropriate.	✓		
(5) Explore the possibility of making available urban land, low-interest loans, and housing subsidies to encourage the provision of housing to support selective economic and population growth on the neighbor islands.			✓
(6) Seek federal funds and other funding sources outside the State for research, program development, and training to provide future employment opportunities on the neighbor islands.			✓
(7) Support the development of high technology parks on the neighbor islands.			✓
(b) Priority guidelines for regional growth distribution and land resource utilization:			
(1) Encourage urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditures, and away from areas where other important benefits are present, such as protection of important agricultural land or preservation of lifestyles.	✓		
(2) Make available marginal or nonessential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the agricultural district.	✓		
(3) Restrict development when drafting of water would result in exceeding the sustainable yield or in significantly diminishing the recharge capacity of any groundwater area.	✓		
(4) Encourage restriction of new urban development in areas where water is insufficient from any source for both agricultural and domestic use.			✓
(5) In order to preserve green belts, give priority to state capital-improvement funds which encourage location of urban development within existing urban areas except where compelling public interest dictates development of a noncontiguous new urban core.	✓		
(6) Seek participation from the private sector for the cost of building infrastructure and utilities, and maintaining open spaces.	✓		
(7) Pursue rehabilitation of appropriate urban areas.	✓		
(8) Support the redevelopment of Kaka'ako into a viable residential, industrial, and commercial community.			✓
(9) Direct future urban development away from critical environmental areas or impose mitigating measures so that negative impacts on the environment would be minimized.	✓		

Table 5.1: Hawai'i State Plan – HRS Ch. 226 – Part III. Priority Guideline	S	N/S	N/A
(10) Identify critical environmental areas in Hawai'i to include but not be limited to the following: watershed and recharge areas; wildlife habitats (on land and in the ocean); areas with endangered species of plants and wildlife; natural streams and water bodies; scenic and recreational shoreline resources; open space and natural areas; historic and cultural sites; areas particularly sensitive to reduction in water and air quality; and scenic resources.	✓		
(11) Identify all areas where priority should be given to preserving rural character and lifestyle.			✓
(12) Utilize Hawai'i's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline, conservation lands, and other limited resources for future generations.	✓		
(13) Protect and enhance Hawai'i's shoreline, open spaces, and scenic resources.	✓		
Discussion: Kapolei Harborside Center is located within the 'Ewa Development Plan Area, which includes census tracts 83 through 86.02. The area has experienced a 60% increase in its population in the past 10 years to a population of 84,150. In comparison, the population for the City and County of Honolulu as a whole increased only 4.8% from 836,231 to 876,156 between 1990 and 2000. 'Ewa's population is expected to grow to 96,000 by 2010 and up to 141,000 by 2025. **The proposed project provides employment opportunities to accommodate population growth in the general area, which is consistent with available and planned resource capacities. Adequate support services and facilities are available from developed and/or to be developed areas adjacent to the project. It will utilize largely marginal or non-essential agricultural lands.**			
§226-105 Crime and criminal justice. Priority guidelines in the area of crime and criminal justice:			
(1) Support law enforcement activities and other criminal justice efforts that are directed to provide a safer environment.	✓		
(2) Target state and local resources on efforts to reduce the incidence of violent crime and on programs relating to the apprehension and prosecution of repeat offenders.			✓
(3) Support community and neighborhood program initiatives that enable residents to assist law enforcement agencies in preventing criminal activities.			✓
(4) Reduce overcrowding or substandard conditions in correctional facilities through a comprehensive approach among all criminal justice agencies which may include sentencing law revisions and use of alternative sanctions other than incarceration for persons who pose no danger to their community.			✓
(5) Provide a range of appropriate sanctions for juvenile offenders, including community-based programs and other alternative sanctions.			✓
(6) Increase public and private efforts to assist witnesses and victims of crimes and to minimize the costs of victimization.			✓
Discussion: While the Petitioner supports the State's policies related to crime and criminal justice, they are not directly applicable to the proposed project. The Petitioner will support State and local authorities to provide safer environments for citizens and visitors of the area.			
§226-106 Affordable housing. Priority guidelines for the provision of affordable housing:			
(1) Seek to use marginal or nonessential agricultural land and public land to meet housing needs of low- and moderate-income and gap-group households.			✓
(2) Encourage the use of alternative construction and development methods as a means of reducing production costs.			✓
(3) Improve information and analysis relative to land availability and suitability for housing.			✓
(4) Create incentives for development which would increase home ownership and rental opportunities for Hawai'i's low- and moderate-income households, gap-group households, and residents with special needs.			✓
(5) Encourage continued support for government or private housing programs that provide low interest mortgages to Hawai'i's people for the purchase of initial owner- occupied housing.			✓
(6) Encourage public and private sector cooperation in the development of rental housing alternatives.			✓
(7) Encourage improved coordination between various agencies and levels of government to deal with housing policies and regulations.			✓
(8) Give higher priority to the provision of quality housing that is affordable for Hawai'i's residents and less priority to development of housing intended primarily for individuals outside of Hawai'i.			✓
§**226-107 Quality education.** Priority guidelines to promote quality education:			
(1) Pursue effective programs which reflect the varied district, school, and student needs to strengthen basic skills achievement;			✓
(2) Continue emphasis on general education "core" requirements to provide common background to students and essential support to other university programs;			✓
(3) Initiate efforts to improve the quality of education by improving the capabilities of the education work force;			✓

Table 5.1: Hawai'i State Plan – HRS Ch. 226 – Part III. Priority Guideline	S	N/S	N/A
(4) Promote increased opportunities for greater autonomy and flexibility of educational institutions in their decision-making responsibilities;			✓
(5) Increase and improve the use of information technology in education by the availability of telecommunications equipment for:			✓
(A) The electronic exchange of information;			✓
(B) Statewide electronic mail; and			✓
(C) Access to the Internet.			✓
§**226-108** Encourage programs that increase the public's awareness and understanding of the impact of information technologies on our lives;			✓
(6) Pursue the establishment of Hawai'i's public and private universities and colleges as research and training centers of the Pacific;			✓
(7) Develop resources and programs for early childhood education;			✓
(8) Explore alternatives for funding and delivery of educational services to improve the overall quality of education; and			✓
(9) Strengthen and expand educational programs and services for students with special needs.			✓
Discussion: The policies for education are not directly applicable to the proposed project.			

Table 5.2: Hawai'i Revised Statutes – Section 205 – Land Use Commission	S	N/S	N/A
Section 205.2: Districting and classification of lands.			
(a) There shall be four major land use districts in which all lands in the State shall be placed: urban, rural, agricultural, and conservation. The land use commission shall group contiguous land areas suitable for inclusion in one of these four major districts. The commission shall set standards for determining the boundaries of each district, provided that:	✓		
(1) In the establishment of boundaries of urban districts those lands that are now in urban use and a sufficient reserve area for foreseeable urban growth shall be included;	✓		
(2) In the establishment of boundaries for rural districts, areas of land composed primarily of small farms mixed with very low density residential lots, which may be shown by a minimum density of not more than one house per one-half acre and a minimum lot size of not less than one-half acre shall be included, except as herein provided;			✓
(3) In the establishment of the boundaries of agricultural districts the greatest possible protection shall be given to those lands with a high capacity for intensive cultivation; and	✓		
(4) In the establishment of the boundaries of conservation districts, the "forest and water reserve zones" provided in Act 234, section 2, Session Laws of Hawaii 1957, are renamed "conservation districts" and, effective as of July 11, 1961, the boundaries of the forest and water reserve zones theretofore established pursuant to Act 234, section 2, Session Laws of Hawaii 1957, shall constitute the boundaries of the conservation districts; provided that thereafter the power to determine the boundaries of the conservation districts shall be in the commission.			✓
In establishing the boundaries of the districts in each county, the commission shall give consideration to the master plan or general plan of the county.	✓		
(b) Urban districts shall include activities or uses as provided by ordinances or regulations of the county within which the urban district is situated.	✓		
(c) Rural districts shall include activities or uses as characterized by low density residential lots of not more than one dwelling house per one—half acre, except as provided by county ordinance pursuant to section 46—4(c), in areas where "city—like" concentration of people, structures, streets, and urban level of services are absent, and where small farms are intermixed with low density residential lots except that within a subdivision, as defined in section 484—1, the commission for good cause may allow one lot of less than one-half acre, but not less than 18,500 square feet, or an equivalent residential density, within a rural subdivision and permit the construction of one dwelling on such lot, provided that all other dwellings in the subdivision shall have a minimum lot size of one-half acre or 21,780 square feet. Such petition for variance may be processed under the special permit procedure. These districts may include contiguous areas which are not suited to low density residential lots or small farms by reason of topography, soils, and other related characteristics. Rural districts shall also include golf courses, golf driving ranges, and golf-related facilities.			✓
(d) Agricultural districts shall include activities or uses as characterized by the cultivation of crops, orchards, forage, and forestry; farming activities or uses related to animal husbandry, aquaculture, and game and fish propagation; aquaculture, which means the production of aquatic plant and animal life for food and fiber within ponds and other bodies of water; wind generated energy production for public, private, and commercial use; bona fide agricultural services and uses that support the agricultural activities of the fee or leasehold owner of the property and accessory to any of the above activities, whether or not conducted on the same premises as the agricultural activities to which they are accessory, including but not limited to farm dwellings as defined in section 205-4.5(a)(4), employee housing, farm buildings, mills, storage facilities, processing facilities, vehicle and equipment storage areas, and roadside stands for the sale of products grown on the premises; wind machines and wind farms; small-scale meteorological, air quality, noise, and other scientific and environmental data collection and monitoring facilities occupying less than one-half acre of land, provided that these facilities shall not be used as or equipped for use as living quarters or dwellings; agricultural parks; and open area recreational facilities. For the purposes of this chapter, golf courses and golf driving ranges are prohibited in agricultural districts, except as provided in section 205-4.5(d).			✓
(e) Conservation districts shall include areas necessary for protecting watersheds and water sources; preserving scenic and historic areas; providing park lands, wilderness, and beach reserves; conserving indigenous or endemic plants, fish, and wildlife, including those which are threatened or endangered; preventing floods and soil erosion; forestry; open space areas whose existing openness, natural condition, or present state of use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural or scenic resources; areas of value for recreational purposes; other related activities; and other permitted uses not detrimental to a multiple use conservation concept.			✓

Table 5.2: Hawai'i Revised Statutes – Section 205 – Land Use Commission	S	N/S	N/A
Discussion: All of the current and planned land uses surrounding the project area are urban, with no adjacent or nearby agricultural activities. Thus, the project area is an agricultural remnant. Reclassification of the Petition Area to the Urban District and the subsequent County Zone Change Application would permit the Petition Area to conform to the surrounding land uses. The proposed project conforms the goals of the Hawai'i State Plan, as well as the County and District Plans. Reclassification would allow this remnant to conform to surrounding uses and provide for a contiguous urban area. The land does not have a high capacity for cultivation, given its poor soils and disturbed landscape.			
Section 205-17: Land use commission decision-making criteria. In its review of any petition for reclassification of district boundaries pursuant to this chapter, the commission shall specifically consider the following:			
(1) The extent to which the proposed reclassification conforms to the applicable goals, objectives, and policies of the Hawaii State Plan and relates to the applicable priority guidelines of the Hawaii state plan and the adopted functional plans;	✓		
(2) The extent to which the proposed reclassification conforms to the applicable district standards;	✓		
(3) The impact of the proposed reclassification on the following areas of state concern:			
(A) Preservation or maintenance of important natural systems or habitats;	✓		
(B) Maintenance of valued cultural, historical, or natural resources;	✓		
(C) Maintenance of other natural resources relevant to Hawaii's economy, including agricultural resources;			✓
(D) Commitment of state funds and resources;			✓
(E) Provision for employment opportunities and economic development; and	✓		
(F) Provision for housing opportunities for all income groups, particularly the low, low-moderate, and gap groups;			✓
(4) The standards and criteria for the reclassification or rezoning of important agricultural lands in section 205-50; and	✓		
(5) The representations and commitments made by the petitioner in securing a boundary change.			
Discussion: The project is consistent with the urban standards of the district and conforms to the applicable goals, objectives and policies of the Hawai'i State Plan as discussed in Table 5-1. All surrounding uses are urban and uses on the east, west, and south sides of the project area are all industrial. The project provides for the maintenance of important cultural and historic habitats by continuing the preservation of a site containing sinkholes, recognized in having historical importance. The project will provide a new employment center for the Kapolei/'Ewa region, contributing approximately 3,800 new, permanent jobs at buildout. The Petitioner has submitted current financial statements as part of the Land Use Boundary Amendment petition (Docket No. A06-763). Review of the financial statements show that the Petitioner has the necessary economic ability to carry out the proposed development.			

Table 5.3: Hawai'i Administrative Rules – Chapter 15-15-18 – Land Use Commission Rules	S	N/S	N/A
Section 15-15-18: Standards for determining "U" urban district boundaries. Except as otherwise provided in this chapter, in determining the boundaries for the "U" urban district, the following standards shall be used:			
(1) It shall include lands characterized by "city-like" concentrations of people, structures, streets, urban level of services and other related land uses;	✓		
(2) It shall take into consideration the following specific factors:			
(A) Proximity to centers of trading and employment except where the development would generate new centers of trading and employment;	✓		
(B) Availability of basic services such as schools, parks, wastewater systems, solid waste disposal, drainage, water, transportation systems, public utilities, and police and fire protection; and	✓		
(C) Sufficient reserve areas for foreseeable urban growth;	✓		
(3) It shall include lands with satisfactory topography, drainage, and reasonably free from the danger of any flood, tsunami, unstable soil condition, and other adverse environmental effects;	✓		
(4) Land contiguous with existing urban areas shall be given more consideration than non-contiguous land, and particularly when indicated for future urban use on state or county general plans;	✓		
(5) It shall include lands in appropriate locations for new urban concentrations and shall give consideration to areas of urban growth as shown on the state and county general plans;	✓		
(6) It may include lands which do not conform to the standards in paragraphs (1) to (5)			
(A) When surrounded by or adjacent to existing urban development; and	✓		
(B) Only when those lands represent a minor portion of this district;			✓
(7) It shall not include lands, the urbanization of which will contribute toward scattered spot urban development, necessitating unreasonable investment in public infrastructure or support services; and	✓		
(8) It may include lands with a general slope of twenty per cent or more if the commission finds that those lands are desirable and suitable for urban purposes and that the design and construction controls, as adopted by any federal, state, or county agency, are adequate to protect the public health, welfare and safety, and the public's interests in the aesthetic quality of the landscape.			✓
Discussion: The project is consistent with the urban standards, including its location contiguous to existing urban areas and its proximity to existing industrial centers. The Petition Area is within the County's Urban Growth Boundary and has been identified for future urban growth in the 'Ewa DP. It is highly developable, with satisfactory topography, with less than 20% slope, and is free from natural hazard potential, such as flooding or tsunami inundation. Services, such as wastewater systems, water, sanitation, and police and fire protection would be available to serve the Petition Area or developed by the project.			

Table 5.4: Hawai'i State Functional Plans	S	N/S	N/A
Employment Functional Plan			
Objective I.A: Improve the qualifications of entry level workers and their transition to employment			✓
Objective I.B: Develop and deliver education, training and related services to ensure and maintain a quality and competitive workforce.			✓
Objective II.A: Improve labor exchange	✓		
Objective III.A: Improve quality of life for workers and families.	✓		
Objective IV.A: Improve planning of economic development, employment and training activities	✓		
Discussion: This project will address the objective of improving the planning of economic development and employment centers. While residential expansion has been occurring in the central and leeward O'ahu area, the movement of employment centers away from the Honolulu corridor has also been sought as a means of alleviating commuter traffic congestion from these outlying areas. The employment base of the region, while increasing, is still limited. Eighty percent of the region's residents work outside of the area. Many of those commute to Honolulu's CBD. Sixty-seven percent of those working outside of the region want to work within the Kapolei/'Ewa area. The project will benefit an area with substantial employment needs, help to improve quality of life for residents, help to reduce commuter congestion, and foster greater cooperation between government and the private sector. **In the short-term, the new project would be consistent with this public policy by providing added employment for construction workers, and professionals involved in project design and permitting. Kapolei Harborside Center will provide employment for about 450 construction workers during the 10-year development period, with a payroll of about $29 million per year during development activities. Average employment of about 630 additional workers dependent on construction activities will be supported, with a payroll of about $24 million per year. Approximately, 700 direct and indirect jobs in the Kapolei/'Ewa region will be generated by the project.** **At full occupancy, the project is anticipated to provide almost 3,800 permanent new industrial jobs, with a payroll of about $174 million per year (versus about 40 jobs for current activities on the property that will relocate). About 2,270 additional jobs dependent on the industrial operations, along with a payroll of about $87 million per year will result from the project's development. Thus, total direct-plus-indirect employment associated with the industrial operations at full development is expected to exceed 6,000 jobs. Over 4,500 of these jobs are expected to be in the Kapolei/'Ewa region. The new jobs provided by the project will result in less commuting by Kapolei/'Ewa residents to jobs outside the region.**			
Agriculture Functional Plan			
Objective A: Achievement of increased agricultural production and growth through cultural and management practices.			✓
Objective B: Achievement of an orderly agricultural marketing system through production promotion and industry organization.			✓
Objective C: Achievement of increased consumption of and demand for Hawai'i's agricultural products through consumer education and product quality.			✓
Objective D: Achievement of optimal contribution by agriculture to the State's economy.		✓	
Objective E: Achievement of adequate capital, and knowledge of its proper management, for agricultural development.			✓
Objective F: Achievement of increased agricultural production and growth through pest and disease controls.			✓
Objective G: Achievement of effective protection and improved quality of Hawai'i's land, water, and air.			✓
Objective H: Achievement of productive agricultural use of lands most suitable and needed for agriculture	✓		
Objective I: Achievement of efficient and equitable provision of adequate water for agricultural use.			✓
Objective J: Achievement of maximum degree of public understanding of agriculture in Hawai'i.			✓
Objective K: Achievement of adequate supply of properly trained labor for agricultural needs.			✓
Objective L: Achievement of adequate transportation services and facilities to meet agricultural needs.	✓		
Objective M: Achievement of adequate support services and infrastructure to meet agricultural needs.	✓		

Table 5.4: Hawai'i State Functional Plans	S	N/S	N/A
Discussion: The soil in much of the project area is coral outcrop. Based on the various soil classification systems that rate Hawai'i soils, little of the property (from 0% to 25% depending on the particular soil rating system) has good soils. It is, for the most part, marginal land for agricultural productivity. While the proposed project may appear to conflict with certain Economic Priority Guidelines (Sec. 226-103, HRS) relating to Agriculture, the minimal productivity of the greater portion of the project area would not significantly impact such priority guidelines as Sec. 226-103(c)(1) "Provide adequate agricultural lands to support the economic viability of the sugar and pineapple industries"; and Sec. 226-103(d)(1) "Identify, conserve, and protect agricultural land of importance and initiate affirmative and comprehensive programs to promote economically productive agricultural and aquacultural uses of such lands. Further Sec. 226-104(b)(2) directs that marginal or non-essential agricultural lands be made available for urban uses while maintaining agricultural lands of importance in the Agricultural District.			
Energy Functional Plan			
Objective A: Moderate the growth and energy demand through conservation and energy efficiency.	✓		
Objective B: Displace oil and fossil fuels consumption through the application of appropriate alternate and renewable energy resources and technologies.	✓		
Objective C: Promote energy education and legislation.			✓
Objective D: Support and develop an integrated approach to energy development and management.	✓		
Objective E: Ensure State's abilities to implement energy emergency actions immediately in event of fuel supply disruptions. Ensure essential public services are maintained and provisions are made to alleviate economic and personal hardships which may arise.			✓
Discussion: The project area is located adjacent to existing industrial use areas and the City of Kapolei. It would constitute an addition to an already compact, concentrated area of development with Campbell Industrial Park to the south, Kalaeloa/Barbers Point Harbor to the east, and the City of Kapolei to the north and east. Energy efficiency guidelines will be developed, in consultation with DBEDT Energy Branch, to encourage energy conservation in the development of the project site. Some efficient energy measures that could be included in the guidelines include innovative architectural design of buildings, solar heating systems, high-efficiency air conditioners and appliances, and occupant-sensing environmental controls.			
Transportation Functional Plan			
Objective A: Expansion of the transportation system and reduction of congestion by increasing transportation capacity, modernizing transportation infrastructure, improving regional mobility, and promoting the development of public transportation systems.	✓		
Objective B: Reduction of travel demand through zoning and decentralization initiatives, by closing the gap between where people live and work.	✓		
Objective C: Management of existing transportation systems through a program of transportation systems management.	✓		
Objective D: Identification and reservation of lands and rights-of-way required for future transportation improvements.			✓
Objective E: Planning and designing State highways to enhance inter-regional mobility.			✓
Objective F: Improving and enhancing transportation safety			✓
Objective G: Improved transportation maintenance programs.			✓
Objective H: Ensure that transportation facilities are accessible to people with disabilities.	✓		
Objective I: Development of a transportation infrastructure that supports economic development initiatives.	✓		
Objective J: Expansion of revenue bases for transportation improvements.	✓		
Objective K: Providing educational programs.			✓
Discussion: The project contributes to the idea of a planned, balanced transportation system by providing centralized areas for common activities such as industrial and commercial parks. This can avoid unnecessary congestion resulting from scattered pockets of uncoordinated commercial-industrial transportation activities. The development of Kalaeloa/Barbers Point Harbor depends in part on the development of adjacent land areas. The project can enhance the Harbor's volume of use by providing an affordable and accessible area specifically for maritime and intensive industrial and commercial businesses.			

Table 5.5: Coastal Zone Management Program – HRS Section 205 A-2 - Objective and Policies	S	N/S	N/A
OBJECTIVES			
(1) Recreational resources; (A) Provide coastal recreational opportunities accessible to the public.			✓
Discussion: Industrial parks generally are not appropriate sites for providing recreational opportunities, and this specific location neither abuts the shoreline nor provides coastal access; accordingly, the recreation objective and policy are not applicable in this situation. However, KPD ~~the Estate~~ is in discussions with the County regarding a possible transfer of approximately ten (10) acres of land on Parcel 33 to be developed and dedicated as a recreational sports complex (Ref. No. 2006/PIM-2). The dedication would fulfill a unilateral agreement associated with a previous zone change for the City of Kapolei, approved under Ordinance 90-30.			
(2) Historic resources; (A) Protect, preserve, and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.	✓		
Discussion: The project site has previously been subject to extensive archaeological and paleontological salvage and survey projects. A significant number of sinkholes in a 6- ~~7.4~~-acre area are located at the NW corner of Malakole and Hanua Roads. Some of the sinks contain Polynesian cultigens and fossilized bird bones.			
(3) Scenic and open space resources; (A) Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.	✓		
Discussion: The height of the industrial structures will be compliant with allowable height limits of the area. Consideration will be taken to avoid structure heights causing any adverse impacts on coastal views, residential viewing corridors, or apartment areas mauka of the site. Urban design controls shall consider the overall visual effects of the proposed development as seen from off-site locations.			
(4) Coastal ecosystems; (A) Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.			✓
Discussion: The proposed project will preserve the unique sinkhole habitats found on the site; no other valuable coastal ecosystems are found on the site. Further, proposed drainage improvements (both as part of this present project and as an element of a larger regional flood control project) will be made to alleviate run-off and flooding concerns. Accordingly, the project will not adversely impact coastal ecosystems.			
(5) Economic uses; (A) Provide public or private facilities and improvements important to the State's economy in suitable locations.	✓		
Discussion: The Kapolei Harborside Center project is consistent with the State's goals to provide economic vitality, stability and growth for present and future generations in suitable locations. The requested changes from Agriculture to Urban will further urbanize the area strengthening the concept of the Second City. The area to the south and east are already in commercial and industrial use. The proposed project is consistent with the State and City's goal that this location continue to grow as one of O'ahu and the State's most important industrial areas.			
(6) Coastal hazards; (A) Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.	✓		
Discussion: Due to site location, elevation and other characteristics, the project will not be subject to many coastal hazards, such as tsunami, storm waves, subsidence and erosion. Further, proposed drainage improvements (both as part of this present project and as an element of a larger regional flood control project) will be made to alleviate run-off and flooding concerns, and the pollution that inevitably follows flood events.			
(7) Managing development; (A) Improve the development review process, communication, and public participation in the management of coastal resources and hazards.			✓
Discussion: The review process for necessary land entitlements provides numerous opportunities for appropriate public participation.			
(8) Public participation; (A) Stimulate public awareness, education, and participation in coastal management.			✓
Discussion: The review process for necessary land entitlements provides numerous opportunities for appropriate public participation.			
(9) Beach protection; (A) Protect beaches for public use and recreation.			✓

Table 5.5: Coastal Zone Management Program – HRS Section 205 A-2 - Objective and Policies	S	N/S	N/A
Discussion: The project site is not located adjacent to any beaches or shoreline areas.			
(10) Marine resources; (A) Promote the protection, use, and development of marine and coastal resources to assure their sustainability.			✓
Discussion: The project does not involve the direct use of marine and coastal resources.			
POLICIES			
(1) Recreational resources;			
(A) Improve coordination and funding of coastal recreational planning and management; and			✓
(B) Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:			
(i) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;			✓
(ii) Requiring replacement of coastal resources having significant recreational value including, but not limited to, surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the State for recreation when replacement is not feasible or desirable;			✓
(iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;			✓
(iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;			
(v) Ensuring public recreational uses of county			✓
(vi) Adopting water quality standards and regulating point and non-point sources of pollution to protect	✓		
(vii) Developing new shoreline recreational opportunities			✓
(viii) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, and county authorities; and crediting such dedication against the requirements of section 46-6.			✓
(2) Historic resources;			
(A) Identify and analyze significant archaeological resources;	✓		
(B) Maximize information retention through preservation of remains and artifacts or salvage operations; and	✓		
(C) Support state goals for protection, restoration, interpretation, and display of historic resources.	✓		
Discussion: A significant number of historically relevant sinkholes exist in a 6- ~~7.4~~-acre area on the proposed project site. Because of its accessibility, the close concentration of sinkholes and its scientific value, the site will be preserved. An enclosure will be maintained for the Malakole Sinkhole area. This will enable the site to be accessible for future research, as well as site visitations by the archeological community and interested segments of the public, while protecting the resources from vandalism and/or destruction from unauthorized entry.			
(3) Scenic and open space resources;			
(A) Identify valued scenic resources in the coastal zone management area;			✓
(B) Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;	✓		
(C) Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and			✓
(D) Encourage those developments that are not coastal dependent to locate in inland areas.	✓		
Discussion: Subdivision design of the project area will not have significant adverse effect on scenic resources.			
(4) Coastal ecosystems;			
(A) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;			✓
(B) Improve the technical basis for natural resource management;			✓
(C) Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;			✓
(D) Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and			✓
(E) Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and non-point source water pollution control measures.	✓		
Discussion: The project will include non-point source water pollution control measures.			
(5) Economic uses;			
(A) Concentrate coastal dependent development in appropriate areas;			✓
(B) Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor industry facilities and energy generating facilities, are located, designed, and constructed to minimize	✓		

Table 5.5: Coastal Zone Management Program – HRS Section 205 A-2 - Objective and Policies	S	N/S	N/A
adverse social, visual, and environmental impacts in the coastal zone management area; and			
(C) Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when: (i) Use of presently designated locations is not feasible; (ii) Adverse environmental effects are minimized; and (iii) The development is important to the State's economy.	✓		
Discussion: The project will provide space for industrial uses, some that are dependant on Kalaeloa/Barbers Point Harbor.			
(6) Coastal hazards;			
(A) Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and non-point source pollution hazards;			✓
(B) Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and non-point source pollution hazards;			✓
(C) Ensure that developments comply with requirements of the Federal Flood Insurance Program; and			✓
(D) Prevent coastal flooding from inland projects.			✓
(7) Managing development;			
(A) Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;			✓
(B) Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements; and			✓
(C) Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the public to facilitate public participation in the planning and review process.			✓
(8) Public participation;			
(A) Promote public involvement in coastal zone management processes;			✓
(B) Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities; and			✓
(C) Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.			✓
(9) Beach protection;			
(A) Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion;			✓
(B) Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and			✓
(C) Minimize the construction of public erosion-protection structures seaward of the shoreline.			✓
(10) Marine resources;			
(A) Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;			✓
(B) Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;			✓
(C) Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;			✓
(D) Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and			✓
(E) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.			✓

Table 5.6: City and County of Honolulu General Plan - Objectives and Policies	S	N/S	N/A
PART I: POPULATION			
Objective A: To control the growth of O'ahu's resident and visitor populations in order to avoid social, economic, and environmental disruptions.			
Policy 1: Participate in State and Federal programs which seek to develop social, economic, legal, and environmental controls over population growth.	✓		
Policy 2: Seek a balance between the rate of in-migration and the rate of out-migration by reducing in-migration.			✓
Policy 3: Support Federal policies providing for a more even distribution of immigrants throughout the country.			✓
Policy 4: Seek to maintain a desirable pace of physical development through City and County regulations.	✓		
Policy 5: Encourage family planning.			✓
Policy 6: Publicize the desire of the City and County to limit population growth.			✓
Objective B: To plan for future population growth.			
Policy 1: Allocate efficiently the money and re- sources of the City and County in order to meet the needs of O'ahu's anticipated future population.	✓		
Policy 2: Provide adequate support facilities to accommodate future growth in the number of visitors to O'ahu.	✓		
Objective C: To establish a pattern of population distribution that will allow the people of O'ahu to live and work in harmony.			
Policy 1: Facilitate the full development of the primary urban center.	✓		
Policy 2: Encourage development within the secondary urban center at Kapolei and the 'Ewa and Central O'ahu urban-fringe areas to relieve developmental pressures in the remaining urban-fringe and rural areas and to meet housing needs not readily provided in the primary urban center.	✓		
Policy 3: Manage physical growth and development in the urban-fringe and rural areas so that: (a) An undesirable spreading of development is prevented; and (b) Their population densities are consistent with the character of development and environmental qualities desired for such areas.	✓		
Policy 4 (Amended, Resolution 02-205, CD1): Direct growth according to Policies 1, 2, and 3 above by providing land development capacity and needed infrastructure to seek a 2025 distribution of O'ahu's residential population as follows:	✓		

LOCATION	% SHARE OF 2025 ISLANDWIDE POPULATION
Primary Urban Center	46.0%
Ewa	13.0%
Central Oahu	17.0%
East Honolulu	5.3%
Koolaupoko	11.6%
Koolauloa	1.4%
North Shore	1.7%
Wajanae	4.0%
	100.0%

Discussion: The requested LUC changes from ~~Agriculture~~ the Agricultural District to ~~Industrial~~ Urban District will further urbanize the area, thereby strengthening the concept of the Second City. The General Plan has provided for population growth in Kapolei/'Ewa by increasing the upper limits of population distribution in the area. The General Plan further encourages the development within the secondary urban center at Kapolei to relieve development pressures in urban Honolulu. A major consideration in public policy is to redirect traffic currently flowing into Honolulu proper by providing alternative employment centers and residences outside of the existing urban core. The Kapolei Harborside Center project is consistent with these goals and the concept of growth in the Secondary Urban Center.

PART II: ECONOMIC ACTIVITY			
Objective A: To promote employment opportunities that will enable all the people of O'ahu to attain a decent standard of living.			
Policy 1: Encourage the growth and diversification of O'ahu's economic base.	✓		
Policy 2: Encourage the development of small businesses and larger industries, which will contribute to the economic and social well-being of O'ahu residents.	✓		
Policy 3: Encourage the development in appropriate locations on O'ahu of trade, communications, and other industries of a nonpolluting nature.	✓		
Policy 4: Encourage the development of local, national, and world markets for the products of O'ahu-based industries.	✓		
Policy 5: Encourage the wider distribution of available employment opportunities through such methods as shortening the work-week and reducing the use of overtime.	✓		
Policy 6: Encourage the continuation of a significant level of Federal employment on O'ahu.			✓

Table 5.6: City and County of Honolulu General Plan - Objectives and Policies	S	N/S	N/A
Objective B: To maintain the viability of O'ahu's visitor industry.			
Policy 1: Provide for the long-term viability of Waikīkī as O'ahu's primary resort area by giving the area priority in visitor industry related public expenditures.			✓
Policy 2: Provide for a high quality and safe environment for visitors and residents in Waikīkī.			✓
Policy 3: Encourage private participation in improvements to facilities in Waikīkī.			✓
Policy 4: Prohibit major increases in permitted development densities in Waikīkī.			✓
Policy 5: Prohibit further growth in the permitted number of hotel and resort condominium units in Waikiki.			✓
Policy 6: Permit the development of secondary resort areas in West Beach, Kahuku, Makaha, and Lā'ie.			✓
Policy 7: Manage the development of secondary resort areas in a manner which respects existing lifestyles and the natural environment, and avoids substantial increases in the cost of providing public services in the area.			✓
Policy 8: Preserve the well-known and widely publicized beauty of O'ahu for visitors as well as residents.			✓
Policy 9: Encourage the visitor industry to provide a high level of service to visitors.			✓
Objective C: To maintain the viability of agriculture on O'ahu.			
Policy 1: Assist the agricultural industry to ensure the continuation of agriculture as an important source of income and employment.			✓
Policy 2: Support agricultural diversification in all agricultural areas on O'ahu.			✓
Policy 3: Support the development of markets for local products, particularly those with the potential for economic growth.			✓
Policy 4: Provide sufficient agricultural land in 'Ewa, Central O'ahu, and the North Shore to encourage the continuation of sugar and pineapple as viable industries.			✓
Policy 5: Maintain agricultural land along the Windward, North Shore, and Waianae coasts for truck fanning, flower growing, aquaculture, livestock production, and other types of diversified agriculture.			✓
Policy 6: Encourage the more intensive use of productive agricultural land.			✓
Policy 7: Encourage the use of more efficient production practices by agriculture, including the efficient use of water.			✓
Policy 8: Encourage the more efficient use of non- potable water for agricultural use.			✓
Objective D: To make full use of the economic resources of the sea.			
Policy 1: Assist the fishing industry to maintain its viability.	✓		
Policy 2: Encourage the development of aquaculture, ocean research, and other ocean- related industries.	✓		
Policy 3: Focus the development of ocean related economic activities in the Northwestern Hawaiian Islands on those, which are compatible with preserving the area's unique environmental, marine, and wildlife assets.			✓
Objective E: To prevent the occurrence of large-scale unemployment.			
Policy 1: Encourage the training and employment of present residents for currently available and future jobs.	✓		
Policy 2: Make full use of State and Federal employment and training programs.	✓		
Policy 3: Encourage the provision of retraining programs for workers in industries with planned reductions in their labor force.	✓		
Objective F: To increase the amount of Federal spending on O'ahu.			
Policy 1: Take full advantage of Federal programs and grants which will contribute to the economic and social well-being of O'ahu's residents.			✓
Policy 2: Encourage the Federal government to pay for the cost of public services used by Federal agencies.	✓		
Policy 3: Encourage the Federal government to lease new facilities rather than construct them on tax exempt public land.	✓		
Policy 4: Encourage the military to purchase locally all needed services and supplies which are available on O'ahu.			✓
Objective G: To bring about orderly economic growth on O'ahu.			
Policy 1: Direct major economic activity and government services to the primary urban center and the secondary urban center at Kapolei.	✓		
Policy 2: Permit the moderate growth of business centers in the urban-fringe areas.	✓		
Policy 3: Maintain sufficient land in appropriately located commercial and industrial areas to help ensure a favorable business climate on O'ahu.	✓		
Policy 4: Encourage the continuation of a high level of military-related employment in the Hickam-Pearl Harbor, Wahiawa, Kailua-Kāne'ohe, and 'Ewa areas.			✓

Table 5.6: City and County of Honolulu General Plan - Objectives and Policies	S	N/S	N/A
Discussion: The proposed project area adjoins and will serve to expand and support the facilities at Kalaeloa/Barbers Point Harbor, James Campbell Industrial Park and the Kapolei Business Park. The industrial and commercial sites will provide employment and business development opportunities for the regional populations as well as suppliers and others servicing the secondary urban center.			
PART III: NATURAL ENVIRONMENT			
Objective A: To protect and preserve the natural environment.			
Policy 1: Protect O'ahu's natural environment, especially the shoreline, valleys, and ridges, from incompatible development.	✓		
Policy 2: Seek the restoration of environmentally damaged areas and natural resources.			✓
Policy 3: Retain the Island's streams as scenic, aquatic, and recreation resources.			✓
Policy 4: Require development projects to give due consideration to natural features such as slope, flood and erosion hazards, water- recharge areas, distinctive land forms, and existing vegetation.	✓		
Policy 5: Require sufficient setbacks of improvements in unstable shoreline areas to avoid the future need for protective structures.			✓
Policy 6: Design surface drainage and flood-control systems in a manner, which will help preserve their natural settings.	✓		
Policy 7: Protect the natural environment from damaging levels of air, water, and noise pollution.	✓		
Policy 8: Protect plants, birds, and other animals that are unique to the State of Hawai'i and the Island of O'ahu.			✓
Policy 9: Protect mature trees on public and private lands and encourage their integration into new developments.			✓
Policy 10: Increase public awareness and appreciation of O'ahu's land, air, and water resources.			✓
Policy 11: Encourage the State and Federal governments to protect the unique environmental, marine, and wildlife assets of the Northwestern Hawaiian Islands.			✓
Objective B: To preserve and enhance the natural monuments and scenic views of O'ahu for the benefit of both residents and visitors.			
Policy 1: Protect the Island's well-known resources: its mountains and craters; forests and watershed areas; marshes, rivers, and streams; shoreline, fishponds, and bays; and reefs and offshore islands.	✓		
Policy 2: Protect O'ahu's scenic views, especially those seen from highly developed and heavily traveled areas.	✓		
Policy 3: Locate roads, highways, and other public facilities and utilities in areas where they will least obstruct important views of the mountains and the sea.	✓		
Policy 4: Provide opportunities for recreational and educational use and physical contact with O'ahu's natural environmental.			✓
(11) Identify all areas where priority should be given to preserving rural character and lifestyle.			✓
(12) Utilize Hawai'i's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline, conservation lands, and other limited resources for future generations.	✓		
(13) Protect and enhance Hawai'i's shoreline, open spaces, and scenic resources.			✓
Discussion: The proposed project is generally consistent with the General Plan's objectives and policies to protect and preserve the natural environment. Within the project site, no endemic, endangered, or protected flora or fauna have been recorded. The present environment, a generally flat, raised coral bed terrain, provides a limited range of habitats utilized by the typical array of exotic plants and animals found at this elevation and type of environment on O'ahu. **A large part of the western portion of the project area has been altered from the construction of Kalaeloa/Barbers Point Harbor and the stockpiling of dredged material removed from the harbor basin. The project site has previously been subject to extensive archaeological and paleontological salvage and survey projects. The Petitioner has stipulated the preservation of historic sites of importance. The height of the industrial structures will be compliant with allowable height limits for the area.**			
PART IV: HOUSING			
Objective A: To provide decent housing for all the people of O'ahu at prices they can afford.			
Policy 1: Develop programs and controls, which will provide decent homes at the least possible cost.			✓
Policy 2: Streamline approval and permit procedures for housing and other development projects.			✓
Policy 3: Encourage innovative residential development, which will result in lower costs, added convenience and privacy, and the more efficient use of streets and utilities.			✓
Policy 4: Establish public, and encourage private, programs to maintain and improve the condition of existing housing.			✓
Policy 5: Make full use of State and Federal programs that provide financial assistance for low- and moderate-income			✓

Table 5.6: City and County of Honolulu General Plan - Objectives and Policies	S	N/S	N/A
homebuyers.			
Policy 6: Expand local funding mechanisms available to pay for government housing programs.			✓
Policy 7: Provide financial and other incentives to encourage the private sector to build homes for low and moderate-income residents.			✓
Policy 8: Encourage and participate in joint public- private development of low- and moderate- income housing.			✓
Policy 9: Encourage the preservation of existing housing which is affordable to low- and moderate-income persons.			✓
Policy 10: Promote the construction of affordable dwellings, which take advantage of O'ahu's year-round moderate climate.			✓
Policy 11: Encourage the construction of affordable homes within established low-density communities by such means as 'ohana' units, duplex dwellings, and cluster development.			✓
Policy 12: Encourage the production and maintenance of affordable rental housing.			✓
Policy 13: Encourage the provision of affordable housing designed for the elderly and the handicapped.			✓
Policy 14: Encourage equitable relationships between landowners and leaseholders, between landlords and tenants, and between condominium developers and owners.			
Objective B: To reduce speculation in land and housing.			
Policy 1: Encourage the State government to coordinate its urban-area designations with the developmental policies of the City and County.			✓
Policy 2: Discourage private developers from acquiring and assembling land outside of areas planned for urban use.			✓
Policy 3: Seek public benefits from increases in the value of land owing to City and State developmental policies and decisions.			✓
Policy 4: Require government-subsidized housing to be delivered to appropriate purchasers and renters.			✓
Policy 5: Prohibit the selling or renting of government-subsidized housing for large profits.			✓
Objective C: To provide the people of O'ahu with a choice of living environments which are reasonably close to employment, recreation, and commercial centers and which are adequately served by public utilities.			
Policy 1: Encourage residential developments that offer a variety of homes to people of different income levels and to families of various sizes.			✓
Policy 2: Encourage the fair distribution of low- and moderate-income housing throughout the Island.			✓
Policy 3: Encourage residential development near employment centers.	✓		
Policy 4: Encourage residential development in areas where existing roads, utilities, and other community facilities are not being used to capacity.			✓
Policy 5: Discourage residential development where roads, utilities, and community facilities cannot be provided at a reasonable cost.			✓
Policy 6: Preserve older communities through self-help, housing-rehabilitation, improvement districts, and other governmental programs.			✓
Discussion: While the Petitioner supports the General Plan's policies related to housing, they are not directly applicable to the proposed project. However, the project is located near planned residential developments and could offer an employment center for new residents in those locations.			
PART V: TRANSPORTATION AND UTILITIES			
Objective A: To create a transportation system which will enable people and goods to move safely, efficiently, and at a reasonable cost; serve all people, including the poor, the elderly, and the physically handicapped; and offer a variety of attractive and convenient modes of travel.			
Policy 1: Develop and maintain an integrated ground-transportation system consisting of the following elements and their primary purposes:	✓		
a. Public transportation-for travel to and from work, and travel within Central Honolulu;	✓		
b. Roads and highways-for commercial traffic and travel in non-urban areas	✓		
c. Bikeways-for recreational activities and trips to work, schools, shopping centers, and community facilities; and			✓
d. Pedestrian walkways-for getting around Downtown and Waikiki, and for trips to schools, parks, and shopping centers.			✓
Policy 2: Provide transportation services to people living within the 'Ewa, Central O'ahu, and Pearl City-Hawai'i Kai corridors primarily through a mass transit system including exclusive right-of-way rapid transit and feeder-bus components as well as through the existing highway system with limited improvements as may be appropriate.	✓		

Table 5.6: City and County of Honolulu General Plan - Objectives and Policies	S	N/S	N/A
Policy 3: Provide transportation services outside the 'Ewa, Central O'ahu, and Pearl City-Hawai'i Kai corridors primarily through a system of express- and feeder-buses as well as through the highway system with limited to moderate improvements sufficient to meet the needs of the communities being served.	✓		
Policy 4: Improve transportation facilities and services in the 'Ewa corridor and in the trans-Koolau corridors to meet the needs of 'Ewa and Windward communities.	✓		
Policy 5: Improve roads in existing communities to reduce congestion and eliminate unsafe conditions.	✓		
Policy 6: Consider both environmental impact as well as construction and operating costs as important factors in planning alternative nodes of transportation.	✓		
Policy 7: Promote the use of public transportation as a means of moving people quickly and efficiently, of conserving energy, and of guiding urban development.	✓		
Policy 8: Make available transportation services to people with limited mobility: the young, the elderly, the handicapped, and the poor.			✓
Policy 9: Promote programs to reduce dependence on the use of automobiles.	✓		
Policy 10: Discourage the inefficient use of the private automobile, especially in congested corridors and during peak-hours.	✓		
Policy 11: Make public, and encourage private, improvements to major walkway systems.			✓
Policy 12: Encourage the provision of separate aviation facilities for small civilian aircraft.			✓
Policy 13: Facilitate the development of a second deep-water harbor to relieve congestion in Honolulu Harbor.	✓		
Objective B: To meet the needs of the people of O'ahu for an adequate supply of water and for environmentally sound systems of waste disposal.			
Policy 1: Develop and maintain an adequate supply of water for both residents and visitors.	✓		
Policy 2: Develop and maintain an adequate supply of water for agricultural and industrial needs.	✓		
Policy 3: Encourage the development of new technology, which will reduce the cost of providing water and the cost of waste disposal.	✓		
Policy 4: Encourage a lowering of the per-capita consumption of water and the per-capita production of waste.	✓		
Policy 5; Provide safe, efficient, and environmentally sensitive waste-collection and waste- disposal services.	✓		
Policy 6: Support programs to recover resources from solid-waste and recycle wastewater.	✓		
Policy 7: Require the safe disposal of hazardous waste.	✓		
Objective C: To maintain a high level of service for all utilities.			
Policy 1: Maintain existing utility systems in order to avoid major breakdowns.	✓		
Policy 2: Provide improvements to utilities in existing neighborhoods to reduce substandard conditions.	✓		
Policy 3: Plan for the timely and orderly expansion of utility systems.	✓		
Policy 4: Increase the efficiency of public utilities by encouraging a mixture of uses with peak periods of demand occurring at different times of the day.	✓		
Objective D: To maintain transportation and utility systems which will help O'ahu continue to be a desirable place to live and visit.			
Policy 1: Give primary emphasis in the capital- improvement program to the maintenance and improvement of existing roads and utilities.			✓
Policy 2: Use the transportation and utility systems as a means of guiding growth and the pattern of land use on O'ahu.			✓
Policy 3: Encourage the study and use of telecommunications as an alternative to conventional transportation facilities.			✓
Policy 4: Evaluate the social, economic, and environmental impact of additions to the transportation and utility systems before they are constructed.	✓		
Policy 5: Require the installation of underground utility lines wherever feasible.			✓
Policy 6: Seek improved taxing powers for the City and County in order to provide a more equitable means of financing transportation and utility services.			✓

Table 5.6: City and County of Honolulu General Plan - Objectives and Policies	S	N/S	N/A
Discussion: The proposed project is consistent with the General Plan's transportation and utility policies. The intent of the proposed industrial project is, among other things, to provide space for storage requirements as needed by harbor uses. The proposed development will provide opportunities for harbor-oriented businesses as well as other industrial and commercial establishments. **Just north of the development area, and part of the Petitioner's Kapolei West development area, will be a transit hub to designed to service the western portion of the 'Ewa area. This is in direct support of the State and County's desire to develop multi-modal transit options for O'ahu.** **Development of the project will be coordinated with existing and potential water supply, and will be supportive of water conservation programs and practices in private industry to help meet long-term needs. The area is currently served by 24-inch and 20-inch mains in Kalaeloa Boulevard. These mains were installed by the Applicant and dedicated to the Board of Water Supply. The two mains extend down Kalaeloa Boulevard to Malakole Road where a 20-inch main runs toward the harbor and a 16-inch main runs toward the former Barbers Point Naval Air Station. The existing water mains in Kalaeloa Boulevard are intended to supply the drinking water for the expansion areas. Distribution lines will be located in the interior roadways to services the lots.** **The Petitioner will employ a conservation ethic to adhere to public health and sanitation standards relating to treatment and disposal of solid and liquid wastes, the provision of adequate sewerage facilities for physical and economic activities. Further the project will promote re-use and recycling to reduce solid and liquid wastes. The project area will be served by a sewer system with pump stations connecting to the existing municipal system mauka of the industrial area, eventually discharging at the Honouliuli Wastewater Treatment Plant (WWTP). Based on average daily flows, the Honouliuli WWTP has a primary treatment capacity of 38 million-gallons per day (mgd) and is currently accepting flows of about 28 mgd. The primary means of disposal is through a deep ocean outfall with a design capacity of 112 mgd.**			
PART VI: ENERGY			
Objective A: To maintain an adequate, dependable, and economical supply of energy for O'ahu residents.			
Policy 1: Develop and maintain a comprehensive plan to guide and coordinate energy conservation and alternative energy development and utilization programs on O'ahu.	✓		
Policy 2: Establish economic incentives and regulatory measures which will reduce O'ahu's dependence on petroleum as its primary source of energy.	✓		
Policy 3: Support programs and projects which contribute to the attainment of energy self- sufficiency on O'ahu.	✓		
Policy 4: Promote and assist efforts to establish adequate petroleum reserves within Hawai'i's boundaries.	✓		
Policy 5: Give adequate consideration to environmental, public health, and safety concerns, to resource limitations, and to relative costs when making decisions concerning alternatives for conserving energy and developing natural energy resources.	✓		
Policy 6: Work closely with the State and Federal governments in the formulation and implementation of all City and County energy-related programs.	✓		
Objective B: To conserve energy through the more efficient management of its use.			
Policy 1: Ensure that the efficient use of energy is a primary factor in the preparation and administration of land use plans and regulations.	✓		
Policy 2: Provide incentives and, where appropriate, mandatory controls to achieve energy- efficient siting and design of new developments.	✓		
Policy 3: Carry out public, and promote private, programs to more efficiently use energy in existing buildings and outdoor facilities.	✓		
Policy 4: Promote the development of an energy- efficient transportation system.	✓		
Objective C: To fully utilize proven alternative sources of energy.			
Policy 1: Encourage the use of commercially available solar energy systems in public facilities, institutions, residences, and business developments.	✓		
Policy 2: Support the increased use of operational solid waste energy recovery and other biomass energy conversion systems.	✓		
Objective D: To develop and apply new, locally available energy resources.			
Policy 1: Support and participate in research, development, demonstration, and commercialization programs aimed at producing new, economical, and environmentally sound energy supplies from:	✓		

Table 5.6: City and County of Honolulu General Plan - Objectives and Policies	S	N/S	N/A
a. solar insolation;	✓		
b. biomass energy conversion;			✓
c. wind energy conversion;			✓
d. geothermal energy; and			✓
e. ocean thermal energy conversion.			✓
Policy 2: Secure State and Federal support of City and County efforts to develop new sources of energy.			✓
Objective E: To establish a continuing energy information program.			
Policy 1: Supply citizens with the information they need to fully understand the potential supply, cost, and other problems associated with O'ahu's dependence on imported petroleum.			✓
Policy 2: Foster the development of an energy conservation ethic among O'ahu residents.			✓
Policy 3: Keep consumers informed about available alternative energy sources and their costs and benefits.			✓
Policy 4: Provide information concerning the impact of public and private decisions on future energy use.			✓
Discussion: The project supports the General Plan's policies related to conservation of energy and use of alternative energy sources to the extent possible. Energy efficiency guidelines will be developed, in consultation with DBEDT Energy Branch, to encourage energy conservation in the development of the project site. Some efficient energy measures that could be included in the guidelines include innovative architectural design of buildings, solar heating systems, high-efficiency air conditioners and appliances, and occupant-sensing environmental controls.			
PART VII: PHYSICAL DEVELOPMENT AND URBAN DESIGN			
Objective A: To coordinate changes in the physical environment of O'ahu to ensure that all new developments are timely, well-designed, and appropriate for the areas in which they will be located.			
Policy 1: Plan for the construction of new public facilities and utilities in the various parts of the Island according to the following order of priority: first, in the primary urban center; second, in the secondary urban center at Kapolei; and third, in the urban- fringe and rural areas.	✓		
Policy 2: Coordinate the location and timing of new development with the availability of adequate water supply, sewage treatment, drainage, transportation, and public safety facilities.	✓		
Policy 3: Phase the construction of new developments so that they do not require more regional supporting services than are available.	✓		
Policy 4: Require new developments to provide or pay the cost of all essential community services, including roads, utilities, schools, parks, and emergency facilities that are intended to directly serve the development.	✓		
Policy 5: Provide for more compact development and intensive use of urban lands where compatible with the physical and social character of existing communities.	✓		
Policy 6: Encourage the clustering of developments to reduce the cost of providing utilities and other public services.	✓		
Policy 7: Locate new industries and new commercial areas so that they will be well related to their markets and suppliers, and to residential areas and transportation facilities.	✓		
Policy 8: Locate community facilities on sites that will be convenient to the people they are intended to serve.			✓
Policy 9: Exclude from residential areas, uses which are major sources of noise and air pollution.	✓		
Policy 10: Establish danger zones to exclude incompatible uses from hazardous areas surrounding airfields, electromagnetic- radiation sources, and storage places for fuel and explosives.	✓		
Policy 11: Prohibit new airfields, electromagnetic-radiation sources, and storage places for fuel and explosives from locating on sites where they will endanger or disrupt nearby communities.	✓		
Objective B: To develop Honolulu (Waialae-Kahala to Halawā), 'Aiea, and Pearl City as the Island's primary urban center.			
Policy 1: Stimulate development in the primary urban center by means of the City and County's capital improvement program and State and Federal grant and loan programs.			✓
Policy 2: Provide for the expanded development of low-rise multi-unit housing.			✓
Policy 3: Encourage the establishment of mixed-use districts with appropriate design and development controls to insure an attractive living environment and compatibility with surrounding land uses.			✓
Policy 4: Provide downtown Honolulu and other major business centers with a well-balanced mixture of uses.			✓
Policy 5: Encourage the development of attractive residential communities in downtown and other business centers.			✓
Policy 6: Maintain and improve downtown as the financial and office center of the Island, and as a major retail center.			✓
Policy 7: Provide for the continued viability of the Hawai'i Capital District as a center of government activities and as an attractive park-like setting in the heart of the City.			✓
Policy 8: Foster the development of Honolulu's waterfront as the State's major port and maritime center, as a people-oriented mixed-use area, and as a major recreation area.			✓

Table 5.6: City and County of Honolulu General Plan - Objectives and Policies	S	N/S	N/A
Policy 9: Facilitate the redevelopment of Kaka'ako as a major residential, as well as commercial and light industrial area.			✓
Objective C: To develop a secondary urban center in 'Ewa with its nucleus in the Kapolei area.			
Policy 1: Allocate funds from the City and County's capital-improvement program for public projects that are needed to facilitate development of the secondary urban center at Kapolei.	✓		
Policy 2: Encourage the development of a major residential, commercial, and employment center within the secondary urban center at Kapolei.	✓		
Policy 3: Encourage the continuing development of Barbers Point as a major industrial center.	✓		
Policy 4: Coordinate plans for the development of the secondary urban center at Kapolei with the State and Federal governments and with the sugar industry.	✓		
Policy 5: Cooperate with the State and Federal governments in the development of a deep water harbor at Barbers Point.	✓		
Policy 6: Encourage the development of the 'Ewa Marina Community as a major residential and recreation area emphasizing recreational boating activities through the provision of a major marina and a related maritime commercial center containing light-industrial, commercial, and visitor accommodation uses.	✓		
Objective D: To maintain those development characteristics in the urban-fringe and rural areas which make them desirable places to live.			
Policy 1: Develop and maintain urban-fringe areas as predominantly residential areas characterized by generally low rise, low density development which may include significant levels of retail and service commercial uses as well as satellite institutional and public uses geared to serving the needs of households.	✓		
Policy 2: Coordinate plans for developments within the 'Ewa and Central O'ahu urban-fringe areas with the State and Federal governments and with the sugar, pineapple, and other emerging agricultural industries.	✓		
Policy 3: Establish a green belt in the 'Ewa and Central O'ahu areas of O'ahu in the Development Plans.	✓		
Policy 4: Maintain rural areas as areas which are intended to provide environments supportive of lifestyle choices which are dependent on the availability of land suitable for small to moderate size agricultural pursuits, a relatively open and scenic setting, and/or a small town, country atmosphere consisting of communities which are small in size, very low density and low rise in character, and may contain a mixture of uses.	✓		
Objective E: To create and maintain attractive, meaningful, and stimulating environments throughout O'ahu.			
Policy 1: Prepare and maintain a comprehensive urban-design plan for the Island of O'ahu.			✓
Policy 2: Integrate the City and County's urban-design plan into all levels of physical planning and developmental controls.	✓		
Policy 3: Encourage distinctive community identities for both new and existing districts and neighborhoods.			✓
Policy 4: Require the consideration of urban-design principles in all development projects.	✓		
Policy 5: Require new developments in stable, established communities and rural areas to be compatible with the existing communities and areas.	✓		
Policy 6: Provide special design standards and controls that will allow more compact development and intensive use of lands in the primary urban center.	✓		
Policy 7: Promote public and private programs to beautify the urban and rural environments.	✓		
Policy 8: Preserve and maintain beneficial open space in urbanized areas.	✓		
Policy 9: Design public structures to meet high aesthetic and functional standards and to complement the physical character of the communities they will serve.	✓		
Policy 10: Establish a review process to evaluate the design of major development projects.			✓
Objective F: To promote and enhance the social and physical character of O'ahu's older towns and neighborhoods.			
Policy 1: Encourage new construction to complement the ethnic qualities of the older communities of O'ahu.			✓
Policy 2: Encourage, wherever desirable, the rehabilitation of existing substandard structures.			✓
Policy 3: Provide and maintain roads, public facilities, and utilities without damaging the character of older communities.			✓
Policy 4: Seek the satisfactory relocation of residents before permitting their displacement by new development, redevelopment, or neighborhood rehabilitation.			✓
Discussion: The proposed project is consistent with the policies to promote development in the Secondary Urban Center. The project is consistent with the policy to provide for dense development and intensive use of urban and industrial lands. The project is generally compatible with the existing physical and social character of the surrounding community (James Campbell Industrial Park) and will be compliant with the allowable height limits of the area.			

Table 5.6: City and County of Honolulu General Plan - Objectives and Policies	S	N/S	N/A
PART VIII: PUBLIC SAFETY			
Objective A: To prevent and control crime and maintain public order.			
Policy 1: Provide a safe environment for residents and visitors on O'ahu.	✓		
Policy 2: Provide adequate criminal justice facilities and staffing for City and County law- enforcement agencies.			✓
Policy 3: Emphasize improvements to police and prosecution operations which will result in a higher proportion of wrongdoers who are arrested, convicted, and punished for their crimes.	✓		
Policy 4: Keep the public informed of the nature and extent of criminal activity on O'ahu.	✓		
Policy 5: Establish and maintain programs to encourage public cooperation in the prevention and solution of crimes.	✓		
Policy 6: Seek the help of State and Federal law- enforcement agencies to curtail the activities of organized crime syndicates on O'ahu.			✓
Policy 7: Conduct periodic reviews of criminal laws to ensure their relevance to the community's needs and values.			✓
Policy 8: Cooperate with other law-enforcement agencies to develop new methods of fighting crime.	✓		
Policy 9: Encourage the improvement of rehabilitation programs and facilities for criminals and juvenile offenders.			✓
Objective B: To protect the people of O'ahu and their property against natural disasters and other emergencies, traffic and fire hazards, and unsafe conditions.			
Policy 1: Keep up-to-date and enforce all City and County safety regulations.	✓		
Policy 2: Require all developments in areas subject to floods and tsunamis to be located and constructed in a manner that will not create any health or safety hazard.	✓		
Policy 3: Participate with State and Federal agencies in the funding and construction of flood- control projects.	✓		
Policy 4: Cooperate with State and Federal agencies to provide tsunami warning and protection for O'ahu.	✓		
Policy 5: Cooperate with State and Federal agencies to provide protection from war, civil disruptions, and other major disturbances.	✓		
Policy 6: Reduce hazardous traffic conditions.	✓		
Policy 7: Provide adequate fire protection and effective fire prevention programs.	✓		
Policy 8: Provide adequate search and rescue and disaster response services.			✓
Policy 9: Design safe and secure public buildings.			✓
Policy 10: Provide adequate staff to supervise activities at public facilities.			✓
Policy 11: Develop civil defense plans and programs to protect and promote public health, safety and welfare of the people.			✓
Policy 12: Provide educational materials on civil defense preparedness, fire protection, traffic hazards and other unsafe conditions.			✓
Discussion: The project will be constructed in compliance with all applicable building codes to ensure that public health and safety are protected, especially during times of natural disasters. **The project development area is within the City Police Department's District 8, which encompasses the Leeward Coast and the 'Ewa Plain. There are approximately 100 field officers assigned to this district. Response time for the entire district fluctuates between five and seven minutes. In order to meet the growing needs of the 'Ewa Plain communities, in 2000, the City and County of Honolulu opened the Regional Kapolei District Station at 1100 Kamokila Boulevard. A storefront station is located at the intersection of Fort Weaver Road and Renton Road. A substation is located in Wai`anae. The HPD expects to expand its presence in the region as Kapolei develops into the Second City. Based on population estimates, the City and County of Honolulu anticipate the need for two additional substations to service the region. These are planned to be in operation by 2020 at 'Ewa Villages and Ko Olina.** **Fire protection in Kapolei and 'Ewa is provided by the City and County of Honolulu Fire Department (HFD) 'Ewa Beach Fire Station (an engine company), Makakilo Fire Station (an engine company), and Kapolei Fire Station (an engine and ladder company, and the Battalion 4 Headquarters). Located in Kapolei Business Park, the Kapolei Fire Station was completed in 1995 to serve the expanding development on the 'Ewa Plain. According to the 'Ewa Development Plan, to meet the projected population and economic growth in 'Ewa by 2020, three fire stations at 'Ewa Villages, Ko 'Ōlina, and Makaīwa Hills are planned, but service dates have not been determined.**			
PART IX: HEALTH AND EDUCATION			
Objective A: To protect the health of the people of O'ahu.			
Policy 1: Encourage the provision of health-care facilities that are accessible to both employment and residential centers.	✓		

Table 5.6: City and County of Honolulu General Plan - Objectives and Policies	S	N/S	N/A
Policy 2: Encourage prompt and adequate ambulance and first-aid services in all areas of O'ahu.	✓		
Policy 3: Coordinate City and County health codes and other regulations with State and Federal health codes to facilitate the enforcement of air-, water-, and noise-pollution controls.	✓		
Objective B: To provide a wide range of educational opportunities for the people of O'ahu.			
Policy 1: Support education programs that encourage the development of employable skills.	✓		
Policy 2: Encourage the provision of informal educational programs for people of all age groups.			✓
Policy 3: Encourage the after-hours use of school buildings, grounds, and facilities.			✓
Policy 4: Encourage the construction of school facilities that are designed for flexibility and high levels of use.			✓
Policy 5: Facilitate the appropriate location of learning institutions from the preschool through the university levels.			✓
Objective C: To make Honolulu the center of higher education in the Pacific.			
Policy 1: Encourage continuing improvement in the quality of higher education in Hawai'i.	✓		
Policy 2: Encourage the development of diverse opportunities in higher education.	✓		
Policy 3: Encourage research institutions to establish branches on O'ahu.	✓		
Discussion: While the General Plan's policies for health and education are directly related largely to public and private agencies and not directly applicable to the proposed project, the Petitioner acknowledges the importance and need to support such policies. The project area is readily assessable to a variety of health care facilities. There are more than 25 choices of health care providers. St. Francis Medical Center – West is the nearest hospital to the Kapolei Harborside Center property. Existing facilities and their planned improvements should be adequate to accommodate the needs of the development project.			
PART X: CULTURE AND RECREATION			
Objective A: To foster the multiethnic culture of Hawai'i.			
Policy 1: Encourage the preservation and enhancement of Hawai'i's diverse cultures.	✓		
Policy 2: Encourage greater public awareness, understanding, and appreciation of cultural heritage and contributions to Hawai'i made by the City's various ethnic groups.	✓		
Policy 3: Encourage opportunities for better interaction among people with different ethnic, social, and cultural backgrounds.			✓
Policy 4: Encourage the protection of the ethnic identities of the older communities of O'ahu.			✓
Objective B: To protect O'ahu's cultural, historic, architectural, and archaeological resources.			
Policy 1: Encourage the restoration and preservation of early Hawaiian structures, artifacts, and landmarks.	✓		
Policy 2: Identify, and to the extent possible, pre- serve and restore buildings, sites, and areas of social, cultural, historic, architectural, and archaeological significance.	✓		
Policy 3: Cooperate with the State and Federal governments in developing and implementing a comprehensive preservation program for social, cultural, historic, architectural, and archaeological resources.	✓		
Policy 4: Promote the interpretive and educational use of cultural, historic, architectural, and archaeological sites, buildings, and artifacts.	✓		
Policy 5: Seek public and private funds, and public participation and support, to protect social, cultural, historic, architectural, and archaeological resources.			✓
Policy 6: Provide incentives for the restoration, preservation, and maintenance of social, cultural, historic, architectural, and archaeological resources.			✓
Objective C: To foster the visual and performing arts.			
Policy 1: Encourage and support programs and activities for the visual and performing arts.			✓
Policy 2: Encourage creative expression and access to the arts by all segments of the population.			✓
Policy 3: Provide permanent art in appropriate City public buildings and places.			✓
Objective D: To provide a wide range of recreational facilities and services that are readily available to all residents of O'ahu.			
Policy 1: Develop and maintain community-based parks to meet the needs of the different communities on O'ahu.			✓
Policy 2: Develop and maintain a system of regional parks and specialized recreation facilities.			✓
Policy 3: Develop and maintain urban parks, squares, and beautification areas in high-density urban places.			✓
Policy 4: Encourage public and private botanic and zoological parks on O'ahu to foster an awareness and appreciation of the natural environment.			✓
Policy 5: Encourage the State to develop and maintain a system of natural resource-based parks, such as beach, shoreline, and mountain parks.			✓
Policy 6: Provide convenient access to all beaches and inland recreation areas.			✓
Policy 7: Provide for recreation programs which serve a broad spectrum of the population.			✓

Table 5.6: City and County of Honolulu General Plan - Objectives and Policies	S	N/S	N/A
Policy 8: Encourage ocean and water-oriented recreation activities that do not adversely impact on the natural environment.			✓
Policy 9: Require all new developments to provide their residents with adequate recreation space.			✓
Policy 10: Encourage the private provision of recreation and leisure-time facilities and services.			✓
Policy 11: Encourage the after-hours, weekend, and summertime use of public schools facilities for recreation.			✓
Policy 12: Provide for safe and secure use of public parks, beaches, and recreation facilities.			✓
Policy 13: Encourage the safe use of O'ahu's ocean environments.			✓
Policy 14: Encourage the State and Federal governments to transfer excess and underutilized land to the City and County for public recreation use.			✓
Discussion: While the Petitioner supports the General Plan's policies related to culture and recreation, they are not directly applicable to the proposed project. However, KPD ~~the Estate~~ is in discussions with the County regarding a possible transfer of approximately ten (10) acres of land on Parcel 33 to be developed and dedicated as a recreational sports complex (Ref. No. 2006/PIM-2). The dedication would fulfill a unilateral agreement associated with a previous zone change for the City of Kapolei, approved under Ordinance 90-30.			
PART XI: GOVERNMENT OPERATIONS AND FISCAL MANAGEMENT			
Objective A: To promote increased efficiency, effectiveness, and responsiveness in the provision of government services by the City and County of Honolulu.			
Policy 1: Maintain City and County government services at the level necessary to be effective.			✓
Policy 2: Promote consolidation of State and City and County functions whenever more efficient and effective delivery of government programs and services can be achieved.			✓
Policy 3: Ensure that government attitudes, actions, and services are sensitive to community needs and concerns.			✓
Policy 4: Prepare, maintain, and publicize policies and plans which are adequate to guide and coordinate City programs and regulatory responsibilities.			✓
Objective B: To ensure fiscal integrity, responsibility, and efficiency by the City and County government in carrying out its responsibilities.			
Policy 1: Provide for a balanced budget.			✓
Policy 2: Allocate fiscal resources of the City and County to efficiently implement the policies of the General Plan and Development Plans.			✓
Discussion: While the Petitioner supports the General Plan's policies related to government operations and management, they are not directly applicable to the proposed project.			

Table 5.7: ʻEwa Development Plan - Objectives and Policies - City and County of Honolulu	S	N/S	N/A
Chapter 1: ʻEWA'S ROLE IN OŸAHU'S DEVELOPMENT PATTERN			
In support of the General Plan policies, the ʻEwa Development Plan:			
Provides a secondary employment center with its nucleus in the City of Kapolei to supplement the Primary Urban Center (PUC) and to divert commuter traffic from the PUC;	✓		
Concentrates primary employment activities at industrial and resort areas and at government service and higher education centers around the City of Kapolei so that secondary markets are created for office and retail activities;	✓		
Provides for significant residential development throughout ʻEwa, consistent with the General Plan to meet the needs of Oʻahu's citizens;			✓
Provides for a variety of housing types from affordable units and starter homes to mid-size multi-family and single family units;			✓
Promotes diversified agriculture on prime agricultural lands along Kunia Road and surrounding the West Loch Naval Magazine in accordance with the General Plan policy to support agricultural diversification in all agricultural areas on Oʻahu;			✓
Provides a secondary resort area at West Beach (Ko ʻŌlina);			✓
Helps relieve urban development pressures on rural and urban fringe Development Plan Areas (Waiʻanae, North Shore, Koʻolau Loa, and Koʻolau Poko) so as to preserve the "country" lifestyle of these areas; and	✓		
Provides, along with the PUC, a focus for directed and concentrated public and private infrastructure investment for growth.	✓		
Discussion: The requested zoning changes from ~~Agriculture~~ the Agricultural District to ~~Industrial~~ Urban District will further urbanize the area strengthening the c the City of Kapolei. The ʻEwa Development Plan has provided for population growth in Kapolei/ʻEwa by increasing the upper limits of population distribution in the area. The ʻEwa Development Plan further encourages the development within the Secondary Urban Center at Kapolei to relieve development pressures in urban Honolulu. A major consideration in public policy is to redirect traffic currently flowing into Honolulu proper by providing alternative employment centers and residences outside of the existing urban core. The Kapolei Harborside Center project is consistent with these goals and the concept of growth in the Secondary Urban Center.			
Chapter 2: THE VISION FOR ʻEWA'S FUTURE			
This vision for ʻEwa has two horizons. The first is a 25-year horizon, extending from the present (1995) to the year 2020. This is the horizon that was used to project likely socioeconomic change in ʻEwa and to assess the infrastructure and public facility needs that will have to be met over that period. **The Vision to 2020.** By 2020, the ʻEwa Development Plan Area will have experienced tremendous growth, and will have made significant progress toward providing a Secondary Urban Center for Oʻahu. Population will have grown from 43,000 people in 1990 to almost 125,000. Nearly 28,000 new housing units will have been built in a series of master planned communities. Job growth will be equally impressive, rising from 17,000 jobs to over 64,000 in 2020. Oʻahu residents and visitors will be attracted to ʻEwa by a new university campus, the Ko Olina resort, ocean and waterfront activities at ʻEwa Marina, a major super regional park, and a thriving City of Kapolei which has retail and commercial establishments and private and government offices. **Beyond 2020.** In the course of the Development Plan revision, it became clear that there was value in looking beyond 2020 to identify what ʻEwa should look like when "fully" developed. Such a perspective helped identify where open space should be preserved within the urbanized area, where the rapid transit corridor should be located, and where to set the limits to development in ʻEwa for the foreseeable future. As such, this second horizon might be called the "built-out" horizon and is probably 40 or 50 years in the future.	✓		
Discussion: The Kapolei Harborside Center Project is consistent with the ʻEwa Development Plan's vision for ʻEwa's growth to 2020 and beyond. The Kapolei Harborside Center Project will provide a significant new job center for the ʻEwa region's expanding population base. The proposed project area adjoins and will serve to expand and support the facilities at Kalaeloa/Barbers Point Harbor, James Campbell Industrial Park and the City of Kapolei. The industrial sites will provide employment and business development opportunities for the regional populations as well as suppliers and others servicing the secondary urban center.			

Table 5.7: 'Ewa Development Plan - Objectives and Policies - City and County of Honolulu	S	N/S	N/A
Chapter 3: LAND USE POLICIES, PRINCIPLES, AND GUIDELINES			
3.1 OPEN SPACE PRESERVATION AND DEVELOPMENT – General Policies			
Open space will be used to:			
a. Provide long range protection for diversified agriculture on lands outside the Urban Growth Boundary,			✓
a. Protect scenic views and provide recreation,	✓		
b. Define the boundaries of communities,	✓		
c. Provide a fire safety buffer where developed areas border "wildlands" either in preservation areas within the Urban Growth Boundary or in the State Conservation District, and	✓		
d. Create linkages between communities through a network of Greenways along transportation and utility corridors and drainageways.	✓		
Discussion: The proposed project is consistent with the 'Ewa Development Plan's objectives and policies to protect and preserve open space and provide for development because the project is inside the Urban Growth Boundary and no Open Space Network elements are impacted by the proposal. The project does not border "wildlands." The height of the industrial structures will comply with allowable height limits of the area. **A large part of the western portion of the project area has been altered from the construction of Barbers Point Harbor and the stockpiling of dredged material removed from the harbor basin. The project site has previously been subject to extensive archaeological and paleontological salvage and survey projects. Parks, golf courses and the O'ahu Rail and Land's right-of-way borders the project area just to the north; these greenways link the proposed Kapolei Harborside Center with existing and proposed neighboring communities. While there is potential to utilize the edge of the proposed drainage swale in to create a pedestrian and bicycle linkage through the project area, there are potential safety and liability concerns because both the project area and makai areas are proposed for or existing industrial areas. The Petitioner will continue to explore the issue with the Department of Planning and Permitting.** **Much of the soil is coral outcrop. Based on various soil classification systems that rate Hawai'i soils, little of the property (from 0% to less than 25% depending on the particular soil rating system) has good soils. The loss of the site for agricultural purposes should not adversely impact the economic vitality of agricultural production, and could provide alternatives to agricultural employment.**			
Chapter 3.2. REGIONAL PARKS AND RECREATION COMPLEXES – General Policies			
Regional parks and recreation complexes include the Kalaeloa Regional Park and Recreation Complex proposed for Barbers Point Naval Air Station, Kapolei Regional Park, Pu'u Palailai Park, various beach and shoreline parks, and public and private golf courses. To sustain economic, development, the City is encouraged to look towards public-private partnerships to build, and maintain new park and recreation complexes.	✓		
The new Kalaeloa Regional Park at the present Barbers Point Naval Air Station will feature a large shoreline park with beach recreation and support facilities; a wide range of activity areas including athletic fields in the mauka lands; and preserves for wildlife habitats, wetlands and endangered plant colonies. The Park will encompass mostly undeveloped lands, bordered by the shoreline on the south, the airfield and developed portions of the facility to the north and west, and the existing military golf course and future 'Ewa Marina golf course to the east.			✓
Kapolei Regional Park is a 73-acre park which includes the Pu'u o Kapolei. The Park will serve as a defining limit for the northeastern edge of the City of Kapolei and as a visual gateway to the City. The park will provide diverse active and passive recreation within easy walking distance of both the City Center and the Villages of Kapolei.			✓
Pu'u Palailai Park will be located below Makakilo, and is to be a nature park. It will offer hikers excellent views of the 'Ewa Plain and distant views of Honolulu and Diamond Head.			✓
Two future beach parks are planned at both ends of Ko Olina. The larger park at the northern end of the resort will provide for picnicking and other passive recreation. A park at the southern end will provide direct access to one of the four swimming lagoons. A boat launching ramp, which will be available for public use, will be located adjacent to the southern park, and will provide access to the marina channel.			✓
Golf courses can provide protection for open space, and help reduce flooding and non-point pollution by helping retain storm waters. Golf course development should be approved only after determination that the course meets social, growth, economic, and environmental guidelines and approval of a community integration program.	✓		
Sports and recreation complexes designed to attract visitors from throughout the region and the rest of O'ahu have been proposed for a number of areas in 'Ewa. Proposals for a Kalaeloa Center on surplus lands at Barbers Point Naval Air Station call for creation of an "Olympic Village" type international training center, a baseball training facility, a rowing water course, a motorsports center, and a water theme park. Such complexes should be designed to be compatible with surrounding land uses and environmental features.			✓

Table 5.7: 'Ewa Development Plan - Objectives and Policies - City and County of Honolulu	S	N/S	N/A
Discussion: While the Petitioner supports the 'Ewa Development Plan's policies related to regional parks and recreation complexes, they are not directly applicable to the proposed project. However, KPD ~~the Estate~~ is in discussions with the County regarding a possible transfer of approximately ten (10) acres of land on Parcel 33 to be developed and dedicated as a recreational sports complex (Ref. No. 2006/PIM-2). The dedication would fulfill a unilateral agreement associated with a previous zone change for the City of Kapolei, approved under Ordinance 90-30. In addition, the Petitioner's proposed project to the north, Kapolei West, provisions are made for parks, recreational areas and golf courses that may be used as mitigation measures helping to reduce flooding and providing protection for open space.			
3.3 COMMUNITY-BASED PARKS – General Policies			
Adequate parks to meet residents' recreational needs should be provided.			✓
New residential development should strive to provide land for open space and recreation purposes at a minimum of two acres of park per 1,000 residents. Community-based parks (and associated service radius) include mini-parks (1/4 mile), neighborhood parks (1/2 mile), community parks (one mile), and district parks (two miles).			✓
Access to recreational resources in the mountains, at the shoreline, and in the ocean should be protected and expanded. New development projects are an opportunity to provide public access to trail heads from the streets extending toward the mountain slopes or approaching the edges of the gulches.			✓
Discussion: The proposed development is not residential in character, thus these policies are not relevant to the project.			
3.4 HISTORIC AND CULTURAL RESOURCES - GENERAL POLICIES			
Physical references to 'Ewa's history and cultural roots should be emphasized to help define 'Ewa's unique sense of place.	✓		
Existing visual landmarks should be protected, and creation of new culturally appropriate landmarks should be supported.	✓		
Significant historic features from the plantation era and earlier periods should be preserved.	✓		
Whenever possible, significant vistas should be retained.	✓		

TABLE 3.1: SIGNIFICANT EWA HISTORIC AND CULTURAL RESOURCES

HISTORIC FEATURES

Lanikuhonua
OR&L Historic Railway
Ewa Villages
Pearl Harbor National Historic Landmark

NATIVE HAWAIIAN CULTURAL AND ARCHAEOLOGICAL SITES

Barbers Point Archaeological District
Oneula Archaeological District

SIGNIFICANT VIEWS AND VISTAS

- Distant vistas of the shoreline from the H-1 Freeway above the Ewa Plain;
- Views of the ocean from Farrington Highway between Kahe Point and the boundary of the Waianae Development Plan Area;
- Views of the Waianae Range from H-1 Freeway between Kunia Road and Kaloi Gulch and from Kunia Road;
- Views of na pu'u at Kapolei, Palailai, and Makakilo;
- Mauka and makai views; and
- Views of central Honolulu and Diamond Head.

Discussion: The project site has previously been subject to extensive archaeological and paleontological salvage and survey projects. The proposal to protect and restrict access to the sinkholes to protect historic resources is consistent with the 'Ewa Development Plan. The height of the industrial structures will be compliant with height limits of the area. Urban design controls shall consider the overall visual effects of the proposed development as seen from off-site locations.			
Chapter 3.5: CITY OF KAPOLEI - GENERAL POLICIES			
The City of Kapolei should serve as the urban core, or the "downtown" for the Secondary Urban Center.	✓		
The City of Kapolei should accommodate a major share of the new employment in the Secondary Urban Center.	✓		
The City of Kapolei should have a balanced mix of business and residential areas, complemented by the recreational, social and cultural activities of a city. Mixed use should be permitted and encouraged throughout most of the City area, in order to achieve the diversity and intensity of uses that characterize a city.	✓		
The City of Kapolei is envisioned to be a true city, encompassing a full range of urban land uses, and laid out in small blocks connected by a grid system of public streets.	✓		
The City should be composed of six different districts which should accommodate the full array of business, commercial, residential, cultural and public uses that characterize a city center.	✓		

Table 5.7: ʻEwa Development Plan - Objectives and Policies - City and County of Honolulu	S	N/S	N/A
Discussion: The project is consistent with the ʻEwa Development Planʻs vision to develop the Secondary Urban Center because it promotes industrial job creation and utilizes its proximity to the Kalaeloa/Barbers Point Harbor, James Campbell Industrial Park, and other nearby industrial areas. **The City General Plan targets growth for the ʻEwa Development Plan Area. ʻEwaʻs population is expected to grow to 96,000 by 2010 and up to 141,000 by 2025. The project offers substantial job opportunities for the Secondary Urban Center and supports current population distribution policies. The development of industrial sites in this location will assist in providing job opportunities for the expanding communities of ʻEwa, Kapolei, Central Oʻahu and the Leeward Coast. Most importantly, though, this development, bordering the City of Kapolei will provide a major employment center to the growing city. Proposed as industrial-business use, Kapolei Harborside Center will provide broader outlets for new or expanded Hawaiʻi businesses, expand existing markets and create new markets for products and services, encourage labor intensive activities, and help increase the Stateʻs capacity to adjust to and capitalize upon economic changes and opportunities occurring outside the State. The employment base for the area population is growing but limited. Currently over 24,000 jobs are in the ʻEwa/Kapolei region. The project will provide for approximately 3,800 new jobs at buildout.**			
Chapter 3.6: RESIDENTIAL DEVELOPMENT – General Policies			
The following general policies may be applied to the expansion or renovation of existing residential communities, as well as to new communities.			
Overall Density. To achieve the desired compactness and character of development in planned residential communities, the housing density of the aggregate area zoned for residential use (including the streets) should be in the range of 10 to 15 units per acre. (This average does not include areas zoned for commercial or industrial use.)			✓
Higher Density Housing Along the Transit Corridor. To promote use of mass transit, higher-density residential use should be developed along a major rapid transit corridor linking Kapolei with Waipahu and Primary Urban Center communities to the east. High-Density Residential and Commercial uses should be developed at six transit nodes, which would cover a one-quarter-mile radius around major transit stops. Areas along the rapid transit corridor should have housing densities of 25 units per acre, and greater densities are expected within the transit nodes.			✓
Physical Definition of Neighborhoods. The boundaries of neighborhoods should be made evident through the use of street patterns, landscape or natural features, and building form and siting. The focus of neighborhood activity should be on the local street or a common pedestrian right-of-way or recreation area.			✓
Compatible Mix of Building Forms. There should be a variety of housing types and densities to avoid visual monotony and accommodate a variety of housing needs, but without sharp contrasts between the exterior appearance of adjacent housing areas.			✓
Transit-Oriented Streets. Street patterns and rights-of-way should be designed to accommodate mass transit service and make it convenient to access for as many households as possible.			✓
Pedestrian and Bicycle Travel. Pedestrian and bicycle travel should be encouraged, particularly to reach neighborhood destinations such as schools, parks and convenience stores.			✓
Integration of Linear Corridors. Physical and visual connections between communities should be encouraged through the creative design of transportation and utility corridors and drainage systems.			✓
Provision of Community Facilities. Land should be provided for community facilities including churches, community centers, and elderly and child care centers.			✓
Discussion: These residential policies are not directly relevant to the proposed industrial park project.			
3.7 NON-RESIDENTIAL DEVELOPMENT			
This section provides general policies, non-residential development, including planned commercial retail centers, Ko ʻŌlina Resort, industrial centers, Kalaeloa (Barbers Point Naval Air Station), Pearl Harbor Naval Base (West Loch), and the University of Hawaiʻi West Oʻahu.			
Planned commercial centers, outside of the City of Kapolei, should provide retail shopping and services for the ʻEwa residential communities in which they are located. These centers differ from commercial areas within towns such as Waipahu or the City of Kapolei because they are typically managed as a unit with shared parking and center management.	✓		
Commercial centers outside of the City of Kapolei should concentrate commercial uses in central locations instead of in continuous commercial strips along arterial roads. Pedestrian and transit access to and within the centers should be emphasized.	✓		
Ko ʻŌlina Resort is designated in the General Plan as one of four "secondary" resort destinations which are part of an overall strategy to relieve growth pressure on Waikiki.			✓
Ko ʻŌlina Resort should be an integral part of the Secondary Urban Center.			✓

Table 5.7: ʻEwa Development Plan - Objectives and Policies - City and County of Honolulu	S	N/S	N/A
Ko ʻŌlina Resort should be a water-oriented residential and resort community with about 4,000 visitor units in hotels and resort condominiums and 8,700 residential units in Phase I and II.			✓
Ko ʻŌlina Resort should be a water-oriented residential and resort community with about 4,000 visitor units in hotels and resort condominiums and 8,700 residential units in Phase I and II.			✓
Ko ʻŌlina should provide substantial waterfront areas for public use. The entire shoreline should be natural open space, softened by landscaping, and should focus on the beach and swimming lagoons.			✓
3.7.3 INDUSTRIAL CENTERS - General Policies			
Barbers Point Industrial Area			
Industrial centers in ʻEwa include the Barbers Point Industrial Area and Honouliuli Industrial Area. Industrial activity should also be permitted at other dispersed industrial areas, as noted below.	✓		
As an alternative to industrial uses, a commercial, cultural or recreational entertainment attraction may be permitted in the area fronting the OR&L Historic Railway, provided that the use is designed to enhance the viability of the operation of the railway for historic theme rides, strengthen the linkage between the Ko Olina Resort and the City of Kapolei and proceed with a strong community based planning process.			✓
Barbers Point Industrial Area includes Campbell Industrial Park, Barbers Point Deep Draft Harbor, Kenai Industrial Park, and Kapolei Business Park. It should continue to grow as one of Oʻahu and the State's most important industrial areas. It is the site of the State's largest heavy industrial area (Campbell Industrial Park) and an important industrial harbor and fuel transfer point.	✓		
The northern parts of Kapolei Business Park and any BPNAS lands designated for industrial use should provide for light industrial uses as a transition between heavy industry at Campbell Industrial Park and the City of Kapolei.	✓		
An additional electrical power generating plant could be constructed at the Barbers Point Industrial Area, possibly taking advantage of cogeneration opportunities with other industrial activities. The 138 kilovolt transmission corridor running from the Barbers Point Industrial Area to Waiau could accommodate additional load on the existing poles.	✓		
Honouliuli Industrial Area			
Honouliuli should remain a smaller industrial area, used primarily for wastewater treatment. It includes 13 acres of land in the ʻEwa by Gentry project which is designated for light industrial use. A power generation facility may be included if it is dependent on wastewater treatment operations and can be designed so that it is generally not visible from nearby major public rights-of-way, residential areas, and commercial areas.			✓
The Honouliuli Wastewater Treatment Plant should be expanded to accommodate additional growth in the region as well as to provide additional facilities for higher levels of wastewater treatment. The City should acquire an additional 60 acres to accomplish this.	✓		
Other Industrial Areas			
Service-oriented industrial uses should be allowed throughout the region as noted below. Uses requiring larger lots should be located in Campbell Industrial Park. Small-lot uses, including automobile repair shops, contractor's yards, and businesses serving residential and commercial areas, should be allowed to locate near the City of Kapolei in the Kapolei Business Park and on any industrial lands which may be designated within Barbers Point Naval Air Station.	✓		
The **Hawaiian Electric Company generating plant** in Kahe Valley should remain the largest source of electrical power on Oʻahu. The plant could be expanded which would take advantage of available land area, cooling system capacity, and power transmission lines.			✓
The **industrial area planned for the western edge of ʻEwa Marina** should accommodate marine haul-out facilities, repair shops, and related small boat industrial uses.			✓
Coastal Environment - There should be a minimum building setback of 60 feet and 150 feet where possible. A lateral public access easement should be provided along the entire shoreline from the Barbers Point Deep Draft Harbor to Barbers Point Naval Air Station.			✓
Small industrial lots (10,000 square feet or less) for repair services and "incubator" businesses should be located near the commercial core of the City of Kapolei, but not on the principal commercial streets.	✓		
Warehousing and other industrial uses requiring larger lots should be located in industrial parks.	✓		
<u>Discussion</u>: Bordering the City of Kapolei and Barbers Point Industrial Area, the development of industrial sites in this location will assist in providing job opportunities for the expanding communities of ʻEwa, Kapolei, Central Oʻahu and the leeward Coast. Consistent with the ʻEwa Development Plan, this project will provide broader outlets for new or expanded Hawaiʻi businesses, expand existing markets and create new markets for products and services, encourage labor intensive activities, and help increase the Stateʻs capacity to adjust to and capitalize upon economic changes and opportunities occurring outside the State. The project will not have a negative impact on or detract from development of the OR&L Historic Railway. The site will further expand the capabilities of Kalaeloa/Barbers Point Deep Draft Harbor catering to marine industrial enterprises. The project will			

Table 5.7: 'Ewa Development Plan - Objectives and Policies - City and County of Honolulu	S	N/S	N/A
also provide a new wastewater pump station to mitigate pressures on the Honouliuli Wastewater Treatment Plant. **The project will be phased over a 10-year period and will implement the 'Ewa Development Plan's vision to phase development to provide adequate infrastructure so congestion and capacity shortfalls are minimized as development proceeds.**			
3.7.4 KALAELOA (BARBERS POINT NAVAL AIR STATION)			
Development of a major new regional public park, and provision of continuous lateral public access along the shoreline are priority reuse options for the BPNAS Local Reuse Plan.			✓
A continuous pedestrian route along the entire 'Ewa coast should be created. The entire shoreline of the BPNAS should be reserved for public access and recreation after military use of BPNAS ceases.			✓
Building setbacks from the shoreline should be required, a lateral public access easement along the Campbell Industrial Park shoreline should be acquired, and public shoreline pathways should be established at Ko Olina and 'Ewa Marina.			✓
The road network should be integrated with the regional circulation system.			✓
There should be ample lands devoted to uses that will create long term jobs for 'Ewa's residents.			✓
3.7.5 PEARL HARBOR NAVAL BASE (WEST LOCH)			
The City should request expansion of limited public access to the shoreline waters of West Loch beyond the West Loch Shoreline Park and should support retaining and enhancing wetland areas along the Pearl Harbor shoreline.			✓
3.7.6 UNIVERSITY OF HAWAI'I WEST O'AHU			
The campus should evoke a unique sense of place that distinguishes it as an important civic and cultural institution in 'Ewa.			✓
The campus should be oriented to support pedestrian access to and transit usage from a major transit node located on the North-South Road. The development of the University of Hawai'i West O'ahu campus should include plans to provide shuttle bus service to the transit node at the corner of Farrington Highway and the proposed North-South Road.			✓
The campus should be designed so that open space areas can be used for flood detention and retention as part of the Kaloi Gulch watershed master plan.			✓
<u>Discussion</u>: These projects are not directly applicable to the proposed project.			

6.0 Alternatives

6.0 ALTERNATIVES

This section reviews alternatives to the proposed action that were considered during the planning process.

To weigh the benefits and impacts of alternative plans for the project, a consistent set of evaluation guidelines by which each alternative can be uniformly compared was developed. Guidelines for this alternative analysis include compatibility with adjacent land uses, market demand and owner's objectives.

The proposed action would create an industrial center, which is consistent with adjacent industrial land uses, meets a market demand for industrial space, and meet's the owner's objectives of project profitability, regional and State economic benefits, and opportunities for new or expanded businesses, products and markets.

The viable alternatives described herein are a No-Action Alternative and a Residential Alternative. Alternate locations for the proposed project are not considered in this section as a viable alternative. The Petitioner does not own any other equivalent land mass to support a similar project in the Kapolei/'Ewa region. The proposed site has long been identified by County planning documents as a future location for industrial development. The site is one of the last remaining areas identified on the 'Ewa DP as a future industrial location that is still available for development within the region.

6.1 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, the industrial facilities and infrastructure associated with the proposed Kapolei Harborside Center project will not be realized. Current site uses may continue on for a period of time.

This alternative includes forgoing the following benefits and positive effects of the proposed action:

- No construction would occur at the site. The planned approximate 251 acres and 5.4 million square feet of industrial space would not be built. Strong demand for additional industrial space in West O'ahu would not be met.
- In terms of employment, 1,780 person years of construction and service-related jobs generating an expected $53 million per year in salaries and 3,780 long-term, permanent jobs at buildout generating total payroll of $260 million would be forgone.
- At full development of the project industrial operation revenues of $7.9 million per year to the City and County of Honolulu and $8.3 million per year to the State of Hawai'i -- would be forgone. Revenues of $6 million to the City and County of Honolulu and $7.9 million to the State of Hawai'i for transportation and highway improvements would not be realized. The expected nearly $590 million in investment over a 10-year period would not occur and the indirect economic impacts of the construction expenditures for this project would not occur.

- Future economic opportunities for new businesses and relocation opportunities for displaced Honolulu businesses would be forgone.
- Project land may enter a period of unproductivity, as other potential land uses may not be immediately feasible.

The following summarizes the impact of the No-Action Alternative:

The No-Action alternative is not consistent with adjacent industrial and 'Ewa DP land uses, does not meet a market demand, does not meet the owner's objectives of project profitability, regional and State economic benefits, and opportunities for new or expanded businesses, products and markets. The No-Action alternative would ultimately result in less environmental impacts than the proposed project. Traffic, soils, surface water, topography, groundwater, runoff, flood, vegetation, and biological conditions would remain essentially the same. The projected economic benefits would, however, not occur. In addition, this alternative would not work toward making Kapolei the nucleus of O'ahu's Secondary Urban Center. This alternative would not fulfill the 'Ewa Development Plan Special Provisions that recognize the project area as a potential industrial expansion area.

6.2 RESIDENTIAL ALTERNATIVE

Under the Residential Alternative, the 345-acre project area could be considered for the development of a new residential community. The area could accommodate approximately 2,600 units including approximately 2,200 medium density residential units, at 14 du/ac on 160 acres on the makai section of the site and 420 low-density residential units, at 7.5 du/ac on 56 acres, near the mauka boundary of the site, adjacent to the future Kapolei West residential site. The land would require rezoning from Agriculture (Ag-1 and Ag-2) to Low-and Medium-Density Residential uses. This alternative would include significant setbacks from adjoining industrial uses, a regional drainage system easement, internal roadways, an approximately 20-acre park and appropriate setbacks for the existing waste materials site. A range of housing options would be provided in this alternative, including affordable housing. No long-term jobs would be created by this development.

The Residential Alternative is not consistent with adjacent industrial and 'Ewa DP land uses and does meet a market demand for residential units. This alternative could meet the owner's objectives of project profitability and would provide regional and State economic benefits in the form of property taxes, but would not provide opportunities for new or expanded businesses, jobs, products, or markets. The provision of housing options would help satisfy a portion of the needs for both market and affordable housing in the region, but it would also be in conflict with the City and County's General Plan, which designates the site for industrial use. The difficulty with this alternative is the incompatibility of residential uses adjacent to the existing industrial uses at James Campbell Industrial Park, Kapolei Business Park and Kalaeloa/Barbers Point Harbor, as well as, proximity to the hazardous waste sites and planned regional drainage channel.

Residential land uses are to those of industrial land uses, requiring dedication of new water, utility, and waste resources, as well as, new roads for increased traffic. Impacts to soils, vegetation, topography, surface water resources, cultural resources, and archaeological

resources would be the same as the proposed action. Residential uses place greater demand on public services such as schools, libraries, recreation, police services and fire services. Residential use would place a greater demand on the region's traffic and connectivity conditions. This alternative is not preferred due to incompatibility with surrounding land uses and in consistencies with County and State plans.

6.3 RESIDENTIAL/COMMERCIAL MIXED-USE ALTERNATIVE

Under the Residential/Commercial Mixed-Use Alternative, the project area would be developed for commercial and residential uses. This alternative would allow for a mixture of commercial and light industrial, uses in the southern section of the site, while reserving the mauka section of the site for residential uses. This would provide some flexibility for meeting market demands for commercial space and residential needs. This flexibility would also enable a broader tenant mix than possible under the proposed Kapolei Harborside Center plans. The site would require rezoning from Agriculture (Ag-1 and Ag-2) to Medium Density Residential, Business, and Industrial.

The area could accommodate a approximately 1,550 medium density residential units, at 14 du/ac on 110 acres on the makai section of the site, adjacent to the future Kapolei West residential site. A 25 acre area for commercial would allow approximately 270,000 square feet of floor area to be developed using a commercial density of 0.25 floor area ratio (FAR). An approximate 110 acres would be developed as industrial uses, allowing 1,198,000 square feet of floor area to be developed using an industrial density of 0.25 FAR. The remaining acreage would include a 20-acre park, a regional drainage system easement, internal roadways, and appropriate setbacks for the existing waste materials site.

While this alternative would provide some new housing, as well as some new, permanent jobs, residential/commercial mixed-use development would not conform to adjacent area uses. This alternative could meet the owner's objectives of project profitability and would provide regional and State economic benefits in the form of property taxes, but would not provide opportunities for new or expanded businesses, jobs, products, or markets. The provision of housing options would help satisfy a portion of the needs for both market and affordable housing in the region, but it would also be in conflict with the 'Ewa DP, which designates the site for industrial use. The difficulty with this alternative is the incompatibility of residential uses adjacent to the existing industrial uses at James Campbell Industrial Park, Kapolei Business Park and Kalaeloa/Barbers Point Harbor, as well as, proximity to the hazardous waste sites and planned regional drainage channel. Additionally, the current and planned industrial uses of neighboring parcels would present a conflict to residents. The City of Kapolei is the focal point for commercial development within the region. This alternative would increase traffic and require greater demand from public resources, specifically schools, police, fire, and medical services. Public infrastructure would also be more heavily impacted.

7.0 Summary of Unresolved Issues

7.0 SUMMARY OF UNRESOLVED ISSUES

The primary unresolved issue at this time involves the petroleum contaminated site in the southwest corner of the project site. Chevron conducted an risk assessment investigation of the area north of Malakole road to define the boundary of the SPH plume and collect information required to design a remediation system for the portion of the plume that was not on Chevron property. An active skimming remediation system was installed and operated until the yield of SPH declined to levels that indicated skimming was no longer effective. The remediation effort was conducted with oversight from the EPA Region 9, and the DOH. The results also indicate that natural bioattenuation is occurring at the site and the area of impacted soil and the dissolved plume are stable and slowly receding. EPA and DOH accepted the risk assessment and signed off on the site in 1998 Results from a 2005 monitoring and testing indicated that the remediation was quite successful in reducing the amount of petroleum in the groundwater and soil.

The future use of the area of petroleum affected soil and groundwater, adjacent to the Chevron refinery, is uncertain at this time .It could be used for parking, pending further investigation. The site may be suitable for State Brownfield redevelopment and therefore could be eligible for Brownfields assessment and loan funds. The State Office of Planning encourages this type of redevelopment and has indicated it would provide assistance with the application process.

The Petitioner is in discussion with the County regarding transfer of approximately 10 acres at the project area to be developed and dedicated as a recreational sports complex. The dedication would fulfill a Unilateral Agreement, not directly related to the Kapolei Harborside Center, though associated with a previous zone change for the City of Kapolei, approved under Ordinance 90-30 ~~(Ref. No. 2006/PIM-2)~~. DPP processed an Ewa Public Infrastructure Map (PIM) revision request on behalf of the Department of Design and Construction for the proposed Kapolei Regional Sports Complex (2006/PIM-2). On May 12, 2006, the DPP requested that this PIM application be deferred from placement on the agenda of the Planning and Intergovernmental Affairs Committee to resolve outstanding issues.

An additional unresolved issue is the potential for a difference in the completion schedule for State highway improvements and the pace of completion for private developments. There are numerous development and infrastructure projects in the region with uncertain timetables for funding and government approvals. Infrastructure improvements need to be in step with the approval of new development projects in order to serve the project areas and fund the improvements. Coordination between governmental agencies and private development is needed to ensure the implementation of the necessary infrastructure to serve regional and project area demands.

8.0 References

8.0 REFERENCES

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Cultural Surveys Hawai'i, Inc. (May 2006). *Cultural Impact Assessment for the Proposed 345-Acre Kapolei Harborside Center, Honouliuli Ahupua'a, 'Ewa District, O'ahu Island.*

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LFR, Inc. (2006). *Environmental Summary Report Kapolei Harborside Center Former Hawaiian Western Steel Wastepile Malakole Road Parcel North of Chevron Refinery Kapolei, Hawaii.*

Mikiko Corporation. (September 2005). *'Ewa and O'ahu's Affordable For-Sale Housing: Summary of Recent Market Conditions.*

Pacific Analytics. (October 2006). *Kapolei Harborside Center: Arthropod Survey.*

Rana Productions, Ltd. (May 2006). *A Survey of Botanical, Avian, and Mammalian Resources, Kapolei Harborside Center, 'Ewa District, O'ahu, Hawai'i.*

Robert Charles Lesser & Co., LLC (January 2006). *Industrial Market Feasibility 345-acre Kapolei Harborside Center.*

Wilbur Smith Associates (May 2006). *Kapolei Harborside Center: Traffic Impact Assessment Report.*

William E. Wanket (April 1990). *Final Environmental Impact Statement: Kapolei Business-Industrial Park.*

9.0 Agencies and Parties Consulted

9.0 AGENCIES AND PARTIES CONSULTED

Table 9-1 lists the agencies, organizations, and individuals who were contacted during the preparation of the Environmental Impact Statement Preparation Notice (EISPN), the Draft Environmental Impact Statement (DEIS) or the Final Environmental Impact Statement (FEIS) for the proposed Kapolei Harborside Center project. Copies of the written comment letters and responses are included in this report.

Table 9-1: Consulted Parties

Respondents and Distribution	Received April 2006 EISPN	Comments Received on EISPN	Received July 2006 DEIS	Comments Received on DEIS	Receiving November 2006 FEIS
A. Federal Agencies					
U.S. Army Corps of Engineers – Pacific Ocean Division	x		x		
U.S. Department of the Interior – Fish and Wildlife Service	x		x	x	
U.S. Department of the Interior – Geological Survey	x	x	x	x	
U.S. EPA, Region 9 – Pacific Islands Contact Office	x		x		
U.S. Department of Agriculture, Natural Resources Conservation Service	x		x		
Federal Highway Administration	x		x		
B. State Agencies					
BUF – Department of Budget and Finance	x		x		
DAGS – Department of Accounting and General Services			x	x	
DBEDT - Department of Business, Economic Development & Tourism	x		x		
DBEDT – Energy, Resources, & Technology Division	x		x		
DBEDT - Housing Finance & Development Corporation			x		
DBEDT – Land Use Commission	x		x	x	x
DBEDT - Office of Planning	x	x	x	x	x
DBEDT – Strategic Industries Division		x	x	x	
DHHL - Department of Hawaiian Home Lands	x		x		
DLIR – Department of Labor and Industrial Relations	x		x		
DLNR - Department of Land and Natural Resources	x		x		
DLNR – Commission on Water Resources			x		
DLNR – Division of Forestry & Wildlife					x
DLNR - Historic Preservation Division	x	x	x		
DHS – Department of Human Services, Housing and Community Development Corporation	x		x		

Respondents and Distribution	Received April 2006 EISPN	Comments Received on EISPN	Received July 2006 DEIS	Comments Received on DEIS	Receiving November 2006 FEIS
B. State Agencies (cont.)					
DOD - Department of Defense	x		x		
DOA - Department of Agriculture					
DOE - Department of Education	x	x	x	x	
DOH - Department of Health	x		x		
DOH - Environmental Planning Office	x		x	x	
DOH – Wastewater Branch		x	x	x	
DOH – Environmental Management Division, Clean Water Branch	x	x	x	x	
DOT - Department of Transportation	x	x	x	x	
OEQC - Office of Environmental Quality Control	x	x	x	x	x
OHA - Office of Hawaiian Affairs	x		x	x	
OMPO – O'ahu Metropolitan Planning Organization	x	X	x		
Public Utilities Commission	x		x		
University of Hawai'i – Environmental Center	x		x	x	x
University of Hawai'i Water Resources Research Center	x		x		
C. City and County of Honolulu					
Board of Water Supply	x	x	x	x	
Department of Community Services	x	x	x	x	
Department of Design and Construction	x	x	x	x	
Department of Environmental Services	x		x	x	
Department of Facility Maintenance	x		x		
Department of Parks and Recreation	x	x	x	x	
Department of Planning and Permitting	x	x	x	x	x
Department of Transportation Services	x	x	x		
Honolulu Fire Department	x	x	x	x	
Honolulu Police Department	x	x	x		
O'ahu Civil Defense Agency	x		x		
Office of the Mayor	x		x		
D. Elected Officials					
Todd Apo, Honolulu City Councilmember, District 1	x		x		
Nester Garcia, Honolulu City Councilmember, District 9	x		x		
Michael Puamamo Kahikina, State Representative, District 44	x		x		
Brian Kanno, State Senator, District 19	x		x		
Mark Moses, State Representative, District 40	x		x		

Respondents and Distribution	Received April 2006 EISPN	Comments Received on EISPN	Received July 2006 DEIS	Comments Received on DEIS	Receiving November 2006 FEIS
E. Media					
Honolulu Advertiser			x		x
Honolulu Star Bulletin			x		x
F. Public Libraries					
DBEDT Library			x		x
Hawai'i State Library			x		x
Honolulu Department of Customer Services Library					x
Legislative Reference Bureau			x		x
Kapolei Library	x		x		x
Hilo Regional Library			x		x
Kaneohe Regional Library			x		x
Kahului Regional Library			x		x
Kaimuki Regional Library			x		x
Lihue Regional Library			x		x
Pearl City Regional Library			x		x
UH Hamilton Library			X		x
G. Community Organizations, Non-Profit Special Interest Organizations & Individuals					
Association of Hawaiian Civic Clubs	x		x		
Conservation Council for Hawai'i				x	
'Ewa Neighborhood Board No. 23	x		x		
Hawai'i Audubon Society	x		x	x	
Hawai'i Building and Construction Trade Council	x		x		
Hawai'i Farm Bureau Foundation	x		x		
Hawai'i Thousand Friends	x		x		
Hawaiian Electric Company			x	x	
KAHEA				x	
Kamehameha Schools	x		x		
Kapolei Rotary Club	x		x		
Land Use Research Foundation of Hawai'i	x		x		
League of Women Voters	x		x		
Leeward O'ahu Transportation Management Association	x		x		
Life of the Land	x		x		
Makakilo/Kapolei/Honokai Hale Neighborhood Board No. 34	x		x		
Makakilo Kapolei Lions Club	x		x		
Outdoor Circle	x		x		
Sierra Club, Hawai'i Chapter	x		x		

Respondents and Distribution	Received April 2006 EISPN	Comments Received on EISPN	Received July 2006 DEIS	Comments Received on DEIS	Receiving November 2006 FEIS
G. Community Organizations, Non-Profit Special Interest Organizations & Individuals (cont.)					
Smithsonian - National Museum of Natural History				x	
The Nature Conservancy	x		x		
Wai'anae Coast Neighborhood Board No. 24	x		x		
West O'ahu Economic Development Association	x		x		
Bergstrom, Stanley				x	
Buddenhagen, Chris				x	
Welda Fleetham, Jan				x	
Ha, Phyllis				x	
Helmstetter, Eileen				x	
Hinol, George Keoki				x	
James, Choon				x	
Kalodimos, Nicholas				x	
Kane, Shad				x	
Kaohelaulii, Annette				x	
Krueger, Keith				x	
Miller, Alyssa				x	
Lamerson, Doug				x	
McCoy, Floyd				x	
Penniman, Teya				x	
Tanaka, Daniel				x	
Tice, Kimberly				x	
Varady, Suzanne				x	
Watts, Joseph				x	
Wianecki, Shannon				x	

9.1 COMMENT AND RESPONSE LETTERS FOR THE DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122, Box 50088
Honolulu, Hawaii 96850

In Reply Refer To:
1-2-2006-TA-658

SEP 2 2 2006

Mr. Jeffrey H. Overton
Vice President
Group 70 International, Incorporated
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Subject: Kapolei Harborside Center, Draft Environmental Impact Statement, Ewa, Hawaii; TMK (1) 9-1-14:33(por); 34; 9-1-14:35 and 9-1-15:20 (por)

Dear Mr. Overton:

The U.S. Fish and Wildlife Service (Service) has reviewed the subject Draft Environmental Impact Statement (EIS) prepared pursuant to Chapter 343 of the Hawaii Revised Statutes. We provide the following comments in accordance with section 7 of the Endangered Species Act of 1973, as amended (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

The Draft EIS project summary (page 1-11) states that no threatened or endangered species are found at the project site. However, text on page 4-9 notes the federally endangered Hawaiian stilt (*Himantopus mexicanus knudsenii*) was observed on site on May 4, 2006. Page 16 of Appendix H ("Survey of Botanical, Avian, and Mammalian Resources") documents four stilts observed on site, two of which followed the observers "circling and calling vociferously." During May, stilts are typically incubating eggs and caring for flightless young, and the observed aggressive behavior may be indicative of protective parental care. The Draft EIS states that no on-site habitat is "important" for listed species. To the contrary, stilts are opportunistic birds that often take advantage of available wetland habitats, including ephemeral ponds and depressions, to forage and breed. We recommend that the Final EIS be revised to account for the possible nesting of Hawaiian stilts in the project area and to reassess habitat quality where the birds were observed this year and determine if these water-filled depressions could support breeding stilts. If the area is suitable habitat for nesting stilts, then we recommend you contact this office regarding take authorization pursuant to section 7 or section 10 of the Endangered Species Act of 1973, as amended.

At a minimum, to avoid harm to Hawaiian stilt nests, eggs, and young, we recommend that the Final EIS incorporate the following measures. First, any clearing, grading, construction, or other disturbing activities in areas of likely stilt nesting habitat should take place outside of the

TAKE PRIDE IN AMERICA

stilt breeding season. Work may take place during the breeding season (February through August) if pre-construction surveys by a qualified biologist indicate the absence of nests and/or chicks. Additional surveys should be conducted after any work stoppage of three or more days (during which birds may attempt nesting). If a nest with eggs is discovered, all work should cease if a nest with eggs or chicks is discovered and the Service should be contacted immediately. These standard guidelines are intended to protect chicks, and may be shortened if monitoring is conducted often enough to note when chicks have fledged (i.e., 5-6 weeks after hatching). If a previously undiscovered nest is found after work begins, all work should cease within a minimum radius of 100 feet of the nest and the Service should be contacted immediately.

We appreciate the opportunity to comment on the Draft EIS for the proposed Kapolei Harborside Center. If you need more information or have questions about our comments, please contact Patrice Ashfield, Acting Consultation Program Coordinator, at (808) 792-9400.

Sincerely,

Patrick Leonard
Field Supervisor

cc:
Kapolei Property Development, LLC
Hawaii State Land Use Commission
Hawaii Office of Environmental Quality
Hawaii Office of Planning

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Of Counsel

November 20, 2006

Mr. Patrick Leonard, Field Supervisor
U.S. DOI, Fish and Wildlife Service, Pacific Islands Office
300 Ala Moana Blvd., Room 3-122
P.O. Box 50088
Honolulu, HI 96850

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Mr. Leonard,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

Hawaiian waterbirds require wetlands for their survival, including freshwater marshes, coastal ponds, taro patches, and irrigation ditches. (FWS Draft Recovery Plan, 1999). The project site does not contain wetlands or suitable nesting habitat for the Hawaiian Stilt. The areas in question are low spots with transient water creating the possibility of temporary ponding at the edge of the site. The site is constantly being modified from coral stock pile excavation activities. Typically, there is no water in the same area of the site where these birds were observed.

While four stilt were encountered and flushed when approached during the survey of the site, does not necessarily mean that the birds flushed because they were involved in breeding behavior. Stilts are extremely vocal birds and easily flush when disturbed. In an effort to detect active stilt nests, an extensive search was conducted of the three mining scrapes present on the site. None were found, nor were chicks, sub-adult birds, or nests found during the 2006 survey. Additionally, no chicks, sub-adult birds, or nests were found during the course of Bruner's July 1989 survey, or an August 2005 survey of the same area (David and Guinther 2005). The bulk of stilts nest between February and mid-August, thus if active nesting was occurring on the site, it is probable that the 2005 or the 2006 survey would have detected such activity.

The Petitioner will consult with the U.S. Fish and Wildlife Service and, if applicable, will comply with the Endangered Species Act of 1973. Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

United States Department of the Interior

U.S. GEOLOGICAL SURVEY
Pacific Islands Water Science Center
677 Ala Moana Blvd., Suite 415
Honolulu, HI 96813
Phone: (808) 587-2400/Fax: (808) 587-2401

SEP 14

September 12, 2006

Mr. Jeffrey H. Overton, AICP
Vice President
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813

Dear Mr. Overton:

Subject: Kapolei Harborside Center – Draft Environmental Impact Statement, Ewa, Hawaii, TMK: (1) 9-1-14:33 (por); 34; 9-1-14:35 and 9-1-15:20 (por)

Thank you for forwarding the subject Engineering Report for review and comment by the staff of the U.S. Geological Survey, Pacific Islands Water Science Center. We regret however, that due to prior commitments and lack of available staff, we are unable to review this document.

We appreciate the opportunity to participate in the review process.

Sincerely,

Gordon Tribble
Center Director

cc: Mr. Steve Kelly
Kapolei Property Development, LLC
1001 Kamokila Blvd., Suite 250
Kapolei, Hawaii 96707

Mr. Anthony Ching
State Land Use Commission
P.O. Box 2359
Honolulu, Hawaii 96804

Mr. Abe Mitsuda
State of Hawaii Office of Planning - DBEDT
P.O. Box 2359
Honolulu, Hawaii 96804-2359

Office of Environmental Quality Control
235 S. Beretania St., Suite 702
Honolulu, Hawaii 96813

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November 20, 2006

Mr. Gordon Tribble, Center Director
U.S. Department of the Interior
U.S. Geological Survey
Pacific Islands Water Science Center
677 Ala Moana Blvd., Suite 415
Honolulu, HI 96813

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Mr. Tribble,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

We acknowledge that you are unable to review the document.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

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LINDA LINGLE
GOVERNOR

RUSS K. SAITO
COMPTROLLER

KATHERINE H. THOMASON
DEPUTY COMPTROLLER

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810

(P)1178.6

AUG 23 2006

AUG 24

Mr. Jeffrey H. Overton, AICP, Vice President
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Subject: Kapolei Harborside Center
Draft Environmental Impact Statement
TMK: (1) 9-1-014:33 (Portion), 034 and 035 and 9-1-015:020 (Portion)
Ewa, Oahu, Hawaii

Thank you for the opportunity to review the subject project. This project does not impact any Department of Accounting and General Services projects or existing facilities. Therefore, we have no comments to offer.

If you have any questions, please have your staff call Mr. Allen Yamanoha of Planning Branch at 586-0488.

Sincerely,

ERNEST Y. W. LAU
Public Works Administrator

AY:mo
c: Ms. Genevieve Salmonson, OEQC
Kapolei Property Development, LLC
State Land Use Commission
Office of Planning

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Of Counsel

November 20, 2006

Mr. Ernest Y. W. Lau, Public Works Administrator
State of Hawai'i
Department of Accounting and General Services
P.O. Box 119
Honolulu, HI 96810

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Mr. Lau,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact.

We acknowledge that the project does not affect any Department of Accounting and General Services projects or existing facilities and that you do not have any comments at this time.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

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LINDA LINGLE
GOVERNOR

ANTHONY J.H. CHING
EXECUTIVE OFFICER

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
LAND USE COMMISSION
P.O. Box 2359
Honolulu, Hawaii 96804-2359
Telephone: 808-587-3822
Fax: 808-587-3827

RECEIVED
SEP 18 2006
GROUP 70 INT'L

September 15, 2006

Mr. Steve Kelly
Kapolei Property Development, LLC
1001 Kamokila Boulevard, Suite 250
Kapolei, Hawaii 96707

Dear Mr. Kelly:

Subject: LUC Docket No. A06-763
Draft Environmental Impact Statement (DEIS)
Kapolei Harborside Center
Ewa, Oahu, Hawaii
Tax Map Keys: 9-1-14: por. 33, 34, and 35; and 9-1-15: por. 20

1) We note that certain sections within the DEIS incorrectly use the term *Agriculture* when referring to the State Land Use Agricultural District (e.g., section 1.4, page 1-9; section 2.2.1, page 2-4; section 3.1, page 3-1; section 3.2.2, page 3-2). Such references should be corrected in the Final EIS (FEIS) to reflect the proper name of said district.

2) As we pointed out in our April 4, 2006, letter on the Petition for Land Use District Boundary Amendment, the Land Use Commission (LUC) has required petitioners of industrial developments to complete and submit a housing study to address, among other things, the type of employee/affordable housing demands that will be created by the proposed use. In light of the LUC's concerns, we suggested that the petitioner address the affordable housing impact of the proposed use upon the low income, low-moderate income, and gap groups, and the potential measures that may be employed to mitigate such impact. Although the manner in which this issue ultimately is addressed was left to the petitioner's discretion, we believe that it would be appropriate to

include discussion on this matter in the EIS in the interest of full environmental disclosure.

3) In the DEIS, there are numerous references to the term *potable water*. We request that it be replaced by the term *drinking water*. We have been advised that although potable water has been used generally to mean drinking water, the Department of Health (DOH) uses the latter term specifically to indicate water for human consumption that is derived from surface water and/or groundwater and is regulated by the DOH pursuant to chapter 11-20, Hawaii Administrative Rules (HAR).

4) Information on the number of lots proposed in the project and their projected selling range (based on size and market demand) should be provided.

5) In the Economic and Fiscal Impacts study, it is assumed that the excise-tax/mass transit revenues, highway impact fees, and other revenue sources generated by the proposed action, as applicable, will (i) negate the City's expenditures on mass transit and highways; and (ii) far exceed the State's expenditures on highways. The bases upon which these assumptions rest are unclear as there are no data on the specific types of governmental expenditures and their corresponding amounts that will be necessary to support the proposed action. In order to clearly document the economic and fiscal impacts of the proposed action, this information should be provided.

6) Pursuant to section 11-200-17(f), HAR, we request that a discussion on alternative locations for the proposed action be included in chapter 6.0 Alternatives.

7) Pursuant to section 11-200-17(h), HAR, the status of each identified governmental approval required for the proposed action should be described. Although we acknowledge that "[a]ll permits and approvals, including ministerial permits, such as grading and building, will be obtained prior to construction," we request that to the extent possible the projected submittal dates (i.e., by month/year) of the applications and plans to the various agencies be provided.

8) Pursuant to section 11-200-17(i), HAR, the interrelationships and cumulative environmental impacts of the proposed action and other related projects should be discussed. We acknowledge that the DEIS discusses other developments in the City of Kapolei and near the proposed action and generally addresses the anticipated cumulative and secondary impacts. The DEIS concludes that the net cumulative impact as well as the potential secondary impacts of the proposed action are anticipated to be positive. We request that further discussion on the specific impacts (both favorable and adverse) generated by each of the other developments be provided to support this conclusion.

9) Pursuant to section 11-200-20(d), HAR, the original copy of the DEIS or FEIS should be signed and dated by the applicant indicating that the statement and all ancillary documents were prepared under the signatory's direction or supervision and that the information submitted, to the best of the signatory's knowledge, fully addresses document content requirements as set forth in sections 11-200-17 and 11-200-18, HAR, as appropriate. We note that the DEIS is not signed by the applicant as required. This should be corrected when the FEIS is filed.

Thank you for the opportunity to comment on the subject DEIS. Should you have any questions, please feel free to call me or Bert Saruwatari of our office at 587-3822.

Sincerely,

ANTHONY J. H. CHING
Executive Officer

c: Office of Environmental Quality Control
Jeffrey Overton, Group 70 International, Inc.

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November 20, 2006

Mr. Anthony J.H. Ching, Executive Officer
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P.O. Box 2359
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Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Mr. Ching,

Thank you for your comment letter to Mr. Stephen Kelly of Kapolei Property Development concerning the Kapolei Harborside Center Draft Environmental Impact Statement. The following are offered in response to your comments.

1. State Land Use Agricultural District Reference. In the Final EIS, the term *Agriculture* (used for identifying the State Land Use Agricultural District) has been corrected to reflect the proper name of said district.

2. Affordable Housing. The discussion on affordable housing has been revised and is included in the Final EIS, Section 4.16, Socio-Economic Conditions. The Kapolei Harborside Center will provide much needed employment opportunities for the growing number of people residing in the Kapolei region. Many of the current and planned residential communities in Kapolei include significant affordable housing components.

   The ʻEwa DP Area has played a very significant role in meeting the island's affordable housing needs. According to a June 2005 Mikiko Corporation report, the ʻEwa DP Area recorded a higher share of affordable housing sales than did the rest of Oʻahu. In recent years, the ʻEwa DP Area has increased its number of home sales at affordable prices by over 70% from year 2000 sales. The ʻEwa DP Area has served far more than its "fair share", providing over 20% of Oʻahu's affordable housing sales.

3. Drinking Water Reference. In the Final EIS, the term *potable water* has been replaced by the term *drinking water* per your request.

4. Lot Information. Detailed information on the individual industrial subdivision lots is unavailable at this time. The number, types, and selling range of lots will be dependant upon market conditions. The Petitioner anticipates that lots will be in the size range of one to three acres and could consist of industrial condominiums, bulk lot sales, or other possible configurations.

5. Economic and Fiscal Impacts Study. Potential impacts to City and State finances are summarized on pages 13 to 16 of the Economic Impact Assessment report (*Appendix E*), while the detailed analysis is presented in the accompanying Tables 4 and 5. For both development activity and operations

at full development, the analysis covers the anticipated changes in the tax and expenditure base, revenues from taxes and fees, support expenditures, and net revenues. The tables also show the multipliers (i.e., assumptions) that were used in the analysis (e.g., applicable tax rates, government support expenditures per job, etc.).

Details are not yet available on the mass transit system final route and transit stops, anticipated capital and operating costs, total ridership, fares, how the system will be financed, etc. Given this lack of information, it was assumed that the length of the route will reflect what the City can afford, with this being based primarily on capital improvements financed from the excise-tax surcharge and from Federal subsidies: the higher the cost per mile the shorter the system, and vice versa. Thus, revenues from the excise tax surcharge should approximately equal the City's share of capital expenditures. Since information is not available on projected ridership associated with the proposed Project, it was assumed that the fair share of the capital cost will equal the amount of the excise-tax surcharge generated by the Project.

Regarding City and State highway improvements, highway impact fees for ʻEwa were established to (1) generate sufficient funds to cover the entire local share of highway improvements in ʻEwa, and (2) have each development pay its fair share based on estimated traffic generated. Thus, highway impact fees generated by the Project should approximately equal City and State expenditures on highway improvements to support the Project. This relationship was assumed for the fiscal analysis. Although not addressed in the Economic Impact Assessment report, it suggests that the highway impact fees may be set too high. The Project will actually pay more than its fair-share of highway improvements, based on the following estimates (in 2005 dollars):

- about $400 million for highway improvements in ʻEwa;
- about $80 million for the local share (20%);
- about $100 million in impact fees generated by projected development over the next 20 years;
- about $20 million collected in excess of the local share of highway costs ($100 million in impact fees vs. $80 million for the local share).

Significant portions of the infrastructure will be built by the developer, or the Project's fair-share will be financed via connect charges and user fees, although such infrastructure is typically financed by the city. Thus, the finding in the Economic Assessment report is that the Project's development activity will have a negligible impact on City finances.

However, as shown in Table 4, project operations are expected to generate net revenues to the City of about $8 million per year once the Project reaches full development. As indicated in *Appendix E*, most of the revenues will come from property taxes. Other revenues (fuel taxes; motor vehicle weight taxes; water and sewer fees; solid-waste disposal fees; other departmental earnings; public service company taxes; other licenses, permits and fees; and fines, forfeits and penalties) and expenditures on support services (police, fire, road

maintenance, bus service, water delivery, O&M of sewer systems and the wastewater treatment plant, solid waste disposal, etc.) were assumed to be proportional to the number of new jobs generated by the Project. Annual revenues are estimated at about $460 per job while annual expenditures are estimated at about $780 per job. These multipliers are based on an analysis of the City budget.

Unlike the City, the State derives substantial revenues from development activity, including conveyance taxes on property sales, excise taxes on lot sales and construction expenditures, and income taxes. However, State services in support of development activity are minor. Thus, as shown in Table 5 of *Appendix E*, net revenues to the State during the 10 years of development activity are estimated to average about $4.5 million per year.

As shown in Table 5, operations are expected to generate net revenues to the State of about $8.4 million per year once the Project reaches full development, including excise taxes on sales (mostly taxed at 0.5%), income taxes and other revenues. Other revenues (public service companies tax; fuel tax; motor vehicle weight tax; charges for various licenses, permits, and services; departmental earnings; etc.) and expenditures on support services (highway maintenance, government administration, and other expenditures) were assumed to be proportional to the number of new jobs. Annual revenues are estimated at about $650 per job while annual expenditures are estimated at $1,080 per job. These multipliers are based on an analysis of the State budget.

6. Alternative Locations. Alternative locations for the proposed project are not proposed in Chapter 6.0 Alternatives. The Petitioner owns no other equivalent land mass to support a similar project in the Kapolei/'Ewa region. The proposed site has long been identified by County planning documents as a future location for industrial development. It is one of the last areas identified on the 'Ewa DP as a future industrial site that still available for development within the region.

7. Approvals and Permits. Section 1.10 in the Final EIS identify each approval and permit required for the project to proceed as well as the approving authority. Due to the early stage of the development process and the conceptual nature of the proposed development, projected submittal dates of the applications and plans are unavailable at this time. As the proposed project progresses further in development phases, specifically during the Change of Zone phase, the timing of approvals and permits will become clearer.

8. Cumulative Impacts. The Final EIS, Section 4.18.1 discusses further specific cumulative impacts generated by the proposed action as well as other developments within the region. Adverse impacts relating to traffic, increased demand on regional infrastructure, and air quality are likely to be expected by the cumulative development of all of the proposed regional projects. Yet, at the same time, the proposed developments involve significant improvements

to regional roadways, drainage, water, and sewer facilities. The majority of development in the Kapolei/'Ewa region focus on the introduction of new housing options. The Kapolei Harborside Center project, as well as other proposed development projects, compliments the future housing stock by providing new employment opportunities within the region. The project will help to relieve development pressures in urban Honolulu by allowing more 'Ewa residents to work within their community. A major consideration in public policy is to redirect traffic currently flowing into Honolulu proper by providing alternative employment centers and residences outside of the existing urban core. Finally, the cumulative development of the region's proposed projects will provide additional tax revenue and economic benefits to State and County governments to fund necessary public services.

9. Final EIS Signature Page. The signature page of the Final EIS now correctly includes the signature and date of the Petitioner.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

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Ref. No. P-11512

September 22, 2006

Mr. Jeff Overton, AICP
Group 70 International
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Subject: A06-763/Kapolei Harborside Center
Kapolei Property Development LLC
Draft Environmental Impact Statement (DEIS)
Ewa, Kapolei, Island of Oahu
TMK(s): 9-1-14: 33 (por.) 34, 35; and 9-1-15: 20 (por.)

The proposed Kapolei Harborside Center development is planned for light industrial, warehouse, and related business uses. A portion of the site is planned for a regional drainage way, with small areas identified for preservation uses and for existing hazardous waste remediation activities. The proposed development encompasses approximately 344 acres; all of which is proposed to be reclassified from the State Agricultural District to the State Urban District.

We have reviewed the above referenced document and have the following comments to offer:

1. **Water Supply**

According to the DEIS the nearest drinking water well is located approximately 2.2 miles northeast and hydraulically upgradient from the project. While the project is within a designated groundwater management area regulated by the Commission on Water Resource Management (CWRM), there are no plans to develop new wells in conjunction with this project. All potable water is planned to be provided by the Board of Water Supply (BWS). The Ewa Water Master Plan is referenced as a planning document for the area in terms of required infrastructure to service the proposed development. We recommend coordination

with the County to incorporate this project into the County's Water Use and Development Plan which is in the process of being updated.

The BWS currently provides non-potable water for the Kapolei area through recycled effluent from the Honouliuli Wastewater Treatment Plant. The DEIS indicates that a dual water system is being proposed in order to conserve valuable freshwater resources and plans have been prepared for continuation of the existing R1 water line to storage tanks mauka of the freeway west of Puu Pālailai, and for the installation of transmission lines down into the project area. The Final EIS should elaborate on these plans.

The State Commission on Water Resource Management (CWRM) has indicated that an existing monitoring well (Well No. 1906-01) appears to fall within the boundary of the proposed project. This well was constructed by the Department of Transportation, Harbors Division, to conduct baseline and post-construction monitoring for the Barbers Point Harbor Expansion. CWRM required post-construction monitoring for at least one year following the harbor expansion. Please indicate in the final EIS whether this well is in fact within the proposed project's boundary. If this well is not longer used for monitoring purposes, then the well should be sealed in accordance with the Hawai'i Well Construction and Pump Installation Standards. A permit from CWRM is required prior to any well sealing work. Proper well sealing is necessary to prevent possible waste and contamination of the underlying aquifer.

2. **Agricultural lands**

The project area is currently in the State Agricultural District and is zoned Ag-1 and AG-2 by the County. Only intermittent agricultural activity has occurred on the site during the last ten years except for the current, existing nursery operation (32 acres) and a greenwaste composting facility (39 acres) which hold short-term leases. The site is surrounded entirely by urban uses and is an agricultural remnant. Only one percent of the project area is ALISH-designated as Prime with an additional sixteen percent designated OTHER. The proposed development would appear to minimally impact the availability of important agricultural lands. However, given the relationship between greenwaste composting and solid waste (particularly with respect to current and future pressures on West Oahu facilities) the final EIS should include some discussion about the displacement of the lessee and suitable areas for relocation of such activities.

3. **Housing**

The proposed project does not intend to provide any housing as part of its development.

The DEIS discusses the probable impacts due to direct and indirect employment during both the 10-year development period and at full buildout. During the 10-year development period the study estimated employment due to the project will result in 1,480 persons expected to reside in 440 homes just in the Kapolei/Ewa region; and at full buildout 9,180 residents in 2,750 homes in the Kapolei/Ewa region. As stated in the DEIS "…the increase in employment opportunities in the Ewa region is likely to encourage more residential growth in the region…"

The supply of affordable housing to meet the needs of Hawaii's working families is critical to both the State and County. Inasmuch as this project will not supply any housing but will contribute to demand within the region, the final EIS should discuss to what extent anticipated wages for the projected employment, during both the 10-year development period and at full buildout, will be sufficient for those employed to afford housing within the region.

4. Public Health

The DEIS identifies two areas of hazardous materials within the project area that are said to pose no anticipated risks to human health due to past and ongoing remediation: (1) the former Hawaiian Western Steel hazardous waste pile and (2) hydrocarbon (petroleum components)-impacted soil and groundwater. The DEIS mentions that the petitioner is currently in discussion regarding possible transfer of the petroleum affected area to the City and County. The City's comments on the EISPN indicated that this dedication would fulfill a 1990 Unilateral Agreement (Ordinance 90-30) requiring this land for a recreational sports complex. The final EIS should provide greater detail on the Unilateral Agreement and the expected final use of this portion of the property.

The DEIS provides information on the region's existing and planned medical services and health care facilities and goes on to state that these facilities should be adequate to accommodate the needs of the proposed project. The final EIS should provide context for this statement including the types and range of possibly injuries that might be expected from light industrial uses as proposed and whether area medical facilities are adequate to treat some or all of these.

5. **Ocean Resources**

The DEIS discusses proposed drainage improvements to handle onsite runoff and future anticipated development within the watershed. The project proposes to construct a large drainage swale sufficient to collect and transport onsite and upslope runoff to a proposed offsite concrete lined discharge channel. The State Department of Transportation, Harbors Division, raised concerns in its comments

on the EISPN regarding drainage from the site negatively impacting Kalaeloa Barbers Point Harbor. The proposed improvements, both onsite and offsite, are to be designed to channel storm water flow to a site well south of the Harbor and should improve the current storm water flow in the area. However, the construction of the proposed offsite channel is not part of the Harborside Center project and is to be permitted and implemented separately. The final EIS should discuss how the onsite and offsite drainage improvements will be coordinated, and by whom, in order that they will be functional at the same time to provide necessary storm water flow and management services to the proposed project and region.

6. **Environmental Resources**

The DEIS indicates that energy efficiency guidelines will be developed as part of the Conditions, Convenants and Restrictions that will apply to the development of the project site. These guidelines will be submitted to the Energy Branch, State Department of Economic Development and Tourism for review and input.

The DEIS botanical survey indicated no plant species were found which are listed as threatened, endangered, or proposed for listing under either federal or State of Hawaii endangered species statutes. The lack of surveys carried out during winter months leaves a gap in information on potential seasonal variations in presence and/or relative abundance of organisms. The rationale for this omission should be discussed or a winter season survey should be provided to supplement the current surveys in the final EIS.

Mammalian and avian surveys conducted turned up only one avian sub-species (Black-necked Stilt) that is listed as endangered under federal and State statutes. These individuals were noted as displaying distress behavior possibly indicating breeding activity. The final EIS should discuss potential negative impacts on these birds if suitable habitat areas on site are removed.

The DEIS does not include a survey for invertebrates. The rationale provided was that only one federally-listed species is known from the island and it has not been recorded since the 1940's. Therefore, it was concluded that the only invertebrates likely to be found in the project area would be non-listed native species and this would not result in any additional regulatory requirements. While the foregoing may be true, the inter-relationship of invertebrates (even non-listed species) with plants, birds, and mammals is important in assessing the biological resources of a given area and potential mitigation measures. The final EIS should address this issue.

The DEIS identifies more than 50 sinkholes eligible for listing under National and Hawaii Register of Historic Places. The sinkholes are located within a 7.4-acre archaeological/paleontological Preserve Area created in the 1990's and bound by a chain-link fence. These sinkholes have been found to contain unique and extinct Hawaiian bird bones known only from the archaeological record; they represent a small portion of the many sinkholes that once existed within this region. The DEIS indicates that the existing fence will remain to protect the resources and that there are no plans for development in this area at this time. We support efforts to protect and preserve the sinkhole resources in this area in perpetuity and would encourage the landowner to partner with an appropriate conservation organization in managing these resources.

7. **Transportation**

The Traffic Impact Analysis Report (TIAR) included in the DEIS computes the amount of the anticipated impact fees for highways pursuant to the County's Ewa Impact Fee Ordinance (Ordinance 02-52). The figure contained in Table 4, section 4.b., provides a figure of $309,048 based upon a projected total square footage for the Harborside Center of 546,678 square feet. Applying the formula found in the ordinance's impact fee for industrial uses of $2,019 per 1,000 square feet the correct figure appears to be approximately $1.1 million (547 x 2,019). The discrepancy appears to be related to a "28% City Share" factor. The final EIS and TIAR should explain the rationale for this apparent discrepancy in the calculation of the highway impact fees anticipated from this project.

Thank you for the opportunity to review this document. If you have any questions, please contact Scott Derrickson, AICP, of the Land Use Division at 587-2805.

Sincerely,

Mary Lou Kobayashi for

Laura H. Thielen
Director

c: Anthony Ching, LUC
Genevieve Salmonson, OEQC

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November 20, 2006

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Honolulu, HI 96804

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Ms. Thielen,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement. The following are offered in response to your comments.

1. Water Supply. We acknowledge that no new wells will be developed in conjunction with this project and that potable water is planned to be provided by the Board of Water Supply. We will coordinate with the County regarding the feasibility of incorporating the Kapolei Harborside Center project into the County's Water Use and Development Plan that is now being updated.

   As development plans progress into design phases specifics regarding the planned dual-water system that will provide non-potable water will be elaborated on. Kapolei Harborside Center will connect to the dual-water system once the Board of Water Supply brings non-potable source water to the project area. During future phases of development, the Petitioner will coordinate with the State Commission on Water Resource Management (CWRM) to resolve the proper action needed for Well No. 1906-01. Further investigation will be performed to determine the location of the existing monitoring well. Should the well be found to be within the project site, coordination with DOT Harbors will proceed to ensure proper procedures for closure are followed.

2. Agricultural Lands. We acknowledge that the proposed development will have minimal impact on the availability of important agricultural lands. The Petitioner has kept its existing lessees informed prior to and since announcing plans to develop the Kapolei Harborside Center. Of the four existing tenants, only two – Milo Nursery and Menehune Green – are intensive users of the site. These lessees are already planning for the eventual relocation of their operations. All tenants will continue to be kept informed of the development plans as they progress.

3. Housing. The Project contributes to the on-going transformation of the Kapolei/'Ewa region from its past role as largely a suburb of Honolulu's Primary Urban Center, to its current and future role as O'ahu's second full-service urban center. As a past suburb of the Primary Urban Center, population and housing growth in the region outpaced employment growth,

thereby requiring many residents to commute to jobs outside the region. More balanced growth will require more job creation in the Kapolei/'Ewa region, which is one of the major benefits of the proposed Project. Economic impacts of the Project are addressed in the Economic and Fiscal Impacts report (*Appendix E*).

Economic impacts related to Project development activity are addressed on pages 5 to 8 and in Table 2 of the Economic Impact Assessment report. As indicated in this table, direct employment is expected to average about 450 construction jobs during the 10-year construction period. In turn, these jobs will support about 1,000 residents living in about 300 homes, of which about 200 homes are expected to be in 'Ewa. While these will be new construction jobs, this does not imply an increase in construction employment since construction workers move from project to project. As stated on page 8 of the Economic Assessment report: "Development activities will support the families of many construction workers and other workers who already live on O'ahu." Thus, development activity is not expected to contribute to significant demand for more housing in 'Ewa or in nearby communities.

Wages of construction workers are expected to average about $65,000 per year. This is nearly 70% higher than the average wage of about $38,500 for all O'ahu jobs. Assuming a second wage-earner at the average O'ahu wage of $38,5000, the family income of construction workers will exceed $100,000 per year. Thus, most construction workers are able to purchase homes that are priced for families earning more than 140% of median family income for a family of four.

Economic impacts related to Project operations at full development are addressed on pages 8 and 9 and in Table 3 of the Economic Assessment report. As indicated in this table, operations are expected to provide about 3,830 on-site industrial jobs. In turn, these jobs will support about 8,420 residents living in about 2,530 homes, of which about 1,770 homes are estimated to be in 'Ewa. As stated on page 9 of the Economic Assessment report: "The new jobs will provide employment to (1) workers who already live in the Kapolei/'Ewa region and nearby communities but who must commute to distant jobs, and (2) workers who will be new residents of the Kapolei/'Ewa region and nearby communities."

Wages of industrial workers are expected to average about $46,000 per year. This is nearly 20% higher than the average wage of about $38,500 for all O'ahu jobs. Assuming a second wage-earner at the average O'ahu wage of $38,5000, family income of industrial workers will reach about $84,500 per year. Thus, most industrial workers will be able to purchase homes that are priced for families earning about 118.5% of median family income for a family of four.

4. Public Health. The Unilateral Agreement referred to in the Draft EIS is associated with the City of Kapolei and is not directly related to the Kapolei Harborside Center project. The Petitioner has been in discussion with the

County regarding the potential transfer of approximately 10 acres of land within the project area to satisfy conditions of the agreement.

The existing medical facilities described in the Draft EIS, specifically St. Francis Medical Center, Pali Momi Medical Center and Wahiawā General Hospital are full service general, emergency, and surgical medical facilities with the capabilities of treating injuries that might be expected from light industrial uses.

5. Ocean Resources/Drainage. During future phases of the development process a Drainage Master Plan will be developed and submitted to Department of Planning and Permitting. We will coordinate development of the Drainage Master Plan with the State Department of Transportation as it relates to the Harbors Division.

6. Environmental Resources. As energy efficient guidelines are developed for the project, they will be submitted to the Energy Branch, State Department of Economic Development and Tourism for review and input.

The botanical survey was done during the dry season. It is unusual to conduct surveys twice a year, they are typically done when the study is commissioned. However, when the site was surveyed in May 2006, it followed a particularly wet period and most of the annual species that one would expect from the site were recorded. If another survey were to be conducted between November and January, typically the wetter months, additional species, would be recorded, thought the majority of these would likely be weedy alien species. This site has been surveyed for botanical resources by Char in August (1989), David and Guinther August (2005), and by David and Guinther in May (2006).

Hawaiian waterbirds require wetlands for their survival, including freshwater marshes, coastal ponds, taro patches, and irrigation ditches (FWS Draft Recovery Plan, 1999). The project site does not contain wetlands or suitable nesting habitat for the Hawaiian Stilt (Rana, 2006). The areas in question are low spots with transient water creating the possibility of temporary ponding at the edge of the site. The site is constantly being modified from coral stockpile excavation activities. Typically, there is no water in the same area of the site where these birds were observed.

While four stilt were encountered and flushed when approached during the survey of the site, flushing does not necessarily mean that the birds were involved in breeding behavior. Stilts are extremely vocal birds and easily flush when disturbed. In an effort to detect active stilt nests, an extensive search was conducted of the three mining scrapes present on the site. None were found, nor were chicks, sub-adult birds, or nests found during the 2006 survey. Additionally, no chicks, sub-adult birds, or nests were found during the course of Bruner's July 1989 survey, or an August 2005 survey of the same area (David and Guinther 2005). The bulk of stilts nest between February and mid-August, thus if active nesting was occurring on the site, it is probable that the

2005 or the 2006 survey would have detected such activity. The Petitioner will consult with the U.S. Fish and Wildlife Service and, if applicable, will comply with the Endangered Species Act of 1973.

An arthropod study has been completed by Pacific Analytics for the Final EIS to supplement studies already completed on botanical, avian and mammalian resources. Section 4.5.3 addresses issues concerning invertebrates and a full report is found in Appendix I. The study did not indicate the presence of sensitive invertebrate species.

The Petitioner is committed to the preservation of the existing coral sinkholes found in an approximately 6-acre area of the proposed Kapolei Harborside Center (also see attached). Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, we recognize the works of Dr. Alan Ziegler, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. These resources shall remain unaffected by the proposed industrial center through the formal establishment of an approximately 6-acre sinkhole preserve area.

As part of the subject State Land Use Boundary Amendment process, the owners will accept a condition to set aside this approximately 6-acre area as a natural resource preserve. Since the early 1990's, a chain link fence was erected to enclose the preserve area, with some openings along the western and southern sides. This fence will be extended to enclose the entire approximately 6-acre preserve, with the addition of locked gates. Access to the preserve will be provided for future scientific investigations, and to continue the use of this area as a "living classroom" setting for schools and environmental education groups.

7. Transportation. The DEIS is based on the Economic Impact Assessment report by Decision Analysts Hawai'i, Inc., Table 5 (Impact on City Revenues and Expenditures) and Table 6 (Impact on State Revenues and Expenditures). As indicated by the following, there is no discrepancy between this report and the TIAR:

City share of highway impact fee (28%)	$	309,048
State share of highway impact fee (72%)	$	794,695
Total highway impact fee (100%)	$	1,103,743

The percentage split of the highway impact fee is based on the estimated cost of City and State highway improvements in 'Ewa.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

Attachments:
Table 1
Final EIS Section 2.2.3 Preservation Component

Table 1. Ewa and Oahu Housing Statistics: 2000 and 2004/05*

Item	Ewa						Oahu			
	Price Range		2000		2004/05		2000		2004/05	
	2000	2004/05	Number	Distribution	% of O'ahu	Number	Distribution	% of O'ahu	Number	Distribution
Existing Homes			20,804		7%	25,657		8%	33,141	
Number of Home Sales by Type and Price Affordable to Families Earning % of Median Income										
Less than 80% of median income	Below $150,000	Below $200,000	265	21%	15%	308	12%	14%	2,294	17%
80% to 100% of median income	$150,000 to $200,000	$200,000 to $240,000	239	19%	13%	280	11%	13%	4,119	32%
100% to 120% of median income	$200,000 to $240,000	$240,000 to $640,000	6	0%	3%	88	4%	15%	645	5%
120% to 200% of median income	$240,000 to $670,000	$640,000 to $640,000	-	0%	8%	46	2%	18%	319	2%
Over 200% of median income	Over $670,000	Over $640,000	-	0%	8%	83	3%	19%	430	3%
Total of Homes			500	40%	12%	1,315	53%	17%	7,717	59%
Single-family Homes										
Less than 80% of median income	see above	see above	67	5%	18%	20	1%	4%	144	1%
80% to 100% of median income	*	*	483	39%	22%	478	19%	30%	1,598	12%
100% to 120% of median income	*	*	199	16%	29%	345	14%	32%	1,089	8%
120% to 200% of median income	*	*	1	0%	9%	204	8%	25%	824	6%
Over 200% of median income	*	*	1	0%	8%	119	5%	7%	1,694	13%
Total of homes			751	60%	17%	1,166	47%	22%	5,337	41%
All Homes										
Less than 80% of median income	see above	see above	332	27%	15%	328	14%	25%	2,348	18%
80% to 100% of median income	*	*	712	57%	19%	1,258	51%	27%	4,735	44%
100% to 120% of median income	*	*	205	16%	23%	443	18%	29%	1,714	13%
120% to 200% of median income	*	*	1	0%	8%	250	10%	22%	1,143	9%
Over 200% of median income	*	*	1	0%	8%	202	8%	10%	2,124	16%
Total Home Sales			1,251	100%	15%	2,481	100%	19%	12,054	100%
Median Sales Price										
Multi-family Homes			$125,450		7%	$384,466		10%	$286,000	
Single-family Homes			$238,100		8%	$400,000		8%	$525,000	
All Homes			$190,500		8%	$384,858		10%	$399,000	
Average Sales Price										
Multi-family Homes			$144,881		7%	$328,137		10%	$317,393	
Single-family Homes			$232,817		6%	$478,403		7%	$484,357	
All Homes			$200,552		7%	$398,758		8%	$446,975	

* Year 2004/05 = 6/1/04 to 7/31/05

Source:
Mahi Corporation. "Ewa and Oahu's Affordable For-sale Housing Survey: a Recent Market Condition." September 28, 2005.
City & County of Honolulu. 2005.

2.2.3 *Preservation Component*

~~More than 40 sinkholes, eligible for listing National/Hawai'i Register of Historic Places, are located within an 7.4-acre archaeological/paleontological Preserve Area at the southwest corner of the site. The preserve was created in the 1990s and is bound by a chain-link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. The close concentration of sinkholes has scientific value, and the 7.4-acre area surrounding the sinkholes will be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.~~

Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

The preserve area was formed in the early 1990s, with the guidance of Bishop Museum zoologist Dr. Alan Ziegler, who conducted substantial investigations of the sinkhole resources. In December 1992, Dr. Ziegler walked the site with representatives of the Estate of James Campbell, to delineate the position for a boundary fence to protect the significant sinkhole resources. The area was subsequently fenced by the Estate. At the time the fence was erected, the area of the preserve was estimated to be between 7 and 8 acres, but was never formally surveyed. In the Draft EIS, the approximate land area for the sinkhole preserve was erroneously estimated to be 7.4 acres. As a follow-up to inquiries regarding the sinkhole preserve, Kapolei Property Development commenced a land survey of the fenced area in October 2006. The survey indicates an actual area of approximately 6 acres enclosed by the boundary of the fenced sinkhole preserve. Sinkhole resources of significance lie within this approximate 6-acre area, as bounded by the AES coal conveyor to the west, the HWS waste pile to the north, existing Hanua Road to the east, and an existing access road off Hanua Road serving the compost business tenant. The land between Malakole Street and the fence is not included in the sinkhole preserve area, as it includes an easement for pipelines and the roadway access to the adjoining compost business tenant.

The close concentration of sinkholes has significant scientific value, and the approximate 6-acre area will continue to be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The existing fence has gaps in two portions that will be closed, and locked gates will be added. The sinkhole preserve will continue to be accessible for future research and education.

Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

LINDA LINGLE
GOVERNOR
THEODORE E. LIU
DIRECTOR
MARK K. ANDERSON
DEPUTY DIRECTOR

STRATEGIC INDUSTRIES DIVISION
235 South Beretania Street, Leiopapa A Kamehameha Bldg., 5th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-3807
Fax: (808) 586-2536
Web site: www.hawaii.gov/dbedt

RECEIVED
AUG 16 2006
GROUP 70 INC.

August 11, 2006

Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813

Attn: Jeffrey Overton

Re: Draft Environmental Impact Statement (DEIS)
Kapolei Harborside Center, Ewa, Oahu
TMK: (1) 9-1-14:33 (por); 34; 9-1-14:35 and 9-1-15:20

In response to your August 4, 2006, notice, thank you for the opportunity to provide comments on the DEIS for the Kapolei Harborside Center. We note that this is a proposed business-industrial park. Our comments are addressed to: 1) State energy conservation goals, 2) energy saving design practices and technologies, and 3) recycling and recycled-content products. We would encourage the developers to include requirements that would reduce energy use in the park by future tenants, and, in that regard, refer them to Act 96, 2006, SLH.

(1) **State energy conservation goals**. Project buildings, activities, and site grounds should be designed with energy saving considerations. The mandate for such consideration is found in Chapter 344, HRS ("State Environmental Policy") and Chapter 226 ("Hawaii State Planning Act"). In particular, we would like to call to your attention HRS 226 18(c) (4) which includes a State objective of promoting all cost-effective energy conservation through adoption of energy-efficient practices and technologies. We suggest that you contact Hawaiian Electric Company, Inc., which may offer demand-side management rebates for energy efficient technologies and other measures which would reduce the use of energy within the park.

(2) **Energy saving design practices and technologies.** Methods and technologies that could be considered during the design phase of the project include:

a. Use of site shading, orientation, and use of naturally ventilated areas to reduce cooling load;
b. Maximum use of day lighting;
c. Use of high efficiency compact fluorescent lighting;
d. Exceed Model Energy Code requirements;
e. Use of photovoltaics, fuel cells and other renewable energy sources.

f. Use of roof and gutter to divert rainwater for landscaping; and
g. Use of landscaping for dust control and to minimize heat gain to area.

(3) Recycling and recycled-content products.

a. Develop a job-site recycling plan for the construction phase of the project and recycle or otherwise provide for beneficial use as much construction and demolition waste as possible;
b. Incorporate provisions for recycling into the project – a collection system and space for bins for recyclables;
c. Specify and use products with recycled-content such as: steel, concrete aggregate fill, drywall, carpet and glass tile; and
d. Specify and use as appropriate, locally produced products such as plastic lumber, hydro-mulch, soil amendment, and glass tile.

In regard to your statement on page 4-51 regarding development of energy efficiency design guidelines, we would like to refer you to Hawaiian Electric Company, Inc. (HECO), and the Hawaii Solar Energy Association (HSEA) for review and comment. HECO has strict requirements to quality for rebates and works closely with HSEA on their requirements.

If you need clarification of any of the above, please do not hesitate to contact me.

Sincerely,

for Maurice H. Kaya
Chief Technology Officer

c: Kapolei Property Development, LLC
State Land Use Commission
State of Hawaii Office of Planning
OEQC

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Ralph E. Portmore, AICP
Of Counsel

November 20, 2006

Mr. Maurice H. Kaya, Chief Technology Officer
State of Hawaii
DBEDT, Strategic Industries Division
P.O. Box 2359
Honolulu, HI 96804

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Mr. Kaya,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement. Your comments are addressed in the order they are presented.

1. Strategic energy conservation goals. The Petitioner supports State energy conservation goals, which include an objective of promoting cost-effective energy conservation through adoption of energy-efficient practices and technologies.

2. Energy saving design practices and guidelines. The Final EIS, Section 4.15, addresses some energy saving design practices and technologies, including those listed under Comment 2:

"Project requirements will be coordinated with these utility providers. Energy efficiency design guidelines will be developed as part of the Conditions, Covenants and Restrictions that will apply to the development of the project site. These "guidelines" will be submitted to the Energy Branch, State Department of Business, Economic Development and Tourism for review and input. Some energy conserving measures that will be included in the guidelines, among others, are:

- Use of timer or occupant-sensing light and air conditioning controls.
- Use of high-efficiency air conditioners and appliances.
- Use of heat pumps and solar heating systems.
- Promotion of energy saving opportunities through innovative building design.
- Use of landscaping for dust control and to minimize heat gain in the area."

3. Recycling. As stated in Section 4.13.4 of the Final EIS: "The project will develop a job-site recycling plan for the construction phase of the project and recycle or otherwise provide for beneficial use as much construction or demolition waste as possible. As appropriate, there will be consideration of establishing a recycling collection system and space for bins to collect glass, plastic, cardboard, cans, as well as recyclable construction materials. Where possible and appropriate, the project will specify and use products with

recycled content such as steel, concrete aggregate fill, drywall, carpet and glass tile. The project will also, where possible and appropriate, specify and use locally produced projects such as plastic lumber, hydro-mulch, soil amendment, and glass tile. The individual site contractor and leasees will be encouraged to implement their own recycling plans. Non-recycled solid waste generated at the site would be directed to H-power for energy generation."

Thank you for identifying relevant resources at the conclusion of your letter. The documents have been reviewed and recommendations will be addressed in the project design and construction.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

LINDA LINGLE
GOVERNOR

PATRICIA HAMAMOTO
SUPERINTENDENT

STATE OF HAWAI'I
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAII 96804

OFFICE OF THE SUPERINTENDENT

September 15, 2006

Mr. Steve Kelly
Kapolei Property Development, LLC
1001 Kamokila Boulevard, Suite 250
Kapolei, Hawaii 96707

Dear Mr. Kelly:

Subject: Draft Environmental Impact Statement for Kapolei Harborside Center
TMK: 9-1-014: por. 33, 34 & 35; & 9-1-015: por. 20, Ewa, Oahu

The Department of Education has no comment on the Draft Environmental Impact Statement for the Kapolei Harborside Center.

Thank you for the opportunity to review and comment. Should you have any questions, please call Heidi Meeker of the Facilities Development Branch at 733-4862.

Very truly yours,

Patricia Hamamoto
Superintendent

PH:jmb

c: Randolph Moore, Acting Assistant Superintendent, OBS
Duane Kashiwai, Public Works Manager, FDB
Anthony Ching, SLUC
Genevieve Salmonson, OEQC
Laura Thielen, Office of Planning, DBEDT
✓Jeffrey Overton, Group 70

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER

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Ralph E. Portmore, AICP
Of Counsel

November 20, 2006

Ms. Patricia Hamamoto, Superintendent
State of Hawai'i
Department of Education
P.O. Box 2360
Honolulu, HI 96804

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Ms. Hamamoto,

Thank you for your comment letter to Mr. Stephen Kelly of Kapolei Property Development concerning the Kapolei Harborside Center Draft Environmental Impact.

We acknowledge that you have no comment on the project.

Your letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

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LINDA LINGLE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. Box 3378
HONOLULU, HAWAII 96801-3378

CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

In reply, please refer to:
EPO-06-143

September 21, 2006

Mr. Jeffrey H. Overton, Vice President
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

SUBJECT: Draft Environmental Impact Statement for Kapolei Harborside Center
Honouliuli, Ewa District, Kapolei, Oahu, Hawaii
TMK: (1) 9-1-014: 033 (portion), 034 and 035
(1) 9-1-015: 020 (portion)

Thank you for allowing us to review and comment on the subject document. The document was routed to the various branches of the Environmental Health Administration. We have the following Wastewater Branch, Safe Drinking Water Branch, Clean Water Branch and Clean Air Branch, and Hazard Evaluation & Emergency Response Office (attached) comments.

Wastewater Branch

We have reviewed the subject document which proposes a reclassification of approximately 345 acres of land from the Agricultural District to Urban District to accommodate future industrial growth by providing additional industrial, including maritime related lease space. The project will also accommodate existing businesses that are being displaced from Honolulu.

We have no objections to the proposed Kapolei Harborside Center development as domestic wastewater treatment and disposal will be via a new connection system and new pump station to the existing Honouliuli Wastewater Treatment Plant.

We encourage the developer to work with the County and utilize recycled water for irrigation and other non-potable water purposes in major common areas such as parks, golf courses and other open spaces or landscaping areas.

All wastewater plans must conform to applicable provisions of the Department of Health's Administrative Rules, Chapter 11-62, "Wastewater System." We reserve the right to review the detailed wastewater plans for conformance to applicable rules. Should you have any questions, please contact the Planning & Design Section of the Wastewater Branch at (808) 586-4294.

Safe Drinking Water Branch

We have examined the DEIS and have the following comments to offer:

1. Section 4.3, Hydrology, states that, "Potable water will be provided to Kapolei Harborside Center by BWS, as discussed below in Section 4.14." However, the discussion of Water Supply was found in Section 4.13.2, beginning on page 4-44.

2. Page 4-45 of the DEIS indicates that a dual water system will be utilized to help conserve valuable freshwater resources. The potable and non-potable water systems must be carefully designed and operated to prevent cross-connections and backflow conditions. The two systems must be clearly labeled and physically separated by air gaps or reduced pressure principle backflow preventers to avoid contaminating the portable water supply. In addition, all non-potable spigots and irrigated areas should be clearly labeled with warning signs to prevent the inadvertent consumption of non-potable water.

If you have any questions, please contact Stuart Yamada of the Safe Drinking Waster Branch at 586-4258.

Clean Water Branch

The Department of Health (DOH), Clean Water Branch (CWB) has reviewed the limited information contained in the subject document and offers the following comments:

1. The Army Corps of Engineers should be contacted at (808) 438-9258 for this project. Pursuant to Federal Water Pollution Control Act (commonly known as the "Clean Water Act" (CWA) Paragraph 401(a)(1), a Section 401 Water Quality Certification (WQC) is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may **result** in any discharge into the navigable waters..." (emphasis added). The term "discharge" is defined in CWA, Subsections 502(16), 502(12), and 502(6); Title 40, Code of Federal Regulations (CFR), Section 122.2; and Hawaii Administrative Rules (HAR), Chapter 11-54.

2. In accordance with HAR, Sections 11-55-04 and 11-55-34.05, the Director of Health may require the submittal of an individual permit application or a Notice of Intent (NOI) for general permit coverage authorized under the National Pollutant Discharge Elimination System (NPDES).

   a. An application for an NPDES individual permit is to be submitted at least 180 days before the commencement of the respective activities. The NPDES application forms may also be picked up at our office or downloaded from our website at: thttp://www.hawaii.gov/health/environmental/water/cleanwater/forms/indiv-index.html.

b. An NOI to be covered by an NPDES general permit is to be submitted at least 30 days before the commencement of the respective activity. A separate NOI is needed for coverage under each NPDES general permit. The NOI forms may be picked up at our office or downloaded from our website at: http://www.hawaii.gov/health/environmental/water/cleanwater/forms/genl-index.html.

   i. Storm water associated with industrial activities, as defined in Title 40, CFR, Sections 122.26(b)(14)(i) through 122.26(b)(14)(ix) and 122.26(b)(14)(xi). [HAR, Chapter 11-55, Appendix B]

   ii. Construction activities, including clearing, grading, and excavation, that result in the disturbance of equal to or greater than one (1) acre of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. **An NPDES permit is required before the commencement of the construction activities.** [HAR, Chapter 11-55, Appendix C]

   iii. Discharges of treated effluent from leaking underground storage tank remedial activities. [HAR, Chapter 11-55, Appendix D]

   iv. Discharges of once through cooling water less than one (1) million gallons per day. [HAR, Chapter 11-55, Appendix E]

   v. Discharges of hydrotesting water. [HAR, Chapter 11-55, Appendix F]

   vi. Discharges of construction dewatering effluent. [HAR, Chapter 11-55, Appendix G]

   vii. Discharges of treated effluent from petroleum bulk stations and terminals. [HAR, Chapter 11-55, Appendix H]

   viii. Discharges of treated effluent from well drilling activities. [HAR, Chapter 11-55, Appendix I]

   ix. Discharges of treated effluent from recycled water distribution systems. [HAR, Chapter 11-55, Appendix J]

   x. Discharges of storm water from a small municipal separate storm sewer system. [HAR, Chapter 11-55, Appendix K]

   xi. Discharges of circulation water from decorative ponds or tanks. [HAR, Chapter 11-55, Appendix L]

3. In accordance with HAR, Section 11-55-38, the applicant for an NPDES permit is required to either submit a copy of the new NOI or NPDES permit application to the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD), or demonstrate to the satisfaction of the DOH that the project, activity, or site covered by the NOI or application has been or is being reviewed by SHPD. If applicable, please submit a copy of the request for review by SHPD or SHPD's determination letter for the project.

4. Any discharges related to project construction or operation activities, with or without a Section 401 WQC or NPDES permit coverage, shall comply with the applicable State Water Quality Standards as specified in HAR, Chapter 11-54.

The Hawaii Revised Statutes, Subsection 342D-50(a), requires that "[n]o person, including any public body, shall discharge any water pollutants into state waters, or cause or allow any water pollutant to enter state waters except in compliance with this chapter, rules adopted pursuant to this Chapter, or a permit or variance issued by the director."

If you have any questions, please contact Mr. Alec Wong, Supervisor of the Engineering Section, CWB, at (808) 586-4309.

Clean Air Branch

Control of Fugitive Dust

A significant potential for fugitive dust emissions exists during all phases of construction and operations. Proposed activities that occur in proximity to existing residences, businesses, public areas or thoroughfares, exacerbate potential dust problems. It is recommended that a dust control management plan be developed which identifies and addresses all activities that have a potential to generate fugitive dust. The plan, which doses not require the Department of Health (DOH) approval, would help with recognizing and minimizing the dust problems from the proposed project.

Activities must comply with the provisions of Hawaii Administrative Rules, §11-60.1-33 on Fugitive Dust. In addition, for cases involving mixed land use, we strongly recommend that buffer zones be established, wherever possible, in order to alleviate potential nuisance problems.

The contractor should provide adequate measures to control the fugitive dust from the road areas and during the various phases of construction. Examples of measures that can be implemented to control dust include, but are not limited to, the following:

a) 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;

b) Providing an adequate water resource at the site prior to start-up of construction activities;
c) Landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase;
d) Minimizing dust from shoulders and access roads;
e) Providing adequate dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and
f) Controlling dust from debris being hauled away from the project site.

If you have any questions, please contact the Clean Air Branch at 586-4200

We strongly recommend that you review all of the Standard Comments on our website at: www.state.hi.us/health/environmental/env-planning/landuse/landuse.html. Any comments specifically applicable to this project should be adhered to.

If there are any questions about these comments please contact Jiacai Liu with the Environmental Planning Office at 586-4346.

Sincerely,

KELVIN H. SUNADA, MANAGER
Environmental Planning Office

c: EPO
WWB
SDWB
CWB
CAB
Mr. Steve Kelly, Kapolei Property Development, LLC
Mr. Anthony Ching, State Land Use Commission
Mr. Abe Mitsuda, State of Hawaii Office of Planning
Office of Environmental Quality Control

KHS
FL

LINDA LINGLE
GOVERNOR OF HAWAII

CHIYOME LEINAALA FUKINO,
M.D. DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:
06-589 HL

September 18, 2006

TO: Kelvin Sunada, Manager
Environmental Planning Office

FROM: Keith E. Kawaoka, D. Env., Program Manager KK
Hazard Evaluation & Emergency Response Office (HEER)

SUBJECT: Comments from HEER for Land Use Review
Kapolei Harborside Center Draft Environmental Impact Statement

Existing environmental concerns related to hazardous substance releases include an industrial-waste landfill in the southeast corner of the site and subsurface, petroleum contamination along the southern margin of the property, and residual pesticide contamination in the former sugarcane areas. Both the landfill areas and the area contaminated with petroleum are currently under HDOH oversight. Comments on each of these areas are provided below.

Industrial Landfill Area

Discuss the need to address potential vapor intrusion concerns for future buildings constructed in vicinity of the landfill. The landfill has been permanently capped and there are no plans to disturb the area during the proposed redevelopment. Direct-exposure to contaminated soil or other hazardous material that might be present in the landfill is therefore not likely to pose a concern to future workers in the redevelopment area. Vapors emitted from landfills can intrude into utility trenches or nearby buildings and pose potential explosion and toxicity concerns, (e.g., methane, petroleum and volatile organic compounds). The potential for these concerns to exist around the subject landfill needs to be discussed in the EIS, based on the nature of material disposed of in the landfill and data from past vapor studies. The presence or absence of vapors in the landfill was probably incorporated into the cap design so the information needed for the EIS should already exist.

Petroleum Contamination Area

Discuss the need to address potential vapor intrusion concerns for future buildings constructed in vicinity of the landfill. The nature and magnitude of remaining petroleum contamination along the southern margin of the site is not clearly discussed in the EIS. In some cases, the breakdown of petroleum in soil and groundwater over time can lead to the buildup of methane and potentially explosive condition in utility trenches and under buildings or other covered areas. This may require that engineered controls be included into the design of new utility trenches and buildings in areas where significant petroleum contamination is present.

Former Sugar Cane Areas

Discuss the need to test soils in the former sugar cane areas for the presence of residual pesticides, including arsenic and dioxin. Potentially harmful levels of pesticides pesticide-related contaminants have been identified in several former sugar cane lands. The primary contaminants of concern are dioxins and arsenic, although other pesticides could also be present above levels of potential concern. These contaminants pose potential threats to human health and the environment if present in soil above HDOH action levels. It is important to carry out at least a screening level evaluation of residual pesticide contamination in former agricultural land soils prior to redevelopment. Higher levels of residual contamination may be acceptable for industrial areas in comparison to residential areas. It is especially important to test former agricultural land soils prior to offsite reuse in new, residential redevelopment areas.

GROUP 70 INTERNATIONAL

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Of Counsel

November 20, 2006

Mr. Kelvin Sunada, Manager
State of Hawai'i
Department of Health, Environmental Planning Office
P.O. Box 3378
Honolulu, HI 96801-3378

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Mr. Sunada,

Thank you for your comment letter and memorandum concerning the Kapolei Harborside Center Draft Environmental Impact. The following responses are offered to the Department of Health's (DOH) comments.

1. Wastewater Branch. We acknowledge that the Wastewater Branch has no objections to the Kapolei Harborside Center project. The Petitioner will work with the County to facilitate use of recycled water for irrigation and other non-potable water purposes. Detailed wastewater plans will be provided to DOH for review and input as the development progresses to future phases.

2. Safe Drinking Water Branch. The Final EIS correctly states the location of the Water Supply discussion found in Section 4.13.2. As development plans progress more detailed information will become available on the planned dual-water system. In all instances, however, the two systems will be carefully designed and clearly labeled to prevent cross-connections, backflow conditions and contamination of drinking water supply.

3. Clean Water Branch. The Army Corps of Engineers has received copies of the Kapolei Harborside Center Environmental Impact Statement Preparation Notice and the Draft Environmental Impact Statement and have provided no comments on the project. The project will comply with the requirements of the Clean Water Act, including the rules under HAR, Sections 11-54, 11-55-04, 11-55-34.05, 11-55-38 for submission of application for general permit coverage authorized under the National Pollutant Discharge Elimination System (NPDES). The Petitioner will comply with applicable discharge requirements.

4. Clean Air Branch. Development activities will comply with the provisions of HAR 11-60.1-33 on Fugitive Dust. We appreciate your recommendations that can be implemented to control dust and will take them into consideration as development plans progress.

5. Hazard Evaluation & Emergency Response.

   Industrial Landfill Area
   The industrial landfill associated with the former Hawaiian Western Steel operations is a monofill comprised of scrap steel, wet scrubber material, mill

scale [iron oxide], slag, electrode remnants, furnace bricks and inorganic baghouse dust containing iron, zinc, lead and cadmium. There were no records or evidence of any petroleum products or any appreciable amount of organic material being disposed of in the landfill. The design of the landfill cap was not required to incorporate provisions for the collection or venting of landfill gasses. With the exception of one area on the south slope of the west lobe of the waste pile where a buried tree stump was discovered and removed in 1995, there has been no evidence (such as bubbles or heaving of the asphalt) that gas has been generated in the landfill.

Petroleum Contamination Area

The hazards associated with the product plume were addressed in the Technical Memorandum, Tier II Evaluation of the Off-site Area, Kapolei, Hawaii, prepared by Dames and Moore for Chevron and dated June 13, 1997, and in subsequent correspondence between Chevron and the Estate of James Campbell (Campbell Estate). Chevron reported in a 1997 letter from Patricia Wagner to Susan Sublett-Graham (June 20, 1997) that U.S. Environmental Protection Agency (U.S. EPA) and Hawaii Department of Health (DOH) were currently reviewing the Tier II Evaluation.

During the review conducted in 1997, Campbell Estate and LFR asked Chevron and Dames and Moore (letter dated July 8, 1997) if there were any ignitability or explosive hazard risks posed by volatile hydrocarbons or methane gas (which might be produced by the biological break-down of the petroleum). Chevron assured LFR and Campbell Estate that Dames and Moore had measured the concentrations of flammable gases in samples collected on site and in samples collected on the south side of Malakole Road (closer to the Chevron Refinery, where conditions would presumably be worse), and the results indicated that there were no ignitability or explosive hazard risks.

This assertion is supported by the Organic Vapor Analyzer (OVA) results listed in Table 2 of the Dames and Moore 1997 Technical Memorandum which lists the highest concentration of volatile organic vapors in gas samples collected using surface isolation flux chambers as 170 ppmv in sample number F3-A04. The lower explosive limit (LEL) for gasoline is 14,000 ppmv.

In 1997, before the remediation was conducted, there was a plume of separate phase petroleum in the ground at the site at measured thicknesses up to one foot. After the remediation was completed, Chevron installed additional soil borings and monitoring wells in December 2005 in the subject area. No measurable thickness of separate phase petroleum was detected in any of the wells during the 2005 investigation. It is likely that the vapor concentrations now are significantly lower than they were in 1997.

Additionally, the nature and magnitude of the remaining petroleum contamination was investigated in 2005 by the installation of four soil borings and monitoring wells located within 30 feet of the pipeline corridor along the southern boundary of the site. The results of the 2005 sampling indicate that

no concentrations of BTEX and PAHs were detected in these wells or borings above the DOH environmental action levels (EALs). No measurable thickness of PSH was detected in any of the wells.

As noted in LFR's July 6, 2006 report, remaining elevated petroleum hydrocarbon concentrations in a limited portion of the area north of Malakole road will also require some on-going institutional controls. Specifically, future subsurface utility work or building construction which includes excavation to depths greater than five feet in the vicinity of boring/well F2-OBLO20A (*see figure 3, Appendix K*) will require the following precautions. First, construction workers at the site must have hazardous materials training (HAZWOPER) as required by 40 CFR 1910.120, and must prepare a health and safety plan prior to conducting any work at the site. The health and safety plan should include requirements to monitor the LEL in the work area and monitor for hydrocarbon concentrations in the breathing zone. Any soil that is excavated from depths greater than four (4) feet will have to be sampled and characterized for proper re-use on site or off-site disposal. Finally, any groundwater that is pumped during de-watering activities may require treatment before it is disposed on-site or off-site to avoid worker exposure or regulatory violations.

Former Sugar Cane Areas

A screening level evaluation of the soils on the property for agricultural chemical residue will be conducted prior to construction of the project. If contaminants are identified at levels of concern, appropriate measures will be taken in compliance with State DOH requirements.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

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GOVERNOR

RODNEY K. HARAGA
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:

STP 8.2279

September 21, 2006

TO: LAURA H. THIELEN, DIRECTOR
OFFICE OF PLANNING
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT AND TOURISM

FROM: RODNEY K. HARAGA
DIRECTOR OF TRANSPORTATION

SUBJECT: KAPOLEI PROPERTY DEVELOPMENT, LLC
KAPOLEI HARBORSIDE CENTER, DRAFT EIS
PETITION DOCKET NO. A06-763, AS AMENDED

Our earlier comments on the subject project provided in our earlier letter STP 8.2167 dated May 23, 2006 (copy attached) are still applicable. The following are additional or supplemental comments on the project:

1. The overflights of aircraft using Kalaeloa Airport and Honolulu International Airport can cause single-noise events to be experienced in the project. The petitioner/developer should provide the necessary notification and disclosure to prospective occupants of the project that such aircraft events can happen.

2. Actual uses, activity and construction of industrial facilities in the project that can impact aircraft flight need to be identified and reviewed. Examples are, but not limited to, tall towers, smoke or heat emissions and wildlife attractants. We recommend that the proposed developments in the project go through a screening process implemented by the petitioner/developer, that can involve our Airports Division, or a condition for avigation easement be provided to our Airports Division to allow the necessary review to be done to prevent any tenant or occupant activity from being detrimental to the aircraft operations, particularly for Kalaeloa Airport. Additionally, developments in the project that need further scrutiny should be required to submit a Notice of Proposed Construction or Alteration (FAA Form 7460-1) to the local Federal Aviation Administration office.

3. The future Lauwiliwili Street (makai), which is proposed as a four-lane divided roadway from the Hanua Street Extension to Kalaeloa Barbers Point Harbor, is planned to serve as the primary access to the harbor. The Draft EIS indicated that the roadway would be constructed by the State "once the right-of-way is transferred by the Harborside Center Project." The path of the roadway may impact tenancy at the harbor. Coordination of the right-of-way and alignment of the proposed roadway needs to be done by the petitioner/developer as early as possible with both our Highways and Harbors Divisions.

4. We acknowledge the August 4, 2006 response by the planning/environmental consultant for the petitioner/developer on our initial storm water and drainage comments, particularly related to Kalaeloa Barbers Point Harbor. We remain concerned that delays or lengthy construction schedules for the improvements may allow surface water to impact the harbor. We seek a timely construction of the drainage improvements to prevent any further storm water runoff into Kalaeloa Barbers Point Harbor.

5. We recommend the petitioner/developer consult with and discuss the following two utility improvements with our Harbor Division:

   a. Need for a sewer line and/or easement or reservation for a line from the boundary of Kalaeloa Barbers Point Harbor through the project or roads in the project to the appropriate sewer mains and pump station.

   b. Need for an electric service line from the boundary of Kalaeloa Barbers Point Harbor through the project to the appropriate transmission line.

6. Since Hanua Street, between Lauwiliwili Street and the Palailai Interchange, and Lauwiliwili Street, between Kalaeloa Barbers Point Harbor and Hanua Street, are planned to become State highways, we want these roadways to be designed and constructed to State highway standards as a 4-lane, divided, access-controlled highway, at no cost to the State.

7. As a condition of land use entitlements, before the subject project can proceed, we need to reach a binding agreement with the petitioner/developer and the Estate of James Campbell concerning dedication of right-of-ways, funding of design, funding of improvements, and the management of access for Hanua Street mauka of Lauwiliwili Street and Lauwiliwili Street between Kalaeloa Barbers Point Harbor and Hanua Street.

8. The Draft EIS represented that nearly every project in the Ewa region listed in the TOP 2025 is going to be completed by 2018. This appears to be presumptive and also not up to date. The 2030 Oahu Regional Transportation Plan (ORTP) superseded the TOP 2005. Moreover, because we do not have unlimited resources and there are competing statewide priorities, the ORTP does not commit State funding of highway improvements.

9. We would like to have an explanation and clarification on how the following improvements, reported in the Traffic Impact Assessment Report (TIAR), Appendix C of the Draft EIS, are to be funded and what arrangements are being made for the improvements:

   a. On Page 3-6 of the TIAR, for the statement, " The mauka section [of Kalaeloa Boulevard] between the OR & L Tracks and the Palailai Interchange ramps is planned for widening to six lanes in conjunction with the Kapolei Commons development."

   b. On Page 3-8 of the TIAR, for the statement, "The section of Kalaeloa Boulevard between the OR & L track line and Malakole Street would be improved to City and/or State standards in conjunction with the development of the I-2 land along the west side of this section."

   c. On Page 3-8 of the TIAR, for the statement, "The Hanua Street Extension would likely be constructed as a four-lane roadway with landscaped median and separate turn lanes at the major cross streets."

   d. On Page 3-9 of the TIAR, for the statement, "Lauwiliwili Street is planned for extension westward [of Hanua Street] to provide the primary access route to the [Kalaeloa] Barbers Point Harbor, with this extension expected to be constructed by the State DOT." We need to note on this item that we have not agreed to construct any portion of Lauwiliwili Street outside the harbor.

The project's traffic impact and contribution to the cumulative traffic in Kapolei coupled with certain planned new roads and highway interchange improvements in the area will require further discussion and coordination. Kapolei is experiencing growth and change. There are other land development projects in Kapolei and on-going plans for roads and highway improvements. Our Highways staff will need to continue reviewing of the project and the local and regional traffic factors with the petitioner/developer.

We appreciate the opportunity to provide our comments.

Attach.

c: Anthony Ching, Land Use Commission
Genevieve Salmonson, Office of Environmental Quality Control
Jeffrey Overton, Group 70 International, Inc.
Steve Kelly, Kapolei Property Development, LLC

LINDA LINGLE
GOVERNOR

STATE OF HAWAII
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IN REPLY REFER TO:

STP 8.2167

May 23, 2006

Mr. Jeffrey H. Overton
Principal
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Subject: Kapolei Property Development, LLC
Kapolei Harborside Center
Environmental Impact Statement Preparation Notice (EISPN)
TMK: 9-1-14: 33 por., 34, 35, 9-1-15: 20 por.

In response to the public comment period for the notice on the subject project, we offer the following initial comments as an interested party:

1. We are very concerned about the water runoff from rainfall and drainage impacting Kalaeloa Barbers Point Harbor. Construction of berms at strategic locations are a temporary fix and will not prevent runoff into the harbor during heavy rains. The developer should install the appropriate drainage improvements prior to the urbanization of the area to prevent any flooding of our harbor facilities and runoff into the harbor. Flooding and runoff results in silt build-up in the harbor basin and more frequent dredging cycles and increases clean up costs for our Harbors Division and its lessees. Additionally, the storm water runoff exposes us to further costs and liabilities in complying with the Clean Water Act.

2. We should be included in agency reviews and approvals of the drainage plans for and around the subject project.

3. Due to the development's proximity to our harbor facilities, prospective tenants/occupants will be subjected to potential impacts from maritime operations. The petitioner/developer should provide the necessary notification and disclosures to these tenants/occupants to indemnify and provide liability protection to the State.

STP 8.2167

4. The subject project is under the flight patterns into and out of Kalaeloa Airport and on the approach to Runways 8L and 8R at Honolulu International Airport and will be impacted by single-event noise from aircraft. The petitioner/developer should provide the necessary notification and disclosures to prospective occupants of the project and indemnification and liability protection for the State, including any necessary avigation easement to the State.

5. We understand that a Traffic Impact Analysis Report (TIAR) will be prepared as part of the draft environmental impact statement. The TIAR should cover both the project traffic impacts and the cumulative traffic impacts to the community and region, which the project contributes to, including the existing and future road network in the area. The TIAR should provide recommended and required transportation mitigation measures and roadway improvements to address the impacts. We will need to review and approve the TIAR.

   We will defer any other additional comments until the draft environmental impact report is prepared. We would appreciate receiving at least seven (7) copies of the report for review by our operating divisions.

Thank you for your notification of the subject project. We appreciate the opportunity to provide our comments.

Very truly yours,

RODNEY K. HARAGA
Director of Transportation

DS:km

c: Laura Theilen, Office of Planning

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Ralph E. Portmore, AICP
Of Counsel

November 20, 2006

Mr. Rodney Haraga, Director
State of Hawai'i
Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Mr. Haraga,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact.

1. Aircraft Overflights. The landowner will notify prospective purchasers of properties in the Petition Area of the occurrence of single-noise events due to aircraft overflights from Kalaeloa Airport. The disclosure will be made through a disclosure document, which shall be signed by the purchaser as an affirmative acknowledgement of potential impacts.

2. Airports Division Coordination. Kapolei Property Development will coordinate with the Airports Division as the project progresses to examine appropriate height considerations as it relates to aviation and airport operations at Kalaeloa Airport.

3. Lauwiliwili Street. Kapolei Property Development will coordinate with the State DOT Highways and Harbors Divisions regarding the right-of-way and alignment for Lauwiliwili Street as the project progresses. The project is currently in the State Land Use Boundary Amendment phase of approvals with a conceptual master plan level of detail. Further detail will be established as development plans progress, at which time roadway plans will be evaluated more closely with DOT representatives.

4. Storm Water and Drainage Improvements. Planning and initial design of the ultimate drainage improvements for the region have begun. Also, the permitting process necessary for the offsite ultimate drainage outlet is underway. Initial calculations for the project indicate that the planned on-site controls will be adequate to serve the planned industrial center, including short-term construction phase runoff and runoff will not be directed toward Kalaeloa Barbers Point Harbor. Temporary drainage improvements are also being investigated to help alleviate the drainage problems in the area for the interim period prior to construction of the ultimate regional drainage system.

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925 Bethel Street, 5th Floor • Honolulu, Hawai'i 96813-4307 • Ph (808) 523-5866 • Fax (808) 523-5874 • www.group70int.com • mail1@group70int.com

5. Sewer and Electrical Service Coordination. As the project and roadway plans are advanced, Kapolei Property Development will coordinate with DOT Harbors Division in the planning for future sewer and electrical service routes through Kapolei Harborside Center.

6. Highway Access. Kapolei Harborside Center will need appropriate access to the major circulation roadways throughout the project area to serve the planned industrial center uses and to address regional connectivity. Kapolei Property Development will help facilitate improvements by providing the necessary land area, which holds significant value in the overall cost to develop these roadways, and by continuing to work with the State DOT to construct roadways necessary to serve State and private lands.

7. Discussions with DOT. Kapolei Property Development will continue to hold discussions with DOT to address the issues associated with providing land for State roadways, necessary roadway accesses for the industrial center and State lands and other roadway development issues.

8. 2030 Oahu Regional Transportation Plan (ORTP). The projects identified in the Draft EIS are part of the 2030 ORTP. We recognize the State has many priorities for highway funding and the Kapolei projects may be competing with others elsewhere in the State. Several of these projects, being regional in nature and connecting multiple State facilities, are strong candidates for State and Federal funding.

9. Clarification of Improvements.
   a. Improvements to section of Kalaeloa Boulevard mauka of the OR&L track line will be implemented as part of the recommended traffic mitigations for the Kapolei Commons project. These improvements are currently under design.

   b. Improvements to serve adjoining lands along the section of Kalaeloa Boulevard makai of the OR&L track line will be addressed as part of adjacent industrially-zoned projects, per City subdivision requirements.

   c. The Hanua Street extension is addressed within the Kapolei West docket (LUC A04-753), where Aina Nui Corporation agreed to provide the land necessary for the right-of-way. This contribution holds significant value in the overall cost of the roadway and can be used for local "soft match" funds needed to secure Federal funding as has been done for projects in the area such as the Kapolei Interchange Complex. Because of this road's importance to serve the Kalaeloa Barber's Point Harbor, we feel this project is a candidate for State and Federal funding.

   d. Lauwiliwili Street, along with Hanua Street, will provide public access between the H-1 freeway and Kalaeloa Barbers Point Harbor. Kapolei Property Development could agree to provide the land necessary for the right-of-way. We feel this project is a candidate for State and Federal funding with the value of the land going towards local "soft match" funding as explained above.

As the planning for Kapolei Harborside Center progresses, we look forward to continued discussions with the State DOT. Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

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GENEVIEVE SALMONSON
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September 20, 2006

Mr. Steve Kelly, Manager
Kapolei Property Development, LLC
1001 Kamokila Boulevard, Suite 250
Kapolei, Hawai'i 96707

Mr. Anthony Ching
State of Hawaii, Land Use Commission
P.O. Box 2359
Honolulu, Hawai'i 96804

Mr. Jeff Overton
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawai'i 96813

Dear Messrs. Kelly, Ching, and Overton:

The Office of Environmental Quality Control has reviewed the draft environmental impact statement for the Kapolei Harborside Center (LUC Docket A06-763/Kapolei Property Development, LLC) and offers the following comments.

1. ***Former Hawaiian Steel Waste Pile and Malakole Road Parcel North of the Chevron Refinery***: Figure 1 of Appendix K of the draft environmental impact statement indicates the locations of the Chevron Investigation Area north of Malakole Road and the HWS Waste Pile. We request that you superimpose the locations of these two sites on Figure 1-2, Tax Map Key and include this as a *separate figure* in the body of the environmental impact statement (preferably within Section 4.14 Hazardous and Regulated Sites).
2. ***Subsurface Product Plume***: The product plume on the Malakole Road Parcel possibly consists of gasoline and diesel as well as other petroleum related constituents. Please discuss the possibility of volatilization of the product plume past the ground surface and the additional possibility of an ignitability and/or explosive hazard from such volatilization.

Thank you for the opportunity to comment. Please call Mr. Leslie Segundo, Environmental Health Specialist at (808) 586-4185 if you have any questions.

Sincerely,

Genevieve Salmonson

GENEVIEVE SALMONSON
Director

GROUP 70 INTERNATIONAL

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Of Counsel

November 20, 2006

Ms. Genevieve Salmonson, Director
State of Hawai'i
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, HI 96813

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Ms. Salmonson,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact.

The hazards associated with the product plume were addressed in the Technical Memorandum, Tier II Evaluation of the Off-site Area, Kapolei, Hawaii, prepared by Dames and Moore for Chevron and dated June 13, 1997, and in subsequent correspondence between Chevron and the Estate of James Campbell (Campbell Estate). Chevron reported in a 1997 letter from Patricia Wagner to Susan Sublett-Graham (June 20, 1997) that U.S. Environmental Protection Agency (U.S. EPA) and Hawaii Department of Health (DOH) were currently reviewing the Tier II Evaluation.

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This assertion is supported by the Organic Vapor Analyzer (OVA) results listed in Table 2 of the Dames and Moore 1997 Technical Memorandum which lists the highest concentration of volatile organic vapors in gas samples collected using surface isolation flux chambers as 170 ppmv in sample number F3-A04. The lower explosive limit (LEL) for gasoline is 14,000 ppmv.

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2005 investigation. It is likely that the vapor concentrations now are significantly lower than they were in 1997.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

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STATE OF HAWAI'I
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OCT 11

HRD06/2270D

October 2, 2006

Laura H. Thielen, Director
State of Hawai'i Office of Planning
Department of Business, Economic Development & Tourism
235 South Britannia Street, 6th Floor
Honolulu, HI 96813

RE: Petition for Amendment to the State Land Use District Boundaries, Kapolei Harborside Center, 'Ewa, Oahu, TMK: 9-1-014:033 (por.) and 034, 9-1-014:035, and 9-1-015:020 (por.).

Dear Ms. Thielen,

The Office of Hawaiian Affairs (OHA) is in receipt of the subject petition and offers the following comments. We apologize for the delayed response and thank you for continuing consultation on this proposed undertaking.

Our staff has several recommendations regarding the 7.4-acre Sinkhole Preserve Area. First, we recommend that the subject petition be conditional upon approval of a Preservation Plan by the State Department of Natural Resources, State Historic Preservation Division (DLNR/SHPD). This plan should include provisions to replace the existing fence around the sinkholes with a stronger fence, and include the wet sinkhole and any other nearby sinkholes that are outside and adjacent to the existing fence. The plan should also detail long-term commitments to maintain the fence, in order to ensure the preserve is honored. Second, we recommend that the state land use classification for the sinkhole preserve be amended from Agricultural to Conservation District. Third, we recommend that the county re-zone the sinkhole preserve from Agriculture to Preservation.

We also recommend that the subject petition be conditional upon approval of Preservation Plans by the DLNR/SHPD for the newly-discovered sites designated CSH-1 and CSH-2. Both of these sites are prehistoric and/or early historic stone enclosures that most likely served as temporary shelters in support of traditional, subsistence fishing and gathering activities. Such sites are rare on the 'Ewa Plain, and, as such, they should be preserved in perpetuity.

We also recommend that the subject petition be conditional upon preparation of an Archaeological Monitoring Plan, for approval by the DLNR/SHPD, to make a reasonable effort

to safeguard any areas where sinkholes and potential burials or other culturally-significant and/or natural resources (*e.g.,* paleontological avifauna) may be exposed during construction (*e.g.,* grading and bulldozing). We are not suggesting that all ground disturbance throughout the project area will have to be monitored, but that a qualified archaeological consultant should design a program of monitoring that combines on-site (full-time) monitoring with periodic spot checks, during planned construction, as deemed appropriate.

We also recommend the use of non-potable or reclaimed water sources for all construction activities associated with this project. Finally, we encourage the use of native (indigenous and endemic) plants for landscaping.

OHA further requests your assurances that if this project goes forward, should iwi or Native Hawaiian cultural or traditional deposits be found during ground disturbance, work will cease, and the appropriate agencies will be contacted pursuant to applicable law.

Thank you again for the opportunity to comment. If you have further questions or concerns, please contact Kai Markell, Lead Advocate – Culture, at (808) 594-1945 or kaim@oha.org.

Sincerely,

Clyde W. Nāmu'o
Administrator

C: Mr. Steve Kelly
Kapolei Property Development, LLC
1001 Kamokila Boulevard, Suite 250
Kapolei, HI 96707

Mr. Anthony Ching
State Land Use Commission
P.O. Box 2359
Honolulu, HI 96804

Ms. Genevieve Salmonson
OEQC
235 South Beretania Street, Suite 702
Honolulu, HI 96813

Mr. Jeffrey Overton
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813

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INTERNATIONAL

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Donna D. Pennington
Kimberly Polkinhorn, AIA, LEED
Scott Tangonan
Tom Young, AIA

Ralph E. Portmore, AICP
Of Counsel

November 20, 2006

Mr. Clyde W. Nāmuʻo, Administrator
State of Hawaiʻi
Office of Hawaiian Affairs
711 Kapiʻolani Boulevard, Suite 500
Honolulu, HI 96813

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Mr. Nāmuʻo,

Thank you for the copy of your comment letter to Laura Thielen concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

The Petitioner is committed to the preservation of the existing coral sinkholes found in an approximately 6-acre area of the proposed Kapolei Harborside Center (also see attached). Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, we recognize the works of Dr. Alan Ziegler, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. These resources shall remain unaffected by the proposed industrial center through the formal establishment of an approximately 6-acre sinkhole preserve area.

As part of the subject State Land Use Boundary Amendment process, the owners will accept a condition to set aside this approximately 6-acre area as a natural resource preserve. An amendment to a Conservation District would be inappropriate from a land use planning and policy standpoint, as the parcel would be surrounded by industrial land. When Kapolei Harborside Center proceeds into Change of Zone phase, the sinkhole preserve will be classified as Preservation.

Since the early 1990's, a chain link fence was erected to enclose the preserve area, with some openings along the western and southern sides. This fence will be extended to enclose the entire approximately 6-acre preserve, with the addition of locked gates. The wet sinkhole is included in question is located inside the preserve area. Access to the preserve will be provided for future scientific investigations, and to continue the use of this area as a "living classroom" setting for schools and environmental education groups.

The Petitioner will coordinate with the State Department of Land and Natural Resources, State Historic Preservation Division (DLNR/SHPD) to develop Preservation Plans for the approximately 6-acre sinkhole preserve area and for the newly discovered sites designated CSH-1 and CSH-2. As development plans

progress and as appropriate, the Petitioner will also coordinate with DLNR/SHPD on a archaeological monitoring plan.

Kapolei Property Development intends to develop a dual-water system for the Kapolei Harborside Center project. While the Petitioner is committed to use non-potable and/or reclaimed water for Kapolei Harborside Center, these sources are not available at this time. Kapolei Harborside Center will connect to the dual-water system once the Board of Water Supply brings non-potable source water to the project area. The Petitioner will explore other interim options that may allow the use of non-potable water during construction phases. As the project develops and as appropriate, there will be consideration for the use of native plants for landscaping.

As a standard contracting procedure, contractors working in the project area will be advised that, should any significant cultural features be found during construction, work in the immediate vicinity will stop and DLNR/SHPD will be promptly notified to determine the appropriate course of action.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

Attachment

2.2.3 Preservation Component

~~More than 40 sinkholes, eligible for listing National/Hawai'i Register of Historic Places, are located within an 7.4-acre archaeological/paleontological Preserve Area at the southwest corner of the site. The preserve was created in the 1990s and is bound by a chain-link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. The close concentration of sinkholes has scientific value, and the 7.4-acre area surrounding the sinkholes will be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.~~

Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

The preserve area was formed in the early 1990s, with the guidance of Bishop Museum zoologist Dr. Alan Ziegler, who conducted substantial investigations of the sinkhole resources. In December 1992, Dr. Ziegler walked the site with representatives of the Estate of James Campbell, to delineate the position for a boundary fence to protect the significant sinkhole resources. The area was subsequently fenced by the Estate. At the time the fence was erected, the area of the preserve was estimated to be between 7 and 8 acres, but was never formally surveyed. In the Draft EIS, the approximate land area for the sinkhole preserve was erroneously estimated to be 7.4 acres. As a follow-up to inquiries regarding the sinkhole preserve, Kapolei Property Development commenced a land survey of the fenced area in October 2006. The survey indicates an actual area of approximately 6 acres enclosed by the boundary of the fenced sinkhole preserve. Sinkhole resources of significance lie within this approximate 6-acre area, as bounded by the AES coal conveyor to the west, the HWS waste pile to the north, existing Hanua Road to the east, and an existing access road off Hanua Road serving the compost business tenant. The land between Malakole Street and the fence is not included in the sinkhole preserve area, as it includes an easement for pipelines and the roadway access to the adjoining compost business tenant.

The close concentration of sinkholes has significant scientific value, and the approximate 6-acre area will continue to be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The existing fence has gaps in two portions that will be closed, and locked gates will be added. The sinkhole preserve will continue to be accessible for future research and education.

Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

UNIVERSITY OF HAWAI'I AT MANOA
Environmental Center

September 22, 2006
RE:0754

Mr. Steve Kelly
Kapolei Property Development, LLC
1001 Kamokila Boulevard, Suite 250
Kapolei, HI 96707

Dear Mr. Kelly:

Draft Environmental Impact Statement
Kapolei Harborside Center
Kapolei, Oahu

The site of the proposed Kapolei Harborside Center is 345 acres of former agricultural land. The majority of the site is vacant, though existing onsite uses include a nursery, a green waste collection and compost processing operation, fill material stockpiling, and a coal conveyor belt that transports coal from the harbor to power stations to the south of the site. All of the current and planned land uses surrounding the project area are urban, with no adjacent or nearby agricultural activities. A range of industrial uses is planned for Kapolei Harborside Center, which is consistent with City and County of Honolulu General Plan and 'Ewa Development Plan. The project will offer about 250 acres of industrial, warehouse and related business uses. The remaining acreage will be used for drainage, roadways, wastewater pumping station.

General Comment

The applicant should be commended for recognizing the archeological importance of the existing sinkholes on 7.4 acres of the subject property. The 'Ewa sinkholes are part of a coral reef formed about 120,000 years ago when sea level was higher. Today, this area consists of weathered karst (limestone substrate) dotted with sinkholes. At one time there were thousands of sinkhole located in an area between Kalaeloa and Waianae. Most were lost to agriculture and development. However, the remaining sinkholes contain many unique remains of extinct Hawaiian fauna including the *moa nalo* (a flightless goose-like duck) geese, 2 species of extinct crow, long-legged owl, a hawk, a sea eagle, gapers, flightless rails, a small petrel, and new Hawaiian honeycreepers.

In addition to its archeological significance, is its importance as an educational resource. Future generations will be able to learn about this significant site, which is eligible for inclusion on the Hawai'i Register of Historic Places because it is being preserved now. Groups, such as the Hawaii Nature Center and Hawaii Audubon Society, have led educational field trips to the sinkholes. Hundreds of students, teachers, and others have learned about, and enjoyed visiting this interesting area.

2500 Dole Street, Krauss Annex 19, Honolulu, Hawai'i 96822-2313
Telephone: (808) 956-7361 • Facsimile: (808) 956-3980

An Equal Opportunity/Affirmative Action Institution

Enclosure by a chain link fence if well maintained by the landowner should be adequate to protect the resource. Some provisions should be made to allow legitimate researchers and educational groups to visit the site. These provisions should include written procedures for how to go about obtaining permission to enter the area and the conditions for viewing the area. Perhaps some form of interpretative signage could be developed by the landowner and the Department of Land and Natural Resources explaining the significance of the area. This might help reduce inadvertent damage. Interpretative signage in the Hanauma Bay Nature Preserve, for example, has helped reduce inadvertent damage done to the Bay by visitors.

Another issue raised in the DEIS, but not receiving enough attention, is the fate of the existing tenants and business presently using the land. Throughout the DEIS there are references to the higher or best use of the land as a justification for moving the present tenants off the land. However, there is little about were they will be able to relocate or whether they will be able to relocate. Since they are few in number and the landowner and state will profit from the proposed new use of the land, there should be some way to assist in the relocation of the present tenants or compensation for the loss of their place of business. The FEIS could be improved by a fuller discussion of the fate of present tenants.

In addition to the general comments, there are several areas that need further elaboration:

Purpose and Need for Development (p. 3-1 – 3-2)

On page 3-1, the last paragraph states that the Kapolei Harborside Center "will accommodate future industrial growth by providing additional industrial, including maritime-related lease space." It would be helpful to know how much industrial development is planned for this area and how much of the demand this project will satisfy.

On page 3-1, the bottom paragraph should have a citation. Who has determined that Oahu's industrial market is in a "frenzied" state with developers unable to meet demand?

On page 3-2, paragraphs 2 and 3, contains a reference to a Colliers Monroe Friedlander prediction about the industrial market and rents in the Hawaii market. There is no citation to the source of that opinion (study?) in the Reference section of the DEIS.

Agricultural and Soils (p. 4-18)

The statement in the mitigative subsection of the Agricultural and Soils section that the loss of a small amount of agriculture land is offset by the socio economic benefits may be technically correct, but in the future Hawaii may wish it had all the agriculturally suitable lands back to grow food. As fuel prices rise, we may be forced to produce our own food here.

Public Transit and Bicycle Travel (p. 4-37)

One of the ways to encourage commuting by bicycle is to install showers in each of the buildings planned. The relatively flat open ewa area makes it ideal for commuting by bicycle. Unfortunately, the heat and humidity in this part of the island makes staying dry while bicycling difficult. Installing showers will make it possible for area residents to bike to work and clean off before starting the day.

Water Supply (p. 4-45)

In the section on probable impacts on the top of the page, the DEIS states that "Development of the project will be coordinated with existing and potential water supply, and will be supportive of water conservation programs and practices in private industry to help meet long-term needs. Although that might be the plan, how can it be assured that the business moving into the area will continue to follow water conservation programs?

Power and Utilities (p. 4-50)

The DEIS states in the subsection of Possible Impacts that HECO will be able to supply the power needed to the project site. Assuming all the other projects in the area are also developed, UH West Oahu for example, will HECO need to build another power plant to handle the additional load? What happens if HECO is prevented from developing another generating facility are there any plans to look at the possibility that alternate power sources can be developed in the area to satisfy the additional demand for power that will be generated by this proposed development? Several mainland companies have developed or bought into alternative power development to satisfy their energy requirement. The Brooklyn Brewery in Brooklyn, New York, gets its power from an upstate wind farm and does not use power from the local utility.

Thank you for the opportunity to review this Draft EIS

Sincerely,

Peter Rappa
Environmental Review Coordinator

cc: OEQC
Anthony Ching, State Land Use Commission
Jeffry Overton, Group 70 International
Abe Mitsuda, Office of Panning-DBEDT
James Moncur, WRRC

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Of Counsel

November 20, 2006

Mr. Peter Rappa, Environmental Review Coordinator
University of Hawaii at Manoa
Environmental Center
2500 Dole Street, Krauss Annex 19
Honolulu, HI 96822-2313

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Mr. Rappa,

Thank you for your comment letter to Mr. Steve Kelly of Kapolei Property Development concerning the Kapolei Harborside Center Draft Environmental Impact Statement. The following are offered in response to your comments.

1. 'Ewa Sinkholes. We appreciate your recognition of Kapolei Property Development's efforts in maintaining this scientifically significant site. The Petitioner is committed to the preservation of the existing coral sinkholes found in an approximately 6-acre area of the proposed Kapolei Harborside Center (also see attached). Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, we recognize the works of Dr. Alan Ziegler, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. These resources shall remain unaffected by the proposed industrial center through the formal establishment of an approximately 6-acre sinkhole preserve area.

   As part of the subject State Land Use Boundary Amendment process, the owners will accept a condition to set aside this approximately 6-acre area as a natural resource preserve. Since the early 1990's, a chain link fence was erected to enclose the preserve area, with some openings along the western and southern sides. This fence will be extended to enclose the entire approximately 6-acre preserve, with the addition of locked gates. Access to the preserve will be provided for future scientific investigations, and to continue the use of this area as a "living classroom" setting for schools and environmental education groups.

2. Existing Tenants. The Petitioner has kept its existing tenants informed prior to and since announcing plans to develop the Kapolei Harborside Center. Of the four existing tenants, only two – Milo Nursery and Menehune Green – are intensive users of the site. All tenants will continue to be kept informed of the development plans as they progress.

3. Industrial Development. The market study for the Project was conducted by Robert Charles Lesser & Co. (*Appendix A*). This study determined that, in 2005, O'ahu had a supply of undeveloped industrial land of about 729 acres, of

which about 485 acres are likely to be developed for industrial users. By the beginning of 2009, this supply is expected to decrease to about 582 acres, of which about 349 acres are likely to be developed for industrial users.

At the beginning of 2009, this projected supply of about 349 acres will be comprised of the following: 251 acres (updated from 240 acres in the Market Feasibility Study) for the Project, about 54 acres elsewhere in West O'ahu, and about 44 acres for the remainder of the island. Thus, the Project accounts for about 85% of the West O'ahu supply of undeveloped industrial land that is likely to be developed for industrial users, and about 72% of the island-wide supply. Further discussion of industrial demand is found in Section 3.2.1 of the Final EIS.

4. Citation. The Industrial Market Feasibility study completed by Robert Charles Lesser & Co., LLC, which is included in Appendix A, identifies O'ahu's industrial market as being in a "frenzied" state with developers unable to meet demand. This has been cited appropriately in the Final EIS.

5. Reference. The reference to Colliers Monroe Friedlander's industrial market prediction is from Colliers Monroe Friedlander's Industrial Market Report – Honolulu Year-End 2005. This reference has been corrected and added to the Section 8.0 References.

6. Agricultural and Soils. We respectfully acknowledge your concern regarding Hawai'i's future and the potential need to produce our own food here. The site is designated as Industrial on the 'Ewa DP and has not been actively used for food production for years due to its poor soils. Kapolei Harborside Center meets some of O'ahu's industrial demand and keeps industrial uses within predescribed areas.

7. Public Transit and Bicycle Travel. As the project develops and as appropriate, there will be consideration of measures to accommodate pedestrian and bicycle commuters.

8. Water Supply. The Petitioner will work, to the extent possible, with new tenants and businesses to help ensure the application of water conservation programs.

9. Power and Utilities. HECO has indicated that it has planned for cumulative developments of West O'ahu and that this project is accommodated in those plans. Kapolei Harborside Center will continue to work with HECO to develop appropriate electrical infrastructure.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

Attachment

2.2.3 Preservation Component

~~More than 40 sinkholes, eligible for listing National/Hawai'i Register of Historic Places, are located within an 7.4 acre archaeological/paleontological Preserve Area at the southwest corner of the site. The preserve was created in the 1990s and is bound by a chain-link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. The close concentration of sinkholes has scientific value, and the 7.4 acre area surrounding the sinkholes will be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.~~

Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

The preserve area was formed in the early 1990s, with the guidance of Bishop Museum zoologist Dr. Alan Ziegler, who conducted substantial investigations of the sinkhole resources. In December 1992, Dr. Ziegler walked the site with representatives of the Estate of James Campbell, to delineate the position for a boundary fence to protect the significant sinkhole resources. The area was subsequently fenced by the Estate. At the time the fence was erected, the area of the preserve was estimated to be between 7 and 8 acres, but was never formally surveyed. In the Draft EIS, the approximate land area for the sinkhole preserve was erroneously estimated to be 7.4 acres. As a follow-up to inquiries regarding the sinkhole preserve, Kapolei Property Development commenced a land survey of the fenced area in October 2006. The survey indicates an actual area of approximately 6 acres enclosed by the boundary of the fenced sinkhole preserve. Sinkhole resources of significance lie within this approximate 6-acre area, as bounded by the AES coal conveyor to the west, the HWS waste pile to the north, existing Hanua Road to the east, and an existing access road off Hanua Road serving the compost business tenant. The land between Malakole Street and the fence is not included in the sinkhole preserve area, as it includes an easement for pipelines and the roadway access to the adjoining compost business tenant.

The close concentration of sinkholes has significant scientific value, and the approximate 6-acre area will continue to be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The existing fence has gaps in two portions that will be closed, and locked gates will be added. The sinkhole preserve will continue to be accessible for future research and education.

Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843

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G-70 INTERNATIONAL

MUFI HANNEMANN, Mayor

RANDALL Y. S. CHUNG, Chairman
HERBERT S. K. KAOPUA, SR.
SAMUEL T. HATA
ALLY J. PARK

RODNEY K. HARAGA, Ex-Officio
LAVERNE T. HIGA, Ex-Officio

CLIFFORD P. LUM
Manager and Chief Engineer

August 28, 2006

Mr. Jeffrey H. Overton, AICP
Vice President
Group 70 International, Incorporated
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813

Dear Mr. Overton:

Subject: Kapolei Harborside Center Draft Environmental Impact Statement,
TMK: 9-1-014: Por. 033 & 34; 9-1-014: 035 and 9-1-015: Por. 20

Thank you for the opportunity to comment on the proposed project.

The developer will be required to install the necessary water system improvements, including a reservoir, to serve the proposed development. The construction drawings should also be submitted for our review and approval.

When water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development.

The Board of Water Supply Rules and Regulations require the use of non-potable water for the irrigation of large landscaped areas.

If you have any questions, please contact Robert Chun at 748-5443.

Very truly yours,

for KEITH S. SHIDA
Principal Executive
Customer Care Division

cc: Mr. Steve Kelly, Kapolei Property Development, LLC
Mr. Anthony Chang, State Land Use Commission
Office of Environmental Quality Control
Mr. Abe Mitsuda, State of Hawaii Office of Planning

Water for Life . . . Ka Wai Ola

GROUP 70 INTERNATIONAL

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Scott Tangonan
Tom Young, AIA

Ralph E. Portmore, AICP
Of Counsel

November 20, 2006

Mr. Keith S. Shida, Principal Executive
City and County of Honolulu
Customer Care Division
Board of Water Supply
630 South Beretania Street
Honolulu, HI 96843

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Mr. Shida,

Thank you for your comment letters concerning the Kapolei Harborside Center Draft Environmental Impact Statement. The following are offered in response to your comments.

1. Kapolei Property Development will coordinate with the Board of Water Supply to address the necessary water improvements to serve the proposed project. Prior to installation, the construction drawings will be submitted for to the Board of Water Supply for review and approval.

2. We acknowledge that the Petitioner will be required to pay a Water System Facilities Charge for resource development.

3. Kapolei Property Development is planning to implement a dual-water system for the project area. We recognize that the Board of Water Supply Rules and Regulations require the use of non-potable water for the irrigation of large landscaped areas.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

Group 70 International, Inc. • Architecture • Planning • Interior Design • Building Diagnostics • Assets Management • Environmental Services
925 Bethel Street, 5th Floor • Honolulu, Hawai'i 96813-4307 • Ph (808) 523-5866 • Fax (808) 523-5874 • www.group70int.com • mail1@group70int.com

DEPARTMENT OF COMMUNITY SERVICES
CITY AND COUNTY OF HONOLULU
715 SOUTH KING STREET, SUITE 311 • HONOLULU, HAWAII 96813 • AREA CODE 808 • PHONE: 527-5311 • FAX: 527-5498

MUFI HANNEMANN
MAYOR

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AUG 16 2006

DEBORAH KIM MORIKAWA
DIRECTOR

DANILO "DANNY" AGSALOG
SENIOR ADVISOR

August 14, 2006

Mr. Jeffrey Overton, AICP, Vice President
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4907

Dear Mr. Overton:

Subject: Kapolei Harborside Center
Draft Environmental Impact Statement

We have reviewed the subject Draft Environmental Impact Statement and determined that the proposed Kapolei Harborside Center project will have no impact on any projects or programs of the Department of Community Services. We appreciate the opportunity to review and comment on the Draft Environmental Impact Statement. Questions regarding this matter may be directed to Mr. Keith Ishida at 527-5092.

Sincerely,

Deborah Kim Morikawa
Director

DKM:dk

cc: Kapolei Property Development, LLC
State Land Use Commission
Office of Environmental Quality Control
State of Hawaii, Office of State Planning

GROUP 70 INTERNATIONAL

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Ralph E. Portmore, AICP
Of Counsel

November 20, 2006

Ms. Deborah Kim Morikawa, Director
City and County of Honolulu
Department of Community Services
715 South King Street, Suite 311
Honolulu, HI 96813

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Ms. Morikawa,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

We acknowledge that this project will not affect projects or programs of the Department of Community Services.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 11TH FLOOR
HONOLULU, HAWAII 96813
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MUFI HANNEMANN
MAYOR

EUGENE C. LEE, P.E.
DIRECTOR

CRAIG I. NISHIMURA, P.E.
DEPUTY DIRECTOR

SEP - 5 2006

September 5, 2006

Mr. Jeffrey H. Overton, AICP
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Subject: Kapolei Harborside Center – Draft Environmental Impact Statement
Ewa, Hawaii
TMK: (1) 9-1-14:33 (por); 34; 9-1-14:35 and 9-1-15:20 (por)

Thank you for giving us the opportunity to comment on the above proposed facility.

The Department of Design and Construction recommends that the existing street lighting system on the roadways in and surrounding the proposed development be upgraded as required to meet the anticipated roadway classification caused by the proposed development.

Should you have any questions, please call Gerald Hamada, chief of our Mechanical and Electrical Division, at 527-5002.

Very truly yours,

for Eugene C. Lee, P.E.
Director

ECL:lt (167471)

c: DDC MED Division

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Of Counsel

November 20, 2006

Mr. Eugene C. Lee, P.E., Director
City and County of Honolulu
Department of Design and Construction
650 South King Street, 11th Floor
Honolulu, HI 96813

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Mr. Lee,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

Kapolei Property Development recognizes the desire to improve the existing street lighting system on the roadways in and surrounding the proposed development. As development plans progress, we will work closely with your Department to meet street lighting standards in accordance with the future anticipated roadway classifications.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY AND COUNTY OF HONOLULU
1000 ULUOHIA STREET, SUITE 308, KAPOLEI, HI 96707
TELEPHONE: (808) 692-5159 FAX: (808) 692-5113 WEBSITE: http://www.co.honolulu.gov

MUFI HANNEMANN
Mayor

ERIC S. TAKAMURA, Ph.D, P.E.
Director

KENNETH A. SHIMIZU
Deputy Director

PRO 06-052

September 25, 2006

VIA FACSIMILE: 808-523-5874

Jeffrey H. Overton, AICP, Vice President
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Subject: Kapolei Harborside Center
– Draft Environmental Impact Statement
'Ewa, Hawai'i TMK: (1) 9-1-14:33 (por); 34;
9-1-14:35 and 9-1-15:20 (por).

In reply to your subject letter of August 4, 2006, we provide the following comments from our Storm Water Quality Branch, Division of Environmental Quality:

- Pg 4-42, sec 4.13.1 Drainage Facilities
  - Include a reference to Appendix B, Preliminary Engineering Report. Include drainage maps of total drainage area and a separate drainage map specific to Kapolei Harborside Center. The Harborside Center drainage map should show location of the proposed 240-foot wide, 10-foot deep drainage channel.
  - Why are only 1-hour storms discussed in this section of the text? The Preliminary Engineering Report discusses discharges using Plate 6 of the City's "Rules Relating Storm Drainage Standards," which a requirement for all drainage areas over 100 acres. This should also be addressed in the main text.
- Appendix B, Preliminary Engineering Report
  - Pg 10: Why were one-hour storms used for Table 1, "Existing Runoff (1-hr Duration)," when the drainage areas are nearly all over 100 acres?
  - Pg 11: In Figure 6, "Onsite Drainage System," the 240-foot wide drainage channel narrows down considerably at Makakole. Is/will that portion of the channel be hardened? Describe how the runoff upstream of the railroad right-of-way will be collected.

  - Pg 14, last sentence: States that "It is anticipated that the channel will be excavated in hard coral and will not require concrete lining through its entire length. Is it the intent that it be left bare or vegetated?
  - Pg 15, par. 3: "Runoff will be diverted away from the Barbers Point Harbor and directed to the major drainage channel. How will this affect water quality at the coast?
  - Pg 16, par 3: States that soil erosion potential of the entire watershed should decrease after development. However, the table does not include sediment yield, change in the sediment discharge to the coast caused by diversion of runoff from the Barbers Point Deep Draft Harbor, and impact on coastal water quality.

Thank you for the opportunity to comment. Should you have any questions, please call Gerald Takayesu, Storm Water Quality Branch Head, at 692-5579 or call me at 692-5727.

Sincerely,

Jack Pobuk
CIP Program Coordinator

cc: DPP

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY AND COUNTY OF HONOLULU
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TELEPHONE: (808) 692-5159 FAX: (808) 692-5113 WEBSITE: http://www.co.honolulu.gov

MUFI HANNEMANN
Mayor

ERIC S. TAKAMURA, Ph.D, P.E.
Director

KENNETH A. SHIMIZU
Deputy Director

PRO 06-051

September 22, 2006

VIA FACSIMILE: 808-523-5874

Jeffrey H. Overton, AICP, Vice President
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Subject: Kapolei Harborside Center
– Draft Environmental Impact Statement
'Ewa, Hawai'i TMK: (1) 9-1-14:33 (por); 34;
9-1-14:35 and 9-1-15:20 (por),

We received a copy of your subject letter of August 4, 2006 and have the following comment for your consideration:

- Although the capacity of the liquid treatment side of the Honouliuli Wastewater Treatment Plant (WWTP) is up to 38 mgd, the capacity of the solids handling side is limited to about 27 to 29 mgd. Therefore, the statements in regards to the WWTP's capacity should be corrected to state that the average daily flow capacity is 27 to 29 mgd. This capacity limit of 27 to 29 mgd is only slightly more than the current flow. A City project to increase the solids handling capacity of the WWTP is proposed to start in the near future. Until this City project is completed, the WWTP cannot accommodate significant additional flow, such as from new developments that propose to connect to the City sewer system.

Thank you for the opportunity to comment. Should you have any questions, please call me at 692-5727.

Sincerely,

Jack Pobuk
CIP Program Coordinator

cc: DPP

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Of Counsel

November 20, 2006

Mr. Jack Pobuk, CIP Program Director
City and County of Honolulu
Department of Environmental Services
1000 Uluohia Street, Suite 308
Kapolei, HI 96707

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Mr. Pobuk,

Thank you for your comment letters concerning the Kapolei Harborside Center Draft Environmental Impact Statement. The following are offered in response to your comments.

1. Honouliuli Wastewater Treatment Plant. Discussions were held with the Department of Environmental Services regarding the treatment capacity at the Honouliuli Wastewater Treatment Plant (WWTP). The treatment plant was expanded to handle a liquid stream of 38 millions gallons per day (mgd), however, the solids handling capacity is limited to 27 – 29 mgd. There is still a limited amount of capacity in the solids handling stream, but is not sufficient to handle a large increase in flows that could be generated by a project of this size.

   The City is currently in negotiations with a contractor to implement improvements to increase the solids handling capacity. The improvements are estimated to take two years to complete. The planned improvements to the WWTP appear to fit well with the planned buildout of the Kapolei Harborside Center, which does not expect to be completed until 2018. It is likely that the development of the project site will begin after the completion of the improvements at the Honouliuli WWTP since additional entitlements are required. In the event that the Honouliuli WWTP improvements are not completed as hoped, temporary means of wastewater disposal could be investigated for the initial developments with the approval of the DES and the State's Department of Health. We will continue to coordinate our efforts with the Department of Environmental Services and the Department of Permitting and Planning on this issue.

2. Drainage Facilities. A reference to Appendix B, Preliminary Engineering Report, has been included in the Final EIS, Section 4.13.1 Drainage Facilities. Figure 5 of the Preliminary Engineering Report shows the total drainage basin and the location of the drainage channel running through the middle of the site. Figure 5 of the Preliminary Engineering Report shows the proposed drainage channel specific to Kapolei Harborside Center running from the railroad right-of-way to the ocean. Maps depicting the total drainage area and the specific drainage improvement for Kapolei Harborside Center have also been included in Section 4.13.1.

3. One-Hour Storms. Existing runoff was based on a one-hour duration for comparative purposes between areas both larger and smaller than 100 acres. Peak runoff rates under developed conditions were estimated for the 10-, 50-, and 100-year storms with a duration of one-hour. The 10- and 50-year runoff was estimated using the Soil Conservation Service's TR-20 hydrology program, while the 100-year runoff was based on Plate 6 of the City's "Rules Relating to Storm Drainage Standards". Actual design of drainage systems will be based on future developed conditions and will be based on the drainage areas served in accordance with the City's "Rules Relating to Storm Drainage Standards".

4. Onsite Drainage System. The drainage channel transitions from a trapezoidal unlined channel to a rectangular lined channel at Malakole Street. The channel below Malakole Street will continue the rectangular lined configuration to the shoreline. The channel makai of Malakole will also be tidal.

5. Drainage Improvement Surface. Initial hydraulic analysis assumes the channel will be ledge coral or limestone in accordance with the City's "Rules Relating to Storm Drainage Standards".

6. Coastal Water Quality. Developments draining to the drainage channel will be required to address water quality in accordance with the requirements of the storm drainage standards. This will minimize the impacts to the coastal waters.

7. Potential Soil Erosion. The approved 1991 Final EIS for the regional drainage channel has addressed erosion and water quality considerations. Not all of the runoff from the area is currently discharged to Kalaeloa/Barbers Point Harbor. A large portion of the area runs off to Malakole Street to the existing drainageway adjacent to Chevron U.S.A. Prior to construction of the existing coal conveyor, most of this runoff from the area made its way to Malakole Street and the drainageway. Diversion of runoff away from the harbor will follow the more historic path of previous runoff. With the implementation of water quality improvements by the individual developments within the watershed, sediment discharge and resulting impacts to coastal waters should be minimized.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

HONOLULU FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU
636 SOUTH STREET • HONOLULU, HAWAII 96813
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MUFI HANNEMANN
MAYOR

KENNETH G. SILVA
FIRE CHIEF

ALVIN K. TOMITA
DEPUTY FIRE CHIEF

August 17, 2006

Mr. Jeffrey H. Overton, AICP
Vice President
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

AUG 23 2006

Dear Mr. Overton:

Subject: Draft Environmental Impact Statement
Kapolei Harborside Center
Tax Map Keys: 9-1-014: 033 (Portion), 034, and 035
9-1-015: 020 (Portion)
Ewa, Kapolei, Oahu, Hawaii

In response to your letter of August 4, 2006, regarding the above-mentioned project, the Honolulu Fire Department reviewed the material you provided and has no additional comments. Please refer to our original comments dated May 1, 2006.

Should you have any questions, please call Battalion Chief Lloyd Rogers of our Fire Prevention Bureau at 723-7151.

Sincerely,

KENNETH G. SILVA
Fire Chief

KGS/SK:jl

cc: Steve Kelly, Kapolei Property Development, LLC
Anthony Ching, State Land Use Commission
Abe Mitsuda, State of Hawaii, Office of Planning
Office of Environmental Quality Control

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Ralph E. Portmore, AICP
Of Counsel

November 20, 2006

Mr. Kenneth G. Silva, Fire Chief
City and County of Honolulu
Fire Department
636 South Street
Honolulu, HI 96813

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Chief Silva,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

We acknowledge that the Fire Department has no further comments at this time.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

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DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU
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MUFI HANNEMANN
MAYOR

LESTER K.C. CHANG
DIRECTOR

DANA TAKAHARA-DIAS
DEPUTY DIRECTOR

AUG 23 2006

August 21, 2006

Mr. Jeffrey H. Overton, AICP, Vice President
Group 70 International
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Subject: Draft Environmental Impact Statement
Kapolei Harborside Center
Ewa, Hawaii, TMK (1) 9-1-14:33 (por); 34; 9-1-14:35 and 9-1-15:20 (por)

Thank you for the opportunity to review and comment on the Draft Environmental Impact Statement relating to the development of Kapolei Harborside Center.

The Department of Parks and Recreation has no comment on this project, other than to note that among the unresolved issues, is the matter of the petitioner being in discussion with the City and County of Honolulu regarding transfer of approximately 10 acres at the project area to be developed and dedicated as a recreational sports complex.

Should you have any questions please contact Mr. John Reid, Planner, at 692-5454.

Sincerely,

LESTER K. C. CHANG
Director

LKCC:mk
(168083)

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Scott Tangonan
Tom Young, AIA

Ralph E. Portmore, AICP
Of Counsel

November 20, 2006

Mr. Lester K.C. Chang, Director
City and County of Honolulu
Department of Parks and Recreation
Kapolei Hale
1000 Uluohia Street, Suite 309
Kapolei, HI 96707

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Mr. Chang,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

We acknowledge that the Department of Parks and Recreation has no comment at this time. We also note that the potential transfer of approximately 10 acres within the project area to the City and County of Honolulu for development as a recreational sports complex is still unresolved, and is being discussed further with the City.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

DEPARTMENT OF PLANNING AND PERMITTING
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MUFI HANNEMANN
MAYOR

HENRY ENG, FAICP
DIRECTOR

DAVID K. TANOUE
DEPUTY DIRECTOR

2006/ELOG-1956 (rys)

September 25, 2006

Mr. Jeffrey H. Overton, AICP
Vice President
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

RECEIVED
SEP 27 2006

Dear Mr. Overton:

Re: Draft Environmental Impact Statement (DEIS)
For the Kapolei Harborside Center Project at Kapolei, Oahu, Hawaii
TMK: 9-1-014: por. 033; 9-1-014: 034 & 035 and 9-1-015: por. 020

This is in response to your August 4, 2006 request for comments on the Draft Environmental Impact Statement (DEIS) dated July 2006 for the proposed Project in support of the applicant's petition to the Land Use Commission, and in support of County zoning from agriculture to industrial zoning. We have reviewed the DEIS and offer the following comments for your review and consideration for inclusion in the Final Environmental Impact Statement (FEIS):

1. Section 1.4 Reasons for Preparing This Environmental Impact Statement on page 1-9 and Table 5.7 Ewa Development Plan on page 5.38: The FEIS should explicitly state the applicant's intent to also use this EIS to satisfy the City and County of Honolulu's "significant" zone change requirement in Section 5.4.1 on pages 5-9 to 5-11 of the Ewa DP (specifically, that a significant zone change involves an application that involves a zone change of more than 25 acres or more to any zoning district or a combination of zoning districts, excluding preservation and agricultural zoning districts; or a change of more than 5 acres to the Apartment, Resort, Commercial; Industrial, or Mixed use zoning district). However, it should be noted that the DPP reserves the right to require additional information with the zone change application that may not be necessary for the impact statement.

2. Section 1.8 Unresolved Issues on page 1-16 and Section 7.0 Summary of Unresolved Issues on page 7-1: The traffic conditions during any anticipated "lag" between the construction time-table for highway improvements and pace of private developments should be disclosed and discussed (possibly in Section 2.3 Development Schedule and Process).

3. Section 1.10 Necessary Permits and Approvals on page 1-17: The drainage master plan shall be submitted to the DPP, not Board of Water Supply, and must also address the storm water quality requirements.

4. Section 2.2.2 Infrastructure - Roadways and Circulation on page 2-6, Section 4.10 Traffic on pages 4-22 to 4-37, and page 4-2 of Appendix C July 20, 2006 TIAR,:

- In support of efforts to improve connectivity throughout the Ewa development region, the DEIS states: "Specific issues regarding connectivity will be addressed as project planning and design advances for the change of zone process." The DEIS further states in Appendix C that, "Right-of-way would be preserved to allow the future connection of this street (Opakapaka) to the Kapolei West roadways to provide access to the Kapolei West and Makaiwa Hills areas via Kapolei West Road D if and when such a connection is desired by the city." These statements are encouraging in that they indicate that the developer and their consultants recognize the need for improving connectivity between developments where such opportunities exist, and where such potential connections can be accommodated.

- The Opakapaka Street Extension into the planned Kapolei West development should be indicated graphically on Figure 2-1 land use plan map, and that this connectivity option be noted in the section related to "proposed mitigative measures" for roadways and traffic in Section 1.6 on page 1-14 of the DEIS.

  Hanua Street Extension on pages 2-6 and Section 4.10 traffic – Planned Regional Transportation Improvements on page 4-28: The DEIS states that the project will provide "land for the Hanua Street ROW", and that the constructions of the Hanua Street Extension from Malakole Street to the Palailai Interchange are listed on the ORTP as project numbers 84 and 111. Please delete reference to the 2006-2008 Transportation Improvement Program (TIP).

  The EIS should indicate that the 2030 Oahu Regional Transportation Plan (ORTP) describes the Hanua Street projects as follows: Hanua Street Extension from Malakole to Farrington as a new 4-lane roadway, and the constructions of new on- and off-ramps (2 lanes/ramp) at the Interstate Route H-1 Palailai Interchange for the Hanua Street Extension, as project numbers 84 and 111, respectively.

  Since the Hanua Street extension from Malakole Street to the Palailai Interchange is the development's principal north-south connector, the FEIS should include a discussion of the anticipated completion date of these two important ORTP projects, and the alternate plan for ensuring their completion, should the Federal/State funding be unavailable to complete these two (2) projects in time for the opening of the project.

- Intermediary Traffic Conditions: The TIAR and FEIS should also add the analysis of the intermediary traffic conditions at 2010 in addition to the existing conditions, and conditions at project buildout in 2018. This will help assess the traffic conditions during the "lag" between construction of the on-site roadways and the regional improvements listed on page 4-28, which will directly affect the project area (especially ORTP projects 84 and 111), and the building permits for the industrial facilities.

5. Section 2.3 Development Schedule and Process on page 2-10:

- The project development schedule should be coordinated with the roadway improvement schedule. A graphic showing what segments of proposed roadway within (especially the construction of the Hanua Street Extension from Malakole Street to the Palailai Interchange) and without the project, along with estimated completion dates, should be included as part of the traffic analysis. This would allow the reader to better understand how the project phasing is being coordinated with the roadway improvements.

- Revise the last sentence of the last paragraph to read: "Construction of the regional drainage channel, which crosses the project area and will receive flows from mauka lands, shall be completed prior to full development of Kapolei Harborside Center." The anticipated route, including the origin and terminus, and the completion date of the onsite and offsite portions of the regional drainage channel should be provided, if it is available, to ensure the runoff through the section of the regional drainage channel through the project site, is conveyed to the ocean.

6. Section 4.2 Topography/Geology – Mitigative Measures on page 4-2: The discussion of the "construction period erosion control best management practices", which was supposed to be included in Section 4.8 Agriculture and Soils on pages 4-16 to 4-18 was apparently overlooked. This discussion should be included in the "Mitigative Measures" portion of Section 4.8 and include the following requirements:

- Sodding and plantings "shall be established on disturbed areas, which are at final grade or will not be worked for longer than 14 days." (DPP *Rules Relating to Soil Erosion Standards and Guidelines).*

- Grading and erosion control plans shall be performed in accordance with Chapter 14 (Public Works Infrastructure Requirements Including Fees and Services) of the Revised Ordinances of Honolulu (ROH).

7. Section 4.13 Drainage, Water, Wastewater, and Solid Wastes

- 4.13.2 Water Supply – Mitigative Measures on page 4-45: The anticipated date for the filing of the "Application for Water Use Permit" with the State Commission on Water Resource Management should be added, to confirm the adequacy of the potable water supply for the proposed industrial-business park.

- 4.13.3 Wastewater on pages 4-45 and 4-46: While the Honouliuli Wastewater Treatment Plant (WWTP) has a liquid treatment capacity of up to 38 mgd, the June 29, 2006 letter to the DPP from the Department of Environmental Services (ENV) on Aina Nui Corporation's zone change request for the Kapolei Commons Project, stated that the solids handling capacity is limited to about 27 to 29 mgd; and that the solids handling limit is only slightly more than the current flow into the facility. The solids handling capacity will be increased under the proposed

"Honouliuli Wastewater Treatment Plan Solids Handling System" project, which is tentatively scheduled "to start in the near future." Until this City project is completed, the WWTP cannot accommodate significant additional flow, such as from new developments that propose to connect to the City sewer system.

The applicant's discussion with the ENV about the solids handling capacity of the WWTP and ENV's anticipated completion date for increasing the solids handling capacity should be included in the FEIS.

Mitigative Measures on page 4-46: The approximate date of construction and the party responsible for the "parallel sewer", which "will ultimately be required to handle the additional flows" (last sentence of the second paragraph) from the Kapolei Harborside Center project, should be included in the FEIS.

DPP's Wastewater Branch reports that the subject area is part of the Kapolei Business Park, which will be serviced by the Kapolei Interceptor Sewer. The entire Kapolei Business Park is limited to a peak flow of 13 mgd. The overall peak flow is limited by the Kapolei Interceptor Sewer Agreement, which was approved the City Council on November 25, 2004. A wastewater master plan, sewer connections, and plan review are all required. Review of the master plan will determine the available wastewater capacity for the project. A wastewater master plan, including sewer connections, should be included in the FEIS if it is available.

You may call Ms. Tessa Ching of our Wastewater Branch at 523-4956 if you have any questions.

8. Section 4.16.1 Population and Affordable Housing on page 4-51: Please include the reference/source and basis of the data to support the following statements cited in the DEIS: (a) The Ewa Development Plan region "has offered approximately 7% to 10% more affordable housing units for sale than the island as a whole in recent years"; and (2) "the 'Ewa region has been satisfying an increasing share of O'ahu's affordable housing needs, well in excess of its 'fair share'." A table summarizing the data supporting these statements would be helpful.

9. Table 5.7. Ewa Development Plan – Objectives and Policies. Chapter 3, Land Use Policies, Principles, and Guidelines.

   - Section 3.1. Open Space Preservation and Development - General Policies of the DP on page 5-39 of the DEIS: The EIS should discuss utilizing the proposed drainageway corridor to create a linkage between existing and proposed neighboring communities, the Kapolei Harborside Center, and the waterfront. The DP's recreational policies further promote access to existing and potential recreational resources at the shoreline and ocean. This could be achieved through the provision of a bikeway/pedestrian connection from the Pearl Harbor Historic Trail (PHHT, a.k.a. OR&L Right-of-way) directly to the waterfront, located within or alongside the corridor.

Pearl Harbor Historic Trail Master Plan (May 2001): The PHHT plan should be included and addressed in the EIS in table 5.7 (in the discussion of Section 3.1 of the DP) and in Section 2.2.2. Infrastructure – Roadways and Circulation on page 2-6. The project should enhance the usability of the PHHT. A bikeway/ pedestrian trail connection from the PHHT to the waterfront would be consistent with the objectives of the PHHT Master Plan.

Improvements along the PHHT should be sensitively scaled and articulated to enhance views along the PHHT, and not detract from the Trail's desired character and environment. Landscaping improvements should be provided within the PHHT right-of-way.

10. Please discuss in an appropriate section of the EIS, the compatibility of this project with adjacent proposed land use and projects, especially the Kapolei West Project, regarding land uses and connectivity. Should Opakapaka Street provide access to the proposed industrial development, as part of the Kapolei West Project, on the west side of Kalaeloa Harbor?

11. Appendix B: Preliminary Engineering Report:

    - Water Quality on page 15: The sizing of water quality facilities shall be based upon the ultimate use of the drainage area, unless the water quality feature will be re-built/sized during subsequent phases of construction.

12. The following editing changes are suggested:

    - Section 1.8 Unresolved Issues on page 1-16: The last sentence "Details are provided in Section 8 should be changed to Section 7.
    - Section 2.2 Kapolei Harborside Center Land Use Plan on page 2-4 and figure 2-1: The acreages listed for industrial uses and infrastructure are inconsistent.
    - Figure 2.1 Kapolei Harborside Center Land Use Plan: Area 11 is missing, is it the 12.845-acre Industrial Waste site (TMK: 9-1-14: 35)?
    - Section 4.1 Existing Uses and Activities – Existing Conditions on page 4-1: Add "por." to TMKs 9-1-14: por. 33 and 9-1-15: por. 20.
    - Section 4.4 Natural Hazards – Existing Conditions on page 4-6: Oahu is located in Seismic Zone 2A vice zone 1 as listed.
    - Section 4.13.2 Water supply – Mitigative Measures on page 4-45: The "GWS" in the third sentence of the second paragraph should read "BWS".

- Section 7.0 Summary of Unresolved Issues on page 7-1: Delete "(Ref. No. 2006/PIM-2)" after Ordinance 90-30. Ordinance 90-30 was approved on April 11, 1990 for the "Kapolei City" rezoning. Please add the following to this section: DPP processed an Ewa Public Infrastructure Map revision request on behalf of the Department of Design and Construction for the proposed Kapolei Regional Sports Complex (2006/PIM-2). On May 12, 2006, the DPP requested that this PIM application be deferred from placement on the agenda of the Planning and Intergovernmental Affairs Committee to resolve outstanding issues.

- Appendix B: Preliminary Engineering Report: Soil Erosion – Grading and Erosion Control Plans on page 19: Control plans shall be prepared in accordance with Sections 14-13 through 14-16 of Chapter 14 – Public Works Infrastructure Requirements Including Fees and Services of the Revised Ordinances of Honolulu (ROH) and the Rules Relating to Soil Erosion Standards and Guidelines, instead of Chapter 23, of the ROH.

Should you have any questions, please contact Ray Sakai of our staff at 523-4047.

Very truly yours,

Henry Eng, FAICP, Director
Department of Planning and Permitting

HE:js

cc: Kapolei Property Development, LLC, Attn: Steve Kelly, AICP
State Land Use Commission
Office of Environmental Quality Control
State of Hawaii Office of Planning
DPP Wastewater Branch, Attn: Tessa Ching

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November 20, 2006

Mr. Henry Eng, Director
City and County of Honolulu
Department of Planning and Permitting
650 South King Street, 7th Floor
Honolulu, HI 96813

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Mr. Eng,

On behalf of Kapolei Property Development and Group 70, we wish to express our appreciation for the time and efforts made by you and your staff to address the various issues associated with the Kapolei Harborside Center. The following responses to your comments are addressed in the Final EIS.

1. Significant Zone Change. The Final EIS will include a statement noting that it is the applicant's intent to use this Final EIS to help satisfy the City and County of Honolulu's "significant" zone change requirement in Section 5.4.1. We recognize that the Department of Planning and Permitting may require the provision of additional and more detailed information in the Change of Zone application.

2. Unresolved Issues. There are numerous development and infrastructure projects in the region with uncertain timetables for funding and government approvals. Infrastructure improvements need to be in step with the approval of new development projects in order to serve the project areas and fund the improvements. A statement acknowledging the potential for a difference in the completion schedule for State highway improvements and the pace of private developments will be added as an unresolved issue in the Final EIS.

3. Permits and Approvals. Thank you for correcting our error. A Drainage Master Plan for the region addressing storm water quality requirements will be submitted to the DPP for review and approval as Kapolei Harborside Center and surrounding development progresses.

4. Infrastructure – Roadways and Circulation and Traffic. We have made efforts to address connectivity in the conceptual land plan for Kapolei Harborside Center. Figure 2-1 has been modified for the Final EIS to depict a planned connection of Opakapaka Street to the Kapolei West project area. It is our intent that heavy commercial traffic should be restricted from this route to avoid potential conflicts with the adjoining residential community traffic.

The projects identified in the Draft EIS are part of the 2030 Oahu Regional Transportation Plan (ORTP). The Final EIS indicates that the 2030 ORTP describes the Hanua Street projects as follows: *Hanua Street Extension from Malakole to Farrington as a new 4-lane roadway, and the constructions of new on- and off-ramps (2 lanes/ramp) at the Interstate Route H-1 Palailai Interchange for the Hanua Street Extension, as project numbers 85 and 111, respectively*. The Hanua Street extension is addressed within the Kapolei West docket (LUC A04-753), where Aina Nui Corporation agreed to provide the land necessary for the right-of-way. This contribution holds significant value in the overall cost of the roadway and can be used for local "soft match" funds needed to secure Federal funding as has been done for projects in the area such as the Kapolei Interchange Complex. Because of this road's importance to serve the Kalaeloa Barber's Point Harbor, we feel this project is a candidate for State and Federal funding. Kapolei Property Development will continue discussions with DOT on the roadway planning process.

As with other significant projects in the region, this project will be required to provide multiple updated traffic studies as the project's design and development progresses. These updated studies will provide a better understanding of Federal and State funding priorities and a more accurate estimate of the schedule for planned highway improvements. The traffic study in the Final EIS is based on a preliminary design stage, preliminary land plan, projected types of uses, and projected roadway types, without detailed development phasing schedules. As the project progresses through the Change of Zone process, more detailed traffic data will become available.

5a. Development Schedule. The project build-out estimate presented in the Draft EIS provides the most detail available at this time. Detailed development phasing is not yet available at this point in the approval process. Hanua Street Extension is listed as Project Number 111 on the ORTP 2030 plan. This roadway is a strong candidate for Federal and State funding because of its importance to the future of Kalaeloa Barbers Point Harbor. Kapolei Property Development will continue its discussions with DOT on the roadway planning process.

5b. Drainage Channel Construction Timing. The project description Section 2.3 has been modified to read: *"Construction of the regional drainage system, a portion of which crosses the project area and will receive flows from mauka lands, shall be completed in conjunction with the timing of development of Kapolei Harborside Center and the mauka lands"*. The on-site swale portion of the regional drainage system will be completed as part of the subject project.

6. Topography/Geology. Additional discussion of construction period erosion control best management practices is included in Section 4.2 and 4.8. The Final EIS includes the language you provided on Soil Erosion Standards and conformance to Chapter 14 Revised Ordinance of Honolulu (ROH).

7a. Water Supply. Kapolei Property Development and their civil engineers will address water use requirements and available resources with the Board of Water Supply and, as appropriate, the State Commission on Water Resource Management (CWRM). There is no indication of a problem with supply for the project based on the engineering report and agency comment letters received to date.

7b. Wastewater Treatment. Discussions were held with the Department of Environmental Services (DES) regarding the treatment capacity at the Honouliuli Wastewater Treatment Plant (WWTP). The treatment plant was expanded to handle a liquid stream of 38 millions gallons per day (mgd), however, the solids handling capacity is limited to 27 – 29 mgd. According to DES, there is still a limited amount of capacity in the solids handling stream, but is not sufficient to handle a large increase in flows that could be generated by a project of this size.

As DES explained to us, the City is currently in negotiations with a contractor to implement improvements to increase the solids handling capacity. The improvements are estimated to take two years to complete. This timing fits well with the planned buildout of the Kapolei Harborside Center in 2018. In the event that the Honouliuli WWTP improvements are not completed as scheduled, temporary means of wastewater disposal could be investigated for the initial developments with the approval of the DES and the State Department of Health. We will continue to coordinate our efforts with the Department of Environmental Services and the Department of Planning and Permitting on this issue.

7c. Parallel Sewer Completion. A parallel sewer line, the Ko 'Olina Relief Interceptor Sewer, will be developed as the region's sewage capacity warrants. The date of construction for the parallel sewer will depend on the rate of development of the projects in the area. Construction timetables will be coordinated with the Department of Planning and Permitting as additional information on development schedules becomes available. As the project proceeds to more detailed study, the project engineers will prepare a Wastewater Master Plan in an application submitted to DPP.

8. Affordable Housing. In order to provide for a sustainable and successful new urban center, a mix of housing and jobs are needed in Kapolei. The Kapolei Harborside Center project provides much needed employment opportunities for the growing number of people residing in the Kapolei region. Many of the current and planned residential communities in Kapolei include significant affordable housing components. As compared to other

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areas of the island, there is a very high level of affordable housing provided by private developments in the 'Ewa Development Plan region.

According to a June 2005 Mikiko Corporation report, the 'Ewa DP Area recorded a higher share of affordable housing sales than did the rest of O'ahu. In recent years, the 'Ewa DP Area has increased its number of home sales at affordable prices by over 70% from year 2000 sales. The 'Ewa DP Area has served far more than its "fair share" by providing over 20% of O'ahu's affordable housing sales. A copy of the June 2005 Mikiko Corporation report is included as Appendix L in the Final EIS. Relevant data from this report are summarized in Table 1 at the end of this letter and in Table 4.9 of the Final EIS.

9. 'Ewa DP Open Space. We acknowledge the potential to utilize the edge of the proposed drainage swale in to create a pedestrian and bicycle linkage through the project area. Though this could serve as a pathway, there are potential safety and liability concerns because both the project area and makai areas are proposed for or existing industrial areas. We will continue to explore the issue with the Department of Planning and Permitting.

10. Project Compatibility. The adjoining uses to the east, south and west of the proposed project are all existing or planned industrial uses. To the north is a portion of the planned golf course within the Kapolei West community, which serves as a major buffer between the industrial uses and future residential areas. The project roadway connection along Opakapaka Street will restrict heavy commercial traffic to ensure more compatible vehicle traffic.

11. Water Quality. It is anticipated that water quality requirements will be the responsibility of the individual projects within the development rather than one large, common facility.

12a. Detailed Edits. Thank you for assisting us with these detailed edits.

12b. Unresolved Issues. The Final EIS includes the following clarification regarding the Ewa Public Infrastructure Map revision: *"DPP processed an Ewa Public Infrastructure Map revision request on behalf of the Department of Design and Construction for the proposed Kapolei Regional Sports Complex (2006/PIM-2). On May 12, 2006, the DPP requested that this PIM application be deferred from placement on the agenda of the Planning and Intergovernmental Affairs Committee to resolve outstanding issues."*

12c. Preliminary Engineering Report (PER). The PER will be amended to note that instead of citing Chapter 23, of the ROH: *"Control plans shall be prepared in accordance with Sections 14-13 through 14-16 of Chapter 14 – Public Works Infrastructure Requirements including Fees and Services to the Revised Ordinances of Honolulu (ROH) and the Rules Relating to Soil Erosion Standards and Guidelines."*

Thank you for your detailed comments and we look forward to further discussions with you and your staff on this project. Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

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September 22, 2006

Steve Kelly
Kapolei Property Development, LLC
The Estate of James Campbell
1001 Kamokila Blvd., Ste. 250
Kapolei, Hawai‘i 96707

Via Email Transmittal:

Re: Comments on the Kapolei Harborside Center Draft Environmental Impact Statement

Dear Mr. Kelly,

Conservation Council for Hawai‘i submits the following comments on the Kapolei Harborside Center Draft Environmental Impact Statement. Our comments are restricted to the proposed sinkhole preserve.

We commend The Estate of James Campbell for proposing to protect approximately 50 sinkholes on 7.4 acres at the project site. This unique geologic site is a repository for fossil and other bones of extinct Hawaiian birds. It is a unique scientific treasure that should be protected.

The Estate and others have benefited from the development of hundreds, if not thousands of acres of land on the ‘Ewa Plain. By preserving this small sinkhole site for its scientific and cultural values, The Estate ensures that future generations will be able to learn about this very special place, which is eligible for inclusion on the Hawai‘i Register of Historic Places.

Working Today for the Nature of Tomorrow!

Telephone/Fax 808.593.0255 • email: info@conservehi.org • web: www@conservehi.org
P.O. Box 2923 • Honolulu, HI 96802 • Office: 250 Ward Ave., Suite 212 • Honolulu, HI 96814
Hawai‘i Affiliate of the National Wildlife Federation

The ‘Ewa sinkholes are part of a coral reef formed about 120,000 years ago when sea level was higher. Today, this area consists of weathered karst (limestone substrate) dotted with sinkholes. As far as we know, limestone sinkholes are not found anywhere else in Hawai‘i.

There used to be thousands of these sinkholes on the raised reef from Wai‘anae to Barber’s Point, but 99 percent of them have been lost to agriculture and development. Some of the sinkholes were destroyed in the last few decades when the Barber’s Point Deep Draft Harbor was dredged. Apparently, the unique sinkholes in the area were filled with the dredge spoil. With the exception of a small number of sinkholes in a City Park nearby, the 50 or so sinkholes in the proposed preserve are the last remaining sinkholes of this kind in the state.

Unique and extinct Hawaiian bird bones have been found in the remaining sinkholes, including the moa nalo (a flightless goose-like duck), geese, 2 species of extinct crow, long-legged owl, a hawk, a sea eagle, gapers, flightless rails, a small petrel, and new Hawaiian honeycreepers. These birds are known only from the archaeological record, having gone extinct before 1778. They were unknown to science until their discovery beginning in the 1970s. Many of these birds have been described and named by renowned avian paleontologists, Storrs Olson and Helen James, of the Smithsonian Institution.

Evidence of the Native Hawaiian culture is present in the area, and ‘öpae ‘ula (tiny native red shrimp) also have been found in brackish water in at least one of the remaining sinkholes nearby.

Groups, such as the Hawai‘i Nature Center, Hawai‘i Audubon Society, Sierra Club, Hawai‘i Chapter, and Conservation Council for Hawai‘i, and leaders of the Native Hawaiian community have led educational field trips to teach people about the sinkholes. Hundreds of students, teachers, and others have learned about, and enjoyed visiting this fascinating area. New bird bones have been found in recent months, which could provide clues to even more fascinating Hawaiian birds of our past.

We offer the following recommendations to help ensure that The Estates’ objectives to preserve the sinkhole site are met:

1. require permanent protection of the 7.4 acres and remaining sinkholes in the vicinity as part of any state land use classification boundary amendment by the Land Use Commission,

and in any changes in county zoning for the proposed Kapolei Harborside Center

2. amend the state land use classification for the 7.4 acres from Agricultural District to Conservation District (Protective or Limited Subzone)
3. at the county level, rezone the 7.4 acres and remaining sinkholes in the vicinity from Agriculture to Preservation
4. donate the 7.4 acres, including the remaining sinkholes in the vicinity, to the State of Hawai'i so the area qualifies for inclusion in the Natural Area Reserves System as a unique geologic site
5. replace the existing fence around the sinkholes with a stronger fence, and include the wet sinkhole and any other sinkholes that are outside and adjacent to the existing fence
6. clearly mark the existing and eventual new fence, and brief construction crews about protecting the sinkhole preserve during any construction or modification of adjacent land
7. establish a fund to cover the cost of regular fence maintenance, fence replacement in the future,and educational interpretive displays

Conservation Council for Hawai'i is committed to working with The Estate and others in the community to ensure that this very unique site is protected in perpetuity.

Mahalo nui loa for the opportunity to comment on the Draft Environmental Impact Statement.

Sincerely,

Marjorie Ziegler
Executive Director

cc: State Land Use Commission
Group 70 International
Office of Environmental Quality Control

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November 20, 2006

Ms. Marjorie Ziegler, Executive Director
Conservation Council for Hawaii
P.O. Box 2923
Honolulu, HI 96802

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Ms. Ziegler,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

We appreciate your recognition of Kapolei Property Development's efforts in maintaining this scientifically significant site. The Petitioner is committed to the preservation of the existing coral sinkholes found in an approximately 6-acre area of the proposed Kapolei Harborside Center (also see attached). Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, we recognize the works of your father, Dr. Alan Ziegler, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. These resources shall remain unaffected by the proposed industrial center through the formal establishment of an approximately 6-acre sinkhole preserve area. A survey by an invertebrate zoologist (Pacific Analytics) examined a wet sinkhole on the property in September 2006. No 'ōpae 'ula (native shrimp) were found in the wet sinkhole.

As part of the subject State Land Use Boundary Amendment process, the owners will accept a condition to set aside this approximately 6-acre area as a natural resource preserve. An amendment to a Conservation District would be inappropriate from a land use planning and policy standpoint, as the parcel would be surrounded by industrial land. When Kapolei Harborside Center proceeds into Change of Zone phase, the sinkhole preserve will be classified as Preservation.

Since the early 1990's, a chain link fence was erected to enclose the preserve area, with some openings along the western and southern sides. This fence will be extended to enclose the entire approximately 6-acre preserve, with the addition of locked gates. Access to the preserve will be provided for future scientific investigations, and to continue the use of this area as a "living classroom" setting for schools and environmental education groups.

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Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

Attachment

2.2.3 Preservation Component

~~More than 40 sinkholes, eligible for listing National/Hawai'i Register of Historic Places, are located within an 7.4-acre archaeological/paleontological Preserve Area at the southwest corner of the site. The preserve was created in the 1990s and is bound by a chain-link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. The close concentration of sinkholes has scientific value, and the 7.4-acre area surrounding the sinkholes will be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.~~

Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

The preserve area was formed in the early 1990s, with the guidance of Bishop Museum zoologist Dr. Alan Ziegler, who conducted substantial investigations of the sinkhole resources. In December 1992, Dr. Ziegler walked the site with representatives of the Estate of James Campbell, to delineate the position for a boundary fence to protect the significant sinkhole resources. The area was subsequently fenced by the Estate. At the time the fence was erected, the area of the preserve was estimated to be between 7 and 8 acres, but was never formally surveyed. In the Draft EIS, the approximate land area for the sinkhole preserve was erroneously estimated to be 7.4 acres. As a follow-up to inquiries regarding the sinkhole preserve, Kapolei Property Development commenced a land survey of the fenced area in October 2006. The survey indicates an actual area of approximately 6 acres enclosed by the boundary of the fenced sinkhole preserve. Sinkhole resources of significance lie within this approximate 6-acre area, as bounded by the AES coal conveyor to the west, the HWS waste pile to the north, existing Hanua Road to the east, and an existing access road off Hanua Road serving the compost business tenant. The land between Malakole Street and the fence is not included in the sinkhole preserve area, as it includes an easement for pipelines and the roadway access to the adjoining compost business tenant.

The close concentration of sinkholes has significant scientific value, and the approximate 6-acre area will continue to be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The existing fence has gaps in two portions that will be closed, and locked gates will be added. The sinkhole preserve will continue to be accessible for future research and education.

Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

For the Protection of Hawaii's Native Wildlife
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August 21, 2006

Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813
Attn: Jeffrey Overton

Subject: Kapolei Harborside Center - Draft Environmental Impact Statement
Ewa, Hawaii TMK (1) 9-1-14:33 (por); 34; 9-1-14:35 and 9-1-15:20 (por)

Dear Sir:

The Hawaii Audubon Society has reviewed the subject document with particular attention to the appendix entitled "A Survey of Botanical, Avian and Mammalian Resources, Kapolei Harborside Center, Ewa District, Oahu, Hawaii".

We find that, in general, the surveys were relatively complete in disclosing the natural resources present during the time of year they were conducted. However, we point out that no surveys were carried out during the winter months which might have indicated variations in the presence and/or relative abundance of the organisms listed. This should be discussed in the EIS.

The document admits that no studies were made of invertebrates, which makes the disclosure element of the flora and fauna section of the EIS incomplete. As the interrelationships of invertebrates with plants, birds and mammals is important in assessing the biological resources of a given area, we believe this is a shortcoming of the document.

Finally, the survey indicated the presence of the endangered Hawaiian Stilt, individuals of which were noted displaying distress behavior. This would normally indicate breeding activity in the area. Some discussion should be included about the possible negative impacts on the birds when the small water area which attracts them is filled in during the project.

Thank you for the opportunity to review the draft EIS.

Sincerely,
Wendy Johnson
2nd Vice President
Board of Directors

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Of Counsel

November 20, 2006

Ms. Wendy Johnson, 2nd Vice President
Hawaii Audubon Society
850 Richards Street, Suite 505
Honolulu, HI 96813-4709

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Ms. Johnson,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement. Your comments are addressed in the order they are presented.

1. Surveys in winter months. The Final EIS, Section 4.5 addresses some of the concern over conducting flora/fauna surveys during non-winter months. The botanical survey was done during the dry season. It is unusual to conduct surveys twice a year, they are typically done when the study is commissioned. However, when the site was surveyed in May 2006, it followed on a wet period and most of the annual species that one would expect from the site were recorded. If another survey were to be conducted between November and January, typically the wetter months, additional species, would be recorded, thought the majority of these would likely be weedy alien species. This site has been surveyed for botanical resources by Char in August (1989), David and Guinther August (2005), and by David and Guinther in May (2006).

2. Invertebrate study. An arthropod study has been completed by Pacific Analytics for the Final EIS to supplement studies already completed on botanical, avian and mammalian resources. Section 4.5.3 addresses issues concerning invertebrates and a full report is found in Appendix I. The study did not indicate the presence of sensitive invertebrate species.

3. Hawaiian Stilt. The Final EIS, Section 4.5.2 discusses the possible impacts on birds, specifically the endangered Hawaiian Black-necked Stilt. The proposed project is not anticipated to have a negative effect on endangered Hawaiian waterbirds.

   Hawaiian waterbirds require wetlands for their survival, including freshwater marshes, coastal ponds, taro patches, and irrigation ditches. (FWS Draft Recovery Plan, 1999). The project site does not contain wetlands or suitable nesting habitat for the Hawaiian Stilt. The areas in question are low spots with transient water creating the possibility of temporary ponding at the edge of the site. The site is constantly being modified from coral stock pile excavation activities. Typically, there is no water in the same area of the site where these birds were observed.

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While four stilt were encountered and flushed when approached during the survey of the site, flushing does not necessarily mean that the birds were involved in breeding behavior. Stilts are extremely vocal birds and easily flush when disturbed. In an effort to detect active stilt nests, an extensive search was conducted of the three mining scrapes present on the site. None were found, nor were chicks, sub-adult birds, or nests found during the 2006 survey. Additionally, no chicks, sub-adult birds, or nests were found during the course of Bruner's July 1989 survey, or an August 2005 survey of the same area (David and Guinther 2005). The bulk of stilts nest between February and mid-August, thus if active nesting was occurring on the site, it is probable that the 2005 or the 2006 survey would have detected such activity. The Petitioner will consult with the U.S. Fish and Wildlife Service and, if applicable, will comply with the Endangered Species Act of 1973.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

Hawaiian Electric Company, Inc. • PO Box 2750 • Honolulu, HI 96840-0001

EIS

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OEQC

September 12, 2006

Mr. Jeffrey H. Overton, AICP
Vice President
925 Bethel Street - 5th Floor
Honolulu, HI 96813-4307

Dear Mr. Overton:

Re: Kapolei Harborside Center
Ewa, Oahu
TMK: (1) 9-4-14:33 (por); 34; 35;
and 9-1-15:20 (por)

Thank you for the opportunity to comment on the draft EIS regarding the above-referenced project. Hawaiian Electric Company, Inc. (HECO) has no objections at this time. The following comments were received from the Transmission & Distribution Division of our Engineering Department:

(1) HECO has existing overhead facilities within the proposed area and will require continued access for maintenance purposes. We appreciate your efforts to keep us apprised of the planning process and ask that you continue to keep us informed as the project progresses. We will be better able to evaluate any effects on our system facilities further along in the project's development. We request that development plans forwarded to HECO for review, including the pre-final development plans, show all affected HECO facilities and address any conflicts between the proposed plans and HECO's existing facilities.

(2) Should it become necessary to relocate HECO's facilities, please submit a request in writing and we will work with you so that construction of the project may proceed as smoothly as possible. Please note that there may be costs associated with any relocation work, and that such costs may be borne by the requestor. Because any redesign or relocation of HECO's facilities may cause lengthy delays and may require PUC approval, upon determination that HECO facilities will need to be relocated, HECO should be notified immediately in order to minimize any delays in or impacts on the project schedule.

(3) Based on the projected load estimated at 43.5 to 65.2 MVA, two four-unit 46/12 kV substations will be required to serve the project. One substation should be located near the Campbell Industrial Park end of the project, and the other should be more centrally located within the project area. In addition, the proposed substation sites should be located along the route of the current AES-CEIP No. 1 138-kV line and the future AES-CEIP No. 2 138-kV line so that existing and future underbuilt 46-kV circuits in the project area may be connected to the two substations. Underground ductlines may be required as well.

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The approximate size of the substations may be either *130 feet x 140 feet* or *120 feet x 180 feet*. These dimensions do not include any setbacks required to access the substation, and do not take into account any requirements or restrictions that zoning in the area may impose.

Our point of contact for this project, and the originator of these comments, is Tanay Panalal, Transmission & Distribution Division, Engineering Department (543-7708). I suggest dealing directly with him to coordinate HECO's continuing input in this project.

Sincerely,

Kirk S. Tomita
Senior Environmental Scientist

cc: Mr. Steve Kelly (Kapolei Prop. Dev.)
Mr. Anthony Chang (SLUC)
Ms. Genevieve Salmonson (OEQC)
Mr. Abe Mitsuda (DBEDT)
T. Panalal

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Of Counsel

November 20, 2006

Mr. Kirk S. Tomita, Senior Environmental Scientist
Hawaiian Electric Company, Inc.
P.O. Box 2750
Honolulu, HI 96840-0001
Attn: Tanay Panalal, Transmission & Distribution Division

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Mr. Tomita,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement. We recognize that HECO has no objections to the project at this time. The following are offered in response to your comments.

1. Development plans. The developer recognizes that HECO has existing or proposed overhead facilities within the proposed area that will require continued access. As development plans progress, we will work closely with HECO to address issues concerning affected HECO facilities.

2. Relocation of HECO facilities. Should it become necessary to relocate existing HECO facilities, Kapolei Property Development will submit their request in writing and will work closely with HECO during the design phase. As the development plans progress, you will be contacted to minimize delays and impacts on the project schedule.

3. Electrical Substations. Thank you for providing projected load requirements for electrical needs of the proposed project. Additionally, we appreciate the information you have provided for recommended substation location and dimensions. As development plans progress into design phases your recommendations will be addressed.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

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KAHEA
THE HAWAIIAN-ENVIRONMENTAL ALLIANCE

Protecting Native Hawaiian traditional and customary rights and our fragile environment

September 22, 2007

Steve Kelly
Kapolei Property Development, LLC
1001 Kamokila Blvd., Suite 250
Kapolei, HI 96707

Comments on Draft EIS - Kapolei Harborside Center

Dear Mr. Kelly,

Aloha. KAHEA: The Hawaiian Environmental Alliance supports the protection of the 'Ewa sinkholes. Future generations will be able to learn about this significant site, which is eligible for inclusion on the Hawai'i Register of Historic Places.

The 'Ewa sinkholes are part of our past and the Native Hawaiian culture. The sinkholes are found on a raised coral reef formed about 120,000 years ago when sea level was higher. There used to be thousands of sinkholes on the raised reef from Wai'anae to Barber's Point, but 99 percent of the sinkholes have been lost to agriculture and development.

Unique and extinct Hawaiian bird bones have been found in the remaining sinkholes, including the moa nalo (a flightless goose-like duck), geese, species of extinct crow, long-legged owl, a hawk, a sea eagle, gapers, flightless rails, a small petrel, and new Hawaiian honeycreepers. These birds are known only from the archaeological record, having gone extinct before 1778. They were unknown to science until their discovery beginning in the 1970s. Many of these birds have been described and named by renowned avian paleontologists, Storrs Olson and Helen James, of the Smithsonian Institution.

Evidence of the Native Hawaiian culture is present in the area, which is an important part of our past. Hundreds of students, teachers, and community folks have learned about, and enjoyed visiting this interesting area. Please protect the sinkholes in perpetuity.

Mahalo nui loa for the o

PO Box 27112 • Honolulu HI 96827
tel: (808) 524-8220 • fax: (808) 524-8221
www.kahea.org • kahea-alliance@hawaii.rr.com

Sincerely,

Cha Smith
Executive Director

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November 20, 2006

Ms. Cha Smith, Executive Director
KAHEA
P.O. Box 27112
Honolulu, HI 96827

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Ms. Smith,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

We appreciate your recognition of Kapolei Property Development's efforts in maintaining this scientifically significant site. The Petitioner is committed to the preservation of the existing coral sinkholes found in an approximately 6-acre area of the proposed Kapolei Harborside Center (also see attached). Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, we recognize the works of Dr. Alan Ziegler, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. These resources shall remain unaffected by the proposed industrial center through the formal establishment of an approximately 6-acre sinkhole preserve area.

As part of the subject State Land Use Boundary Amendment process, the owners will accept a condition to set aside this approximately 6-acre area as a natural resource preserve. Since the early 1990's, a chain link fence was erected to enclose the preserve area, with some openings along the western and southern sides. This fence will be extended to enclose the entire approximately 6-acre preserve, with the addition of locked gates. Access to the preserve will be provided for future scientific investigations, and to continue the use of this area as a "living classroom" setting for schools and environmental education groups.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

Attachment

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2.2.3 *Preservation Component*

~~More than 40 sinkholes, eligible for listing National/Hawai'i Register of Historic Places, are located within an 7.4-acre archaeological/paleontological Preserve Area at the southwest corner of the site. The preserve was created in the 1990s and is bound by a chain-link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. The close concentration of sinkholes has scientific value, and the 7.4-acre area surrounding the sinkholes will be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.~~

Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

The preserve area was formed in the early 1990s, with the guidance of Bishop Museum zoologist Dr. Alan Ziegler, who conducted substantial investigations of the sinkhole resources. In December 1992, Dr. Ziegler walked the site with representatives of the Estate of James Campbell, to delineate the position for a boundary fence to protect the significant sinkhole resources. The area was subsequently fenced by the Estate. At the time the fence was erected, the area of the preserve was estimated to be between 7 and 8 acres, but was never formally surveyed. In the Draft EIS, the approximate land area for the sinkhole preserve was erroneously estimated to be 7.4 acres. As a follow-up to inquiries regarding the sinkhole preserve, Kapolei Property Development commenced a land survey of the fenced area in October 2006. The survey indicates an actual area of approximately 6 acres enclosed by the boundary of the fenced sinkhole preserve. Sinkhole resources of significance lie within this approximate 6-acre area, as bounded by the AES coal conveyor to the west, the HWS waste pile to the north, existing Hanua Road to the east, and an existing access road off Hanua Road serving the compost business tenant. The land between Malakole Street and the fence is not included in the sinkhole preserve area, as it includes an easement for pipelines and the roadway access to the adjoining compost business tenant.

The close concentration of sinkholes has significant scientific value, and the approximate 6-acre area will continue to be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The existing fence has gaps in two portions that will be closed, and locked gates will be added. The sinkhole preserve will continue to be accessible for future research and education.

Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

Smithsonian
National Museum of Natural History

22 Sept. 2006

Mr. Steve Kelly
Kapolei Property Development LLC
1001 Kamokila Blvd., Ste 250
Kapolei, HI 96707

COMMENTS ON THE DRAFT EIS FOR THE KAPOLEI HARBORSIDE CENTER

Dear Mr. Kelly,

It was my privilege to excavate the sinkholes in the Kapolei/Barbers Point area in the late 1970s and early 1980s, when fossil birds were first being discovered there. Storrs Olson and I published preliminary papers on the discoveries in 1982, and after carefully studying the bird bones, described sixteen new species of birds from the sinkhole finds in 1991.

Many beautifully preserved subfossil bones were found in the sinkholes near or within the proposed Kapolei Harborside Center development. As an example, I append a photograph of an extinct crow from the "wet sink," showing the extraordinary preservation of 7,000-year-old birds in the site. The sinkholes are not just a source of bird bones but are a valued resource for archaeologists and paleoecologists seeking to understand Hawaii's cultural and ecological past. In addition, the uplifted coral exposed in the walls of the sinkholes provides evidence of the geological processes that have formed the island. The 'Ewa Coral Plain is unique in the sense that there is no other area of the islands where similar uplifted coral landforms could be preserved for education and study.

Smithsonian research on the birdlife that once inhabited the 'Ewa Plain is ongoing. The bones reveal that the region was once inhabited by an eagle similar to the bald eagle, a small hawk, a long-legged owl, a goose related to the Nene, a moa-nalo or large flightless waterfowl species, two flightless rails, two large crows, a large honeyeater, the endangered Palila and six other species of native finches (including the giant "king kong finch"), eleven other species of Hawaiian honeycreepers, and was a major breeding locality for the endangered Hawaiian Dark-rumped Petrel. This is only a partial list. Currently I am studying the bone assemblages to better understand the causes of extinction of these birds. The bones preserve ancient biomolecules such as proteins and DNA fragments that we can extract in the laboratory for radiocarbon dating, stable isotopic analysis, and studies of genetic changes through time. Two PhD students are currently performing laboratory analyses on the bones to help reveal the story of past ecological diversity and its decline on the 'Ewa Plain.

The potential of the remaining sinkholes as an educational resource is enhanced not just by the fossil bird studies but by other previous research, which has produced numerous informative papers and reports on the geology, paleontology, and archaeology of the sinkhole region. A plan to preserve the sinkholes as a park and develop an integrated educational program based on them would have plenty of original research to draw upon.

I strongly urge that the sinkholes be preserved, not just through zoning rules but with a formal plan to protect them and permit them to be used for future research and education.

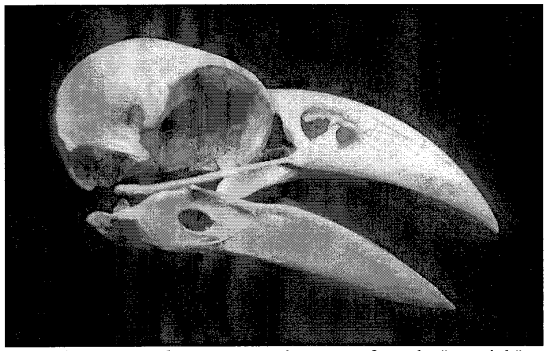
Thank you for the opportunity to comment. You are welcome to contact me if you need further information.

Yours sincerely,

Helen F. James
Museum Specialist
National Museum of Natural History
Smithsonian Institution, MRC-116
P.O. Box 37012
Washington, DC 20013-7012

jamesh@si.edu
phone 202-633-0792

SMITHSONIAN INSTITUTION
National Museum of Natural History
10th & Constitution Avenue NW
Washington DC 20560



Skull of *Corvus impluviatus*, an extinct crow, from the "wet sink" near Kapolei.

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November 20, 2006

Ms. Helen James, Museum Specialist
Smithsonian Institution
National Museum of Natural History
10th & Constitution Avenue NW
Washington, D.C. 20560

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Ms. James,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

We appreciate your recognition of Kapolei Property Development's efforts in maintaining this scientifically significant site. The Petitioner is committed to the preservation of the existing coral sinkholes found in an approximately 6-acre area of the proposed Kapolei Harborside Center (also see attached). Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, we recognize the works of Dr. Alan Ziegler, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. These resources shall remain unaffected by the proposed industrial center through the formal establishment of an approximately 6-acre sinkhole preserve area.

As part of the subject State Land Use Boundary Amendment process, the owners will accept a condition to set aside this approximately 6-acre area as a natural resource preserve. Since the early 1990's, a chain link fence was erected to enclose the preserve area, with some openings along the western and southern sides. This fence will be extended to enclose the entire approximately 6-acre preserve, with the addition of locked gates. Access to the preserve will be provided for future scientific investigations, and to continue the use of this area as a "living classroom" setting for schools and environmental education groups.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request if you would like a copy of the Final EIS, or portions thereof.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
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2.2.3 *Preservation Component*

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Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

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Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

-----Original Message-----
From: stanley bergstrom <stuzhi@lava.net>
Date: Wed, 20 Sep 2006 04:59:52
To:stevek@kapolei.com
Cc:mz@conservehi.org
Subject: Kapolei Harborside Center DEIS

It would be a shame to pass up an opportunity to protect the Ewa sinkholes since the developer is willing to consider this action. I remember reading several years ago about bird bones found in these sinkholes, and wondering if these valuable repositories would be protected. We must seize this opportunity.

Mahalo.

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Ralph E. Portmore, AICP
Of Counsel

November 20, 2006

Mr. Stanley Bergstrom
stuzhi@lava.net

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Mr. Bergstrom,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

We appreciate your recognition of Kapolei Property Development's efforts in maintaining this scientifically significant site. The Petitioner is committed to the preservation of the existing coral sinkholes found in an approximately 6-acre area of the proposed Kapolei Harborside Center (also see attached). Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, we recognize the works of Dr. Alan Ziegler, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. These resources shall remain unaffected by the proposed industrial center through the formal establishment of an approximately 6-acre sinkhole preserve area.

As part of the subject State Land Use Boundary Amendment process, the owners will accept a condition to set aside this approximately 6-acre area as a natural resource preserve. Since the early 1990's, a chain link fence was erected to enclose the preserve area, with some openings along the western and southern sides. This fence will be extended to enclose the entire approximately 6-acre preserve, with the addition of locked gates. Access to the preserve will be provided for future scientific investigations, and to continue the use of this area as a "living classroom" setting for schools and environmental education groups.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

Attachment

Group 70 International, Inc. • Architecture • Planning • Interior Design • Building Diagnostics • Assets Management • Environmental Services
925 Bethel Street, 5th Floor • Honolulu, Hawai'i 96813-4307 • Ph (808) 523-5866 • Fax (808) 523-5874 • www.group70int.com • mail1@group70int.com

2.2.3 *Preservation Component*

~~More than 40 sinkholes, eligible for listing National/Hawai'i Register of Historic Places, are located within an 7.4 acre archaeological/paleontological Preserve Area at the southwest corner of the site. The preserve was created in the 1990s and is bound by a chain-link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. The close concentration of sinkholes has scientific value, and the 7.4 acre area surrounding the sinkholes will be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.~~

Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

The preserve area was formed in the early 1990s, with the guidance of Bishop Museum zoologist Dr. Alan Ziegler, who conducted substantial investigations of the sinkhole resources. In December 1992, Dr. Ziegler walked the site with representatives of the Estate of James Campbell, to delineate the position for a boundary fence to protect the significant sinkhole resources. The area was subsequently fenced by the Estate. At the time the fence was erected, the area of the preserve was estimated to be between 7 and 8 acres, but was never formally surveyed. In the Draft EIS, the approximate land area for the sinkhole preserve was erroneously estimated to be 7.4 acres. As a follow-up to inquiries regarding the sinkhole preserve, Kapolei Property Development commenced a land survey of the fenced area in October 2006. The survey indicates an actual area of approximately 6 acres enclosed by the boundary of the fenced sinkhole preserve. Sinkhole resources of significance lie within this approximate 6-acre area, as bounded by the AES coal conveyor to the west, the HWS waste pile to the north, existing Hanua Road to the east, and an existing access road off Hanua Road serving the compost business tenant. The land between Malakole Street and the fence is not included in the sinkhole preserve area, as it includes an easement for pipelines and the roadway access to the adjoining compost business tenant.

The close concentration of sinkholes has significant scientific value, and the approximate 6-acre area will continue to be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The existing fence has gaps in two portions that will be closed, and locked gates will be added. The sinkhole preserve will continue to be accessible for future research and education.

Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

-----Original Message-----
From: Buddenhagen, Chris [mailto:cbuddenhagen@mlpmaui.com]
Sent: Wednesday, September 20, 2006 8:29 AM
To: stevek@kapolei.com; aching@dbedt.hawaii.gov; Jeff Overton; oeqc@doh.hawaii.gov
Subject: EWA sinkholes

Dear Steve Kelly:

Please do what you can to protect the Ewa sinkholes. They represent a valuable scientific resource as they contain a record of past conditions in Hawaii.

Unique and extinct Hawaiian bird bones have been found in the remaining sinkholes, including the moa nalo (a flightless goose-like duck), geese,
2 species of extinct crow, long-legged owl, a hawk, a sea eagle, gapers, flightless rails, a small petrel, and new Hawaiian honeycreepers.

Sincerely

Chris E. Buddenhagen
Field Operations Supervisor
Pu`u Kukui Watershed Preserve
Maui HI

GROUP 70 INTERNATIONAL

Francis S. Oda, Arch. D., FAIA, AICP
Norman G.Y. Hong, AIA
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Tom Young, AIA

Ralph E. Portmore, AICP
Of Counsel

November 20, 2006

Mr. Chris E. Buddenhagen
Field Operations Supervisor
Pu`u Kukui Watershed Preserve
Maui, HI
cbuddeenhagen@mlpmaui.com

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Mr. Buddenhagen,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

We appreciate your recognition of Kapolei Property Development's efforts in maintaining this scientifically significant site. The Petitioner is committed to the preservation of the existing coral sinkholes found in an approximately 6-acre area of the proposed Kapolei Harborside Center (also see attached). Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, we recognize the works of Dr. Alan Ziegler, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. These resources shall remain unaffected by the proposed industrial center through the formal establishment of an approximately 6-acre sinkhole preserve area.

As part of the subject State Land Use Boundary Amendment process, the owners will accept a condition to set aside this approximately 6-acre area as a natural resource preserve. Since the early 1990's, a chain link fence was erected to enclose the preserve area, with some openings along the western and southern sides. This fence will be extended to enclose the entire approximately 6-acre preserve, with the addition of locked gates. Access to the preserve will be provided for future scientific investigations, and to continue the use of this area as a "living classroom" setting for schools and environmental education groups.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
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Cc: State Land Use Commission
Kapolei Property Development

Attachment

2.2.3 *Preservation Component*

~~More than 40 sinkholes, eligible for listing National/Hawai'i Register of Historic Places, are located within an 7.4-acre archaeological/paleontological Preserve Area at the southwest corner of the site. The preserve was created in the 1990s and is bound by a chain-link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. The close concentration of sinkholes has scientific value, and the 7.4-acre area surrounding the sinkholes will be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.~~

Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

The preserve area was formed in the early 1990s, with the guidance of Bishop Museum zoologist Dr. Alan Ziegler, who conducted substantial investigations of the sinkhole resources. In December 1992, Dr. Ziegler walked the site with representatives of the Estate of James Campbell, to delineate the position for a boundary fence to protect the significant sinkhole resources. The area was subsequently fenced by the Estate. At the time the fence was erected, the area of the preserve was estimated to be between 7 and 8 acres, but was never formally surveyed. In the Draft EIS, the approximate land area for the sinkhole preserve was erroneously estimated to be 7.4 acres. As a follow-up to inquiries regarding the sinkhole preserve, Kapolei Property Development commenced a land survey of the fenced area in October 2006. The survey indicates an actual area of approximately 6 acres enclosed by the boundary of the fenced sinkhole preserve. Sinkhole resources of significance lie within this approximate 6-acre area, as bounded by the AES coal conveyor to the west, the HWS waste pile to the north, existing Hanua Road to the east, and an existing access road off Hanua Road serving the compost business tenant. The land between Malakole Street and the fence is not included in the sinkhole preserve area, as it includes an easement for pipelines and the roadway access to the adjoining compost business tenant.

The close concentration of sinkholes has significant scientific value, and the approximate 6-acre area will continue to be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The existing fence has gaps in two portions that will be closed, and locked gates will be added. The sinkhole preserve will continue to be accessible for future research and education.

Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

-----Original Message-----
From: Jan Welda Fleetham [mailto:janwelda@hawaiiantel.net]
Sent: Friday, September 22, 2006 4:37 AM
To: stevek@kapolei.com
Cc: aching@dbedt.hawaii.gov; oeqc@doh.hawaii.gov; Jeff Overton
Subject: Thank you for protecting 'Ewa sinkholes

Aloha,

I'd like to thank you for proposing to protect the 'Ewa sinkholes near Campbell Industrial Park, and to let you know how much I support this action. Please protect them all.

Sincerely,

Jan Welda Fleetham
190 Hea'aula Street
Haiku HI 96708

GROUP 70 INTERNATIONAL

Francis S. Oda, Arch. D., FAIA, AICP
Norman G.Y. Hong, AIA
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Tom Young, AIA

Ralph E. Portmore, AICP
Of Counsel

November 20, 2006

Ms. Jan Welda Fleetham
190 Hea'aula Street
Haiku HI 96708
janwelda@hawaiiantel.net

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Ms. Fleetham,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

We appreciate your recognition of Kapolei Property Development's efforts in maintaining this scientifically significant site. The Petitioner is committed to the preservation of the existing coral sinkholes found in an approximately 6-acre area of the proposed Kapolei Harborside Center (also see attached). Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, we recognize the works of Dr. Alan Ziegler, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. These resources shall remain unaffected by the proposed industrial center through the formal establishment of an approximately 6-acre sinkhole preserve area.

As part of the subject State Land Use Boundary Amendment process, the owners will accept a condition to set aside this approximately 6-acre area as a natural resource preserve. Since the early 1990's, a chain link fence was erected to enclose the preserve area, with some openings along the western and southern sides. This fence will be extended to enclose the entire approximately 6-acre preserve, with the addition of locked gates. Access to the preserve will be provided for future scientific investigations, and to continue the use of this area as a "living classroom" setting for schools and environmental education groups.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,

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2.2.3 *Preservation Component*

~~More than 40 sinkholes, eligible for listing National/Hawai'i Register of Historic Places, are located within an 7.4-acre archaeological/paleontological Preserve Area at the southwest corner of the site. The preserve was created in the 1990s and is bound by a chain-link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. The close concentration of sinkholes has scientific value, and the 7.4-acre area surrounding the sinkholes will be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.~~

Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

The preserve area was formed in the early 1990s, with the guidance of Bishop Museum zoologist Dr. Alan Ziegler, who conducted substantial investigations of the sinkhole resources. In December 1992, Dr. Ziegler walked the site with representatives of the Estate of James Campbell, to delineate the position for a boundary fence to protect the significant sinkhole resources. The area was subsequently fenced by the Estate. At the time the fence was erected, the area of the preserve was estimated to be between 7 and 8 acres, but was never formally surveyed. In the Draft EIS, the approximate land area for the sinkhole preserve was erroneously estimated to be 7.4 acres. As a follow-up to inquiries regarding the sinkhole preserve, Kapolei Property Development commenced a land survey of the fenced area in October 2006. The survey indicates an actual area of approximately 6 acres enclosed by the boundary of the fenced sinkhole preserve. Sinkhole resources of significance lie within this approximate 6-acre area, as bounded by the AES coal conveyor to the west, the HWS waste pile to the north, existing Hanua Road to the east, and an existing access road off Hanua Road serving the compost business tenant. The land between Malakole Street and the fence is not included in the sinkhole preserve area, as it includes an easement for pipelines and the roadway access to the adjoining compost business tenant.

The close concentration of sinkholes has significant scientific value, and the approximate 6-acre area will continue to be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The existing fence has gaps in two portions that will be closed, and locked gates will be added. The sinkhole preserve will continue to be accessible for future research and education.

Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

Phyllis Ha
47-201 Hui `Akikiki Pl. #E
Kaneohe, HI 96744

September 22, 2006

Mr. Steve Kelly
Kapolei Property Development LLC
1001 Kamokila Blvd., Ste 250
Kapolei, HI 96707

Dear Mr. Kelly:

I strongly support the preservation of the `Ewa plain sinkholes near the Campbell Industrial Park. I personally learned about the `Ewa plain sinkholes while on an interpretive tour given by the late Dr. Alan Ziegler. I was amazed at the fossilized bird bones that may be found in these limestone holes and became concerned about protecting the sinkholes.

The sinkholes are irreplaceable natural resources that should remain available for scientific study and viewing for current and future generations of people. The sinkholes are well known for containing bird bones of extinct birds. Apparently, birds of long ago fell into the pits and perished. Conditions in the dissolution pits allowed for the preservation of the bones in quantities. These bird bones provide a fascinating and informative look at the history of the birds of O`ahu. Some of the sinkholes also contain connections to underground brackishwater habitats and support anchialine shrimp.

It is my understanding that most of the `Ewa plain sinkholes have been lost to development or agriculture. I urge you to take a leadership position in designing a project that will protect these sinkholes and allow them to continue to be protected in perpetuity and available for study and viewing by members of the visiting public.

Sincerely,

Phyllis Ha

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Tom Young, AIA

Ralph E. Portmore, AICP
Of Counsel

November 20, 2006

Ms. Phyllis Ha
47-201 Hui ʻAkikiki Pl. #E
Kanehoe, HI 96744
yvha2000@yahoo.com

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Ms. Ha,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

We appreciate your recognition of Kapolei Property Development's efforts in maintaining this scientifically significant site. The Petitioner is committed to the preservation of the existing coral sinkholes found in an approximately 6-acre area of the proposed Kapolei Harborside Center (also see attached). Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, we recognize the works of Dr. Alan Ziegler, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. These resources shall remain unaffected by the proposed industrial center through the formal establishment of an approximately 6-acre sinkhole preserve area. A survey conducted by an invertebrate zoologist (Pacific Analytics) examined a wet sinkhole on the property in September 2006. No ʻōpae ʻula (native shrimp) were found in the wet sinkhole.

As part of the subject State Land Use Boundary Amendment process, the owners will accept a condition to set aside this approximately 6-acre area as a natural resource preserve. Since the early 1990's, a chain link fence was erected to enclose the preserve area, with some openings along the western and southern sides. This fence will be extended to enclose the entire approximately 6-acre preserve, with the addition of locked gates. Access to the preserve will be provided for future scientific investigations, and to continue the use of this area as a "living classroom" setting for schools and environmental education groups.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

Attachment

2.2.3 Preservation Component

~~More than 40 sinkholes, eligible for listing National/Hawai'i Register of Historic Places, are located within an 7.4-acre archaeological/paleontological Preserve Area at the southwest corner of the site. The preserve was created in the 1990s and is bound by a chain-link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. The close concentration of sinkholes has scientific value, and the 7.4-acre area surrounding the sinkholes will be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.~~

Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

The preserve area was formed in the early 1990s, with the guidance of Bishop Museum zoologist Dr. Alan Ziegler, who conducted substantial investigations of the sinkhole resources. In December 1992, Dr. Ziegler walked the site with representatives of the Estate of James Campbell, to delineate the position for a boundary fence to protect the significant sinkhole resources. The area was subsequently fenced by the Estate. At the time the fence was erected, the area of the preserve was estimated to be between 7 and 8 acres, but was never formally surveyed. In the Draft EIS, the approximate land area for the sinkhole preserve was erroneously estimated to be 7.4 acres. As a follow-up to inquiries regarding the sinkhole preserve, Kapolei Property Development commenced a land survey of the fenced area in October 2006. The survey indicates an actual area of approximately 6 acres enclosed by the boundary of the fenced sinkhole preserve. Sinkhole resources of significance lie within this approximate 6-acre area, as bounded by the AES coal conveyor to the west, the HWS waste pile to the north, existing Hanua Road to the east, and an existing access road off Hanua Road serving the compost business tenant. The land between Malakole Street and the fence is not included in the sinkhole preserve area, as it includes an easement for pipelines and the roadway access to the adjoining compost business tenant.

The close concentration of sinkholes has significant scientific value, and the approximate 6-acre area will continue to be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The existing fence has gaps in two portions that will be closed, and locked gates will be added. The sinkhole preserve will continue to be accessible for future research and education.

Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

From: Helmstetter, Eileen [mailto:mhelmstetter@honolulu.gov]
Sent: Wednesday, September 20, 2006 10:24 AM
To: stevek@kapolei.com; aching@dbedt.hawaii.gov; Jeff Overton; oeqc@doh.hawaii.gov
Subject: Please protect the 'Ewasinkholes'

Please protect the "Ewa sinkholes" near Campbell Industrial Park. As a commuter out to Kapolei every work day, I feel it is important to protect these areas. I recreate/workout in the area by Barber's Point and Cambell Industrial at lunch time and in the short period I've been here I've seen much development, filling in of gravel pits and mounting illegal dumping. Besides protecting what is in the sinkholes, I feel it is important to preserve a designated amount of land around the sinkholes to prevent contamination and destruction. With no central sewage system in place in the Campbell Industrial area the sinkholes are doomed unless protected.

I likewise feel the Campbell Industrial area should have stricter regulations in terms of the industrial development's closeness to the ocean. Industrial sites are too close to the ocean and potential contaminated runoff as well as litter being blown from these sites are a hazard to the ocean. We have limited ocean front on this island and it should be managed as an important natural resource. Thank you.

Eileen Helmstetter
692-5422

GROUP 70 INTERNATIONAL

Francis S. Oda, Arch. D., FAIA, AICP
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Ralph E. Portmore, AICP
Of Counsel

November 20, 2006

Ms. Eileen Helmstetter
mhelmstetter@honolulu.gov

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Ms. Helmstetter,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

We appreciate your recognition of Kapolei Property Development's efforts in maintaining this scientifically significant site. The Petitioner is committed to the preservation of the existing coral sinkholes found in an approximately 6-acre area of the proposed Kapolei Harborside Center (also see attached). Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, we recognize the works of Dr. Alan Ziegler, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. These resources shall remain unaffected by the proposed industrial center through the formal establishment of an approximately 6-acre sinkhole preserve area.

As part of the subject State Land Use Boundary Amendment process, the owners will accept a condition to set aside this approximately 6-acre area as a natural resource preserve. Since the early 1990's, a chain link fence was erected to enclose the preserve area, with some openings along the western and southern sides. This fence will be extended to enclose the entire approximately 6-acre preserve, with the addition of locked gates. Access to the preserve will be provided for future scientific investigations, and to continue the use of this area as a "living classroom" setting for schools and environmental education groups.

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Sincerely,
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Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
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2.2.3 *Preservation Component*

~~More than 40 sinkholes, eligible for listing National/Hawai'i Register of Historic Places, are located within an 7.4-acre archaeological/paleontological Preserve Area at the southwest corner of the site. The preserve was created in the 1990s and is bound by a chain-link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. The close concentration of sinkholes has scientific value, and the 7.4-acre area surrounding the sinkholes will be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.~~

Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

The preserve area was formed in the early 1990s, with the guidance of Bishop Museum zoologist Dr. Alan Ziegler, who conducted substantial investigations of the sinkhole resources. In December 1992, Dr. Ziegler walked the site with representatives of the Estate of James Campbell, to delineate the position for a boundary fence to protect the significant sinkhole resources. The area was subsequently fenced by the Estate. At the time the fence was erected, the area of the preserve was estimated to be between 7 and 8 acres, but was never formally surveyed. In the Draft EIS, the approximate land area for the sinkhole preserve was erroneously estimated to be 7.4 acres. As a follow-up to inquiries regarding the sinkhole preserve, Kapolei Property Development commenced a land survey of the fenced area in October 2006. The survey indicates an actual area of approximately 6 acres enclosed by the boundary of the fenced sinkhole preserve. Sinkhole resources of significance lie within this approximate 6-acre area, as bounded by the AES coal conveyor to the west, the HWS waste pile to the north, existing Hanua Road to the east, and an existing access road off Hanua Road serving the compost business tenant. The land between Malakole Street and the fence is not included in the sinkhole preserve area, as it includes an easement for pipelines and the roadway access to the adjoining compost business tenant.

The close concentration of sinkholes has significant scientific value, and the approximate 6-acre area will continue to be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The existing fence has gaps in two portions that will be closed, and locked gates will be added. The sinkhole preserve will continue to be accessible for future research and education.

Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

-----Original Message-----
-----Original Message-----
From: "keoki hinol" <ghinol@atlasteelco.com>
Date: Tue, 19 Sep 2006 08:21:02
To:<stevek@kapolei.com>
Subject: SAVE SINKHOLES! SAVE HAWAII!

Aloha,
We need to protect anything that has to do with HAWAII' S past. The people them come here do not appreciate the beauty that HAWAII has to offer.
We don't need to build to make HAWAII beautiful because it always was.
We need to preserve these sinkholes so we can explore our HAWAIIAN CULTURE.
Something that was taken away from us a long time ago.. AGAINST OUR WILL!!
Anthing that will help us HAWAIIANS to learn about our past SHOULD NOT BE DESTROYED!.
They have taken our LAND, they have taken our LANGUAGE, they have taken our CULTURE,
I THINK THEY HAVE TAKEN MORE THAN ENOUGH!!!...PLEASE DONT TAKE ANY MORE..
PRESERVE WHAT WE HAVE OR ELSE IT WILL BE LOST FOREVER.....

Mahalo & Aloha
Keoki Hinol

MALAMA HAWAII!
PALEHUA
NAKOA

George "Keoki" Hinol
Inside Sales
Atlas Steel Corporation
2234 Hoonee Place
Honolulu, HI 96819
T: (808) 841-6111
F: (808) 841-0455
www.atlasteelco.com: <http://www.atlasteelco.com>

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Of Counsel

November 20, 2006

Mr. George "Keoki" Hinol
Atlas Steel Corporation
2234 Hoonee Place
Honolulu, HI 96819
ghinol@atlasteelco.com

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Mr. Hinol,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

We appreciate your recognition of Kapolei Property Development's efforts in maintaining this scientifically significant site. The Petitioner is committed to the preservation of the existing coral sinkholes found in an approximately 6-acre area of the proposed Kapolei Harborside Center (also see attached). Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, we recognize the works of Dr. Alan Ziegler, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. These resources shall remain unaffected by the proposed industrial center through the formal establishment of an approximately 6-acre sinkhole preserve area.

As part of the subject State Land Use Boundary Amendment process, the owners will accept a condition to set aside this approximately 6-acre area as a natural resource preserve. Since the early 1990's, a chain link fence was erected to enclose the preserve area, with some openings along the western and southern sides. This fence will be extended to enclose the entire approximately 6-acre preserve, with the addition of locked gates. Access to the preserve will be provided for future scientific investigations, and to continue the use of this area as a "living classroom" setting for schools and environmental education groups.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

Attachment

2.2.3 Preservation Component

~~More than 40 sinkholes, eligible for listing National/Hawai'i Register of Historic Places, are located within an 7.4-acre archaeological/paleontological Preserve Area at the southwest corner of the site. The preserve was created in the 1990s and is bound by a chain-link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. The close concentration of sinkholes has scientific value, and the 7.4-acre area surrounding the sinkholes will be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.~~

Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

The preserve area was formed in the early 1990s, with the guidance of Bishop Museum zoologist Dr. Alan Ziegler, who conducted substantial investigations of the sinkhole resources. In December 1992, Dr. Ziegler walked the site with representatives of the Estate of James Campbell, to delineate the position for a boundary fence to protect the significant sinkhole resources. The area was subsequently fenced by the Estate. At the time the fence was erected, the area of the preserve was estimated to be between 7 and 8 acres, but was never formally surveyed. In the Draft EIS, the approximate land area for the sinkhole preserve was erroneously estimated to be 7.4 acres. As a follow-up to inquiries regarding the sinkhole preserve, Kapolei Property Development commenced a land survey of the fenced area in October 2006. The survey indicates an actual area of approximately 6 acres enclosed by the boundary of the fenced sinkhole preserve. Sinkhole resources of significance lie within this approximate 6-acre area, as bounded by the AES coal conveyor to the west, the HWS waste pile to the north, existing Hanua Road to the east, and an existing access road off Hanua Road serving the compost business tenant. The land between Malakole Street and the fence is not included in the sinkhole preserve area, as it includes an easement for pipelines and the roadway access to the adjoining compost business tenant.

The close concentration of sinkholes has significant scientific value, and the approximate 6-acre area will continue to be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The existing fence has gaps in two portions that will be closed, and locked gates will be added. The sinkhole preserve will continue to be accessible for future research and education.

Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

From: Choon James [mailto:choon@hawaii.rr.com]
Sent: Friday, September 22, 2006 10:15 PM
To: SteveK@kapolei.com; aching@dbedt.hawaii.gov; Jeff Overton; oeqc@doh.hawaii.gov
Subject: Leave something for the future generations...
Importance: High

Aloha to all.

I'm in total support of preserving this area and are appreciative of the efforts of many on this behalf.

Isn't it exciting to know that something like the the 'Ewa sinkholes are part of a coral reef formed about 120,000 years ago when sea level was higher?

We understanding that there used to be thousands of sinkholes on the raised reef from Wai'anae to Barber's Point, but 99 percent of the sinkholes have been lost to agriculture and development.

If we continue to be callous and careless, we could lose everything.

Let's not deprive our children and ourselves the pleasure of enjoying what is natural. We must preserve these areas so that groups, such as the Hawai'i Nature Center and Hawai'i Audubon Society can continue to hold educational field trips to the sinkholes. Our children need stimulation and opportunities for growth and imagination. Let's help them by protecting some of these natural wonders.

It's fascinating to know that new bird bones have been found in recent months, which could provide clues to even more fascinating Hawaiian birds of our past.

Let's preserve what we hold dear about Hawaii. Let's preserve what is unique about Hawaii. Let's preserve what little is left of Hawaii
for ourselves and our keikis and their keikis. Once we destroy something as precious as this, we destroy it forever.

Mahalo,

Ms. Choon James

Choon James, Realtor, B.A.
"Marketing Properties We Would Buy Ourselves!"
CJ Real Estate International
55-052 Naupaka Street
Laie, Hawaii, USA 96762
808 293 9111
808 293 9142 fax 24-hour
Email: choon@hawaii.rr.com
Website: http://www.CJRealEstateHawaii.com

Grassroots uniting for common sense planning
Join http://www.DefendOahuCoalition.org

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Scott Tangonan
Tom Young, AIA

Ralph E. Portmore, AICP
Of Counsel

November 20, 2006

Choon James, Realtor
55-052 Naupaka Street
Laie, Hawaii, USA 96762

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Ms. James,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

We appreciate your recognition of Kapolei Property Development's efforts in maintaining this scientifically significant site. The Petitioner is committed to the preservation of the existing coral sinkholes found in an approximately 6 -acre area of the proposed Kapolei Harborside Center (also see attached). Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, we recognize the works of Dr. Alan Ziegler, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. These resources shall remain unaffected by the proposed industrial center through the formal establishment of an approximately 6-acre sinkhole preserve area. A survey conducted by an invertebrate zoologist (Pacific Analytics) examined a wet sinkhole on the property in September 2006. No ʻōpae ʻula (native shrimp) were found in the wet sinkhole.

As part of the subject State Land Use Boundary Amendment process, the owners will accept a condition to set aside this approximately 6-acre area as a natural resource preserve. Since the early 1990's, a chain link fence was erected to enclose the preserve area, with some openings along the western and southern sides. This fence will be extended to enclose the entire approximately 6-acre preserve, with the addition of locked gates. Access to the preserve will be provided for future scientific investigations, and to continue the use of this area as a "living classroom" setting for schools and environmental education groups.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

Attachment

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2.2.3 *Preservation Component*

~~More than 40 sinkholes, eligible for listing National/Hawai'i Register of Historic Places, are located within an 7.4-acre archaeological/paleontological Preserve Area at the southwest corner of the site. The preserve was created in the 1990s and is bound by a chain-link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. The close concentration of sinkholes has scientific value, and the 7.4-acre area surrounding the sinkholes will be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.~~

Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

The preserve area was formed in the early 1990s, with the guidance of Bishop Museum zoologist Dr. Alan Ziegler, who conducted substantial investigations of the sinkhole resources. In December 1992, Dr. Ziegler walked the site with representatives of the Estate of James Campbell, to delineate the position for a boundary fence to protect the significant sinkhole resources. The area was subsequently fenced by the Estate. At the time the fence was erected, the area of the preserve was estimated to be between 7 and 8 acres, but was never formally surveyed. In the Draft EIS, the approximate land area for the sinkhole preserve was erroneously estimated to be 7.4 acres. As a follow-up to inquiries regarding the sinkhole preserve, Kapolei Property Development commenced a land survey of the fenced area in October 2006. The survey indicates an actual area of approximately 6 acres enclosed by the boundary of the fenced sinkhole preserve. Sinkhole resources of significance lie within this approximate 6-acre area, as bounded by the AES coal conveyor to the west, the HWS waste pile to the north, existing Hanua Road to the east, and an existing access road off Hanua Road serving the compost business tenant. The land between Malakole Street and the fence is not included in the sinkhole preserve area, as it includes an easement for pipelines and the roadway access to the adjoining compost business tenant.

The close concentration of sinkholes has significant scientific value, and the approximate 6-acre area will continue to be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The existing fence has gaps in two portions that will be closed, and locked gates will be added. The sinkhole preserve will continue to be accessible for future research and education.

Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

-----Original Message-----
From: Nicholas P Kalodimos [mailto:kalodimo@hawaii.edu]
Sent: Tuesday, September 19, 2006 7:43 PM
To: stevek@kapolei.com
Cc: aching@dbedt.hawaii.gov; Jeff Overton; oeqc@doh.hawaii.gov
Subject: your responsibility

Dear Kapolei Property Developmet:
>
> I commend the landowner and developer for proposing to protect the Ewa
> sinkholes near Campbell Industrial Park.
> Future generations will be able to learn about this significant site,
> which is eligible for inclusion on the Hawaii Register of Historic
> Places, 99 percent of the sinkholes have been destroyed by land
> development, just like the type you are proposing.
>
> Do you want to be responsable for the destruction of the true
> treasures of Hawaii, such as unique and extinct Hawaiian bird bones of
> completely unique moa nalo (a flightless goose-like duck), geese, 2
> species of extinct crow, long-legged owl, a hawk, a sea eagle, gapers,
> flightless rails, a small petrel, and new Hawaiian honeycreepers?
> The native people of this land would frown on your planned
> development, especially since they once occupied the very area you are going to desecrate.
>
> These birds are known only from the archaeological record, having gone
> extinct before 1778. They were unknown to science until their
> discovery beginning in the 1970s. By developing these areas you are
> literally stealing from the people of Hawaii and other world citizens
> the opportunities of discovering what the ancient Hawaiian natural flora and fauna was like.
>
> In fact, in addition to preserving these sites, you should monetarily
> fund an interpretive learning center so that the people and visitors of Hawaii can visit the sites and learn about their heritage, it is the least
> you can do to redeem face after the shame you have brought by developing it for your materialistic gain.

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Of Counsel

November 20, 2006

Mr. Nicholas P Kalodimos
kalodimo@hawaii.edu

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Mr. Kalodimos,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

We appreciate your recognition of Kapolei Property Development's efforts in maintaining this scientifically significant site. The Petitioner is committed to the preservation of the existing coral sinkholes found in an approximately 6-acre area of the proposed Kapolei Harborside Center (also see attached). Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, we recognize the works of Dr. Alan Ziegler, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. These resources shall remain unaffected by the proposed industrial center through the formal establishment of an approximately 6-acre sinkhole preserve area.

As part of the subject State Land Use Boundary Amendment process, the owners will accept a condition to set aside this approximately 6-acre area as a natural resource preserve. Since the early 1990's, a chain link fence was erected to enclose the preserve area, with some openings along the western and southern sides. This fence will be extended to enclose the entire approximately 6-acre preserve, with the addition of locked gates. Access to the preserve will be provided for future scientific investigations, and to continue the use of this area as a "living classroom" setting for schools and environmental education groups.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

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2.2.3 Preservation Component

~~More than 40 sinkholes, eligible for listing National/Hawai'i Register of Historic Places, are located within an 7.4-acre archaeological/paleontological Preserve Area at the southwest corner of the site. The preserve was created in the 1990s and is bound by a chain-link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. The close concentration of sinkholes has scientific value, and the 7.4-acre area surrounding the sinkholes will be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.~~

Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

The preserve area was formed in the early 1990s, with the guidance of Bishop Museum zoologist Dr. Alan Ziegler, who conducted substantial investigations of the sinkhole resources. In December 1992, Dr. Ziegler walked the site with representatives of the Estate of James Campbell, to delineate the position for a boundary fence to protect the significant sinkhole resources. The area was subsequently fenced by the Estate. At the time the fence was erected, the area of the preserve was estimated to be between 7 and 8 acres, but was never formally surveyed. In the Draft EIS, the approximate land area for the sinkhole preserve was erroneously estimated to be 7.4 acres. As a follow-up to inquiries regarding the sinkhole preserve, Kapolei Property Development commenced a land survey of the fenced area in October 2006. The survey indicates an actual area of approximately 6 acres enclosed by the boundary of the fenced sinkhole preserve. Sinkhole resources of significance lie within this approximate 6-acre area, as bounded by the AES coal conveyor to the west, the HWS waste pile to the north, existing Hanua Road to the east, and an existing access road off Hanua Road serving the compost business tenant. The land between Malakole Street and the fence is not included in the sinkhole preserve area, as it includes an easement for pipelines and the roadway access to the adjoining compost business tenant.

The close concentration of sinkholes has significant scientific value, and the approximate 6-acre area will continue to be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The existing fence has gaps in two portions that will be closed, and locked gates will be added. The sinkhole preserve will continue to be accessible for future research and education.

Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

From: Shad Kane [mailto:kiha@hawaii.rr.com]
Sent: Wednesday, September 20, 2006 10:22 PM
To: stevek@kapolei.com; aching@dbedt.hawaii.gov; Jeff Overton; oeqc@doh.hawaii.gov
Cc: mz@conservehi.org
Subject: testimony in support of preservation of ewa sinkholes

Mahalo for the opportunity to comment:

Shad Kane
92-1309 Uahanai Street
Kapolei, HI 96707

Mahalo nui loa,
Shad Kane

TESTIMONY IN SUPPORT OF PRESERVING THE `EWA SINKHOLES

My name is Shad Kane and I am a 35 year resident of Makakilo. I am a retired Police Lieutenant with 34 years of service. I am a member the Environmental Council of the State of Hawaii Office of Environmental Quality Control; a member of the Makakilo/Kapolei/Honokai Hale Neighborhood Board; a member of the Hawaii Energy Policy Forum. I also belong to a long list of community and cultural organizations to include the Makakilo Kapolei Lions, the Kapolei Hawaiian Civic Club, the Kapolei Outdoor Circle and the Friends of Honouliuli.

I am submitting this comment in support for the preservation of the `Ewa Sinkhole 8 Acre Site. I would like to first commend the Estate of James Campbell for proposing the protection of the `Ewa Sinkholes near Campbell Indistrial Park.

The `Ewa sinkholes are part of a coral reef formed about 120,000 years ago when the sea was higher. Today, this area consists of weathered karst dotted with sinkholes.

There used to be thousands of sinkholes on the raised reef from Wai`anae to Kalaeloa, but 99 percent of the sinkholes have been lost to agriculture and development.

Unique and extinct Hawaiian bird bones have been found in the remaining sinkholes, including the moa nalo (a flightless goose-like duck), geese, 2 species of extinct crow, long-legged owl, a hawk, a sea eagle, gapers, flightless rails, a small petrel, and new Hawaiian honeycreepers.

These birds are known only from the archaeological records, having gone extinct before 1778. They were unknown to science until their discovery beginning in the 1970s.

Many of these birds have been described and named by renowned avian paleontologists, Storrs Olson and Helen James, of the Smithsonian Institution.

Evidence of the Native Hawaiian culture is present in the area, and `opae`ula(tiny native red shrimp) also have been found in brackish water in at least one of the remaining sinkholes.

Groups such as the Hawaii Nature Center and Hawaii Audubon Society, have led educational field trips to the sinkholes. Hundreds of students, teachers, and others have learned about, and enjoyed visiting this interesting area.

New bird bones have been found in recent months, which could provide clues to even more fascinating Hawaiian birds of our past.

It is important that we save this true treasure in an effort to piece together a fragmented history of these islands. In some respects it is sad that we know more of other places than we do in own back yard. We are no longer an agricultural state and it is becoming increasingly more important that we maintain our place as a travel destination in the world travel industry. It is perhaps most important that we preserve the `Ewa Sinkholes for future generations to learn from and enjoy.

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INTERNATIONAL

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November 20, 2006

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92-1309 Uahanai Street
Kapolei, HI 96707
kiha@hawaii.rr.com

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Mr. Kane,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

We appreciate your recognition of Kapolei Property Development's efforts in maintaining this scientifically significant site. The Petitioner is committed to the preservation of the existing coral sinkholes found in an approximately 6-acre area of the proposed Kapolei Harborside Center (also see attached). Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, we recognize the works of Dr. Alan Ziegler, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. These resources shall remain unaffected by the proposed industrial center through the formal establishment of an approximately 6-acre sinkhole preserve area. A survey conducted by an invertebrate zoologist (Pacific Analytics) examined a wet sinkhole on the property in September 2006. No ʻōpae ʻula (native shrimp) were found in the wet sinkhole.

As part of the subject State Land Use Boundary Amendment process, the owners will accept a condition to set aside this approximately 6-acre area as a natural resource preserve. Since the early 1990's, a chain link fence was erected to enclose the preserve area, with some openings along the western and southern sides. This fence will be extended to enclose the entire approximately 6-acre preserve, with the addition of locked gates. Access to the preserve will be provided for future scientific investigations, and to continue the use of this area as a "living classroom" setting for schools and environmental education groups.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

Attachment

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2.2.3 *Preservation Component*

~~More than 40 sinkholes, eligible for listing National/Hawai'i Register of Historic Places, are located within an 7.4-acre archaeological/paleontological Preserve Area at the southwest corner of the site. The preserve was created in the 1990s and is bound by a chain-link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. The close concentration of sinkholes has scientific value, and the 7.4-acre area surrounding the sinkholes will be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.~~

Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

The preserve area was formed in the early 1990s, with the guidance of Bishop Museum zoologist Dr. Alan Ziegler, who conducted substantial investigations of the sinkhole resources. In December 1992, Dr. Ziegler walked the site with representatives of the Estate of James Campbell, to delineate the position for a boundary fence to protect the significant sinkhole resources. The area was subsequently fenced by the Estate. At the time the fence was erected, the area of the preserve was estimated to be between 7 and 8 acres, but was never formally surveyed. In the Draft EIS, the approximate land area for the sinkhole preserve was erroneously estimated to be 7.4 acres. As a follow-up to inquiries regarding the sinkhole preserve, Kapolei Property Development commenced a land survey of the fenced area in October 2006. The survey indicates an actual area of approximately 6 acres enclosed by the boundary of the fenced sinkhole preserve. Sinkhole resources of significance lie within this approximate 6-acre area, as bounded by the AES coal conveyor to the west, the HWS waste pile to the north, existing Hanua Road to the east, and an existing access road off Hanua Road serving the compost business tenant. The land between Malakole Street and the fence is not included in the sinkhole preserve area, as it includes an easement for pipelines and the roadway access to the adjoining compost business tenant.

The close concentration of sinkholes has significant scientific value, and the approximate 6-acre area will continue to be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The existing fence has gaps in two portions that will be closed, and locked gates will be added. The sinkhole preserve will continue to be accessible for future research and education.

Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

From: Annette Kaohelaulii [mailto:annettesadventures@juno.com]
Sent: Thursday, September 21, 2006 2:15 PM
To: stevek@kapolei.com; aching@dbedt.hawaii.gov; Jeff Overton; oeqc@doh.hawaii.com
Subject: Comments on Kapolei Harborside Center Draft EIS

Attached please find my comments on the subject document.

Annette Kaohelaulii
Travel Consultant
Annette's Adventures
(808) 235-5431
Specializing in birding tours and personalized itineraries.

Annette's Adventures
Specializing in Ecotourism and Sustainable Travel
45-403 Koa Kahiko Street
Kaneohe, HI 96744
(808) 235-5431
www.annettesadventures.com

September 21, 2006

Steve Kelly
Kapolei Property Development, LLC
1001 Kamokila Boulevard, Suite 250
Kapolei, Hawaii 96707

Dear Mr. Kelly,

I am writing to submit comments on the **"Kapolei Harborside Center Draft Environmental Impact Statement."** Both the developer and the landowner should be commended for proposing to protect the Ewa sinkholes in this EIS document. I certainly support your efforts.

I have many fond memories of exploring the sinkholes at Campbell Industrial Park with zoologist Dr. Alan Ziegler and archeologist Buddy Neller in the 1980's. I led numerous field trips for Sierra Club members over the years to orient them to the wonders of Hawaii's natural history. I want to see the sinkholes preserved for future generations of school children and adults.

The Ewa sinkholes are a significant resource for studying natural history as well as Hawaiian cultural resources. The formation of the sinkholes is part of a fascinating story of the volcanology and geology which created the Hawaiian Islands. The fact that extinct Hawaiian bird bones have been found in these sinkholes only adds to the mystique of the site.

I can envision the sinkholes preserved in a private, interpretive park which could be visited by geology students from the University of Hawaii and the community colleges, Brigham Young University-Hawaii, Chaminade College and Hawaii Pacific University, as well as local school children and their parents and visitors. The scientific and education value of these sinkholes should be shared while at the same time protecting them in to perpetuity.

There is great potential here for small scale economic development with a small ecotour operation or a voluntourism project to share the knowledge of and protection of this unique Hawaiian resource. I would be happy to discuss my ideas with your firm.

Yours truly,

Annette Kaohelaulii
Travel Consultant

GROUP 70 INTERNATIONAL

Francis S. Oda, Arch. D., FAIA, AICP
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Scott Tangonan
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Ralph E. Portmore, AICP
Of Counsel

November 20, 2006

Ms. Annette Kaohelaulii
Annette's Adventures
45-403 Koa Kahiko Street
Kaneohe, HI 96744
annettesadventures@juno.com

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Ms. Kaohelaulii,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

We appreciate your recognition of Kapolei Property Development's efforts in maintaining this scientifically significant site. The Petitioner is committed to the preservation of the existing coral sinkholes found in an approximately 6-acre area of the proposed Kapolei Harborside Center (also see attached). Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, we recognize the works of Dr. Alan Ziegler, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. These resources shall remain unaffected by the proposed industrial center through the formal establishment of an approximately 6-acre sinkhole preserve area.

As part of the subject State Land Use Boundary Amendment process, the owners will accept a condition to set aside this approximately 6-acre area as a natural resource preserve. Since the early 1990's, a chain link fence was erected to enclose the preserve area, with some openings along the western and southern sides. This fence will be extended to enclose the entire approximately 6-acre preserve, with the addition of locked gates. Access to the preserve will be provided for future scientific investigations, and to continue the use of this area as a "living classroom" setting for schools and environmental education groups.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

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2.2.3 *Preservation Component*

~~More than 40 sinkholes, eligible for listing National/Hawai'i Register of Historic Places, are located within an 7.4 acre archaeological/paleontological Preserve Area at the southwest corner of the site. The preserve was created in the 1990s and is bound by a chain-link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. The close concentration of sinkholes has scientific value, and the 7.4 acre area surrounding the sinkholes will be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.~~

Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

The preserve area was formed in the early 1990s, with the guidance of Bishop Museum zoologist Dr. Alan Ziegler, who conducted substantial investigations of the sinkhole resources. In December 1992, Dr. Ziegler walked the site with representatives of the Estate of James Campbell, to delineate the position for a boundary fence to protect the significant sinkhole resources. The area was subsequently fenced by the Estate. At the time the fence was erected, the area of the preserve was estimated to be between 7 and 8 acres, but was never formally surveyed. In the Draft EIS, the approximate land area for the sinkhole preserve was erroneously estimated to be 7.4 acres. As a follow-up to inquiries regarding the sinkhole preserve, Kapolei Property Development commenced a land survey of the fenced area in October 2006. The survey indicates an actual area of approximately 6 acres enclosed by the boundary of the fenced sinkhole preserve. Sinkhole resources of significance lie within this approximate 6-acre area, as bounded by the AES coal conveyor to the west, the HWS waste pile to the north, existing Hanua Road to the east, and an existing access road off Hanua Road serving the compost business tenant. The land between Malakole Street and the fence is not included in the sinkhole preserve area, as it includes an easement for pipelines and the roadway access to the adjoining compost business tenant.

The close concentration of sinkholes has significant scientific value, and the approximate 6-acre area will continue to be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The existing fence has gaps in two portions that will be closed, and locked gates will be added. The sinkhole preserve will continue to be accessible for future research and education.

Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

From: Marjorie Ziegler [mailto:mz@conservehi.org]
Sent: Thursday, September 21, 2006 2:53 PM
To: stevek@kapolei.com; aching@dbedt.hawaii.gov; Jeff Overton; oeqc@doh.hawaii.gov
Subject: Comments by Keith Krueger re Kapolei Harborside Center Draft EIS

Re: Kapolei Harborside Center Draft EIS

September 21, 2006

Aloha,

My name is Keith Krueger and I am commenting as an individual. I just learned that there is a proposal to develop lands on the 'Ewa Plain on which sinkholes containing the remains of prehistoric life are located. Most of the sinkholes on Oahu have already been lost to development. Sinkholes provide a window into the past through which scientists can study the evolution of life in our state. They contain not only the remains of the long extinct lifeforms that utilized these holes as places in which to live, but they also hold the remains of other creatures that were predated upon.
Additionally, sinkholes are natural collection points for remains of plants and animals that have been transported by processes such as winds or flooding. Due to Hawaii's geographic isolation, many of the species that have aggregated in these sinkholes are found nowhere else on the planet.

The 'Ewa sinkholes are a resource that must be protected. I have heard that provisions to preserve the sinkholes are being considered by the developer. This is an idea that is proper- but the measures implemented should afford permanent protection to this unique and irreplaceable resource. The permitting process must provide the mechanism to secure such protection by directly linking the granting of necessary permits to provisions that stipulate specific and permanent protection to this resource. Additionally, provisions to protect any new sites uncovered by the construction of this project should also be included. Finally, arrangements for educational and scientific access should be guaranteed.

Thank you for your consideration of these comments.

Keith Krueger
P.O. Box 61038
Honolulu, HI 96839

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Francis S. Oda, Arch. D., FAIA, AICP
Norman G.Y. Hong, AIA
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Scott Tangonan
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Ralph E. Portmore, AICP
Of Counsel

November 20, 2006

Mr. Keith Krueger
P.O. Box 61038
Honolulu, HI 96839

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Mr. Krueger,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

We appreciate your recognition of Kapolei Property Development's efforts in maintaining this scientifically significant site. The Petitioner is committed to the preservation of the existing coral sinkholes found in an approximately 6-acre area of the proposed Kapolei Harborside Center (also see attached). Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, we recognize the works of Dr. Alan Ziegler, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. These resources shall remain unaffected by the proposed industrial center through the formal establishment of an approximately 6-acre sinkhole preserve area.

As part of the subject State Land Use Boundary Amendment process, the owners will accept a condition to set aside this approximately 6-acre area as a natural resource preserve. Since the early 1990's, a chain link fence was erected to enclose the preserve area, with some openings along the western and southern sides. This fence will be extended to enclose the entire approximately 6-acre preserve, with the addition of locked gates. Access to the preserve will be provided for future scientific investigations, and to continue the use of this area as a "living classroom" setting for schools and environmental education groups.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

Attachment

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2.2.3 Preservation Component

~~More than 40 sinkholes, eligible for listing National/Hawai'i Register of Historic Places, are located within an 7.4-acre archaeological/paleontological Preserve Area at the southwest corner of the site. The preserve was created in the 1990s and is bound by a chain-link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. The close concentration of sinkholes has scientific value, and the 7.4-acre area surrounding the sinkholes will be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.~~

Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

The preserve area was formed in the early 1990s, with the guidance of Bishop Museum zoologist Dr. Alan Ziegler, who conducted substantial investigations of the sinkhole resources. In December 1992, Dr. Ziegler walked the site with representatives of the Estate of James Campbell, to delineate the position for a boundary fence to protect the significant sinkhole resources. The area was subsequently fenced by the Estate. At the time the fence was erected, the area of the preserve was estimated to be between 7 and 8 acres, but was never formally surveyed. In the Draft EIS, the approximate land area for the sinkhole preserve was erroneously estimated to be 7.4 acres. As a follow-up to inquiries regarding the sinkhole preserve, Kapolei Property Development commenced a land survey of the fenced area in October 2006. The survey indicates an actual area of approximately 6 acres enclosed by the boundary of the fenced sinkhole preserve. Sinkhole resources of significance lie within this approximate 6-acre area, as bounded by the AES coal conveyor to the west, the HWS waste pile to the north, existing Hanua Road to the east, and an existing access road off Hanua Road serving the compost business tenant. The land between Malakole Street and the fence is not included in the sinkhole preserve area, as it includes an easement for pipelines and the roadway access to the adjoining compost business tenant.

The close concentration of sinkholes has significant scientific value, and the approximate 6-acre area will continue to be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The existing fence has gaps in two portions that will be closed, and locked gates will be added. The sinkhole preserve will continue to be accessible for future research and education.

Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

From: Floyd W. McCoy [mailto:fmccoy@hawaii.edu]
Sent: Wednesday, September 20, 2006 5:40 PM
To: stevek@kapolei.com; Jeff Overton; oeqc@doh.hawaii.gov; aching@dbedt.hawaii.gov; mz@conservehi.org
Subject: Commentary on "Kapolei Harborside Center Draft Environmental Impact Statement"

My voice is added to those expressing concern for the preservation of the small plot of land, some 7.4 acres, near Campbell Industrial Park, that contains one of our last remnants of Oahu's prehistoric landscape. Here is a unique geological feature, now all but gone on the Ewa Plain, of a karst topography developed on an ancient raised coral and algal reef. It is a landscape developed over hundreds of thousands of years, once sea level dropped to expose this reef, by rainfall that dissolved the reef rock to form an extensive system of caves and sinkholes (collapsed portions of caves). Debris washing down off the Waianae mountains, and brought in by storm waves and tsunami, have filled some of these caves and sinkholes - and here lies another geologic treasure. Within that fill are fossils. Here is a record of life both pre-settlement (Hawaiian) and contact (the rest of us), from birds to every land mammal that lived on this landscape (the appearance in that fossil record of the Hawaiian rat, for example, announces the arrival of the Hawaiians). Here is a record of plant life from seeds, pollen, spores, phytoliths, etc., that extends back perhaps 100,000 years. Imagine - it is an accounting of life on these islands pre-man! And it remains unstudied. I must have been a barren forbidding landscape to the ancient Hawaiians, now all but gone with historic landscaping (in a large adjacent sinkhole are the remains of a Hawaiian shelter).

The point is that this is indeed a unique and valuable geological site. It is a remnant of a vast landscape now gone. This little plot of land has served me well for educating Hawaii's students in my college courses in geology. It would serve our future research and educational efforts well to preserve it, rather than to see it buried under modern industrial activities. We are fortunate that it has been preserved - my comment is that we should consider it our obligation to ensure preservation of this tiny parcel of land as a unique geological resource in Hawaii.

/s/ Dr. Floyd W. McCoy

Floyd W. McCoy, Professor in Geology and Oceanography

Co-chair, Faculty Senate UH-W

Department of Natural Sciences tel.: 808.236.9115

University of Hawaii - Windward fax: 808.247.5362

45-720 Kea'ahala Rd. Kaneohe, HI 96744 USA

http://www.wcc.hawaii.edu/facstaff/mccoy-f

also: Graduate Affiliate Faculty, Department of Geology & Geophysics

School of Ocean and Earth Science and Technology (SOEST)

University of Hawaii - Manoa Honolulu, HI 96822

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Ralph E. Portmore, AICP
Of Counsel

November 20, 2006

Dr. Floyd W. McCoy, Professor
Department of Natural Sciences
University of Hawaii - Windward
45-720 Kea'ahala Road
Kaneohe, HI 96744 USA
fmccoy@hawaii.edu

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Dr. McCoy,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

We appreciate your recognition of Kapolei Property Development's efforts in maintaining this scientifically significant site. The Petitioner is committed to the preservation of the existing coral sinkholes found in an approximately 6-acre area of the proposed Kapolei Harborside Center (also see attached). Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, we recognize the works of Dr. Alan Ziegler, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. These resources shall remain unaffected by the proposed industrial center through the formal establishment of an approximately 6-acre sinkhole preserve area.

As part of the subject State Land Use Boundary Amendment process, the owners will accept a condition to set aside this approximately 6-acre area as a natural resource preserve. Since the early 1990's, a chain link fence was erected to enclose the preserve area, with some openings along the western and southern sides. This fence will be extended to enclose the entire approximately 6-acre preserve, with the addition of locked gates. Access to the preserve will be provided for future scientific investigations, and to continue the use of this area as a "living classroom" setting for schools and environmental education groups.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

Attachment

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2.2.3 *Preservation Component*

~~More than 40 sinkholes, eligible for listing National/Hawai'i Register of Historic Places, are located within an 7.4 acre archaeological/paleontological Preserve Area at the southwest corner of the site. The preserve was created in the 1990s and is bound by a chain-link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. The close concentration of sinkholes has scientific value, and the 7.4 acre area surrounding the sinkholes will be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.~~

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Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

Alyssa
<greenwaveproductions@gmail.com>
09/19/2006 09:29 AM

To stevek@kapolei.com
cc aching@dbedt.hawaii.gov, jho@group70int.com, oeqc@doh.hawaii.gov
Subject Comments: Kapolei Harborside Center DEIS

Steve Kelly
Kapolei Property Development LLC
1001 Kamokila Blvd., Ste 250
Kapolei, HI 96707

Aloha Mr. Kelly,

The following are my comments concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

I support the proposal to protect the 50 remaining sinkholes on approx. 7.4 acres near Campbell Industrial Park, where fossil and other bones of extinct and unique Hawaiian birds have been found.
Not only are these sites of major scientific interest but they also hold great cultural and educational value for the community. The fact that over 90% of such sites statewide have already been lost to development makes the preservation of these targeted sites even more imperative.

I commend the developer (Kapolei Property Development, LLC), and the landowner (The Estate of James Campbell) for including this proposal to protect these very special places. Future generations will be able to visit and learn about these significant sites, which are eligible for inclusion on the Hawai'i Register of Historic Places.

Thank you for your consideration of my comments,

Alyssa Miller

--
Alyssa Miller
P.O. Box 240421, Honolulu HI 96824-0421
Ph: 808-228-0027

GROUP 70 INTERNATIONAL

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Of Counsel

November 20, 2006

Alyssa Miller
P.O. Box 240421
Honolulu, Hawaii, 96824
greenwaveproductions@gmail.com

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Ms. James,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

We appreciate your recognition of Kapolei Property Development's efforts in maintaining this scientifically significant site. The Petitioner is committed to the preservation of the existing coral sinkholes found in an approximately 6-acre area of the proposed Kapolei Harborside Center project (see attached). Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, we recognize the works of Dr. Alan Ziegler, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. These resources shall remain unaffected by the proposed industrial center through the formal establishment of a 6-acre sinkhole preserve area. A survey conducted by an invertebrate zoologist (Pacific Analytics) examined a wet sinkhole on the property in September 2006. No 'ōpae 'ula (native shrimp) were found in the wet sinkhole.

As part of the subject State Land Use Boundary Amendment process, the owners will accept a condition to set aside this 6-acre area as a natural resource preserve. Since the early 1990's, a chain link fence was erected to enclose the preserve area, with some openings along the western and southern sides. This fence will be extended to enclose the entire 6-acre preserve, with the addition of locked gates. Access to the preserve will be provided for future scientific investigations, and to continue the use of this area as a "living classroom" setting for schools and environmental education groups.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

Attachment

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2.2.3 *Preservation Component*

~~More than 40 sinkholes, eligible for listing National/Hawai'i Register of Historic Places, are located within an 7.4 acre archaeological/paleontological Preserve Area at the southwest corner of the site. The preserve was created in the 1990s and is bound by a chain-link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. The close concentration of sinkholes has scientific value, and the 7.4 acre area surrounding the sinkholes will be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.~~

Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

The preserve area was formed in the early 1990s, with the guidance of Bishop Museum zoologist Dr. Alan Ziegler, who conducted substantial investigations of the sinkhole resources. In December 1992, Dr. Ziegler walked the site with representatives of the Estate of James Campbell, to delineate the position for a boundary fence to protect the significant sinkhole resources. The area was subsequently fenced by the Estate. At the time the fence was erected, the area of the preserve was estimated to be between 7 and 8 acres, but was never formally surveyed. In the Draft EIS, the approximate land area for the sinkhole preserve was erroneously estimated to be 7.4 acres. As a follow-up to inquiries regarding the sinkhole preserve, Kapolei Property Development commenced a land survey of the fenced area in October 2006. The survey indicates an actual area of approximately 6 acres enclosed by the boundary of the fenced sinkhole preserve. Sinkhole resources of significance lie within this approximate 6-acre area, as bounded by the AES coal conveyor to the west, the HWS waste pile to the north, existing Hanua Road to the east, and an existing access road off Hanua Road serving the compost business tenant. The land between Malakole Street and the fence is not included in the sinkhole preserve area, as it includes an easement for pipelines and the roadway access to the adjoining compost business tenant.

The close concentration of sinkholes has significant scientific value, and the approximate 6-acre area will continue to be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The existing fence has gaps in two portions that will be closed, and locked gates will be added. The sinkhole preserve will continue to be accessible for future research and education.

Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

From: Lamerson, Douglas [mailto:LamersoD@EastWestCenter.org]
Sent: Friday, September 22, 2006 4:15 PM
To: 'stevek@kapolei.com'; 'aching@dbedt.hawaii.gov'; Jeff Overton; 'oeqc@doh.hawaii.gov'
Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Aloha,

Following are comments relative to the proposed Kapolei Harborside Center Draft EIS and impacts on the 'Ewa sinkholes.
Also attached is an article on the sinkholes I wrote for the forthcoming issue of *Kolea*, the Conservation Council for Hawai'i newsletter.

I was introduced to the sinkholes by Dr. Alan Ziegler over 20 years ago at a time when there were many more of them. Today, as when I first visited, I find these unique features a delicate, fascinating and irreplaceable natural resource that provides an unparalleled perspective on the natural and cultural history of these islands. Their scientific and cultural value can be commented on more impressively and authoritatively by any number of eminent scholars and cultural custodians.

I am concerned with what I regard as the responsibility of those in positions of power to respond to a hierarchy of values that transcends money and the moment. In less enlightened times, development was pursued single-mindedly without consideration or acknowledgement of community sensibilities which elevated other principles above pure profit. Often these short-sighted, self-serving judgments unilaterally denied subsequent generations access to a history, even a heritage.

The 'Ewa sinkholes are a singular historical repository. The secrets they hold about this place are quite likely to be found nowhere else. The conceit of modernity is that nothing matters but the moment and imagined futures of ever increasing wealth and ease. There may be no persuading those who believe the past has nothing to teach us. But, given that hundreds if not thousands of sinkholes and their historical contents have already been destroyed it seems little to ask that the few remaining sinkholes threatened by this development be preserved for those yet to come and those whose appreciation of the present is informed and enhanced by an understanding of whence we came. I urge you to protect and enhance this invaluable educational resource.

Sincerely,

Doug Lamerson
1711 East-West Road #578
Honolulu, Hawai'i 96848

By Doug Lamerson

The terrain had changed. The heat had not. Nearly twenty years ago the late Alan Ziegler, vertebrate zoologist, conservationist, and raconteur, somehow persuaded me that a tottery descent into a dark, dank, brackish, pit to see some bird bones was a suitable reward for a trek across the unforgiving, broiling, blistered ‘Ewa coastal plain. He was right.

Of course Dr. Ziegler was not your run-of-the-lab scientist. Equal parts scholar, sleuth, adventurer, advocate and humorist, his Southern drawl and disarmingly folksy demeanor routinely seduced the scientifically skittish.

Recently, I returned to the ‘Ewa sinkholes on an educational field trip co-sponsored by The Hawai’i Nature Center and Conservation Council for Hawai’i. By the time of our 9 a.m. rendezvous in a nearby Home Depot parking lot the sun was already a shimmering, menacing presence in a cloudless sky evoking the earlier expedition.

But two decades of development had reduced most of the former ankle-twisting tromp across pocked, Kiawe-punctuated limestone to a comfortable air-conditioned cruise via the asphalt tentacles of O’ahu’s inexorable western sprawl. The sinkholes are now a drive-up archaeological attraction.

Nonetheless, the proximity of marauding modernity notwithstanding, the sinkholes remain an immutable monument to the past; a geologic oddity suspended in pre-time.

Many millennia before Polynesians waded ashore, the ‘Ewa plain was a submerged reef. During periods of glaciation, the retreating sea left the limestone coral exposed to terrestrial weathering forces. Over time acidic rainwater began to corrode the alkaline surface, small pocks eventually evolving into pits, some nearly 20 feet deep and 60 feet in diameter.

Still, however compelling to geologists and spelunkers, holes in the ground for most people are, well, holes in the ground. Unless they also happen to prove a portal to a previously unsuspected past.

As it happens, the ‘Ewa sinkholes are a repository for early Hawaiian cultural clues and the remains of critters no human has ever seen. This is the sort of fantastic phenomenon that holds a particular fascination for those among us still possessed of dynamic imaginations.

Over the years Alan Ziegler introduced hundreds of school children (and adults) to the wonders of a window on the past where the prehistoric became palpable. The composition of our own excursion encompassed three generations, the youngest of which predictably seemed to derive particular delight from, for example, the discovery of an extinct crow’s beak. Who knew?

Well, actually Frank Howarth, the eminent entomologist, knew. How fortuitous to have him along on this exploration with trip leaders Ati Jeffers-Fabro and Pauline Kawamata of The Hawai'i Nature Center. Dr. Howarth is not easily envisioned wriggling into these subterranean cavities, but experience counts and before doubts can be articulated he's looking up from below.

Dr. Howarth knows the secrets these holes have given up: the bones of a long gone Hawaiian sea eagle; a flightless goose-like duck (*moa nalo)*; Hawaiian gapers; a long-legged owl; various rails and petrels, and maybe another dozen extinct avian species. The crow's beak is perfunctory for him, but a sublime revelation for its young discoverer.

A few of these remains are fossilized but most are unaltered. In either case they incline the mind toward a consideration of imponderables: time, change, the pitiable duration of a life, and, mindful of the nearby swarming byways, the outsized capacity of the newly arrived Homo sapiens to transform the planet.

Nearly all of the hundreds of sinkholes that once dotted this landscape have been destroyed by agricultural and development projects, their potential scientific and educational contributions bulldozed into oblivion. The few that remain are now fenced but will soon be further squeezed by the proposed Kapolei Harborside Center, a new industrial development. CCH is active in the effort to preserve this irreplaceable resource and scientific treasure.

Back at the asphalt tentacle, re-hydrating and relaxing around the CCH cooler, the Hill family, visiting from Arizona, observes that this has been the highlight of their Hawaiian holiday.

Alan Ziegler would be pleased.

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November 20, 2006

Mr. Doug Lamerson
1711 East-West Road #578
Honolulu, HI 96848
LamersoD@EastWestCenter.org

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Mr. Lamerson,

Thank you for your comment letter and article concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

The Petitioner is committed to the preservation of the existing coral sinkholes found in an approximately 6-acre area of the proposed Kapolei Harborside Center (also see attached). Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, we recognize the works of Dr. Alan Ziegler, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. These resources shall remain unaffected by the proposed industrial center through the formal establishment of an approximately 6-acre sinkhole preserve area.

As part of the subject State Land Use Boundary Amendment process, the owners will accept a condition to set aside this approximately 6-acre area as a natural resource preserve. Since the early 1990's, a chain link fence was erected to enclose the preserve area, with some openings along the western and southern sides. This fence will be extended to enclose the entire approximately 6-acre preserve, with the addition of locked gates. Access to the preserve will be provided for future scientific investigations, and to continue the use of this area as a "living classroom" setting for schools and environmental education groups.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

Attachment

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2.2.3 *Preservation Component*

~~More than 40 sinkholes, eligible for listing National/Hawai'i Register of Historic Places, are located within an 7.4-acre archaeological/paleontological Preserve Area at the southwest corner of the site. The preserve was created in the 1990s and is bound by a chain-link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. The close concentration of sinkholes has scientific value, and the 7.4-acre area surrounding the sinkholes will be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.~~

Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

The preserve area was formed in the early 1990s, with the guidance of Bishop Museum zoologist Dr. Alan Ziegler, who conducted substantial investigations of the sinkhole resources. In December 1992, Dr. Ziegler walked the site with representatives of the Estate of James Campbell, to delineate the position for a boundary fence to protect the significant sinkhole resources. The area was subsequently fenced by the Estate. At the time the fence was erected, the area of the preserve was estimated to be between 7 and 8 acres, but was never formally surveyed. In the Draft EIS, the approximate land area for the sinkhole preserve was erroneously estimated to be 7.4 acres. As a follow-up to inquiries regarding the sinkhole preserve, Kapolei Property Development commenced a land survey of the fenced area in October 2006. The survey indicates an actual area of approximately 6 acres enclosed by the boundary of the fenced sinkhole preserve. Sinkhole resources of significance lie within this approximate 6-acre area, as bounded by the AES coal conveyor to the west, the HWS waste pile to the north, existing Hanua Road to the east, and an existing access road off Hanua Road serving the compost business tenant. The land between Malakole Street and the fence is not included in the sinkhole preserve area, as it includes an easement for pipelines and the roadway access to the adjoining compost business tenant.

The close concentration of sinkholes has significant scientific value, and the approximate 6-acre area will continue to be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The existing fence has gaps in two portions that will be closed, and locked gates will be added. The sinkhole preserve will continue to be accessible for future research and education.

Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

-----Original Message-----
From: Teya Penniman [mailto:misc@hawaii.edu]
Sent: Wednesday, September 20, 2006 7:59 AM
To: stevek@kapolei.com; aching@dbedt.hawaii.gov; Jeff Overton; oeqc@doh.hawaii.gov
Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Aloha:

Please include my comments as part of public input on the draft EIS for the Kapolei Harborside Center.

It is of utmost cultural, biological, and historical importance to preserve the Ewa sinkholes near Campbell Industrial Park.

This site's historical significance is demonstrated by its eligibility for inclusion on the Hawaii Register of Historic Places. Protection is especially warranted given the site's archaeological significance. The Ewa sinkholes are one of very few remaining representatives of sinkholes on the reef from Waianae to Barbers Point. It is estimated that nearly 99 percent of former sinkholes have been lost to agriculture and development.

Sinkholes provide a unique window to Hawaii's past biological splendor. Many unique and now extinct Hawaiian bird bones have been found in sinkholes.
These species were unknown to science until their discovery beginning in the 1970s.

The sinkholes also are important cultural and educational sites. Evidence of the Native Hawaiian culture is present in the area. The Hawaii Nature Center, Hawaii Audubon Society and other groups use the sinkholes as educational field trips.

Please include adequate measures to protect these treasures in any development decisions.

Sincerely,

Teya M. Penniman

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Ralph E. Portmore, AICP
Of Counsel

November 20, 2006

Ms. Teya Penniman
misc@hawaii.edu

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Ms. Penniman,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

We appreciate your recognition of Kapolei Property Development's efforts in maintaining this scientifically significant site. The Petitioner is committed to the preservation of the existing coral sinkholes found in an approximately 6-acre area of the proposed Kapolei Harborside Center (also see attached). Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, we recognize the works of Dr. Alan Ziegler, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. These resources shall remain unaffected by the proposed industrial center through the formal establishment of an approximately 6-acre sinkhole preserve area.

As part of the subject State Land Use Boundary Amendment process, the owners will accept a condition to set aside this approximately 6-acre area as a natural resource preserve. Since the early 1990's, a chain link fence was erected to enclose the preserve area, with some openings along the western and southern sides. This fence will be extended to enclose the entire approximately 6-acre preserve, with the addition of locked gates. Access to the preserve will be provided for future scientific investigations, and to continue the use of this area as a "living classroom" setting for schools and environmental education groups.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
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Cc: State Land Use Commission
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2.2.3 *Preservation Component*

~~More than 40 sinkholes, eligible for listing National/Hawai'i Register of Historic Places, are located within an 7.4-acre archaeological/paleontological Preserve Area at the southwest corner of the site. The preserve was created in the 1990s and is bound by a chain-link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. The close concentration of sinkholes has scientific value, and the 7.4-acre area surrounding the sinkholes will be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.~~

Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

The preserve area was formed in the early 1990s, with the guidance of Bishop Museum zoologist Dr. Alan Ziegler, who conducted substantial investigations of the sinkhole resources. In December 1992, Dr. Ziegler walked the site with representatives of the Estate of James Campbell, to delineate the position for a boundary fence to protect the significant sinkhole resources. The area was subsequently fenced by the Estate. At the time the fence was erected, the area of the preserve was estimated to be between 7 and 8 acres, but was never formally surveyed. In the Draft EIS, the approximate land area for the sinkhole preserve was erroneously estimated to be 7.4 acres. As a follow-up to inquiries regarding the sinkhole preserve, Kapolei Property Development commenced a land survey of the fenced area in October 2006. The survey indicates an actual area of approximately 6 acres enclosed by the boundary of the fenced sinkhole preserve. Sinkhole resources of significance lie within this approximate 6-acre area, as bounded by the AES coal conveyor to the west, the HWS waste pile to the north, existing Hanua Road to the east, and an existing access road off Hanua Road serving the compost business tenant. The land between Malakole Street and the fence is not included in the sinkhole preserve area, as it includes an easement for pipelines and the roadway access to the adjoining compost business tenant.

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Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

From: Tanaka, Daniel [mailto:dtanaka@mlpmaui.com]
Sent: Thursday, September 21, 2006 7:09 AM
To: stevek@kapolei.com
Cc: aching@dbedt.hawaii.gov; Jeff Overton; oeqc@doh.hawaii.gov; mz@conservehi.org
Subject: Kapolei Harborside DEIS

I support the full protection of the Ewa sinkholes as a habitat for the opae and as a valuable resource for geological, scientific, cultural, and educational purposes.

GROUP 70
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Francis S. Oda,
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Tom Young, AIA

Ralph E. Portmore, AICP
Of Counsel

November 20, 2006

Mr. Daniel Tanaka
dtanaka@mlpmaui.com

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Mr. Tanaka,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

We appreciate your recognition of Kapolei Property Development's efforts in maintaining this scientifically significant site. The Petitioner is committed to the preservation of the existing coral sinkholes found in an approximately 6-acre area of the proposed Kapolei Harborside Center (also see attached). Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, we recognize the works of Dr. Alan Ziegler, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. These resources shall remain unaffected by the proposed industrial center through the formal establishment of a 7.4-acre sinkhole preserve area.

As part of the subject State Land Use Boundary Amendment process, the owners will accept a condition to set aside this approximately 6-acre area as a natural resource preserve. Since the early 1990's, a chain link fence was erected to enclose the preserve area, with some openings along the western and southern sides. This fence will be extended to enclose the entire approximately 6-acre preserve, with the addition of locked gates. Access to the preserve will be provided for future scientific investigations, and to continue the use of this area as a "living classroom" setting for schools and environmental education groups.

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Vice President

Cc: State Land Use Commission
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2.2.3 *Preservation Component*

~~More than 40 sinkholes, eligible for listing National/Hawai'i Register of Historic Places, are located within an 7.4-acre archaeological/paleontological Preserve Area at the southwest corner of the site. The preserve was created in the 1990s and is bound by a chain-link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. The close concentration of sinkholes has scientific value, and the 7.4-acre area surrounding the sinkholes will be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.~~

Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

The preserve area was formed in the early 1990s, with the guidance of Bishop Museum zoologist Dr. Alan Ziegler, who conducted substantial investigations of the sinkhole resources. In December 1992, Dr. Ziegler walked the site with representatives of the Estate of James Campbell, to delineate the position for a boundary fence to protect the significant sinkhole resources. The area was subsequently fenced by the Estate. At the time the fence was erected, the area of the preserve was estimated to be between 7 and 8 acres, but was never formally surveyed. In the Draft EIS, the approximate land area for the sinkhole preserve was erroneously estimated to be 7.4 acres. As a follow-up to inquiries regarding the sinkhole preserve, Kapolei Property Development commenced a land survey of the fenced area in October 2006. The survey indicates an actual area of approximately 6 acres enclosed by the boundary of the fenced sinkhole preserve. Sinkhole resources of significance lie within this approximate 6-acre area, as bounded by the AES coal conveyor to the west, the HWS waste pile to the north, existing Hanua Road to the east, and an existing access road off Hanua Road serving the compost business tenant. The land between Malakole Street and the fence is not included in the sinkhole preserve area, as it includes an easement for pipelines and the roadway access to the adjoining compost business tenant.

The close concentration of sinkholes has significant scientific value, and the approximate 6-acre area will continue to be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The existing fence has gaps in two portions that will be closed, and locked gates will be added. The sinkhole preserve will continue to be accessible for future research and education.

Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

-----Original Message-----
From: Kimberly A Tice [mailto:katice@hawaii.edu]
Sent: Monday, September 18, 2006 10:09 PM
To: stevek@kapolei.com; aching@dbet.hawaii.gov; Jeff Overton; oeqc@doh.hawaii.gov
Subject: Kapolei Harborside Center Draft EIS

Septermber 18, 2006

To Whom It May Concern,

I am writing in regards to the Kapolei Harborside Center Draft Environmental Impact Statement. I support protection of the approximately 50 sinkholes remaining on the site, and commend the landowner and developer of the site for proposing protection for these precious resources. These sinkholes contain fossils and bones of a mysterious and now extinct Hawaiian biota (such as a sea eagle, flightless rails, and the moa nalo), and only by preserving these sites will we be able to more fully understand Hawaii's unique natural history. Thousands of these sinkholes used to exist on the Leeward coast of Hawaii, but 99% of these precious sites have been lost to development and agriculture.

These sinkholes must be preserved. Only recently have scientists begun identifying the extinct species they contain, and much more remains to be learned. In fact, new bird bones have been just been found in recent months. Additionally, there is evidence of Native Hawaiian culture present in the area, and the native öpae ula also have been found in brackish water in at least one of the remaining sinkholes. These sinkholes are also important educational tools, and groups, such as the Hawaii Nature Center and Hawaii Audubon Society have led educational field trips to the site. Hundreds of students, teachers, and others have learned about, and enjoyed visiting this interesting area.

I ask that you please support the protection of these sinkholes for geologic, scientific, cultural, and educational reasons. Future generations will be able to learn about this significant site, which is eligible for inclusion on the Hawaii Register of Historic Places. Please do not allow such a natural, national treasure to be destroyed.

Sincerely,
Kimberly Tice

****
Kimberly Tice
Graduate Student
Department of Zoology
University of Hawai'i at Manoa
2538 McCarthy Mall, Edmondson 152
Honolulu, HI 96822
Office: 808-956-8992 Cell: 808-343-6329
****

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Ralph E. Portmore, AICP
Of Counsel

November 20, 2006

Ms. Kimberly Tice, Graduate Student
Department of Zoology
University of Hawaii at Manoa
2538 McCarthy Mall, Edmondson 152
Honolulu, HI 96822
ktice@hawaii.edu

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Ms. Tice,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

We appreciate your recognition of Kapolei Property Development's efforts in maintaining this scientifically significant site. The Petitioner is committed to the preservation of the existing coral sinkholes found in an approximately 6-acre area of the proposed Kapolei Harborside Center (also see attached). Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, we recognize the works of Dr. Alan Ziegler, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. These resources shall remain unaffected by the proposed industrial center through the formal establishment of an approximately 6-acre sinkhole preserve area. A survey conducted by an invertebrate zoologist (Pacific Analytics) examined a wet sinkhole on the property in September 2006. No 'ōpae 'ula (native shrimp) were found in the wet sinkhole.

As part of the subject State Land Use Boundary Amendment process, the owners will accept a condition to set aside this approximately 6-acre area as a natural resource preserve. Since the early 1990's, a chain link fence was erected to enclose the preserve area, with some openings along the western and southern sides. This fence will be extended to enclose the entire approximately 6-acre preserve, with the addition of locked gates. Access to the preserve will be provided for future scientific investigations, and to continue the use of this area as a "living classroom" setting for schools and environmental education groups.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

Attachment

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2.2.3 *Preservation Component*

~~More than 40 sinkholes, eligible for listing National/Hawai'i Register of Historic Places, are located within an 7.4-acre archaeological/paleontological Preserve Area at the southwest corner of the site. The preserve was created in the 1990s and is bound by a chain-link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. The close concentration of sinkholes has scientific value, and the 7.4-acre area surrounding the sinkholes will be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.~~

Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

The preserve area was formed in the early 1990s, with the guidance of Bishop Museum zoologist Dr. Alan Ziegler, who conducted substantial investigations of the sinkhole resources. In December 1992, Dr. Ziegler walked the site with representatives of the Estate of James Campbell, to delineate the position for a boundary fence to protect the significant sinkhole resources. The area was subsequently fenced by the Estate. At the time the fence was erected, the area of the preserve was estimated to be between 7 and 8 acres, but was never formally surveyed. In the Draft EIS, the approximate land area for the sinkhole preserve was erroneously estimated to be 7.4 acres. As a follow-up to inquiries regarding the sinkhole preserve, Kapolei Property Development commenced a land survey of the fenced area in October 2006. The survey indicates an actual area of approximately 6 acres enclosed by the boundary of the fenced sinkhole preserve. Sinkhole resources of significance lie within this approximate 6-acre area, as bounded by the AES coal conveyor to the west, the HWS waste pile to the north, existing Hanua Road to the east, and an existing access road off Hanua Road serving the compost business tenant. The land between Malakole Street and the fence is not included in the sinkhole preserve area, as it includes an easement for pipelines and the roadway access to the adjoining compost business tenant.

The close concentration of sinkholes has significant scientific value, and the approximate 6-acre area will continue to be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The existing fence has gaps in two portions that will be closed, and locked gates will be added. The sinkhole preserve will continue to be accessible for future research and education.

Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

From: Varady, Suzanne [mailto:svarady@honolulu.gov]
Sent: Wed 9/20/2006 7:16 AM
To: Kelly, Steve
Cc: mz@conservehi.org
Subject: Comments on the "Kapolei Harborside Center Draft EIS"

(This email found its way to me today and, unfortunately, in one hour I'm going to be out of the office for the rest of the week with my co-workers assisting in the production of a large recycling fair. However, this wonderful offer deserves a prompt response.)

Aloha,

This message is to show my strong support for the preservation and protection of the Ewa sinkholes. It is heartening to know Kapolei Property Development LLC and the Estate of James Campbell are proposing to protect these natural creations.

Urban O'ahu has little left of its natural profile and saving these 50 sink holes will be a huge plus and a wonderful gift of nature for all of us, present and future.

With a heartfelt thank you for considering the protection of those remaining sinkholes that hold such a wealth of information.

Me ke aloha pumehana.

Suzanne Varady

Suzanne L. Varady
Recycling Specialist
City and County of Honolulu
Department of Environmental Services
Refuse Division
phone: 808-692-5408; fax: 692-5402
www.opala.org

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Ralph E. Portmore, AICP
Of Counsel

November 20, 2006

Ms. Suzanne Varady, Recycling Specialist
City and County of Honolulu
Department of Environmental Services
Refuse Division
svarady@honolulu.gov

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Ms. Varady,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

We appreciate your recognition of Kapolei Property Development's efforts in maintaining this scientifically significant site. The Petitioner is committed to the preservation of the existing coral sinkholes found in an approximately 6-acre area of the proposed Kapolei Harborside Center (also see attached). Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, we recognize the works of Dr. Alan Ziegler, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. These resources shall remain unaffected by the proposed industrial center through the formal establishment of an approximately 6-acre sinkhole preserve area.

As part of the subject State Land Use Boundary Amendment process, the owners will accept a condition to set aside this approximately 6-acre area as a natural resource preserve. Since the early 1990's, a chain link fence was erected to enclose the preserve area, with some openings along the western and southern sides. This fence will be extended to enclose the entire approximately 6-acre preserve, with the addition of locked gates. Access to the preserve will be provided for future scientific investigations, and to continue the use of this area as a "living classroom" setting for schools and environmental education groups.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

Attachment

2.2.3 *Preservation Component*

~~More than 40 sinkholes, eligible for listing National/Hawai'i Register of Historic Places, are located within an 7.4-acre archaeological/paleontological Preserve Area at the southwest corner of the site. The preserve was created in the 1990s and is bound by a chain-link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. The close concentration of sinkholes has scientific value, and the 7.4-acre area surrounding the sinkholes will be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.~~

Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

The preserve area was formed in the early 1990s, with the guidance of Bishop Museum zoologist Dr. Alan Ziegler, who conducted substantial investigations of the sinkhole resources. In December 1992, Dr. Ziegler walked the site with representatives of the Estate of James Campbell, to delineate the position for a boundary fence to protect the significant sinkhole resources. The area was subsequently fenced by the Estate. At the time the fence was erected, the area of the preserve was estimated to be between 7 and 8 acres, but was never formally surveyed. In the Draft EIS, the approximate land area for the sinkhole preserve was erroneously estimated to be 7.4 acres. As a follow-up to inquiries regarding the sinkhole preserve, Kapolei Property Development commenced a land survey of the fenced area in October 2006. The survey indicates an actual area of approximately 6 acres enclosed by the boundary of the fenced sinkhole preserve. Sinkhole resources of significance lie within this approximate 6-acre area, as bounded by the AES coal conveyor to the west, the HWS waste pile to the north, existing Hanua Road to the east, and an existing access road off Hanua Road serving the compost business tenant. The land between Malakole Street and the fence is not included in the sinkhole preserve area, as it includes an easement for pipelines and the roadway access to the adjoining compost business tenant.

The close concentration of sinkholes has significant scientific value, and the approximate 6-acre area will continue to be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The existing fence has gaps in two portions that will be closed, and locked gates will be added. The sinkhole preserve will continue to be accessible for future research and education.

Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

----Original Message-----
From: "Joey Dakine" <joeydakine@hotmail.com>
Date: Tue, 19 Sep 2006 07:04:36
To:stevek@kapolei.com
Subject: in support of protecting the 'Ewa sinkholes

Aloha! I heard about these sinkholes and the discoveries inside of them 25 years ago from my professor at UH. I never did go down and check them out. I want to do that someday. Just like 99% of the sand dunes in Hawaii are gone now, most of these sinkholes are too. Please save as much of this as you can. It is part of our natural heritage that is going extinct. We must save the remainder for the future, so that we may better understand our past.

Mahalo. Joseph Watts

* We commend the landowner and developer for proposing to protect the 'Ewa sinkholes near Campbell Industrial Park.

* Future generations will be able to about this significant site, which is eligible for inclusion on the Hawai'i Register of Historic Places.

* The 'Ewa sinkholes are part of a coral reef formed about 120,000 years ago when sea level was higher. Today, this area consists of weathered karst (limestone substrate) dotted with sinkholes.

* There used to be thousands of sinkholes on the raised reef from Wai'anae to Barber's Point, but 99 percent of the sinkholes have been lost to agriculture and development.

* Unique and extinct Hawaiian bird bones have been found in the remaining sinkholes, including the moa nalo (a flightless goose-like duck), geese, 2 species of extinct crow, long-legged owl, a hawk, a sea eagle, gapers, flightless rails, a small petrel, and new Hawaiian honeycreepers.

* These birds are known only from the archaeological record, having gone extinct before 1778. They were unknown to science until their discovery beginning in the 1970s.

* Many of these birds have been described and named by renowned avian paleontologists, Storrs Olson and Helen James, of the Smithsonian Institution.

* Evidence of the Native Hawaiian culture is present in the area, and 'öpae 'ula (tiny native red shrimp) also have been found in brackish water in at least one of the remaining sinkholes.

* Groups, such as the Hawai'i Nature Center and Hawai'i Audubon Society, have led educational field trips to the sinkholes. Hundreds of students, teachers, and others have learned about, and enjoyed visiting this interesting area.

* New bird bones have been found in recent months, which could provide clues to even more fascinating Hawaiian birds of our past.

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Ralph E. Portmore, AICP
Of Counsel

November 20, 2006

Mr. Joseph Watts
joeydakine@hotmail.com

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Mr. Watts,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

We appreciate your recognition of Kapolei Property Development's efforts in maintaining this scientifically significant site. The Petitioner is committed to the preservation of the existing coral sinkholes found in an approximately 6-acre area of the proposed Kapolei Harborside Center (also see attached). Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, we recognize the works of Dr. Alan Ziegler, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. These resources shall remain unaffected by the proposed industrial center through the formal establishment of an approximately 6-acre sinkhole preserve area. A survey conducted by an invertebrate zoologist (Pacific Analytics) examined a wet sinkhole on the property in September 2006. No ʻōpae ʻula (native shrimp) were found in the wet sinkhole.

As part of the subject State Land Use Boundary Amendment process, the owners will accept a condition to set aside this approximately 6-acre area as a natural resource preserve. Since the early 1990's, a chain link fence was erected to enclose the preserve area, with some openings along the western and southern sides. This fence will be extended to enclose the entire approximately 6-acre preserve, with the addition of locked gates. Access to the preserve will be provided for future scientific investigations, and to continue the use of this area as a "living classroom" setting for schools and environmental education groups.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

Attachment

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2.2.3 *Preservation Component*

~~More than 40 sinkholes, eligible for listing National/Hawai'i Register of Historic Places, are located within an 7.4 acre archaeological/paleontological Preserve Area at the southwest corner of the site. The preserve was created in the 1990s and is bound by a chain-link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. The close concentration of sinkholes has scientific value, and the 7.4 acre area surrounding the sinkholes will be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.~~

Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

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Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

From: Shannon Wianecki [mailto:mousetrap8@hotmail.com]
Sent: Monday, September 18, 2006 3:50 PM
To: stevek@kapolei.com; aching@dbedt.hawaii.gov; Jeff Overton; oeqc@doh.hawaii.gov
Cc: mz@conservehi.org
Subject: Comments on the Kapolei Harborside Center Draft EIS

Aloha!

Thank you for your consideration to protect the 'Ewa sinkholes near Campbell Industrial Park. As you are aware, these sinkholes have provided mysterious and compelling links to Hawaii's past. The preserved bones of previously unknown bird species discovered here are now part of the Smithsonian Institution. As a part-time science educator and freelance writer, I delight in describing these natural treasures to keiki--sparking their imagination with images of Hawaii's ancient landscape. The remaining 'Ewa sinkholes are truly a significant part of Hawaii's natural heritage and should be preserved. I applaud your efforts to do so.

Mahalo nui loa,

Shannon Wianecki

PO BOX 790666

Paia, HI 96779

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Ralph E. Portmore, AICP
Of Counsel

November 20, 2006

Ms. Shannon Wianecki
P.O. Box 790666
Paia, HI 96779
mousetrap8@hotmail.com

Subject: Kapolei Harborside Center Draft Environmental Impact Statement

Dear Ms. Wianecki,

Thank you for your comment letter concerning the Kapolei Harborside Center Draft Environmental Impact Statement.

We appreciate your recognition of Kapolei Property Development's efforts in maintaining this scientifically significant site. The Petitioner is committed to the preservation of the existing coral sinkholes found in an approximately 6-acre area of the proposed Kapolei Harborside Center (also see attached). Kapolei Property Development recognizes the rich evidence of extinct Hawaiian birds within these existing sinkholes, which has been uncovered over decades of research. Of particular note, we recognize the works of Dr. Alan Ziegler, who conducted extensive studies of the sinkholes during his term with the Bishop Museum. These resources shall remain unaffected by the proposed industrial center through the formal establishment of an approximately 6-acre sinkhole preserve area.

As part of the subject State Land Use Boundary Amendment process, the owners will accept a condition to set aside this approximately 6-acre area as a natural resource preserve. Since the early 1990's, a chain link fence was erected to enclose the preserve area, with some openings along the western and southern sides. This fence will be extended to enclose the entire approximately 6-acre preserve, with the addition of locked gates. Access to the preserve will be provided for future scientific investigations, and to continue the use of this area as a "living classroom" setting for schools and environmental education groups.

Your comment letter and this response will be included in the Final EIS. We appreciate your participation in the environmental review process. Please submit a request to our office if you would like a copy of the Final EIS, or portions thereof.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Cc: State Land Use Commission
Kapolei Property Development

Attachment

2.2.3 Preservation Component

~~More than 40 sinkholes, eligible for listing National/Hawai'i Register of Historic Places, are located within an 7.4-acre archaeological/paleontological Preserve Area at the southwest corner of the site. The preserve was created in the 1990s and is bound by a chain-link fence. These sinkholes have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. The close concentration of sinkholes has scientific value, and the 7.4-acre area surrounding the sinkholes will be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The site will be accessible for future research and education.~~

Approximately 6 acres of the Petition Area contains a cluster of more than 40 coral sinkholes within a fenced archaeological/paleontological preserve area. The subject sinkholes have the potential to contain both paleontological avian and land snail deposits, as well as cultural deposits related to traditional Native Hawaiian land-use, including human burial interment. Some have Polynesian cultigens (noni, *Morinda citrifolia* and *Ti Taetsia fructosa*) growing in them. As such, these features are eligible for listing on the National/Hawai'i Register of Historic Places.

The preserve area was formed in the early 1990s, with the guidance of Bishop Museum zoologist Dr. Alan Ziegler, who conducted substantial investigations of the sinkhole resources. In December 1992, Dr. Ziegler walked the site with representatives of the Estate of James Campbell, to delineate the position for a boundary fence to protect the significant sinkhole resources. The area was subsequently fenced by the Estate. At the time the fence was erected, the area of the preserve was estimated to be between 7 and 8 acres, but was never formally surveyed. In the Draft EIS, the approximate land area for the sinkhole preserve was erroneously estimated to be 7.4 acres. As a follow-up to inquiries regarding the sinkhole preserve, Kapolei Property Development commenced a land survey of the fenced area in October 2006. The survey indicates an actual area of approximately 6 acres enclosed by the boundary of the fenced sinkhole preserve. Sinkhole resources of significance lie within this approximate 6-acre area, as bounded by the AES coal conveyor to the west, the HWS waste pile to the north, existing Hanua Road to the east, and an existing access road off Hanua Road serving the compost business tenant. The land between Malakole Street and the fence is not included in the sinkhole preserve area, as it includes an easement for pipelines and the roadway access to the adjoining compost business tenant.

The close concentration of sinkholes has significant scientific value, and the approximate 6-acre area will continue to be preserved. Measures will be implemented to protect the resources from vandalism and/or destruction from unauthorized entry. The existing fence has gaps in two portions that will be closed, and locked gates will be added. The sinkhole preserve will continue to be accessible for future research and education.

Figure 2-1 Land Use Plan has been modified to indicate the correct extent of the approximately 6-acre fenced sinkhole preserve.

9.2 COMMENT AND RESPONSE LETTERS FOR THE DRAFT ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE (EISPN)

United States Department of the Interior

U.S. GEOLOGICAL SURVEY
Pacific Islands Water Science Center
677 Ala Moana Blvd., Suite 415
Honolulu, HI 96813
Phone: (808) 587-2400/Fax: (808) 587-2401

April 25, 2006

MAY - 2 2006

Mr. Jeffrey H. Overton, AICP
Principal
Group 70 International Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Subject: Environmental Impact Statement Preparation Notice (EISPN)
Kapolei Harborside Center
TMK: 9-1-14:33 por., 34, 35, 9-1-15:20 por. (Ewa, Kapolei, Oahu)

Thank you for forwarding the subject EISPN for review and comment by the staff of the U.S. Geological Survey, Pacific Islands Water Science Center. We regret however, that due to prior commitments and lack of available staff, we are unable to review this document and are returning it for your future use.

We appreciate the opportunity to participate in the review process.

Sincerely,

Gordon Tribble
Director

Enclosure

GROUP 70 INTERNATIONAL

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Scott Tangonan
Tom Young, AIA

Ralph E. Portmore, AICP
Of Counsel

August 4, 2006

Attn: Mr. Gordon Tribble
Director
Department of the Interior
U.S. Geological Survey
Pacific Islands Water Science Center
677 Ala Moana Blvd., Suite 415
Honolulu, HI 96813

Subject: Comment Letter on the Kapolei Harborside Center Environmental Impact Statement Preparation Notice

Dear Mr. Tribble,

Thank you for your comment letter concerning the Kapolei Harborside Center Environmental Impact Statement Notice of Preparation.

We acknowledge that due to prior commitments and lack of available staff, you were unable to review the document. We appreciate that you returned it for our future use.

Your comment letter is included in the Draft EIS. We appreciate your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

MAY 18

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

LINDA LINGLE
GOVERNOR
THEODORE E. LIU
DIRECTOR
MARK K. ANDERSON
DEPUTY DIRECTOR
LAURA H. THIELEN
DIRECTOR
OFFICE OF PLANNING

OFFICE OF PLANNING
235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824

Ref. No. P-11364

May 16, 2006

Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Attn: Mr. Jeffrey H. Overton, AICP

Subject: Docket No. A06-763 Kapolei Harborside Center
Environmental Impact Statement Preparation Notice (EISPN)

Dear Mr. Overton:

We have reviewed the Preparation Document to develop the project area for light industrial. The Property is currently within the Agricultural Land Use District, and the City has designated this area as Industrial within the Ewa Development Plan.

The document indicates that the Draft Environmental Assessment will include studies on topography, groundwater, fauna and flora, archaeological, cultural impacts, social impacts, noise, air quality, visual, potable and non potable water impacts, flood and drainage, wastewater, and traffic impacts. The EISPN indicates that an archaeological preservation area is proposed for a 7.4-acre sinkhole area.

The EISPN does not indicate whether a study on invertebrates will be included in the Draft Environmental Impact Statement (DEIS). The Office of Planning recommends that the Petitioner include a study on invertebrates in the DEIS.

On April 20, 2006, the Land Use Commission conducted a site visit. During the site visit, the Petitioner identified a hazardous waste site. A description of this site is not included in the EISPN. We ask that a complete description of the type and the containment of the waste be included in the DEIS. We note that this site may be suitable for a "Brownfields" redevelopment, and therefore be eligible for Brownfields assessment and loan fund. The Office of Planning encourages this type of redevelopment and will provide assistance with the Brownfields program application process. Please discuss this site and any possible redevelopment plans in the DEIS.

Thank you for the opportunity to comment on this document. If you have any questions, please contact Lorene Maki of my staff at 587-2888.

Sincerely,

Laura H. Thielen
Director

c: Anthony Ching, LUC
Genevieve Salmonson, OEQC

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Ralph E. Portmore, AICP
Of Counsel

August 4, 2006

Attn: Ms. Laura H. Thielen
Director
State of Hawai'i
Department of Business, Economic
Development, and Tourism
Office of Planning
P.O. Box 2359
Honolulu, HI 96804

Subject: Comment Letter on the Kapolei Harborside Center Environmental Impact Statement Preparation Notice

Dear Ms. Thielen,

Thank you for your May 16, 2006 comment letter concerning the Kapolei Harborside Center Environmental Impact Statement Notice of Preparation.

Rana Productions, Ltd conducted a biological survey of the project area, which is included in the Draft EIS. No invertebrate survey was conducted as part of this study. The rationale for not conducting such a survey was as follows: there is only one listed invertebrate species historically known from O'ahu, namely the Blackburn's sphinx moth (*Manduca blacburni*), and this species has not been recorded from the island since the 1940's despite significant efforts to relocate the species on the island (Federal Register 2003). It was felt that the likelihood that this species is present on the subject property or within the 'Ewa plains area, which has been extensively studied over the past 20-years is highly unlikely. In consultation with biologists familiar with the area it was determined that a number of native, though unprotected invertebrate species are likely present within the project site and within the greater 'Ewa area. However, the presence of non-listed though native species would not result in additional regulatory requirements being placed on the project.

The hazardous waste disposal area observed during the Land Use Commission site visit is fully described by LFR, Inc in their Environmental Summary Report, which is included as an appendix and summarized in Section 4 of the DEIS. The report also describes a petroleum product plume that encroaches on the site from offsite sources. Investigation, remediation and containment activities for the two environmental concerns are summarized in the DEIS.

We understand that the environmental concerns identified at the project site may qualify portions of Kapolei Harborside Center for Brownfields redevelopment with potential for financial assistance. The former Hawaiian Western Steel waste pile site is subject to semi-annual waste pile cap inspections and scheduled maintenance activities are required as described in its 30-year Post-closure Plan. 2006 is the tenth year of the post-closure period. Future use of the site is deed restricted per EPA regulations, and thus development of this site is precluded from future development. The petroleum plume affected area along Malakole Street, adjacent to the Chevron Refinery is a site for potential Brownfield redevelopment. A study of the site indicates that development is possible of this site assuming proper precautions and mitigation measures are taken.

We appreciate your offer of assistance with the Brownfields program application process and are giving the idea serious consideration. No decision has been made to date. The DEIS mentions the Brownfields subject as an Unresolved Issue, Section 8.0.

Your comment letter is included in the Draft EIS. We appreciate your participation in the environmental review process.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Federal Register 2003. Department of the Interior, Fish and Wildlife Service, 50 CFR 17. Endangered and Threatened Wildlife and Plants.: Designation of Critical Habitat for the Blackburn's Sphinx Moth; Final Rule. Federal Register, 68 No. 111 (Tuesday, June 10, 2003): 34710-34766.

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Web site: www.hawaii.gov/dbedt

May 23, 2006

MAY 25 2006

Group 70 International, Inc.
925 Bethel Street, 5th floor
Honolulu, Hawaii 96813-4307
Attn: Jeffrey H. Overton, AICP

Re: Environmental Impact Statement Preparation Notice (EISPN)
Kapolei Harborside Center
TMK: 9-1-14:33 por., 34, 35, 9-1-15:20 por. (Ewa, Kapolei, Oahu)

In response to your April 21, 2006, notice, thank you for the opportunity to provide comments on the EISPN for the Kapolei Harborside Center project. We note that this is a proposed industrial park. Our comments are addressed to: 1) State energy conservation goals, 2) energy saving design practices and technologies, and 3) recycling and recycled-content products. We would encourage the developers to include requirements that would reduce energy use in the park by future tenants.

(1) **State energy conservation goals.** Project buildings, activities, and site grounds should be designed with energy saving considerations. The mandate for such consideration is found in Chapter 344, HRS ("State Environmental Policy") and Chapter 226 ("Hawaii State Planning Act"). In particular, we would like to call to your attention HRS 226 18(c) (4) which includes a State objective of promoting all cost-effective energy conservation through adoption of energy-efficient practices and technologies. We suggest that you contact Hawaiian Electric Co., Inc., which may offer demand-side management rebates for energy efficient technologies and other measures which would reduce the use of energy within the park.

(2) **Energy saving design practices and technologies.** Methods and technologies that could be considered during the design phase of the project include:

a. Use of site shading, orientation, and use of naturally ventilated areas to reduce cooling load;
b. Maximum use of day lighting;
c. Use of high efficiency compact fluorescent lighting;
d. Exceed Model Energy Code requirements;
e. Use of photovoltaics, fuel cells and other renewable energy sources.

f. Use of roof and gutter to divert rainwater for landscaping; and
g. Use of landscaping for dust control and to minimize heat gain to area.

(3) **Recycling and recycled-content products.**

a. Develop a job-site recycling plan for the construction phase of the project and recycle or otherwise provide for beneficial use as much construction and demolition waste as possible;
b. Incorporate provisions for recycling into the project – a collection system and space for bins for recyclables;
c. Specify and use products with recycled-content such as: steel, concrete aggregate fill, drywall, carpet and glass tile; and
d. Specify and use as appropriate, locally produced products such as plastic lumber, hydro-mulch, soil amendment, and glass tile.

We recommend that you refer to selected energy efficient design and site development practices from the *Guidelines for Sustainable Building Design in Hawai`i: A Planner's Checklist*. Other references which are available include the *Hawaii Commercial Building Guidelines for Energy Efficiency* at http://www.hawaii.gov/dbedt/ert/cbg/cbg.html and the sustainability guidelines at http://www.hawaii.gov/dbedt/ert/rebuild/pdfs/momisustainable.pdf.

We would also like to call your attention to Act 96, 2006, SLH, which, although it applies to state facilities, may be of interest to you in regard to this project. If you need clarification of any of the above, please do not hesitate to contact me.

Sincerely,

Maurice H. Kaya
Chief Technology Officer

c: OEQC

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Of Counsel

August 4, 2006

Attn: Mr. Maurice H. Kaya
Chief Technology Officer
State of Hawai'i
Department of Business, Economic
Development, and Tourism
Strategic Industries Division
P.O. Box 2359
Honolulu, HI 96804

Subject: Comment Letter on the Kapolei Harborside Center Environmental Impact Statement Preparation Notice

Dear Mr. Kaya,

Thank you for your comment letter of May 23, 2006 concerning the Kapolei Harborside Center Environmental Impact Statement Notice of Preparation. Your comments are addressed in the order they are preented.

1. Strategic energy conservation goals. The Petitioner supports State energy conservation goals, which include an objective of promoting cost-effective energy conservation through adoption of energy-efficient practices and technologies.

2. Energy saving design practices and guidelines. The Draft EIS, Section 5.16, addresses some energy saving design practices and technologies, including those listed under Comment 2:

"Project requirements will be coordinated with these utility providers. Energy efficiency design guidelines will be developed as part of the Conditions, Covenants and Restrictions that will apply to the development of the project site. These "guidelines" will be submitted to the Energy Branch, State Department of Business, Economic Development and Tourism for its review and input. Some energy conserving measures that will be included in the guidelines, among others, are:

- Use of timer or occupant-sensing light and air conditioning controls.
- Use of high-efficiency air conditioners and appliances.
- Use of heat pumps and solar heating systems.
- Promotion of energy saving opportunities through innovative building design.
- Use of landscaping for dust control and to minimize heat gain in the area."

3. As stated in Section 4.13.4 of the Draft EIS: "The project will develop a job-site recycling plan for the construction phase of the project and recycle or otherwise provide for beneficial use as much construction or demolition waste as possible. Provisions will be incorporated into the project for a recycling collection system and space for bins to collect glass, plastic, cardboard, cans, as well as recyclable construction materials. Where possible and appropriate, the project will specify and use products with recycled content such as steel, concrete aggregate fill, drywall, carpet and glass tile. The project will also where possible and appropriate specify and use locally produced projects such as plastic lumber, hydro-mulch, soil amendment, and glass tile. The contractor and leasees will be encouraged to implement a recycling plan. Non-recycled solid waste generated at the site would be directed to H-power for energy generation."

Thank you for identifying relevant resources at the conclusion of your letter. The documents have been reviewed and recommendations will be incorporated into project design and construction as practical when balanced against economic factors, which are very much affected by the cost of non-renewable energy.

Your comment letter is included in the Draft EIS. We appreciate your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

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GOVERNOR OF HAWAII

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CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
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AQUATIC RESOURCES
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COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

May 8, 2006

MAY 15 2006

Mr. Jeffrey H. Overton, AICP
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawai'i 96813-4307

LOG NO: 2006.1451
DOC NO: 0605CM12
Archaeology

Dear Mr. Overton:

SUBJECT: Chapter 6E-42 Historic Preservation Review –
EIS Preparation Notice, Kapolei Harborside Center
Hono'uli'uli Ahupua'a, 'Ewa District, Island of O'ahu
TMK: (1) 9-1-014:033 & 34, 9-1-014:035 & 9-1-015:020

Thank you for the opportunity to review the aforementioned notice, which we received on April 24, 2006. The notice precedes submission of a Draft Environmental Impact Statement regarding planned development of the Kapolei Harborside Center. As stated in your documents, Cultural Surveys of Hawai'i (CSH) has conducted archaeological work at the proposed subject area in support of this project.

Lead O'ahu Archaeologist Dr. Chris Monahan consulted on May 5, 2006, with Mr. Matt McDermott (CSH) regarding the status of this work. Mr. McDermott confirmed having completed the archaeological work, and confirmed that the report submission to this office is pending.

Thank you for early consultation on this project. We look forward to receiving a copy of this study for our review.

Please contact Dr. Chris Monahan at (808) 692-8015 if you have any questions about this letter.

Aloha,

Melanie Chinen, Administrator
State Historic Preservation Division

CM

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Ralph E. Portmore, AICP
Of Counsel

August 4, 2006

Attn: Ms. Melanie Chinen
Administrator
State of Hawai'i
Department of Land and Natural Resources
State Historic Preservation Division
601 Kamokila Blvd., Room 55
Kapolei, HI 96707

Subject: Comment Letter on the Kapolei Harborside Center Environmental Impact Statement Preparation Notice

Dear Ms. Chinen,

Thank you for your comment letter concerning the Kapolei Harborside Center Environmental Impact Statement (EIS) Notice of Preparation.

You noted that Lead O'ahu Archaeologist Dr. Chris Monahan consulted on May 5, 2006, with Mr. Matt McDermott of Cultural Surveys of Hawaii regarding the status of the archaeological work being conducted at the project site.

An archaeological inventory has been completed, and you will be receiving a copy of the study under separate cover. The project conducted additional fieldwork, to more accurately locate the two stacked-stone enclosures within the project area's northwestern corner. Also, additional documentation of the plantation-era drainage feature that passes mauka-makai through the project area was undertaken. Research on historic and archaeological background of the project area, including search of historic maps, written records, and Land Commission Award documents was also conducted. This research focused on the specific area with general background on the *ahupua'a* and district and will emphasize settlement patterns.

Additionally, the salient points of the study are incorporated into the project's Draft EIS, and the entire report will be included as a technical appendix attached to the Draft EIS.

Your comment letter is included in the Draft EIS. We appreciate your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

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LINDA LINGLE
GOVERNOR

PATRICIA HAMAMOTO
SUPERINTENDENT

STATE OF HAWAI'I
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAI'I 96804

OFFICE OF THE SUPERINTENDENT

May 4, 2006

Mr. Jeffrey H. Overton
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Subject: EISPN for Kapolei Harborside Center
TMK: 9-1-014: por. 33, 34, 35; & 9-1-015: por. 20, Ewa, Oahu

The Department of Education has no comment on the Environmental Impact Statement Preparation Notice (EISPN) for the Kapolei Harborside Center.

Thank you for the opportunity to review and comment. Should you have any questions, please call Heidi Meeker of the Facilities Development Branch at 733-4862.

Very truly yours,

Patricia Hamamoto
Superintendent

PH:jmb

c: Randolph Moore, Acting Assistant Superintendent, OBS
Duane Kashiwai, Public Works Manager, FDB

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER

GROUP 70 INTERNATIONAL

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Kimberly Polkinhorn, AIA, LEED
Scott Tangonan
Tom Young, AIA

Ralph E. Portmore, AICP
Of Counsel

August 4, 2006

Attn: Ms. Patricia Hamamoto
Superintendent
State of Hawai'i
Department of Education
P.O. Box 2360
Honolulu, HI 96804

Subject: Comment Letter on the Kapolei Harborside Center Environmental Impact Statement Preparation Notice

Dear Ms. Hamamoto,

Thank you for your comment letter concerning the Kapolei Harborside Center Environmental Impact Statement Notice of Preparation.

We acknowledge that you have no comment on the project.

Your comment letter is included in the Draft EIS. We appreciate your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Group 70 International, Inc. • Architecture • Planning • Interior Design • Building Diagnostics • Assets Management • Environmental Services
925 Bethel Street, 5th Floor • Honolulu, Hawai'i 96813-4307 • Ph (808) 523-5866 • Fax (808) 523-5874 • www.group70int.com • mail1@group70int.com

LINDA LINGLE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. BOX 3378
HONOLULU, HAWAII 96801-3378

CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

MAY 19 2006

In reply, please refer to:
EMD / CWB

05062CEC.06

May 18, 2006

Mr. Jeffrey H. Overton, AICP
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Subject: Kapolei Harborside Center
Comments on Environmental Impact Statement Preparation Notice (EISPN)
TMKs: (1) 9-1-014:033 por., 034, 035, and (1) 9-1-015:020 por.

The Department of Health (Department), Clean Water Branch (CWB), appreciates the opportunity to review and provide comments on the subject EISPN.

The CWB has reviewed the limited information contained in the subject EISPNt and offers the following comments:

1. The Army Corps of Engineers should be contacted at (808) 438-9258 for this project. Pursuant to Federal Water Pollution Control Act (commonly known as the "Clean Water Act" (CWA)), Paragraph 401(a)(1), a Section 401 Water Quality Certification (WQC) is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may **result** in any discharge into the navigable waters..." (emphasis added). The term "discharge" is defined in CWA, Subsections 502(16), 502(12), and 502(6); Title 40, Code of Federal Regulations, Section 122.2; and Hawaii Administrative Rules (HAR), Chapter 11-54.

   The Section 401 WQC application form and Guidelines may be picked up at our office or downloaded from our website at http://www.hawaii.gov/health/environmental/water/cleanwater/forms/forms/wqc-index.html.

2. In accordance with HAR, Sections 11-55-04 and 11-55-34.05, the Director of Health may require the submittal of an individual permit application or a Notice of Intent (NOI) for general permit coverage authorized under the National Pollutant Discharge Elimination System (NPDES).

   a. An application for an NPDES individual permit is to be submitted at least 180 days before the commencement of the respective activities. The NPDES application forms

may also be picked up at our office or downloaded from our website at http://www.hawaii.gov/health/environmental/water/cleanwater/forms/indiv-index.html.

b. An NOI to be covered by an NPDES general permit is to be submitted at least 30 days before the commencement of the respective activity. A separate NOI is needed for coverage under each NPDES general permit. The NOI forms may be picked up at our office or downloaded from our website at: http://www.hawaii.gov/health/environmental/water/cleanwater/forms/genl-index.html.

i. Storm water associated with industrial activities, as defined in Title 40, Code of Federal Regulations, Sections 122.26(b)(14)(i) through 122.26(b)(14)(ix) and 122.26(b)(14)(xi). [HAR, Chapter 11-55, Appendix B]

ii. Construction activities, including clearing, grading, and excavation, that result in the disturbance of equal to or greater than one (1) acre of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. **An NPDES permit is required before the commencement of the construction activities.** [HAR, Chapter 11-55, Appendix C]

Your attention is specifically directed to this requirement. Based on information contained in Section 1.0 (Introduction) of the EISPN, the total acreage of the project site is 344.519 acres.

TMK:	(1) 9-1-014:033 (por.)	137.529 acres
TMK:	(1) 9-1-014:034	19.947 acres
TMK:	(1) 9-1-014:035	12.854 acres
TMK:	(1) 9-1-015:020 (por.)	174.198 acres

iii. Discharges of treated effluent from leaking underground storage tank remedial activities. [HAR, Chapter 11-55, Appendix D]

iv. Discharges of once through cooling water less than one (1) million gallons per day. [HAR, Chapter 11-55, Appendix E]

v. Discharges of hydrotesting water. [HAR, Chapter 11-55, Appendix F]

vi. Discharges of construction dewatering effluent. [HAR, Chapter 11-55, Appendix G]

vii. Discharges of treated effluent from petroleum bulk stations and terminals. [HAR, Chapter 11-55, Appendix H]

viii. Discharges of treated effluent from well drilling activities. [HAR, Chapter 11-55, Appendix I]

ix. Discharges of treated effluent from recycled water distribution systems. [HAR, Chapter 11-55, Appendix J]

x. Discharges of storm water from a small municipal separate storm sewer system. [HAR, Chapter 11-55, Appendix K]

xi. Discharges of circulation water from decorative ponds or tanks. [HAR, Chapter 11-55, Appendix L]

3. In accordance with HAR, Section 11-55-38, the applicant for an NPDES permit is required to either submit a copy of the new NOI or NPDES permit application to the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD), or demonstrate to the satisfaction of the DOH that the project, activity, or site covered by the NOI or application has been or is being reviewed by SHPD. If applicable, please submit a copy of the request for review by SHPD or SHPD's determination letter for the project.

4. Any discharges related to project construction or operation activities, with or without a Section 401 WQC or NPDES permit coverage, shall comply with the applicable State Water Quality Standards as specified in HAR, Chapter 11-54.

5. Please provide the CWB with a copy of the draft EIS for further review and comment.

Should you have any questions regarding this matter, please contact Mr. Edward Chen of the Engineering Section, CWB, at 586-4309.

Sincerely,

for DENIS R. LAU, P.E., CHIEF
Clean Water Branch

c: EPO, DOH

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Of Counsel

August 4, 2006

Attn: Mr. Dennis R. Lau, P.E.
Chief
State of Hawai'i
Department of Health
Clean Water Branch
P.O. Box 3378
Honolulu, HI 96801-3378

Subject: Comment Letter on the Kapolei Harborside Center Environmental Impact Statement Preparation Notice

Dear Mr. Lau,

Thank you for your May 18, 2006 comment letter concerning the Kapolei Harborside Center Environmental Impact Statement Notice of Preparation.

Comments are addressed in the order presented in your letter.

1. Army Corps or Engineers, Section 401 Water Quality Certification. The Kapolei Harborside Center would contribute to storm water discharge to navigable waters of the U.S.; however, the discharge would occur via storm drain improvements proposed outside the project area. The offsite drainage improvements and permit requirements were addressed in the 1991 Final EIS for the Campbell Drainage Channel Supplemental to Kapolei Business-Industrial Park EIS, prepared by Engineering Concepts and accepted by the County Department of General Planning (currently known as Department of Planning and Permitting) in 1991. All requisite permits will be obtained prior to the discharge of storm water to the ocean. The Kapolei Harborside Center EIS scope does not include the offsite drainage improvements. The Draft EIS references the 1991 EIS.

2. National Pollutant Discharge Elimination System (NPDES) Permits. The Draft EIS states that two NOIs to be covered by an NPDES permit will be required for: 1) construction activities, including clearing, grading and excavation that result in land disturbance of equal or greater than one acre of total land area; and 2) storm water associated with industrial activities. Reference to NPDES requirements is included in DEIS Section 4.13.

3. NPDES permit review by State Department of Land and Natural Resources, State Historic Preservation Division (DLNR/SHPD). Per Hawaii Administrative Rules, Section 11-55-38, NPDES new NOIs or NPDES permits will be reviewed by DLNR/SHPD and relevant correspondence will be submitted to your office as noted in DEIS Section 5. 13.

4. State Water Quality Standards. All project elements will comply with State Water Quality Standards per HAR, Chapter 11-54 as noted in DEIS Section 5.3.

5. DEIS distribution. Department of Health Clean Water Branch is included on the DEIS distribution list.

Your comment letter is included in the Draft EIS. We appreciate your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

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LINDA LINGLE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. Box 3378
HONOLULU, HAWAII 96801-3378

CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

MAY 24 2006

In reply, please refer to:
EPO-06-066

May 19, 2006

Mr. Jeffrey H. Overton, AICP
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Sato:

SUBJECT: Environmental Impact Statement Preparation Notice (EISPN) for Kapolei Harborside Center at Ewa, Kapolei, Oahu
TMK: 9-1-14: 33 (portion), 34
TMK: 9-1-14: 35
TMK: 9-1-15: 20 (portion)

Thank you for allowing us to review and comment on the subject document. The document was routed to the various branches of the Environmental Health Administration. We have the following Wastewater Branch comments.

Wastewater Branch

We have reviewed the subject notice which requests comments to a proposal to develop a secondary urban center at Kapolei. The project is strategically located between Kalaeloa/Barbers Point Harbor and the existing industrial areas of Campbell Industrial Park and Kapolei Business Park, on the periphery of the rapidly expanding City of Kapolei

The subject project is located in the Critical Wastewater Disposal Area (CWDA) as determined by the Oahu Wastewater Advisory Committee where no new cesspools will be allowed. We have no cesspool cards or septic tank files on record for the subject property.

We are pleased that the domestic wastewater generated will be treated and disposed of via the Honouliuli Wastewater Treatment Plant. Therefore, we have no objections to the proposed Kapolei Harborside Center.

We encourage the developer to work with the City and utilize recycled water for irrigation and other non-potable purposes. Use of recycled wastewater should be encouraged and utilized in major common areas such as parks, golf courses and other open spaces or landscaping areas.

All wastewater plans must conform to applicable provisions of the Department of Health's Administrative Rules, Chapter 11-62, "Wastewater System." We do reserve the right to review the detailed wastewater plans for conformance to applicable rules. Should you have any questions, please contact the Planning & Design Section of the Wastewater Branch at (808) 586-4294.

We strongly recommend that you review all of the Standard Comments on our website: www.state.hi.us/health/environmental/env-planning/landuse/landuse.html. Any comments specifically applicable to the proposed project should be adhered to.

If there are any questions about these comments please contact Jiacai Liu with the Environmental Planning Office at 586-4346.

Sincerely,

KELVIN H. SUNADA, MANAGER
Environmental Planning Office

c: EPO
WWB

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Ralph E. Portmore, AICP
Of Counsel

August 4, 2006

Attn: Mr. Kelvin H. Sunada
Manager
State of Hawai'i
Department of Health
Environmental Planning Office
Wastewater Branch
P.O. Box 3378
Honolulu, HI 96801-3378

Subject: Comment Letter on the Kapolei Harborside Center Environmental Impact Statement Preparation Notice

Dear Mr. Sunada,

Thank you for your May 19, 2006 comment letter concerning the Kapolei Harborside Center Environmental Impact Statement Notice of Preparation.

We acknowledge that the subject project is within the Oahu Wastewater Advisory Committee Critical Wastewater Disposal Area, which prohibits the use of cesspools as noted in the DEIS Section 4.

We further acknowledge the Environmental Planning office has no objections to the proposed project.

The Petitioner supports efforts to utilize recycled water for irrigation; however the application may not be practical in this industrial development for the following reasons:

- The irrigation requirements are minimal as there is limited area available for landscaping.
- Reliance on roof catchment would not be practical as the rainfall in the region is low.
- Dedicated recycled water distribution systems are costly.

Alternatively, the landscaping could include drought-tolerant plants that require little irrigation.

The wastewater plans for the project will comply with Department of Health's Administrative Rules, Chapter 11-62. We understand your office reserves the right to review detailed wastewater plans.

Your comment letter is included in the Draft EIS. We appreciate your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

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Facsimile (808) 586-4186
Electronic Mail: OEQC@doh.hawaii.gov

GENEVIEVE SALMONSON
DIRECTOR

RECEIVED
MAY 23 2006
GROUP 70 INTL

May 19, 2006

Mr. Anthony Ching
State of Hawai'i – Land Use Commission
Department of Business, Economic Development, and Tourism
P.O. Box 2359
Honolulu, Hawai'i 96804

Mr. Dan Davidson
Kapolei Property Development, LLC
1001 Kamokila Boulevard, Suite 250
Kapolei, Hawai'i 96707

Mr. Jeffrey Overton, AICP
Group 70 International Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawai'i 96813

Dear Messrs. Ching, Davidson and Overton:

Having reviewed the final environmental assessment for the Kapolei Harborside Center, Petition for State Land Use Boundary Amendement from Agricultural to Urban for 345 acres, Tax Map Keys (1st) 9-1-14:33 (portion); (1st) 9-1-14 34; (1st) 9-1-15:20 (portion); (1st) 9-1-14:35, in the judicial district of 'Ewa, the Office of Environmental Quality Control offers the following comments for your review and response.

1. ***Solid Waste Generation***: On page 2-4, of the final environmental assessment, items such as roadways and circulation, drainage, wastewater, water supply and utilities are discussed as elements of the infrastructure support for the proposed project. Please discuss in the draft environmental statement for the project, infrastructure support elements for solid waste generation (solid waste, as defined here, is consistent with the federal definition of "solid waste" under the Resource Conservation and Recovery Act, as hence, may include "hazardous wastes" regulated under Subtitle C of the Resource Conservation Recovery Act (RCRA) and Chapter 342J, Hawaii Revised Statutes. This discussion should include an estimate of the amount of solid waste generated and where such waste will be disposed of. Please include a discussion on the amount of "hazardous wastes" (a subset of solid waste) that the project expects to generate.

2. ***Archaeological, Cultural and Historical Resources***: On page 3-7, please describe the Polynesian cultigens in sinkholes found in the second paragraph – especially, *Ti Taetsia* fructose. Please include a detailed discussion of these and other historic and cultural resources in the environmental setting for the upcoming draft environmental impact statement.

Thank you for the opportunity to comment.

Sincerely,

Genevieve Salmonson

GENEVIEVE SALMONSON
Director

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Of Counsel

August 4, 2006

Attn: Ms. Genevieve Salmonson
Director
State of Hawai'i
Department of Health
Office of Environmental Quality Control
235 South Beretania Street
Leiopapa A Kamehameha, Suite 702
Honolulu, HI 96813

Subject: Comment Letter on the Kapolei Harborside Center Environmental Impact Statement Preparation Notice

Dear Ms. Salmonson,

Thank you for your May 19, 2006 comment letter concerning the Kapolei Harborside Center Environmental Impact Statement Notice of Preparation. Your comments are addressed in the order they were presented.

1. Solid Waste Generation. The Draft Environmental Impact Statement (DEIS), Section 4.13 includes a discussion of solid waste. Recycling of cans, glass, plastic and cardboard will be encouraged during construction and operation of the project. Disposal options in the area include the preferred H-power plant and Waimanalo Gulch municipal landfill. Private companies would be contracted to collect and haul waste to either municipal facilities or private recycling companies.

   With respect to hazardous and regulated materials and waste, DEIS Section 4.13 states that all tenants will be required to adhere to State and federal laws regulating the handling, storage, management, treatment, transport, and disposal of these wastes. In addition, there are reporting requirements for inadvertent releases of these materials to the environment. The future tenants have not been identified and the amount of hazardous waste generation could not be estimated. However, the intent is that heavy industrial uses, which generally handle large volumes of hazardous and regulated materials, would be directed to Campbell Industrial Park and Kapolei Harborside Center would be limited to Light Industrial/commercial uses.

2. Archaeological, Cultural and Historical Resources. Cultural Surveys Hawaii, Inc. prepared a Cultural Impact Assessment and a Cultural Resource Literature and Field Inspection Report for the Kapolei Harborside Center project area in May of 2006. These reports provide the detail you requested on these resource areas. They are included in their entirety as appendices to the DEIA and are summarized in Section 4. The reports will be submitted to the State Historic Preservation Division for review and consultation on the scope of work for an archaeological inventory survey of the project area.

   Ti Taetsia frustosa cultigens in the sinkholes are specifically addressed in the consultant report and DEIS.

Your comment letter is included in the Draft EIS. We appreciate your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

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LINDA LINGLE
GOVERNOR

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

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BARRY FUKUNAGA
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

IN REPLY REFER TO:

STP 8.2167

May 23, 2006

MAY 25 2006

Mr. Jeffrey H. Overton
Principal
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Subject: Kapolei Property Development, LLC
Kapolei Harborside Center
Environmental Impact Statement Preparation Notice (EISPN)
TMK: 9-1-14: 33 por., 34, 35, 9-1-15: 20 por.

In response to the public comment period for the notice on the subject project, we offer the following initial comments as an interested party:

1. We are very concerned about the water runoff from rainfall and drainage impacting Kalaeloa Barbers Point Harbor. Construction of berms at strategic locations are a temporary fix and will not prevent runoff into the harbor during heavy rains. The developer should install the appropriate drainage improvements prior to the urbanization of the area to prevent any flooding of our harbor facilities and runoff into the harbor. Flooding and runoff results in silt build-up in the harbor basin and more frequent dredging cycles and increases clean up costs for our Harbors Division and its lessees. Additionally, the storm water runoff exposes us to further costs and liabilities in complying with the Clean Water Act.

2. We should be included in agency reviews and approvals of the drainage plans for and around the subject project.

3. Due to the development's proximity to our harbor facilities, prospective tenants/occupants will be subjected to potential impacts from maritime operations. The petitioner/developer should provide the necessary notification and disclosures to these tenants/occupants to indemnify and provide liability protection to the State.

4. The subject project is under the flight patterns into and out of Kalaeloa Airport and on the approach to Runways 8L and 8R at Honolulu International Airport and will be impacted by single-event noise from aircraft. The petitioner/developer should provide the necessary notification and disclosures to prospective occupants of the project and indemnification and liability protection for the State, including any necessary avigation easement to the State.

5. We understand that a Traffic Impact Analysis Report (TIAR) will be prepared as part of the draft environmental impact statement. The TIAR should cover both the project traffic impacts and the cumulative traffic impacts to the community and region, which the project contributes to, including the existing and future road network in the area. The TIAR should provide recommended and required transportation mitigation measures and roadway improvements to address the impacts. We will need to review and approve the TIAR.

   We will defer any other additional comments until the draft environmental impact report is prepared. We would appreciate receiving at least seven (7) copies of the report for review by our operating divisions.

Thank you for your notification of the subject project. We appreciate the opportunity to provide our comments.

Very truly yours,

Rodney Haraga

RODNEY K. HARAGA
Director of Transportation

c: Laura Theilen, Office of Planning

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Scott Tangonan
Tom Young, AIA

Ralph E. Portmore, AICP
Of Counsel

August 4, 2006

Attn: Mr. Rodney K. Haraga
Director of Transportation
State of Hawai'i
Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813-5097

Subject: Comment Letter on the Kapolei Harborside Center Environmental Impact Statement Preparation Notice

Dear Mr. Haraga,

Thank you for your May 23, 2006 comment letter concerning the Kapolei Harborside Center Environmental Impact Statement Notice of Preparation.

1. Storm water runoff into Kalaeloa Barber's Point Harbor. Kapolei Harborside Center site improvements will direct regional and site storm water flow to a drainage channel aligned northeast to southwest through the project site. Ultimately the storm water flow discharge at the ocean south of Malakole Street, at a point that is greater than 2,000 feet south of the Kalaeloa Barber's Point Harbor entrance. The proposed project will not impact the waters of Kalaeloa Barber's Point.

2. Drainage plan approvals. State Department of Transportation (DOT) will be included in agency reviews and approvals for the project drainage plans. A separate EIS was prepared for the drainage channel in 1991.

3. Potential impacts of Kalaeloa/Barber's Point Harbor on tenants of the proposed project. We appreciate your concern that harbor activities may adversely impact Kapolei Harborside Center tenants. We would appreciate your input on specific potential impacts so that we can adequately disclose them in the EIS. While there may be potential adverse impacts on Kapolei Harborside Center tenants due to proximity to Kalaeloa Barber's Point Harbor, the proximity is a beneficial impact for the maritime-related businesses we hope to attract as tenants.

4. Airport noise impacts. An Environmental Noise Assessment Report was prepared by D.L. Adams Associates, LTD and it is included as an appendix and summarized in the text of the project Draft Environmental Impact Statement (DEIS). The Kapolei Harborside Center project is outside the Ldn 55 noise contours for both the Kalaeloa and the Honolulu International Airport and no adverse noise impacts from these sources is anticipated.

5. Traffic Impact Analysis Report. Wilbur Smith Associates prepared the Kapolei Harborside Traffic Impact Assessment Report, which is included as an appendix and summarized in the text of the project Draft Environmental Impact Statement (DEIS). The report addresses existing conditions as well as two future scenarios, namely Year 2018 with the proposed project and Year 2018 without the proposed project. The report and DEIS described potential cumulative impacts on the regional traffic and recommendations for mitigation measures.

6. DEIS copies. We will provide seven copies of the DEIS for your review.

Your comment letter is included in the Draft EIS. We appreciate your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

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PHONE (808) 594-1888

FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

JUN 30 2006

HRD06/2270C

June 27, 2006

Jeffrey H. Overton, AICP
Principal
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813-4307

RE: Kapolei Harborside Center, 'Ewa, O'ahu; TMKs: 9-1-014:033, 034, 035; and 9-1-015:020

Dear Jeffrey Overton,

The Office of Hawaiian Affairs (OHA) is in receipt of your request for comment on the above-listed project, for which you provided us with an Environmental Impact Statement Preparation Notice. OHA apologizes for the delayed response and has no comments at this time, but does look forward to the opportunity to comprehensively review the forthcoming Draft Environmental Impact Statement.

Thank you, however, for the opportunity to comment early. If you have further questions or concerns, please contact Heidi Guth by phone at (808) 594-1962 or by e-mail at heidig@oha.org.

Sincerely,

Clyde W. Nāmu'o
Administrator

GROUP 70 INTERNATIONAL

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Kimberly Polkinhorn, AIA, LEED
Scott Tangonan
Tom Young, AIA

Ralph E. Portmore, AICP
Of Counsel

August 4, 2006

Attn: Mr. Clyde W. Nāmu'o
Administrator-
State of Hawaii
Office of Hawaiian Affairs
711 Kapiolani Boulevard, Suite 500
Honolulu, HI 96813

Subject: Comment Letter on the Kapolei Harborside Center Environmental Impact Statement Preparation Notice

Dear Mr. Nāmu'o,

Thank you for your comment letter concerning the Kapolei Harborside Center Environmental Impact Statement Notice of Preparation.

We acknowledge that the Office of Hawaiian Affairs has no comment on the project at this time.

Your comment letter is included in the Draft EIS. We appreciate your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843

RECEIVED
MAY 18
GROUP 70

MUFI HANNEMANN, Mayor

RANDALL Y. S. CHUNG, Chairman
HERBERT S. K. KAOPUA, SR.
SAMUEL T. HATA
ALLY J. PARK

RODNEY K. HARAGA, Ex-Officio
LAVERNE T. HIGA, Ex-Officio

CLIFFORD P. LUM
Manager and Chief Engineer

DONNA FAY K. KIYOSAKI
Deputy Manager and Chief Engineer

May 16, 2006

Mr. Jeffrey H. Overton
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Subject: Your letter Dated April 21, 2006 Regarding the Environmental Impact Statement Preparation Notice for Kapolei Harborside Center, TMK: 9-1-14:33 por., 34, 35; 9-1-15:20 por.

Thank you for the opportunity to comment on the proposed project.

We have the following comments to offer:

1. The developer will be required to install the necessary water system improvements to serve the proposed development. The construction drawings should also be submitted for our review and approval.

2. The applicants for water service will be required to pay our Water System Facilities Charges for resource development, transmission and daily storage.

3. A non-potable water master plan should be submitted for approval.

If you have any questions, please contact Robert Chun at 748-5443.

Very truly yours,

KEITH S. SHIDA
Principal Executive
Customer Care Division

cc: Water Resources

Water for Life . . . Ka Wai Ola

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Scott Tangonan
Tom Young, AIA

Ralph E. Portmore, AICP
Of Counsel

August 4, 2006

Attn: Mr. Keith S. Shida
Principal Executive
City and County of Honolulu
Board of Water Supply
Customer Care Division
630 South Beretania Street
Honolulu, HI 96843

Subject: Comment Letter on the Kapolei Harborside Center Environmental Impact Statement Preparation Notice

Dear Mr. Shida,

Thank you for your comment letter concerning the Kapolei Harborside Center Environmental Impact Statement Notice of Preparation.

The following are offered in response to your comments:

1. The developer will install the necessary water system improvements to serve the proposed development. Prior to installation, the construction drawings will be submitted for your review and approval.

2. The applicants for water service will be notified that they will be required to pay your Water System Facilities Charges for resource development, transmission and daily storage.

3. A Non-Potable Water Master Plan for the project will be submitted for approval prior to construction of the non-potable water system.

Your comment letter is included in the Draft EIS. We appreciate your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

DEPARTMENT OF PLANNING AND PERMITTING
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MUFI HANNEMANN
MAYOR

HENRY ENG, FAICP
DIRECTOR

DAVID K. TANOUE
DEPUTY DIRECTOR

MAY 26 2006

May 25, 2006

2006/ELOG-927 (rys)

Mr. Jeffrey H. Overton, AICP
Principal
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton,

Re: Environmental Impact Statement Preparation Notice (EISPN)
For the Kapolei Harborside Center at Kapolei, Oahu, Hawaii
Tax Map Keys: 9-1-14: por. 33; 9-1-14: 34; 9-1-15: por. 20 and 9-1-14: 35

Thank you for granting us this short extension in responding to your April 21, 2006 request for comments on the Environmental Impact Statement Preparation Notice (EISPN) dated April 2006 for the proposed Kapolei Harborside Center. It is being prepared in support of Kapolei Property Development, LLC's petition to the Land Use Commission to reclassify 344.519 acres of land from the State Agricultural Land Use District to the Urban District, and in support of a future zone change application from AG-1 Restricted Agricultural and AG-2 General Agricultural Districts to Industrial.

We offer the following comments for your review and consideration for inclusion in the Draft Environmental Impact Statement (DFEIS):

1. A glossary listing the abbreviations/acronyms and the definitions/items/entities represented would be helpful. For example, "Commission" in Sections 1.6 and 4.4 on pages 1-7 and 4.4, respectively, should be changed to "Land Use Commission".

2. Section 1.0 Introduction: Please add a new section entitled "Necessary Permits and Approvals" to this section.

3. Section 1.2 Project Site on page 1-3: Please add a section discussing the pending transfer of about ten (10) acres of land on Parcel 33 from Campbell Estate to the City.

   This dedication will fulfill a Unilateral Agreement (UA) associated with a previous zone change for the City of Kapolei, approved under Ordinance 90-30. The UA required the land for a recreational sports complex.

4. Figure 1.2 TMK Map on page 1-5: Delete "(por.)" from TMK: 9-1-014: 034.

5. Section 1.3 Proposed Action, re. Future zone change request on page 1-6 (also Sections 1.6 and 3.1 on pages 1-7 and 3-1, respectively): If known, discuss the type(s) of Industrial Zoning Districts, which will be requested in the zone change application to the DPP.

6. Section 2.2.3 Infrastructure Support

   - Roadways and Circulation and also in Section 3.4 Infrastructure and Utilities on pages 2-2 and 3-9, respectively: Please provide details for the section of Hanua Street through the project area and its relationship with the Hanua Street extension through the adjacent Kapolei West development to ensure the uniform development of Hanua Street. You may reference Condition No. 4 of the LUC's April 10, 2006 Findings of Fact, Conclusions of Law and Decision and Order for the Kapolei West Expansion Area Project, LUC Docket No. A04-753.

   - Drainage on page 2-2: Provide details about the Regional Drainage System, which Figure 2.1 depicts traversing the project site, for example, composition (lined or unlined), approximate dimensions, sectional diagram, estimated construction schedule, off-site destination, and potential for use as a shared-use path for pedestrians and bikers.

   - Wastewater and Section 3.4 Infrastructure and Utilities on pages 2-4 and 3-9, respectively: Provide details of the new sewage collection system and the regional wastewater pump station, including but not limited to the location, capacity, service areas, and approximate construction schedule.

7. Section 3.2 Natural Environment Conditions on pages 3-6 to 3-8: Add discussions of the following:

   - The history/background of the 12.845-acre "industrial waste" site (TMK: 9-1-014: 035), current condition, and reasons for its inclusion in the Petition to the State Land Use Commission.

   - The history/background of the oil leak in the early 1990's from the adjacent Chevron Refinery onto approximately three (3) acres of Campbell Estate property north of Malakole Street (TMK: 9-1-014: por. 033); results of Chevron's reports and risk assessment results to the Environmental Protection Agency (EPA) and the State Department of Health as part of its Resource Conservation and Recovery Act (RCRA) annual reporting requirements, the results of Chevron's recent groundwater sampling tests to assess the extent of any remaining petroleum, the future remediation efforts required to clean the site, and the future uses of the site.

8. Section 3.5 Socio-Economic Conditions, re. Housing Impacts on page 3-12: Please Include the reference/source and basis of data to be cited in this section.

9. Section 5.0 Conformance with Land Use Plans, Policies and Controls: Sections of the northern boundary of the project site has frontages along the OR&L right-of-way. The DEIS should provide a discussion on the project's conformance to the Pearl Harbor Historic Trail (PHHT) Master Plan (May 2001), specifically:

   - How the project proposes to interface with the PHHT.

10. Section 5.4 City and County of Honolulu General Plan on page 5-4:

    - The last amendment of the General Plan was by Resolution 02-205, CD1 on October 3, 2002.

    - The General Plan's chapters, objectives and policies, which the project supports should be listed and discussed. We also suggest adding Chapter VII. Physical Development and Urban Design, especially Objective C. To develop a secondary urban center in Ewa with its nucleus in the Kapolei area.

11. Section 5.5 Ewa Development Plan on pages 5-5 to 5-6: The discussion of conformance with the Ewa DP should include a discussion of how the proposed project will implement the vision and policies of the Ewa DP.

    Specifically, the DEIS should discuss the relation of the project to the following five (5) vision elements:

    - Protect Agricultural Land and Open Space: The project is consistent with this vision element because the project is inside the Urban Growth Boundary and no Open Space Network elements are impacted by the proposal.

    - Develop the Secondary Urban Center: The project is consistent with this vision element because it promotes industrial job creation and utilizes its proximity to the Kalaeloa Barbers Point Deep Draft Harbor, Campbell Industrial Park, and other nearby industrial areas.

    - Build Master Planned Communities: The DEIS should discuss the proposed project's connectivity with adjacent industrial developments to reduce congestion by offering alternatives to travel on the regional arterials. The feasibility of modifications of the preliminary roadway master plan in Figure 2.1 such as, but not limited to the following should be evaluated:

      a. Opakapaka Street is shown as a dead-end.

         * Extension of Opakapaka Street into the "mauka" portion of the adjacent industrial area similar to Lauwiliwili Street to provide another egress/ingress route.

         * Extending Opakapaka Street to the proposed Road "F" in the Kapolei West Development (Figure 3 of the Kapolei West Expansion Area FEIS, which the LUC approved on June 16, 2005).

      b. Proposed Road "E" is shown as a closed loop. A connection between this loop road and Malakole Street will provide another egress/ingress option and provide a quicker connection to the south edge of the harbor and Campbell Industrial Park.

      These evaluations of inter-connectivity alternatives/options should also be discussed in Sections 2.2.3 Infrastructure Support, re. Roadway and Circulation, and Section 3.4 Infrastructure and Utilities, re. Roadways on pages 2-2 and 3-9, respectively.

    - Protect Natural, Historical and Cultural Resources: The proposal to protect and restrict access to the sinkholes to protect historic resources is consistent with this vision element. The DEIS should assess the project's impact on significant views listed in Table 3.1 of the Ewa DP.

    - Phase Development to Provide Adequate Infrastructure: The DEIS should discuss how the project will implement the Ewa DP vision that adequate infrastructure be provided so congestion or capacity shortfalls are minimized as development proceeds.

    - In addition, the DEIS should discuss how the project will implement specific land use and public facilities policies from the Ewa DP, including:

      * Sec. 3.1 Open Space Preservation and Development policies, guidelines, and principles regarding drainage ways;

      * Sec. 3.4 Historic and Cultural Resources policies, guidelines, and principles regarding historic resources and significant vistas;

      * Sec. 3.7.3 Industrial Centers policies, guidelines, and principles regarding industrial centers and uses in the Barbers Point Industrial Area;

      * Sec. 4.1 Transportation Systems policies, guidelines, and principles;

      * Sec. 4.2 Water Allocation and Systems Development policies regarding dual transmission lines, use of non-potable water, and water reclamation; and

      * Sec. 4.6 Drainage Systems policies and principles.

12. Section 7.0 Determination and Findings on page 7-1: The total acreage for the Petition Area should be increased from 332 acres to 344.519 acres (add the 12.845 acre "Industrial Waste" site – TMK: 9-1-014: 035).

If you have any questions, or would like further discussion on the additional information, please contact Ray Sakai of our staff at 523-4047.

Very truly yours,

for Henry Eng, FAICP, Director
Director of Planning & Permitting

HE:js

cc: Dan Davidson, Vice President, Development
Steve Kelly, Manager, Entitlements and Infrastructure
Kapolei Property Development, LLC.

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Of Counsel

August 4, 2006

Attn: Mr. Henry Eng, FAICP
Director
City and County of Honolulu
Department of Planning and Permitting
650 South King Street, 7th Floor
Honolulu, HI 96813

Subject: Comment Letter on the Kapolei Harborside Center Environmental Impact Statement Preparation Notice

Dear Mr. Eng,

Thank you for your comment letter concerning the Kapolei Harborside Center Environmental Impact Statement Notice of Preparation.

The following are offered in response to your comments:

1. Glossary. A glossary of abbreviations and acronyms is provided in the Draft EIS.

2. Permits and Approvals. A new section (1.10) is included in the Draft EIS addressing necessary permits and approvals for the project.

3. Sports Complex Site. Ordinance 90-10 calls for the transfer of about 10 acres from Campbell Estate to the City for a recreational sports complex (Ref. No. 2006/PIM-2). There is a potential site for the sports complex site at the southwest corner of Kapolei Harborside Center adjacent to Malakole Street, as identified in Section 7.0 – Unresolved Issues. Further discussion will be held with the City to evaluate this potential site for a facility.

4. TMK Reference. In the Draft EIS, the citation of TMK 9-1-014:034 has be corrected to delete reference to the "Portion."

5. Zoning District. The Draft EIS notes the preliminary plan for the future zoning district of the project as an Industrial district. Specific industrial designations will be made during the rezoning process.

6. Infrastructure Support. There are several regional-level infrastructure improvements planned for this area of Kapolei, including the Hanua Street extension – a four lane roadway throughout the entire length of the project, a regional drainage swale and a wastewater pump station. A civil engineering report prepared by Engineering Concepts, Inc. is included in the Draft EIS,

and describes these regional infrastructure improvements. Detailed discussion of infrastructure is provided in the DEIS in Sections 2 and 4.

7. Hazardous Materials. There are two areas of hazardous materials conditions at the property, however, these pose no risks to human health. A summary of these conditions, prepared by LFR, Inc. is included in the Draft EIS. The 12.874 acre former Hawaiian Western Steel waste disposal area is a stabilized capped site under EPA consent decree. Future use is deed restricted per EPA regulations. The adjacent Chevron facility had an oil leak from storage tanks, which seeped under a small portion of the property prior to 1985. The remediation of this condition has been successful, as summarized in the LFR report, and there are options for future use of this portion of the site.

8. Reference/Source of Housing data. The Draft EIS will justify the data used in the section on Socio-Economic Conditions.

9. Pearl Harbor Historic Trail. The project will maintain the existing 40-foot setback on either side of the OR&L ROW, with exception of planned roadway crossings. These crossings would require review and approval by the SDOT. The proposed industrial uses bordering the OR&L ROW will be distanced from the OR&L ROW, thereby minimizing impacts to current uses of the railroad. Following resolution of mitigation measures in consultation with SHPD and the Hawaiian Railway Society (HRA), it is anticipated that the proposed development of crossings of the OR&L will have "no effect" on this National Register site. All surface and subsurface work impacting the OR&L ROW will be closely coordinated with the HRA, SHPD, and SDOT. Proposed mitigation measures, including the scheduling of construction activities and the construction of automated crossing guards at major road crossings of the OR&L ROW, will be discussed with SDOT, SHPD, and HRA.

10. General Plan. The Draft EIS includes a detailed listing and discussion of the objectives and policies of the City and County of Honolulu's General Plan, including the objective of developing a Secondary Urban Center in 'Ewa with its nucleus in the Kapolei area. We agree that the project supports the General Plan's objectives and policies.

11. 'Ewa Development Plan. The Draft EIS includes a discussion of the conformance of the project with the 'Ewa Development Plan, including how the project will implement the referenced vision and policies of the Plan. Thank you for your input in this regard. We agree that the project is consistent the 'Ewa DP's vision and policies.

    While evaluations of inter-connectivity are addressed to some degree in this DEIS, the project's master plan is still at a conceptual level. The specific details of the roadway design and connectivity will be addressed as project planning and design advances for the change of zone process.

    The DEIS provides discussion on how the project addresses issues concerning specific land uses and public facilities. The project will be developed in phases so that adequate infrastructure is provided minimizing congestion or capacity shortfalls.

12. Total Acreage of Petition Area. The Draft EIS correctly notes the total acreage of the Petition Area as 344.519 acres, approximated as 345 acres.

Your comment letter is included in the Draft EIS. We appreciate your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Group 70 International, Inc. • Architecture • Planning • Interior Design • Building Diagnostics • Assets Management • Environmental Services
925 Bethel Street, 5th Floor • Honolulu, Hawai'i 96813-4307 • Ph (808) 523-5866 • Fax (808) 523-5874 • www.group70int.com • mail@group70int.com

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 11TH FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 523-4564 • Fax: (808) 523-4567
Web site: www.honolulu.gov

MUFI HANNEMANN
MAYOR

DIRECTOR
EUGENE C. LEE, P.E.
DEPUTY DIRECTOR

May 15, 2006

MAY 16 2006

Mr. Jeffrey H. Overton, AICP
Principal
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Subject: Environmental Impact Statement Preparation Notice (EISPN)
Kapolei Harborside Center
TMK: 9-1-14:33 por., 34, 35, 9-1-15:20 por. (Ewa, Kapolei, Oahu)

Thank you for giving us the opportunity to comment on the above EISPN for Kapolei Harborside Center.

Our comments are as follows:

The draft EIS should attempt to project the types of enterprises that will be located in the proposed harborside industrial park. From that projection, a thorough study should be undertaken regarding the types of externalities (such as sound disturbance, hazards of fires or explosions) and emissions to the air and water that can be anticipated with the development of the Harborside Center. The EISPN should also take into consideration the interaction of the development's tenants with existing adjacent industrial type land uses, such as the oil refineries, and chemical processing plants in the area.

The EISPN should disclose the measures to be taken to eliminate or mitigate the hazards and potential adverse impacts on the surrounding land uses.

Should you have any questions, please call Clifford Lau, Chief of our Facilities Division, at 523-4557.

Very truly yours,

Eugene C. Lee, P.E.
Deputy Director

ECL:lt (152498)

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Ralph E. Portmore, AICP
Of Counsel

August 4, 2006

Attn: Mr. Eugene C. Lee, P.E.
Deputy Director
City and County of Honolulu
Department of Design and Construction
650 South King Street, 11th Floor
Honolulu, HI 96813

Subject: Comment Letter on the Kapolei Harborside Center Environmental Impact Statement Preparation Notice

Dear Mr. Lee,

Thank you for your comment letter concerning the Kapolei Harborside Center Environmental Impact Statement Notice of Preparation.

The following is offered in response to your comments:

The preliminary plan for the future zoning district for the project is classification as an Industrial district, which is similar to the adjoining Kapolei Business Industrial Park. A broad range of enterprises could potentially choose to be located within the Kapolei Harborside Center, including among many others: centralized mail and package handling facilities, food manufacturing and processing, freight movers, heavy equipment sales and rentals, motion picture and television production studios, publishing plants for newspapers, books and magazines, and repair establishments.

Given the enormous diversity of possible tenants and the stage of planning and entitlements processes, we believe it is not feasible to attempt to thoroughly study the specific externalities that could potentially be attributed to each of these future tenants. Each tenant will, of course, be obligated to comply with all appropriate laws, rules and regulations pertaining to land use, public health and safety, environmental management, etc.

Additionally, impact studies (covering such topics as Traffic, Air Quality, and Noise, among others) have been conducted for the project, and are summarized in the Draft EIS and attached as Appendices. As appropriate, these consultant reports have considered the interaction of the fully-built project with adjoining and regional land uses. Relevant mitigation measures are also discussed in the Draft EIS.

Your comment letter is included in the Draft EIS. We appreciate your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

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DEPARTMENT OF COMMUNITY SERVICES
CITY AND COUNTY OF HONOLULU
715 SOUTH KING STREET, SUITE 311 ● HONOLULU, HAWAII 96813 ● AREA CODE 808 ● PHONE: 527-5311 ● FAX: 527-5498

MAY 23

MUFI HANNEMANN
MAYOR

DEBORAH KIM MORIKAWA
DIRECTOR

DANILO "DANNY" AGSALOG
SENIOR ADVISOR

May 18, 2006

Mr. Jeffrey H. Overton, AICP
Principal, Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Subject: Environmental Impact Statement Preparation Notice (EISPN)
Kapolei Harborside Center
TMK: 9-1-14:33 por., 34, 35, 9-1-15:20 por. (Ewa, Kapolei, Oahu)

We have received the Kapolei Harborside Center Environmental Impact Statement Preparation Notice (EISPN). We appreciate having the opportunity to comment on this document.

We have reviewed the EISPN and have no major comments at this stage of the project. We have noted that the project is in line with the City and County's plan for a secondary urban center at Kapolei and that the project will increase the acreage for industrial use. While this project will not add to the inventory of affordable housing units on Oahu, it will provide additional employment opportunities in the area.

We look forward to reviewing the Draft Environmental Impact Statement when it is available. Thank you for the opportunity to comment on this EISPN.

Sincerely,

Deborah Kim Morikawa
Director

DKM:sk

GROUP 70
INTERNATIONAL

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Kimberly Polkinhorn, AIA, LEED
Scott Tangonan
Tom Young, AIA

Ralph E. Portmore, AICP
Of Counsel

August 4, 2006

Attn: Ms. Deborah Kim Morikawa
Director
City and County of Honolulu
Department of Community Services
715 South King Street, Suite 311
Honolulu, HI 96813

Subject: Comment Letter on the Kapolei Harborside Center Environmental Impact Statement Preparation Notice

Dear Ms. Morikawa,

Thank you for your comment letter concerning the Kapolei Harborside Center Environmental Impact Statement Notice of Preparation.

We acknowledge that you have no major comments at this stage of the project. We agree that the project is in line with the City and County's plan for a secondary urban center at Kapolei and that the project will increase the acreage for industrial use. Finally, we concur with your understanding that, while this project will not add to the inventory of affordable housing units on Oahu, it will provide additional employment opportunities in the area.

Your comment letter is included in the Draft EIS. We appreciate your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

DEPARTMENT OF TRANSPORTATION SERVICES
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MUFI HANNEMANN
MAYOR

MELVIN N. KAKU
DIRECTOR

RECEIVED
MAY 30 2006
GROUP 70 INT'L

TP4/06-151327R

May 25, 2006

Mr. Jeffrey H. Overton, AICP
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Subject: Kapolei Harborside Center

Thank you for your April 21, 2006 letter requesting our review of and comments on the Environmental Impact Statement (EIS) Preparation Notice for the subject project. We have the following comments for your consideration as you prepare the draft EIS:

1. The traffic impact assessment should include the impact of the development on the surrounding City streets.

2. We recommend that Hanua Street be constructed and connected to Kapolei Parkway and Malakole Street. Also, Opakapaka Street and Lauwiliwili Street should be constructed and connected to Hanua Street and Kalaeloa Boulevard prior to the development of the project area.

3. The disposition of the roadways within the project should be noted.

4. Current bus service into Campbell Industrial Park is limited and runs along Kalaeloa Boulevard and Malakole Street. As the area is developed, there may be a need for increased bus service. Therefore, roadways and right-of-ways should be transit friendly and meet Americans with Disabilities Act requirements.

We look forward to reviewing the draft EIS. Should you have any questions regarding these comments, please contact Ms. Faith Miyamoto of the Transportation Planning Division at 527-6976.

Sincerely,

for MELVIN N. KAKU
Director

GROUP 70 INTERNATIONAL

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Tom Young, AIA

Ralph E. Portmore, AICP
Of Counsel

August 4, 2006

Attn: Mr. Melvin N. Kaku
Director
City and County of Honolulu
Department of Transportation Services
650 South King Street, 3rd Floor
Honolulu, HI 96813

Subject: Comment Letter on the Kapolei Harborside Center Environmental Impact Statement Preparation Notice

Dear Mr. Kaku,

Thank you for your comment letter concerning the Kapolei Harborside Center Environmental Impact Statement Notice of Preparation.

The following are offered in response to your comments:

1. The Traffic Impact Assessment Report conducted for the project includes the impact of the development on the surrounding region.
2. The construction and connection of Hanua (ORTP# 84,111), Opakapaka and Lauwiliwili Streets are regional level infrastructure improvements being planned for this area of Kapolei in conjunction with governmental agencies.
3. At this point, the timetable for determining the disposition of the roadways within the project has not been finalized. We look forward to continued discussions with the appropriate agencies regarding this matter.
4. To potentially accommodate bus service in the future, the developer will consider making the roadways and right-of-ways within the project "transit friendly." Further, the project will comply with relevant Americans with Disabilities Act requirements.

Your comment letter is included in the Draft EIS. We appreciate your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

Group 70 International, Inc. • Architecture • Planning • Interior Design • Building Diagnostics • Assets Management • Environmental Services
925 Bethel Street, 5th Floor • Honolulu, Hawai'i 96813-4307 • Ph (808) 523-5866 • Fax (808) 523-5874 • www.group70int.com • mail1@group70int.com

DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU
KAPOLEI HALE • 1000 ULUOHIA STREET, SUITE 309 • KAPOLEI, HAWAII 96707
TELEPHONE: (808) 692-5561 • FAX: (808) 692-5131 • INTERNET: www.honolulu.gov

MUFI HANNEMANN
MAYOR

LESTER K.C. CHANG
DIRECTOR

DANA TAKAHARA-DIAS
DEPUTY DIRECTOR

MAY - 4 2006
GROUP 70 INT'L

May 3, 2006

Mr. Jeffrey H. Overton, AICP
Group 70 International Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813

Dear Mr. Overton:

Subject: Environmental Impact Statement Preparation Notice (EISPN)
Kapolei Harborside Center
TMK: 9-1-14:33 por., 34, 35, 9-1-15:20 por. (Ewa, Kapolei, Oahu)

Thank you for the opportunity to review and comment on the Environmental Impact Statement Preparation Notice for the proposed Kapolei Harborside Center.

The Department of Parks and Recreation has no comment at this time.

Should you have any questions, please contact Mr. John Reid, Planner, at 692-5454.

Sincerely,

LESTER K. C. CHANG
Director

LKCC:mk
(151458)

GROUP 70 INTERNATIONAL

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Ralph E. Portmore, AICP
Of Counsel

August 4, 2006

Attn: Mr. Lester K.C. Chang
Director
City and County of Honolulu
Department of Parks and Recreation
Kapolei Hale
1000 Uluohia Street, Suite 309
Kapolei, HI 96707

Subject: Comment Letter on the Kapolei Harborside Center Environmental Impact Statement Preparation Notice

Dear Mr. Chang,

Thank you for your comment letter concerning the Kapolei Harborside Center Environmental Impact Statement Notice of Preparation.

We acknowledge that the Department of Parks and Recreation has no comment at this time.

Your comment letter is included in the Draft EIS. We appreciate your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Principal

HONOLULU FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU
636 SOUTH STREET • HONOLULU, HAWAII 96813
TELEPHONE: (808) 723-7139 • FAX: (808) 723-7111 • INTERNET: www.honolulufire.org

MUFI HANNEMANN
MAYOR

KENNETH G. SILVA
FIRE CHIEF

ALVIN K. TOMITA
DEPUTY FIRE CHIEF

MAY

May 1, 2006

Mr. Jeffrey H. Overton, AICP, Principal
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Subject: Environmental Impact Statement Preparation Notice
Kapolei Harborside Center
Tax Map Keys: 9-1-014: 033 (Portion), 034 and 035
9-1-015: 020 (Portion)
Ewa, Kapolei, Oahu, Hawaii

In response to your letter dated April 21, 2006, regarding the above-mentioned project, the Honolulu Fire Department (HFD) reviewed the material you provided and requires that the following be complied with for all new construction:

1. Provide a fire apparatus access road for every facility, building, or portion of a building hereafter constructed or moved into or within the jurisdiction when any portion of the facility or any portion of an exterior wall of the first story of the building is located more than 150 feet (45 720 mm) from the fire apparatus access road as measured by an approved route around the exterior of the building or facility. (1997 Uniform Fire Code, Section 902.2.1.)

2. Provide a water supply, approved by the county, capable of supplying the required fire flow for fire protection to all premises upon which facilities or buildings, or portions thereof, are hereafter constructed or moved into or within the county.

   On-site fire hydrants and mains capable of supplying the required fire flow shall be provided when any portion of the facility or building is in excess of 150 feet (45 720 mm) from a water supply on a fire apparatus access road, as measured by an approved route around the exterior of the facility or building. (1997 Uniform Fire Code, Section 903.2 as amended.)

3. Submit civil and construction drawings to the HFD for review and approval.

Should you have any questions, please call Battalion Chief Lloyd Rogers of our Fire Prevention Bureau at 723-7151.

Sincerely,

KENNETH G. SILVA
Fire Chief

KGS/SK:bh

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Scott Tangonan
Tom Young, AIA

Ralph E. Portmore, AICP
Of Counsel

August 4, 2006

Attn: Mr. Kenneth G. Silva
Fire Chief
City and County of Honolulu
Fire Department
636 South Street
Honolulu, HI 96813

Subject: Comment Letter on the Kapolei Harborside Center Environmental Impact Statement Preparation Notice

Dear Chief Silva,

Thank you for your comment letter concerning the Kapolei Harborside Center Environmental Impact Statement Notice of Preparation.

The following are offered in response to your comments:

1. An acceptable fire apparatus access road will be constructed, pursuant to the referenced requirements of the 1997 Uniform Fire Code, Section 902.2.1.

2. A county-approved water supply (including on-site fire hydrants and mains, as required) capable of supplying the required fire flow for fire protection will be provided, pursuant to the requirements of the 1997 Uniform Fire Code, Section 903.2 as amended.

3. Relevant civil and construction drawings will be submitted to the Honolulu Fire Department for review and approval.

Your comment letter is included in the Draft EIS. We appreciate your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

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OahuMPO

RECEIVED
MAY 23 2006

May 22, 2006

Mr. Jeffrey H. Overton, AICP, Principal
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Kapolei Harborside Center –
Environmental Impact Statement Preparation Notice

Thank you for the opportunity to review the Kapolei Harborside Center – Environmental Impact Statement Preparation Notice. We have no comments to offer at this time.

Sincerely,

Gordon G.W. Lum
Executive Director

Oahu Metropolitan Planning Organization
Ocean View Center / 707 Richards Street, Suite 200 / Honolulu, Hawaii 96813-4623
Telephone (808) 587-2015 • (808) 523-4178 / Fax (808) 587-2018 / email: ompo001@hawaii.rr.com

(g/p) c: Requests/EIS/Kapolei Harborside Center.doc

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Of Counsel

August 4, 2006

Attn: Mr. Gordon G.W. Lum
Executive Director
Oahu Metropolitan Planning Organization
Ocean View Center
707 Richards Street, Suite 200
Honolulu, HI 96813-4623

Subject: Comment Letter on the Kapolei Harborside Center Environmental Impact Statement Preparation Notice

Dear Mr. Lum,

Thank you for your comment letter concerning the Kapolei Harborside Center Environmental Impact Statement Notice of Preparation.

We acknowledge that you have no comments to offer at this time.

Your comment letter is included in the Draft EIS. We appreciate your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

POLICE DEPARTMENT
CITY AND COUNTY OF HONOLULU
801 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813 - AREA CODE (808) 529-3111
http://www.honolulupd.org
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MUFI HANNEMANN
MAYOR

BOISSE P. CORREA
CHIEF
GLEN R. KAJIYAMA
PAUL D. PUTZULU
DEPUTY CHIEFS

OUR REFERENCE BS-DK

April 27, 2006

RECEIVED
MAY - 2 2006

Mr. Jeffrey H. Overton, AICP
Principal
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Thank you for the opportunity to review and comment on the Environmental Impact Statement Preparation Notice for the Kapolei Harborside Center.

This project should have no significant impact on the facilities or operations of the Honolulu Police Department.

If there are any questions, please call Major Michael Tamashiro of District 8 at 692-4253 or Mr. Brandon Stone of the Executive Bureau at 529-3644.

Sincerely,

BOISSE P. CORREA
Chief of Police

By
KARL GODSEY
Assistant Chief of Police
Support Services Bureau

Serving and Protecting with Aloha

GROUP 70
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Scott Tangonan
Tom Young, AIA

Ralph E. Portmore, AICP
Of Counsel

August 4, 2006

Attn: Mr. Boisse P. Correa
Chief of Police
City and County of Honolulu
Police Department
801 South Beretania Street
Honolulu, HI 96813

Subject: Comment Letter on the Kapolei Harborside Center Environmental Impact Statement Preparation Notice

Dear Chief Correa,

Thank you for your comment letter concerning the Kapolei Harborside Center Environmental Impact Statement Notice of Preparation.

We acknowledge that this project should have no significant impact on the facilities or operations of the Honolulu Police Department.

Your comment letter is included in the Draft EIS. We appreciate your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Vice President

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10.0 Preparers of the Report

10.0 PREPARERS OF THE FEIS

This FEIS was prepared for the petitioner, the Kapolei Property Development, LLC, by Group 70 International, Inc. The following list identifies the individuals and organizations involved in the preparation of this report and their respective contributions.

Group 70 International, Inc.	**Role**
Jeff Overton, AICP	Principal in Charge
Troy Knott	Planner
Tom Eisen	Planner
Kirstin Hochart	GIS/Graphics Preparation
Matthew Ortiz	Graphics Preparation
Kristin Rocheleau	Document/Graphics Preparation
Tracy Furuya	Administrative Coordinator

Other Consultants	**Technical Area**
Robert Charles Lesser	Industrial Market Study
Engineering Concepts, Inc.	Civil Engineering / Infrastructure Analysis
Wilbur Smith Associates	Traffic Impact Assessment
Cultural Surveys Hawai‘i, Inc.	Cultural Impact Assessment
Cultural Surveys Hawai‘i, Inc.	Archaeological Inventory Survey
Decision Analysts Hawai‘i, Inc.	Agricultural Impact Analysis
Decision Analysts Hawai‘i, Inc.	Economic and Fiscal Impact Analysis
B.D. Neal and Associates	Air Quality Study
Rana Productions, Ltd.	Botanical, Avian, and Mammalian Resources Study
D.L. Adams Associates, Ltd.	Noise Impact Assessment
Levine Fricke	Hazardous Materials Summary
Pacific Analytics	Arthropod Inventory and Assessment

APPENDICES

Appendix A
Industrial Market Feasibility

ROBERT CHARLES LESSER & CO., LLC

INDUSTRIAL MARKET FEASIBILITY
345-ACRE KAPOLEI HARBORSIDE CENTER
KAPOLEI, HAWAII

Prepared for:

AINA NUI CORPORATION

January 31, 2006

LOS ANGELES OFFICE • 1880 CENTURY PARK EAST, SUITE 215 • LOS ANGELES, CA 90067 • TEL 310 914 1800 FAX 310 914 1810

AINA NUI CORPORATION

TABLE OF CONTENTS

EXECUTIVE SUMMARY

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EXECUTIVE SUMMARY

Background and Objectives

Aina Nui Corporation (Aina Nui), an affiliate of the James Campbell Estate, is moving forward with plans to develop 345 acres (240 saleable acres) at West Kalaeloa as a light industrial business park. Extremely low vacancies and the potential conversion of existing industrial areas to alternative uses have put the Oahu industrial market in a "frenzied" state, with industrial developers unable to meet demand.

These conditions create the enviable market position for Aina Nui's West Kalaeloa business park, which controls approximately one half of today's undeveloped land inventory that could potentially be used for industrial purposes. Although aware of its advantageous position and the strong local market conditions described above, Aina Nui nevertheless seeks third-party market input concerning these conditions, and specifically, their effect on industrial land absorption at its West Kalaeloa site. Aina Nui states that 2009 is the likely initial year of development at West Kalaeloa.

Against this background, Aina Nui engaged Robert Charles Lesser & Co., LLC (RCLCo) to evaluate West Kalaeloa's capture of regional industrial demand and express this demand potential in annual land absorption. The methodology entailed the completion of the following analytical tasks:

- Analysis of historical trends in the Oahu industrial market (supply, absorption, vacancies, and rents) based on published statistical data.
- Identification of the possible locations for future industrial development and West Kalaeloa's share of this available land, based on interviews with real estate professionals.
- Examination of local and regional economic forecasts that present an employment and industry outlook and discuss the growing and declining economic sectors.

- Calculation of the pent-up and annual employment-driven demand potential for industrial space on the island of Oahu.
- Calculation of future annual industrial demand based on employment growth.
- Use of findings from Colliers Monroe Friedlander Consulting on West Oahu transient industrial demand (defined as "the demand that would contribute to increased industrial space requirements beyond the 'typical' growth based on job and economic census variables") in annual demand and absorption analyses.
- Translation of the preceding into an absorption schedule for Aina Nui's 345-acre industrial parcel in West Kalaeloa.

For your reference we have attached an appendix providing the supporting exhibits and tables for our conclusions and recommendations.

Summary of Conclusions

Our overriding conclusion is that a strong likelihood exists for West Kalaeloa capture a sufficient share of Honolulu County's growing industrial demand to absorb the majority of its 240 acres over a period of nine years (2009-2017). This absorption timeframe is based on pent-up demand, annual employment-driven demand, and transient demand (from transitioning markets and industrial tenants with expiring ground leases). The subject site capture of Honolulu County demand is based on a fair share capture of available land for industrial development.

Industrial demand in Honolulu County is based on pent-up demand, annual employment-driven demand, and transient demand. Pent-up demand is the amount of demand that would need to be absorbed to return the market to equilibrium at 5% vacancy. In 2004, total pent-up demand is estimated at 73 acres for Honolulu County. Between 2004 and 2009, additional demand will be generated by county employment growth. RCLCo estimates that annual employment-driven demand will be approximately 25 acres per year, based on employment growth forecasts and the historical ratio between industrial acreage and employment for Honolulu County (80 square feet of industrial per worker). Transient demand is estimated at 11 acres per year for West Oahu, based on a study by Colliers Monroe Friedlander Consulting.

West Kalaeloa's capture of industrial demand is based on the supply of industrial space in the market. Today, there are approximately 8.45 million square feet of land for industrial development in the county. RCLCo estimates that pent-up demand and annual employment-driven demand for industrial space will be absorbed between now and 2009. Therefore, industrial space for the county at the time that West Kalaeloa begins leasing in 2009 will be approximately 5.89 million square feet; West Oahu (Kapolei Business Park Phase 2 and West Kalaeloa) will represent approximately 89% of the available inventory. The subject site is estimated to represent 82% of West Oahu.

Given West Kalaeloa's capture of employment-driven demand and transient demand, industrial land at the subject site should be virtually absorbed in total by year-end 2017.

Demand and absorption calculations are detailed below and in Exhibits I-1 through I-4.

Figure 1 ***Industrial Demand and West Kalaeloa Absorption 2005-2017***

Demand Source	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Employment Driven Annual Demand		17	17	17	17	17	17	17	17	17
Annual Transient Demand		11	11	11	11	11	11	11	11	11
West Kalaeloa Capture of Transient Demand	82%	9	9	9	9	9	9	9	9	9
Total Annual On-Site Land Absorption		26	26	26	26	26	26	26	26	26
Cumulative On-Site Land Absorption		26	52	79	105	131	157	183	210	236
Subject Site Remaining Developable Land (Acres)	**240**	**214**	**188**	**161**	**135**	**109**	**83**	**57**	**30**	**4**

INDUSTRIAL MARKET ANALYSIS

Supply Trends

Historical Trends

The Honolulu County industrial market comprises approximately 35 million square feet, according to data released by Colliers International Realty in mid-2005. The county's industrial supply has remained fairly constant since 2002, amidst growing employment and waterborne commerce. In fact, employment in Honolulu County has increased approximately 6.9% since 2002, while the supply of industrial space has decreased by 1.8% (Exhibits II-2 and III-1A).

Honolulu County's industrial market is comprised of ten smaller submarkets, according to Colliers International Realty. The two largest submarkets, Kahili/Sand Island/Kapalama and Airport/Mapunapuna, contain 8.8 and 8.1 million square feet, respectively, and each represent approximately 25% of the county's total supply of industrial land. Both submarkets are located near the central business district (CBD) and the county's largest port, Honolulu Harbor.

West Kalaeloa is located within the third largest submarket, Campbell Industrial/Kapolei (approximately 4.7 million square feet) (Exhibit II-2). Although located outside of the CBD, West Kalaeloa benefits from its proximity to the county's second largest port, Kalaeloa/Barbers Point Harbor. The following map depicts the locations of the ten submarkets of the Honolulu County industrial market.

Figure 2

Honolulu County Industrial Submarkets 2005

Absorption Trends

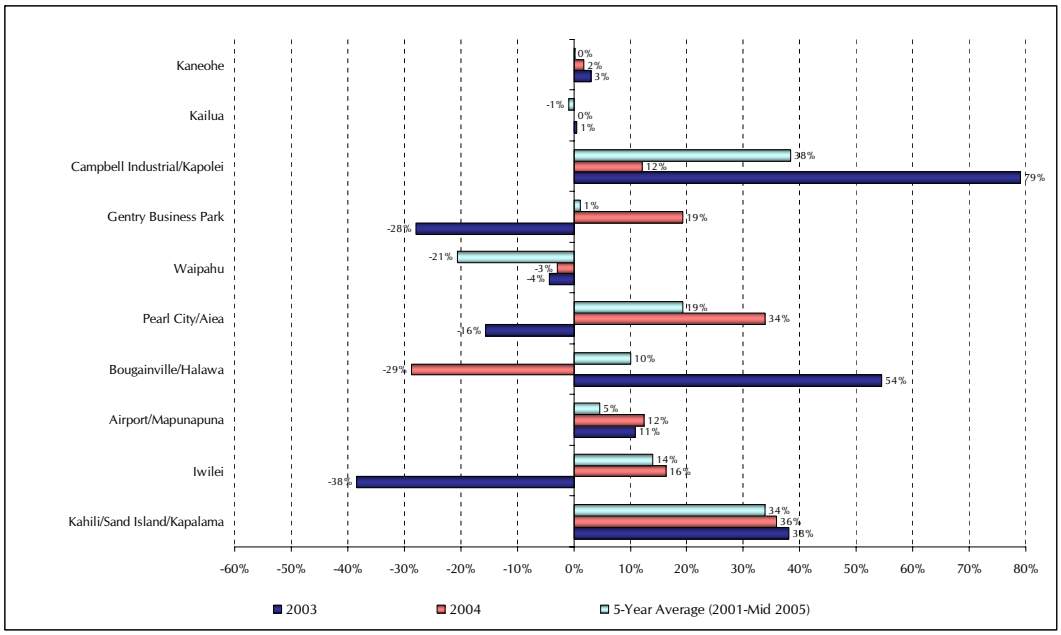
Over 900,000 square feet (or nearly 3% of the total supply) of industrial space was absorbed in Honolulu County between 2002 and mid-2005, cutting already low vacancies from 3% to 1.5% (Exhibit II-2). With Honolulu County's employment and waterborne commerce both growing at steady rates, it is no surprise that industrial land has been absorbed at an average of over five acres per year since 2003. The first half of 2005 experienced more than three acres of industrial land absorption in just a six-month timeframe.

The Campbell Industrial/Kapolei submarket has contributed to a large share of this absorption. In 2003, this submarket represented only 13% of the county's total supply, yet captured 79% of the county's absorption. This trend occurred again in 2005. By mid-2005 the Campbell Industrial/Kapolei submarket represented 14% of the county's total supply of industrial space, yet had already captured 73% of the county's absorption for the year-to-date (Exhibits II-2, II-3, and II-4).

The following graph depicts the relative capture of absorption of industrial space for Honolulu County's submarkets.

Figure 3

Capture of Net Absorption
2003, 2004, and 5 year average (2001-mid 2005)



Future Supply

West Kalaeloa represents the largest parcel of undeveloped industrial land in Honolulu County. With the market already tight, West Kalaeloa would likely be seen as one of the major areas for future industrial development. Colliers Monroe Friedlander Consulting has compiled the following list of undeveloped areas for industrial development in Honolulu County.

Figure 4

Undeveloped Industrial Land Supply Analysis
Honolulu County, 2005

AREA	NET DEVELOPABLE ACRES	SQUARE FOOTAGE	PROBABILITY PERCENTAGE	ESTIMATED SQUARE FEET
Mill Town	15	261,000	100%	261,000
Millilani Tech Park	30	523,000	25%	131,000
I-3 Waterfront Industrial Land	71	1,237,000	50%	619,000
I-2 Zoned Land	123	2,143,000	50%	1,072,000
Hawaii Raceway Park	54	941,000	40%	376,000
Hawaiian Cement	29	505,000	100%	505,000
Tesoro	71	1,237,000	25%	309,000
Honouliuli	43	749,000	10%	75,000
KBP Phase 2	53	923,000	100%	923,000
West Kalaeloa-Subject Site	**240**	**4,182,000**	**100%**	**4,182,000**
Total Oahu Potential New Supply, Year-End 2005	729			8,453,000
Less: Pent-Up Demand	73			1,273,000
Less: Employment-Driven Demand	74			1,287,000
Oahu Year-End 2008 Land Supply	582			5,893,000
Year-End 2005 West Oahu Percentage of Oahu	40%			**60%**
Year-End 2008 West Oahu Percentage of Oahu	50%			**87%**
Year-End 2008 West Kalaeloa Percentage of West Oahu	82%			**82%**

In total, there are 729 undeveloped acres in the county that have potential industrial uses. Most of this land is concentrated in West Oahu; between Kapolei Business Park Phase 2 and West Kalaeloa, there are a total of 293 acres available for industrial development.

Colliers Monroe Friendlander predicts that some of this land is more probable for industrial development than others. The probability percentage is Colliers Monroe Friedlander's estimate of the likelihood of industrial development in each of these areas. The total square feet of industrial land is a function of the total potential acreage for industrial development and the likelihood of development, as estimated by Colliers.

Assuming a 0.4 FAR, the total industrial development potential at year-end 2005 is 8.5 million square feet on 194 acres. Estimating that pent-up industrial demand as well as annual employment-driven demand between 2005 and 2009 will need to be absorbed, only 6 million square feet (135 acres) will be available in Honolulu County at the start of 2009 when industrial leasing can begin at West Kalaeloa. By this time, West Oahu should represent nearly 87% of the industrial land in Honolulu County for potential development, and West Kalaeloa should represent approximately 82% of the land in West Oahu for development.

Demand Outlook -- County

County-wide demand has two components. The first is employment-driven demand which represents the demand created by new job formation. The second is transient demand which represents existing tenants with expiring leases that are likely to be in the market and relocated from their existing space. The sum of Employment-Driven and Transient Demand establishes total industrial demand, expressed in acres, available for capture by existing and projected light industrial/business parks.

Employment-Driven Demand

The first step in determining employment-driven demand is to establish the relationship between the current amount of employment and industrial space in Honolulu County. Through examination of Honolulu County and other West Coast industrial markets, a relationship was established between the supply of industrial land and total employment (non-agricultural). For the West Coast, this relationship ranges from 80 square feet per worker in Honolulu County to 236 square feet per worker in Los Angeles County (Exhibit II-7). The majority of West Coast metro areas show employment to industrial space ratios that range from 100 to 150 square feet per worker. While Honolulu County currently shows the least amount of industrial space per worker, we have continued to utilize the historical equivalent relationship of 80 square feet of industrial space per additional worker.

Assuming an industrial market at equilibrium with a 5% vacancy rate, a pent up demand of 73 acres currently exists in Honolulu County's industrial market in 2004 (or nearly 100 acres in 2005, assuming additional employment-driven demand), given its current low vacancies and an assumption of 80 square feet of industrial space per worker.

To forecast future employment-driven industrial demand, a 5% vacancy rate is assumed. Given forecasted employment growth by Economy.com, Honolulu County is estimated to add more than 5,000 employees per year. Assuming 80 square feet of industrial space per worker, the Honolulu County industrial market would require an additional 25 acres each year from 2005 onward. Between 2000 and

2005, average employment growth was nearly 6,800 workers per year. Given this strong historical employment growth, Economy.com's estimates appear to be conservative.

Given the supply of available land for industrial development and absorption of land between 2005 and 2008, West Oahu would represent 87% of available industrial land at beginning of 2009, when development at the subject site is planned to commence (Exhibit I-4). Of this, West Kalaeloa should represent 82% of available land for industrial development in West Oahu. Therefore, on a fair-share capture basis, the subject site should absorb 19 acres per year of employment-driven demand from 2009 onward (Exhibit I-2). The detailed analysis of employment-driven demand is also shown below.

Figure 5 — ***Employment-Driven Demand***
Honolulu County, West Oahu, and West Kalaeloa, 2005-2016

MARKET AREA	VAC. RATE/ CAP.	PENT UP DEMAND 2004	2005	2006	2007	2008	2009	FORECAST 2010	2011	2012	2013	2014	2015	2016	AVERAGE ANNUAL 2005-2016
HONOLULU COUNTY															
Total non-agricultural employment		419,636	424,713	429,791	434,868	439,946	445,023	450,100	455,178	460,255	465,333	470,410	475,488	480,565	
Total industrial demanded at 80 square feet per worker		33,682,700	34,090,246	34,497,791	34,905,337	35,312,882	35,720,428	36,127,973	36,535,519	36,943,065	37,350,610	37,758,156	38,165,701	38,573,247	36,331,746
Total industrial demanded at 90 square feet per worker		37,767,200	38,224,200	38,681,200	39,138,100	39,595,100	40,052,100	40,509,000	40,966,000	41,423,000	41,879,900	42,336,900	42,793,900	43,250,800	40,737,517
Existing Supply in SqFt		34,182,200	34,182,200	34,182,200	34,182,200	34,182,200	34,182,200	34,182,200	34,182,200	34,182,200	34,182,200	34,182,200	34,182,200	34,182,200	
Occupied Space at 80 SqFt per Worker	5%	33,682,700	34,090,246	34,497,791	34,905,337	35,312,882	35,720,428	36,127,973	36,535,519	36,943,065	37,350,610	37,758,156	38,165,701	38,573,247	36,331,746
Required Supply in SqFt to Achieve 5% Equilibrium Vacancy		35,455,500	35,884,500	36,313,500	36,742,500	37,171,500	37,600,500	38,029,400	38,458,400	38,887,400	39,316,400	39,745,400	40,174,400	40,603,400	
Net Increase in SqFt to Achieve 5% Equilibrium Vacancy		1,273,300	1,702,300	2,131,300	2,560,300	2,989,300	3,418,300	3,847,200	4,276,200	4,705,200	5,134,200	5,563,200	5,992,200	6,421,200	4,061,742
Cumulative Total, Industrial Space Expressed in Land Requirements (Ac)		**73**	**98**	**122**	**147**	**172**	**196**	**221**	**245**	**270**	**295**	**319**	**344**	**369**	
Annual Increase, Industrial Space Expressed in Land Requiremens (Ac)		**--**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**
CAMPBELL INDUSTRIAL/KAPOLEI BUSINESS AT 5% VACANCY															
Total Cumulative Demand For New Construction (Acres) 1/	**60%**	**44**	**59**	**74**	**89**	**104**	**170**	**191**	**213**	**234**	**255**	**277**	**298**	**319**	
Annual Increase, Industrial Space Expressed in Land Requiremens (Ac	**87%**		**15**	**15**	**15**	**15**	**21**	**21**	**21**	**21**	**21**	**21**	**21**	**21**	
WEST KALAELOA CAPTURE AT 5% VACANCY															
Cumulative Demand For Industrial Land (Ac) at 80 SqFt per Worker	**82%**							**35**	**52**	**70**	**87**	**105**	**122**	**140**	
Annual Increase, Industrial Space Expressed in Land Requiremens (Ac)							**17**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	

Transient Demand

In addition to the demand generated by job growth, demand for industrial space in Honolulu County will be produced by transient sources (turnover and relocation). In December 2005, Colliers Monroe Friedlander conducted a transient demand analysis, defined as the "demand that would contribute to increased industrial space requirements beyond the typical growth based on job and economic census variables" (Colliers, p. 2).

Transient demand calculations are generated by the following sources:

- Transitioning markets (relocation due to new land use for existing location)
  - Kapalama military reserve tenants
  - Kakaako Waterfront industrial tenants
  - Airport/Mapunapuna short-term ground lease tenants

- Annual lease turnover
  - Honolulu County industrial market, less above markets
  - Relocation timeframe of 5 years, and assuming 95% renewal of existing leases

Based on the above demand and supply sources and Colliers' estimation of West Oahu's Capture of these markets, West Oahu should absorb approximately 11 acres per year of transient industrial demand (Exhibit IV-3). As the subject site will represent approximately 82% of West Oahu's undeveloped land for industrial uses, the subject site should capture 9 acres per year of transient demand on a fair-share basis from the above sources (Exhibit I-1) and below.

Figure 6

Annual Transient Demand, based on Colliers Monroe Friedlander Study
West Oahu

RELOCATING MARKETS	INVENTORY (SQUARE FEET)	VACANCY RATE	OCCUPANCY (SQUARE FEET)	RELOCATION TIMEFRAME	ANNUAL TURNOVER	WEST OAHU CAPTURE PERCENTAGE	WEST OAHU CAPTURE SQUARE FEET
Kapalama Military Reserve	1,200,000	0.00%	1,200,000	5 years	240,000	20%	48,000
Kakaako	2,884,079	3.59%	2,780,541	15 years	185,000	10%	19,000

LEASE EXPIRING MARKETS	INVENTORY (SQUARE FEET)	VACANCY RATE	OCCUPANCY (SQUARE FEET)	SQFT. EXPIRING 2008-2018	AVG. ANNUAL LEASE EXPIR.	WEST OAHU CAPTURE PERCENTAGE	WEST OAHU CAPTURE SQUARE FEET
Airport/Mapunapuna	8,147,004	0.96%	8,068,793	435,003	54,000	35%	19,000

ANNUAL LEASE TURNOVER	INVENTORY (SQUARE FEET)	VACANCY RATE	OCCUPANCY (SQUARE FEET)	RELOCATION TIMEFRAME	ANNUAL LEASE TURNOVER	WEST OAHU CAPTURE PERCENTAGE	WEST OAHU CAPTURE SQUARE FEET
Oahu Industrial Market-Less Above	22,675,878	1.80%	22,267,712	5 years	4,454,000		
Renewal Percentage	95%				4,231,000		
New Lease Transactions from Turnover					223,000	45%	100,000

TOTAL WEST OAHU TRANSIENT DEMAND BUILDING SQUARE FOOTAGE	**186,000**
TOTAL POTENTIAL WEST OAHU ANNUAL INDUSTRIAL ACREAGE ABSORPTION	**11**

Absorption Potential – West Kalaeloa

Based on the demand analyses previously described, the subject site should capture a total of 26 acres of demand for industrial space each year between 2009 and 2017 (Exhibit I-1). This total demand is based on both annual employment-driven demand and transient demand calculations.

By 2009, when leasing at West Kalaeloa begins, pent-up industrial demand and annual employment driven demand between 2005 and 2009 should be absorbed by the market. Therefore, the total space with potential for industrial development will likely be decreased over this timeframe. Subsequently, West Oahu is estimated to represent 87% of Honolulu County's land for industrial development by year-end 2008. West Kalaeloa should represent approximately 71% of the county's and 82% of West Oahu's land available for industrial development at that time.

Annual employment-driven demand is estimated at 25 acres per year for Honolulu County, from 2005 forward. Based on the capture rates described above, the subject site can absorb approximately 71% of the county's employment-driven industrial demand beginning in 2009, which is equivalent to 17 acres per year.

Annual transient demand for West Oahu is estimated at 11 acres per year by Colliers Monroe Friedlander Consulting. Given the capture rates described above, the subject site should capture approximately 82% of this demand starting in 2009, which is equivalent to nine acres per year.

Combining both annual employment-driven industrial demand with annual transient demand, the subject site should absorb approximately 26 acres per year. At this rate, the subject site should be completely leased in a nine-year timeframe, or by year-end 2017, assuming that leasing commences at the start of 2009.

* * * * *

This market report was conducted by Robert J. Gardner, Managing Director, Malee Tobias, Vice President, and Meredith Hoffmann, Senior Associate. If you have any questions regarding the conclusions and recommendations included herein, or wish to learn about other RCLCo advisory services, please call (310) 914-1800.

CRITICAL ASSUMPTIONS

The conclusions and recommendations presented in this report are based on our analysis of the information available to us from our own sources and from the client as of the date of this report. We assume that the information is correct, complete, and reliable.

Our conclusions and recommendations are based on certain assumptions about the future performance of the global, national, and/or local economy and real estate market, and on other factors similarly outside either our control or that of the client. To the best of our ability, we analyzed trends and the information available to us in drawing conclusions and making the appropriate recommendations. However, given the fluid and dynamic nature of the economy and real estate markets, it is critical to monitor the economy and markets continuously and to revisit the aforementioned conclusions and recommendations periodically to ensure that they stand the test of time.

We assume that, in the future, the economy and real estate markets will grow at a stable and moderate rate. However, history tells us that stable and moderate growth patterns are not sustainable over extended periods of time. Indeed, we find that the economy is cyclical and that the real estate markets are typically highly sensitive to business cycles. Our analysis does not take into account the potential impact of major economic "shocks" on the national and/or local economy and does not account for the potential benefits from a major "boom." Similarly, the analysis does not necessarily reflect the residual impact on the real estate market and the competitive environment of such a shock or boom. The future is always difficult to predict, particularly given changing consumer and market psychology. Therefore, we recommend the close monitoring of the economy and the marketplace. The project and investment economics should be “stress tested” to ensure that potential fluctuations in the economy and real estate market conditions will not cause failure.

In addition, we assume that economic, employment, and household growth will occur more or less in accordance with current expectations, along with other forecasts of trends and demographic and economic patterns. Along these lines, we are not taking into account any major shifts in the level of consumer confidence; in the cost of development and construction; in tax laws (i.e., stable property and

income tax rates, deductibility of mortgage interest, and so forth); or in the availability and/or cost of capital and mortgage financing for real estate developers, owners, and buyers. Should any of the above change, this analysis should probably be updated, with the conclusions and recommendations summarized herein reviewed accordingly (and possibly revised).

We also assume that competitive projects will be developed as planned (active and future) and that a reasonable stream of supply offerings will satisfy real estate demand. Finally, we assume that major public works projects occur and are completed as planned.

GENERAL LIMITING CONDITIONS

Every reasonable effort has been made to ensure that the data contained in this study reflect the most accurate and timely information possible and are believed to be reliable. This study is based on estimates, assumptions, and other information developed by RCLCo from its independent research effort, general knowledge of the industry, and consultations with the client and its representatives. No responsibility is assumed for inaccuracies in reporting by the client, its agent, and representatives or in any other data source used in preparing or presenting this study. This report is based on information that was current as of January 2006, and RCLCo has not undertaken any update of its research effort since such date.

Our report may contain prospective financial information, estimates, or opinions that represent our view of reasonable expectations at a particular time, but such information, estimates, or opinions are not offered as predictions or assurances that a particular level of income or profit will be achieved, that particular events will occur, or that a particular price will be offered or accepted. Actual results achieved during the period covered by our prospective financial analysis may vary from those described in our report, and the variations may be material. Therefore, no warranty or representation is made by RCLCo that any of the projected values or results contained in this study will be achieved.

Possession of this study does not carry with it the right of publication thereof or to use the name of "Robert Charles Lesser & Co., LLC" or "RCLCo" in any manner without first obtaining the prior written consent of RCLCo. No abstracting, excerpting, or summarization of this study may be made without first obtaining the prior written consent of RCLCo. This report is not to be used in conjunction with any public or private offering of securities or other similar purpose where it may be relied upon to any degree by any person other than the client without first obtaining the prior written consent of RCLCo. This study may not be used for any purpose other than that for which it is prepared or for which prior written consent has first been obtained from RCLCo.

I. INDUSTRIAL DEMAND ANALYSIS

AINA NUI CORPORATION

Exhibit I-1

TOTAL ACREAGE ABSORPTION CALCULATIONS
BASED ON EMPLOYMENT-DRIVEN AND TRANSIENT DEMAND CALCULATIONS
WEST KALAELOA
2009 - 2017

Demand Source	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Employment Driven Annual Demand 1/		17	17	17	17	17	17	17	17	17
Annual Transient Demand 2/		11	11	11	11	11	11	11	11	11
West Kalaeloa Capture of Transient Demand 3/	82%	9	9	9	9	9	9	9	9	9
Total Annual On-Site Land Absorption		26	26	26	26	26	26	26	26	26
Cumulative On-Site Land Absorption		26	52	79	105	131	157	183	210	236
Subject Site Remaining Developable Land (Acres)	**240**	**214**	**188**	**161**	**135**	**109**	**83**	**57**	**30**	**4**

1/ See Exhibit I-2. Represents pent-up demand 2005-2008 for the first year.
2/ See Exhibit I-3.
3/ See Exhibit I-4 for subject site capture rate beginning 2009.
SOURCE: Colliers Monroe Friedlander Consultin; RCLCo

Exhibit I-2

INDUSTRIAL SPACE MARKET FORECASTS -- BASED ON ECONOMY.COM PROJECTIONS
HONOLULU COUNTY AND CAMPBELL INDUSTRIAL PARK/KAPOLEI BUSINESS PARK
80 SQUARE FEET PER WORKER SCENARIO
2005 - 2016

MARKET AREA	VAC. RATE/ CAP.	PENT UP DEMAND 2004	FORECAST 3/ 2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	AVERAGE ANNUAL 2005-2016
HONOLULU COUNTY															
Total non-agricultural employment		419,636	424,713	429,791	434,868	439,946	445,023	450,100	455,178	460,255	465,333	470,410	475,488	480,565	
Total industrial demanded at 80 square feet per worker 2/		33,682,700	34,090,246	34,497,791	34,905,337	35,312,882	35,720,428	36,127,973	36,535,519	36,943,065	37,350,610	37,758,156	38,165,701	38,573,247	36,331,746
Total industrial demanded at 90 square feet per worker		37,767,200	38,224,200	38,681,200	39,138,100	39,595,100	40,052,100	40,509,000	40,966,000	41,423,000	41,879,900	42,336,900	42,793,900	43,250,800	40,737,517
Existing Supply in SqFt		34,182,200	34,182,200	34,182,200	34,182,200	34,182,200	34,182,200	34,182,200	34,182,200	34,182,200	34,182,200	34,182,200	34,182,200	34,182,200	
Occupied Space at 80 SqFt per Worker 2/	5%	33,682,700	34,090,246	34,497,791	34,905,337	35,312,882	35,720,428	36,127,973	36,535,519	36,943,065	37,350,610	37,758,156	38,165,701	38,573,247	36,331,746
Required Supply in SqFt to Achieve 5% Equilibrium Vacancy		35,455,500	35,884,500	36,313,500	36,742,500	37,171,500	37,600,500	38,029,400	38,458,400	38,887,400	39,316,400	39,745,400	40,174,400	40,603,400	
Net Increase in SqFt to Achieve 5% Equilibrium Vacancy		1,273,300	1,702,300	2,131,300	2,560,300	2,989,300	3,418,300	3,847,200	4,276,200	4,705,200	5,134,200	5,563,200	5,992,200	6,421,200	4,061,742
Cumulative Total, Industrial Space Expressed in Land Requirements (Ac) 1/		**73**	**98**	**122**	**147**	**172**	**196**	**221**	**245**	**270**	**295**	**319**	**344**	**369**	
Annual Increase, Industrial Space Expressed in Land Requirements (Ac)		**--**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**
CAMPBELL INDUSTRIAL/KAPOLEI BUSINESS AT 5% VACANCY															
Total Cumulative Demand For New Construction (Acres) 1/	**60%**	4/ **44**	**59**	**74**	**89**	**104**	**170**	**191**	**213**	**234**	**255**	**277**	**298**	**319**	
Annual Increase, Industrial Space Expressed in Land Requirements (Ac	**87%**	5/	**15**	**15**	**15**	**15**	**21**	**21**	**21**	**21**	**21**	**21**	**21**	**21**	
WEST KALAELOA CAPTURE AT 5% VACANCY															
Cumulative Demand For Industrial Land (Ac) at 80 SqFt per Worker 1	**82%**	5/						**35**	**52**	**70**	**87**	**105**	**122**	**140**	
Annual Increase, Industrial Space Expressed in Land Requirements (Ac)							**17**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	

1/ Measured in acres at .4 FAR.
2/ In 2004, ratio was 80.266 square feet per worker. This exact number is used for calculation.
3/ Forecast is based on Economy.com's average employment growth projections for Honolulu County between 2005 and 2016.
4/ Capture rate between 2005 and 2009 (Exhibit I-4).
5/ Capture rate from 2009 forward, based on available land reduced from absorption of demand between 2005 and 2009 (Exhibit I-4).
SOURCE: Economy.com; RCLCo

Exhibit I-3

ANNUAL TRANSIENT DEMAND CALCULATIONS
HONOLULU COUNTY
2005

RELOCATING MARKETS	INVENTORY (SQUARE FEET)	VACANCY RATE	OCCUPANCY (SQUARE FEET)	RELOCATION TIMEFRAME	ANNUAL TURNOVER	WEST OAHU CAPTURE PERCENTAGE	WEST OAHU CAPTURE SQUARE FEET
Kapalama Military Reserve	1,200,000	0.00%	1,200,000	5 years	240,000	20%	48,000
Kakaako	2,884,079	3.59%	2,780,541	15 years	185,000	10%	19,000

LEASE EXPIRING MARKETS	INVENTORY (SQUARE FEET)	VACANCY RATE	OCCUPANCY (SQUARE FEET)	SQFT. EXPIRING 2008-2018	AVG. ANNUAL LEASE EXPIR.	WEST OAHU CAPTURE PERCENTAGE	WEST OAHU CAPTURE SQUARE FEET
Airport/Mapunapuna	8,147,004	0.96%	8,068,793	435,003	54,000	35%	19,000

ANNUAL LEASE TURNOVER	INVENTORY (SQUARE FEET)	VACANCY RATE	OCCUPANCY (SQUARE FEET)	RELOCATION TIMEFRAME	ANNUAL LEASE TURNOVER	WEST OAHU CAPTURE PERCENTAGE	WEST OAHU CAPTURE SQUARE FEET
Oahu Industrial Market-Less Above	22,675,878	1.80%	22,267,712	5 years	4,454,000		
Renewal Percentage 1/	95%				4,231,000		
New Lease Transactions from Turnover					223,000	45%	100,000

TOTAL WEST OAHU TRANSIENT DEMAND BUILDING SQUARE FOOTAGE	**186,000**
TOTAL POTENTIAL WEST OAHU ANNUAL INDUSTRIAL ACREAGE ABSORPTION 2/	**11**

NOTE: West Oahu includes Kapolei Business Park and West Kalaeloa industrial land.
1/ An estimate of existing tenants with expiring leases. With respect to Oahu industrial, a conservative estimate of 5% of expiring leases would actually relocate.
2/ At .4 FAR industrial building to land ratio.
SOURCE: Colliers Monroe Friedlander Consulting; RCLCo

Exhibit I-4

UNDEVELOPED INDUSTRIAL LAND SUPPLY PROJECTION
HONOLULU COUNTY
2005

AREA	NET DEVELOPABLE ACRES	SQUARE FOOTAGE 1/	PROBABILITY PERCENTAGE 2/	ESTIMATED SQUARE FEET
Mill Town	15	261,000	100%	261,000
Millilani Tech Park	30	523,000	25%	131,000
I-3 Waterfront Industrial Land	71	1,237,000	50%	619,000
I-2 Zoned Land	123	2,143,000	50%	1,072,000
Hawaii Raceway Park	54	941,000	40%	376,000
Hawaiian Cement	29	505,000	100%	505,000
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West Kalaeloa-Subject Site	**240**	**4,182,000**	**100%**	**4,182,000**
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Less: Pent-Up Demand	73			1,273,000
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Oahu Year-End 2008 Land Supply	582			5,893,000
Year-End 2005 West Oahu Percentage of Oahu	40%			**60%**
Year-End 2008 West Oahu Percentage of Oahu	50%			**87%**
Year-End 2008 West Kalaeloa Percentage of West Oahu	82%			**82%**

1/ Estimated FAR of .4.
2/ Per Colliers Monroe Friedlander Consulting.

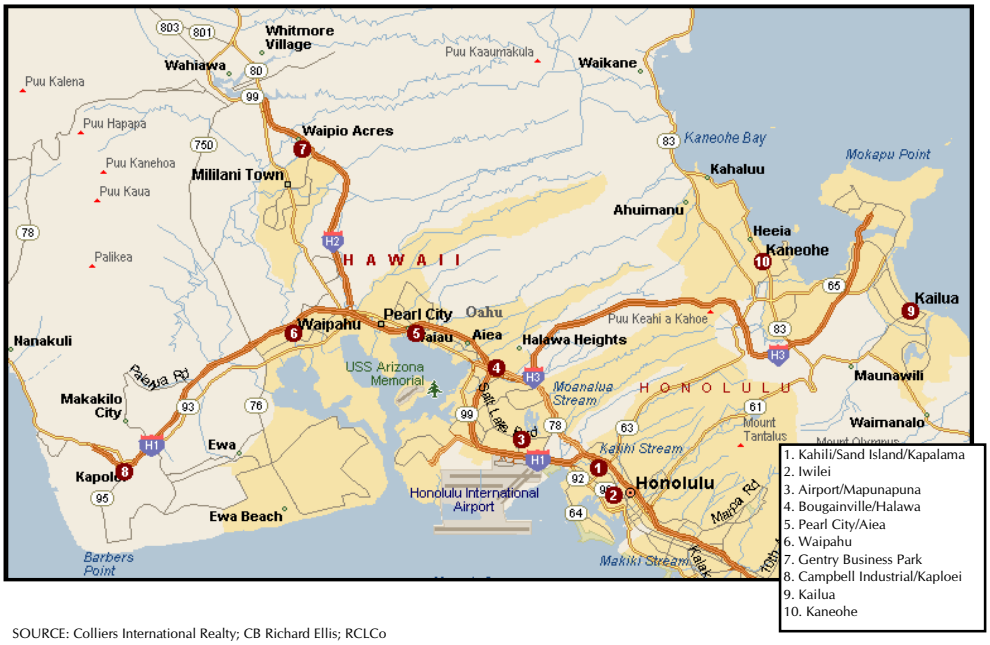
SOURCE: Colliers Monroe Friedlander Consulting

AINA NUI CORPORATION

II. INDUSTRIAL MARKET ANALYSIS

Exhibit II-1A

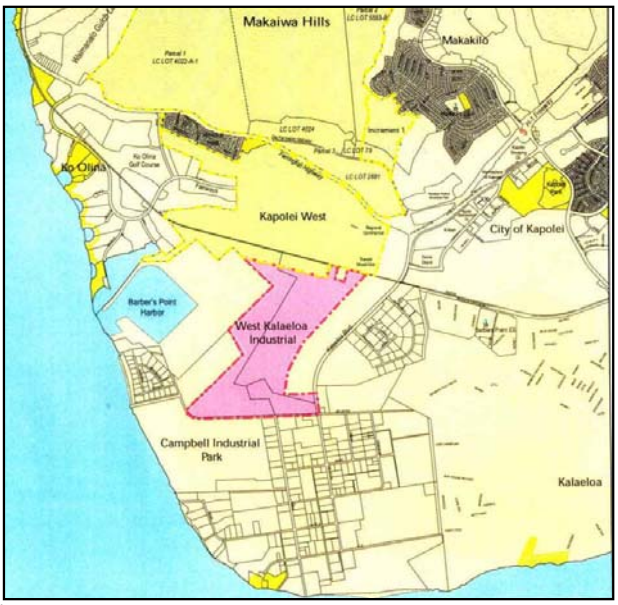
HONOLULU COUNTY
INDUSTRIAL SUBMARKETS
AUGUST 2005



SOURCE: Colliers International Realty; CB Richard Ellis; RCLCo

Exhibit II-1B

SUBJECT SITE
WEST KALAELOA INDUSTRIAL
AUGUST 2005

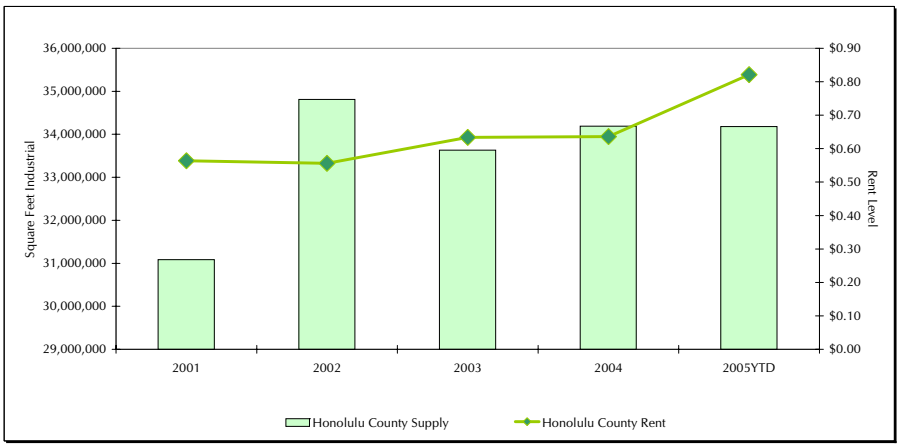


SOURCE: Kapolei Property Development; RCLCo

Exhibit II-2

INDUSTRIAL MARKET CHARACTERISTICS BY SUBMARKET
HONOLULU COUNTY
2001 - MID-YEAR 2005

SUBMARKET	2001	2002	2003	2004	MID 2005
SUPPLY	31,083,076	34,810,139	33,632,034	34,190,307	34,182,247
VACANCY RATE	3.6%	3.0%	2.4%	1.3%	1.5%
RENT LEVEL	$0.56	$0.56	$0.63	$0.64	$0.82
NET ABSORPTION	(180,755)	174,126	199,383	339,683	136,344



AINA NUI CORPORATION

Exhibit II-2

INDUSTRIAL MARKET CHARACTERISTICS BY SUBMARKET
HONOLULU COUNTY
2001 - MID-YEAR 2005

SUBMARKET	2001	2002	2003	2004	MID 2005
Campbell Industrial/Kapolei					
SUPPLY	4,638,605	4,321,031	4,321,031	4,598,322	4,709,922
VACANCY RATE	5.2%	4.9%	1.3%	0.3%	0.5%
RENT LEVEL	$0.45	$0.48	$0.65	$0.82	$0.77
NET ABSORPTION	(22,508)	26,410	157,697	41,402	99,915
PCT. OF TOTAL SUPPLY	15%	12%	13%	13%	14%
PCT. CAPTURE ABS.	12%	15%	79%	12%	73%
Kahili/Sand Island/Kapalama					
SUPPLY	7,423,577	9,433,359	8,934,870	8,947,870	8,844,160
VACANCY RATE	3.7%	3.4%	2.4%	1.1%	0.5%
RENT LEVEL	$0.56	$0.67	$0.83	$0.69	$0.99
NET ABSORPTION	(39,338)	1,791	76,006	121,940	98,990
PCT. OF TOTAL SUPPLY	24%	27%	27%	26%	26%
PCT. CAPTURE ABS.	22%	1%	38%	36%	73%
Iwilei					
SUPPLY	2,587,132	2,824,098	2,511,998	2,511,998	2,511,998
VACANCY RATE	8.3%	5.6%	5.3%	3.1%	3.2%
RENT LEVEL	$0.72	$0.86	$0.90	$0.91	$0.97
NET ABSORPTION	(108,473)	56,843	(76,715)	55,230	(1,068)
PCT. OF TOTAL SUPPLY	8%	8%	7%	7%	7%
PCT. CAPTURE ABS.	60%	33%	-38%	16%	-1%
Airport/Mapunapuna					
SUPPLY	7,177,188	8,571,670	8,103,587	8,115,687	8,132,058
VACANCY RATE	3.2%	1.9%	1.7%	1.2%	1.6%
RENT LEVEL	$0.67	$0.95	$0.91	$1.01	$0.92
NET ABSORPTION	17,128	33,299	21,666	42,270	(13,826)
PCT. OF TOTAL SUPPLY	23%	25%	24%	24%	24%
PCT. CAPTURE ABS.	-9%	19%	11%	12%	-10%
Bougainville/Halawa					
SUPPLY	3,070,109	3,091,330	3,056,923	3,305,429	3,273,108
VACANCY RATE	5.9%	4.9%	1.6%	4.4%	6.1%
RENT LEVEL	$0.76	$0.67	$0.73	$1.13	$1.16
NET ABSORPTION	(83,392)	29,161	108,648	(97,486)	(52,627)
PCT. OF TOTAL SUPPLY	10%	9%	9%	10%	10%
PCT. CAPTURE ABS.	46%	17%	54%	-29%	-39%

Exhibit II-2

INDUSTRIAL MARKET CHARACTERISTICS BY SUBMARKET
HONOLULU COUNTY
2001 - MID-YEAR 2005

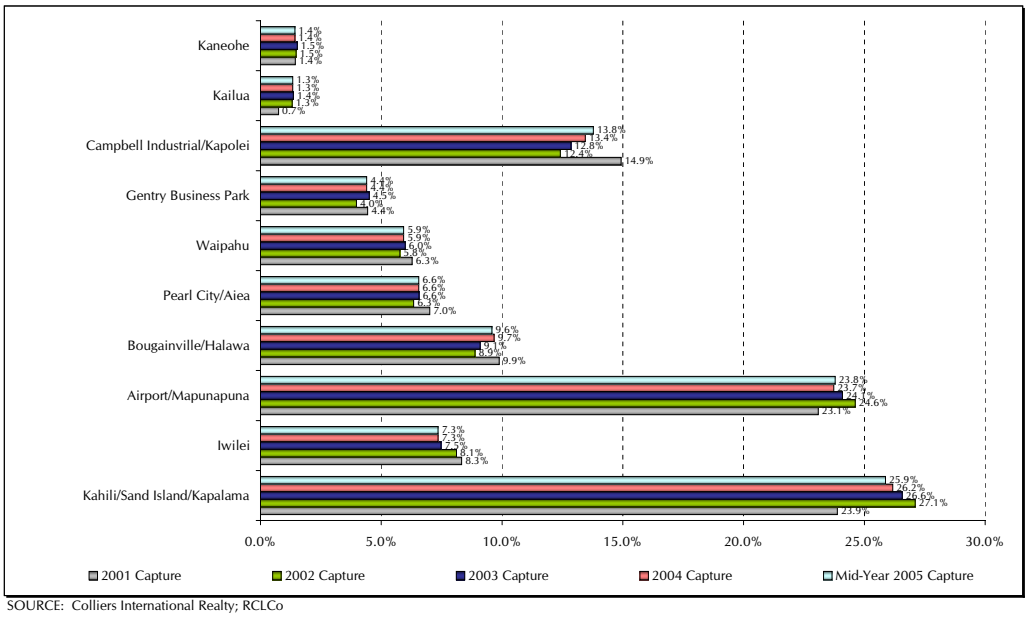
SUBMARKET	2001	2002	2003	2004	MID 2005
Pearl City/Aiea					
SUPPLY	2,178,916	2,206,089	2,205,424	2,239,997	2,239,997
VACANCY RATE	7.8%	5.8%	7.2%	1.9%	0.4%
RENT LEVEL	$0.86	$0.65	$0.88	$0.94	$0.94
NET ABSORPTION	(50,516)	43,308	(30,942)	114,935	34,440
PCT. OF TOTAL SUPPLY	7%	6%	7%	7%	7%
PCT. CAPTURE ABS.	28%	25%	-16%	34%	25%
Waipahu					
SUPPLY	1,949,434	2,009,679	2,015,318	2,025,418	2,025,418
VACANCY RATE	1.4%	2.7%	1.2%	1.7%	3.3%
RENT LEVEL	$0.69	$0.52	$0.67	$0.70	$0.84
NET ABSORPTION	100,318	(28,578)	(8,710)	(10,092)	(32,345)
PCT. OF TOTAL SUPPLY	6%	6%	6%	6%	6%
PCT. CAPTURE ABS.	-55%	-16%	-4%	-3%	-24%
Gentry Business Park					
SUPPLY	1,378,538	1,383,874	1,513,874	1,501,291	1,501,291
VACANCY RATE	2.0%	0.7%	4.3%	0.0%	0.0%
RENT LEVEL	$0.71	$0.70	$0.60	$0.00	n/a
NET ABSORPTION	(7,481)	17,531	(55,562)	65,332	-
PCT. OF TOTAL SUPPLY	4%	4%	5%	4%	4%
PCT. CAPTURE ABS.	4%	10%	-28%	19%	0%
Kailua					
SUPPLY	231,951	456,822	456,822	456,822	456,822
VACANCY RATE	0.0%	0.3%	0.0%	0.0%	0.0%
RENT LEVEL	$0.00	$0.00	$0.00	$0.00	n/a
NET ABSORPTION	11,187	(1,200)	1,200	-	2,865
PCT. OF TOTAL SUPPLY	1%	1%	1%	1%	1%
PCT. CAPTURE ABS.	-6%	-1%	1%	0%	2%
Kaneohe					
SUPPLY	447,626	512,187	512,187	487,473	487,473
VACANCY RATE	2.4%	3.0%	1.8%	0.6%	0.6%
RENT LEVEL	$0.78	$0.62	$0.80	$0.80	$0.80
NET ABSORPTION	2,320	(4,439)	6,095	6,152	-
PCT. OF TOTAL SUPPLY	1%	1%	2%	1%	1%
PCT. CAPTURE ABS.	-1%	-3%	3%	2%	0%

SOURCE: Colliers International Realty; RCLCo

AINA NUI CORPORATION

Exhibit II-3

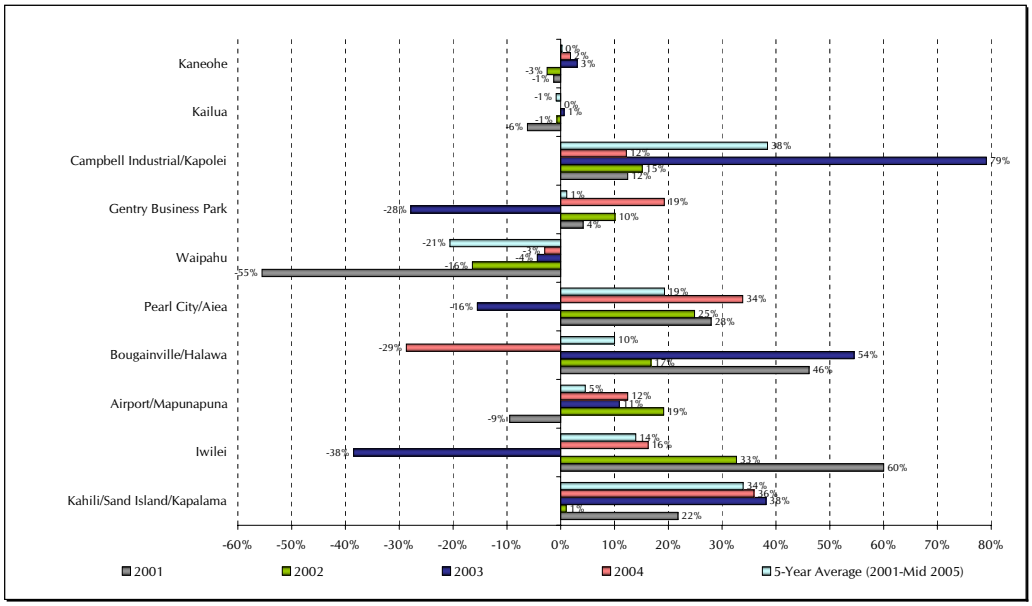
RELATIVE CAPTURE OF TOTAL SUPPLY IN INDUSTRIAL MARKETS
HONOLULU COUNTY SUBMARKETS
2001 - MID-YEAR 2005



SOURCE: Colliers International Realty; RCLCo

Exhibit II-4

CAPTURE OF NET ABSORPTION
HONOLULU COUNTY SUBMARKETS
2001 - MID-YEAR 2005

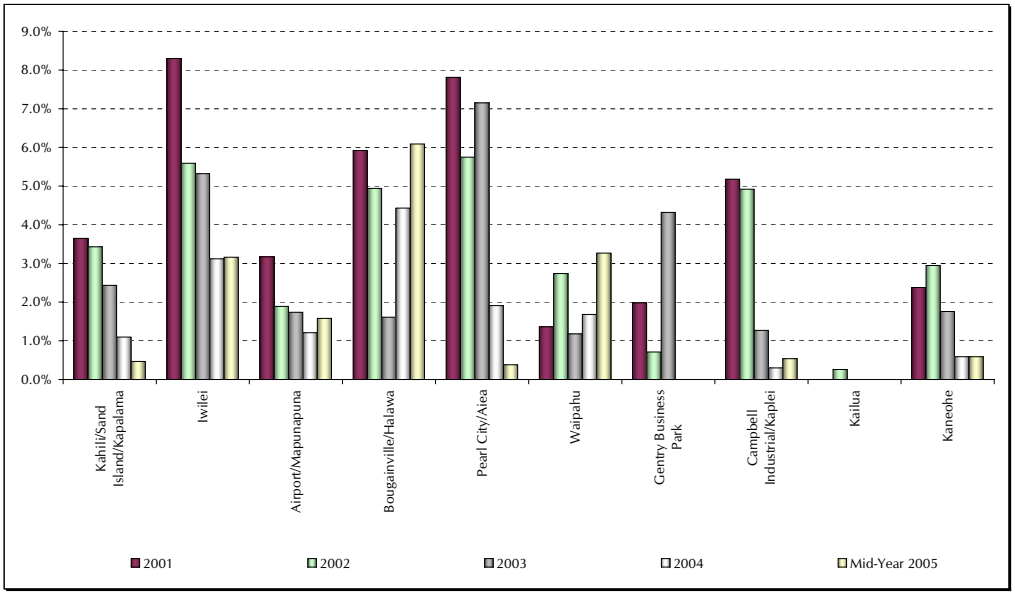


SOURCE: Colliers International Realty; RCLCo

AINA NUI CORPORATION

Exhibit II-5

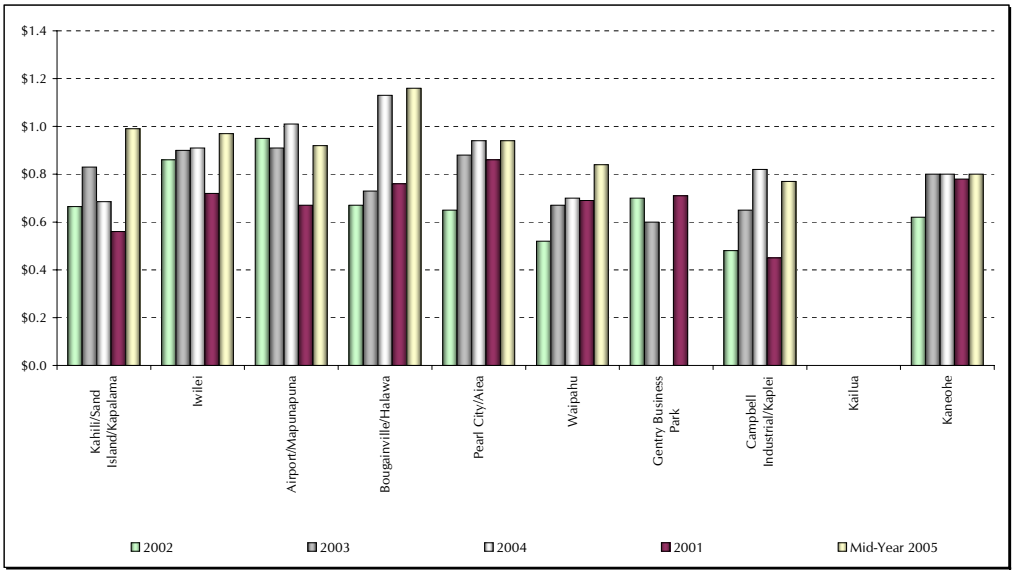
YEAR-END INDUSTRIAL VACANCY RATES
HONOLULU COUNTY SUBMARKETS
2001 - MID-YEAR 2005



SOURCE: Colliers International Realty; RCLCo

Exhibit II-6

ANNUAL INDUSTRIAL RENTS AND RENT GROWTH
HONOLULU COUNTY
2001 - MID-YEAR 2005



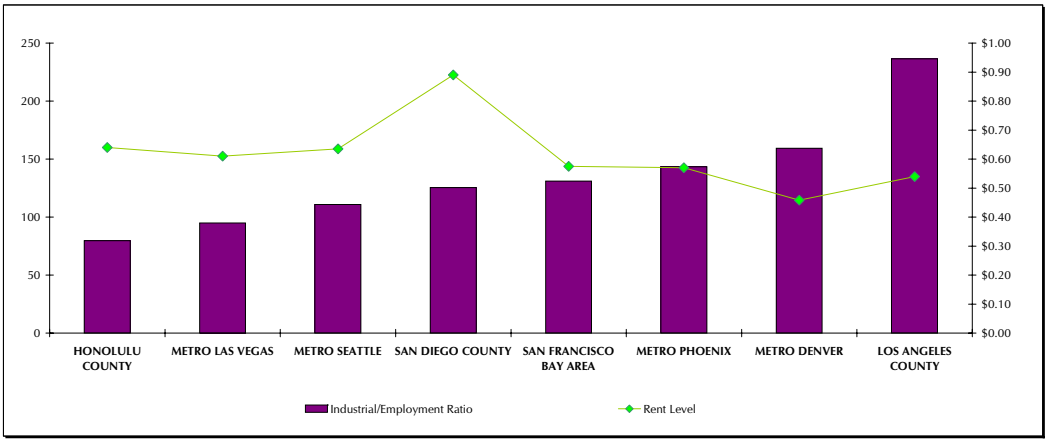
NOTE: Data for Kailua is not available.
SOURCE: Colliers International Realty; RCLCo

AINA NUI CORPORATION

Exhibit II-7

INDUSTRIAL SUPPLY VERSUS TOTAL EMPLOYMENT
SELECT WEST COAST REGIONS
2004

REGION	TOTAL INDUSTRIAL SUPPLY (1,000's)	TOTAL EMPLOYMENT (1,000's)	INDUSTRIAL SPACE PER EMPLOYEE	VACANCY RATE	RENTAL RATE
HONOLULU COUNTY	34,190	428.8	80	1.3%	$0.64
METRO LAS VEGAS	77,100	811.7	95	7.6%	$0.61
METRO SEATTLE	148,092	1,335.5	111	9.5%	$0.64
SAN DIEGO COUNTY	157,879	1,258.6	125	7.6%	$0.89
SAN FRANCISCO BAY AREA	123,000	938.4	131	0.0%	$0.58
METRO PHOENIX	240,053	1,674.8	143	10.0%	$0.57
METRO DENVER	186,114	1,167.6	159	8.8%	$0.46
LOS ANGELES COUNTY	949,277	4,016.3	236	2.7%	$0.54



SOURCE: Grubb and Ellis; BLS; Colliers; RCLCo

Exhibit II-8

UNDER CONSTRUCTION AND PLANNED INDUSTRIAL DEVELOPMENTS
HONOLULU COUNTY
AUGUST 2005

PROJECT NAME/ LOCATION/ DEVELOPER OR OWNER	BUILDING TYPE / TENANCY	STATUS	ESTIMATED COMPLETION DATE	# BLDGS	TOTAL SPACE (SF)	ANNUAL LEASE RATE FOR AVAILABLE SPACE ($/SF) 1/
Pegasus Group Self Storage Pegasus Group	n/a	n/a	3/1/2005	n/a	70,000	n/a

1/ MG = Modified Gross, NNN = Triple Net.

SOURCE: Property and Portfolio Research Inc.; County Planning Department of Honolulu; RCLCo.

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III. EMPLOYMENT

AINA NUI CORPORATION

Exhibit III-1A

HISTORICAL NON-AGRICULTURAL EMPLOYMENT GROWTH
HONOLULU COUNTY, STATE OF HAWAII, AND THE UNITED STATES
1990 - 2005 YTD
(in thousands)

	HONOLULU COUNTY			STATE OF HAWAII			UNITED STATES		
YEAR	TOTAL	ANNUAL CHANGE	PERCENT CHANGE	TOTAL	ANNUAL CHANGE	PERCENT CHANGE	TOTAL	ANNUAL CHANGE	PERCENT CHANGE
1990	410.7	--		528.4	--		109,487.0	--	
1991	415.6	4.9	1.2%	539.1	10.7	2.0%	108,374.0	-1,113.0	-1.0%
1992	418.0	2.4	0.6%	542.8	3.7	0.7%	108,726.0	352.0	0.3%
1993	414.8	-3.2	-0.8%	538.8	-4.0	-0.7%	110,844.0	2,118.0	1.9%
1994	411.6	-3.2	-0.8%	536.1	-2.7	-0.5%	114,291.0	3,447.0	3.1%
1995	408.3	-3.3	-0.8%	532.8	-3.3	-0.6%	117,298.0	3,007.0	2.6%
1996	404.7	-3.6	-0.9%	530.7	-2.1	-0.4%	119,708.0	2,410.0	2.1%
1997	403.6	-1.1	-0.3%	531.6	0.9	0.2%	122,776.0	3,068.0	2.6%
1998	400.9	-2.7	-0.7%	531.3	-0.3	-0.1%	125,930.0	3,154.0	2.6%
1999	401.5	0.6	0.1%	535.0	3.7	0.7%	128,993.0	3,063.0	2.4%
2000	412.0	10.5	2.6%	551.4	16.4	3.1%	131,785.0	2,792.0	2.2%
2001	412.5	0.5	0.1%	555.0	3.6	0.7%	131,826.0	41.0	0.0%
2002	412.9	0.4	0.1%	556.8	1.8	0.3%	130,341.0	-1,485.0	-1.1%
2003	419.6	6.7	1.6%	567.6	10.8	1.9%	129,999.0	-342.0	-0.3%
2004	428.8	9.2	2.2%	582.3	14.7	2.6%	131,480.0	1,481.0	1.1%
2005 YTD	442.2	13.4	3.1%	599.7	17.4	3.0%	134,732.0	3,252.0	2.5%
Avg. Ann. Growth Rate									
1990-1995			-0.1%			0.2%			1.4%
1995-2000			0.2%			0.7%			2.4%
1990-2000			0.0%			0.4%			1.9%
2000-2005			1.4%			1.7%			0.4%

Both the State of Hawaii and Honolulu County have had more rapid employment growth on a percentage basis between 2000 and 2005, as compared with the United States.

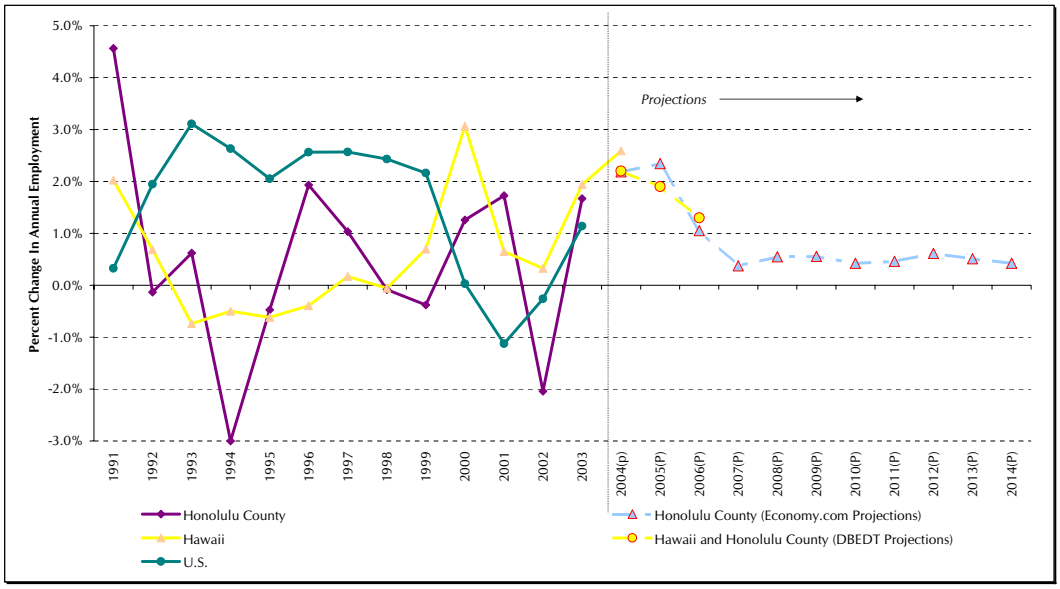
NOTE: 2005 YTD is through June. All other years reflect annual average employment and employment growth.

SOURCE: U.S. Bureau of Labor Statistics; RCLCo

AINA NUI CORPORATION

Exhibit III-1B

HISTORICAL AND PROJECTED NON-AGRICULTURAL EMPLOYMENT GROWTH
HONOLULU COUNTY, STATE OF HAWAII, AND THE UNITED STATES
1991 - 2014

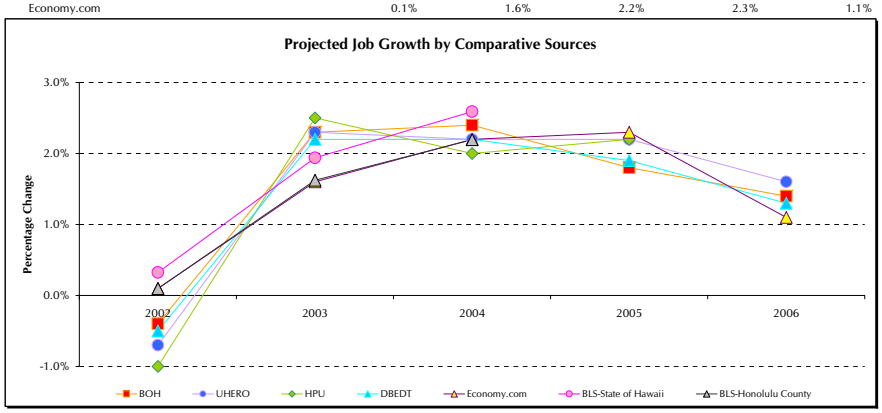


SOURCE: Economy.com; Hawaii Department of Labor and Industrial Division; U.S. Bureau of Labor Statistics; RCLCo

Exhibit III-2

COMPARATIVE HAWAII ECONOMY
2005 - 2006 FORECASTS

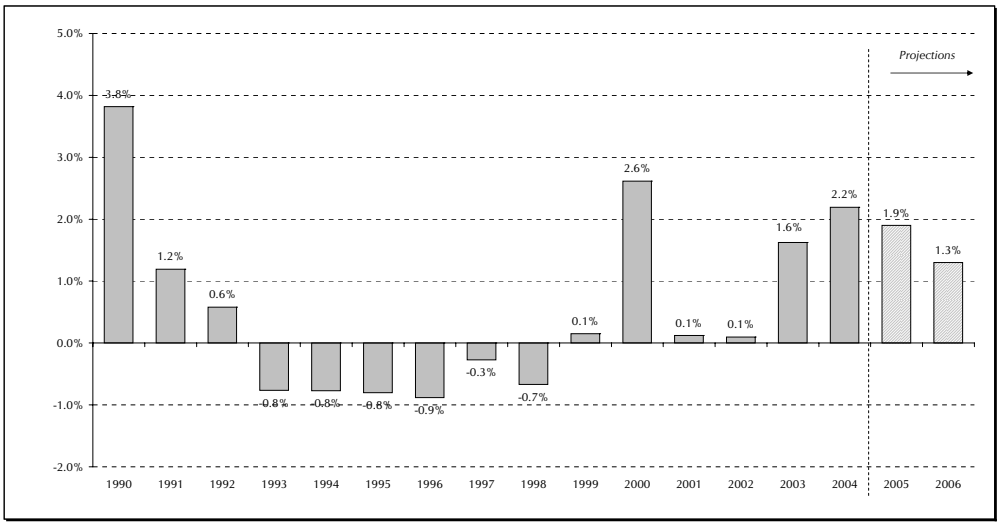
SOURCE	ANNUAL PERCENTAGE CHANGE, EMPLOYMENT 2002	2003	2004	2005	2006
STATE OF HAWAII					
BLS-Actual	0.3%	1.9%	2.6%		
BOH	-0.4%	2.3%	2.4%	1.8%	1.4%
UHERO	-0.7%	2.3%	2.2%	2.2%	1.6%
HPU	-1.0%	2.5%	2.0%	2.2%	
HONOLULU COUNTY					
BLS-Actual	0.1%	1.6%	2.2%		
DBEDT	-0.5%	2.2%	2.2%	1.9%	1.3%
Economy.com	0.1%	1.6%	2.2%	2.3%	1.1%



NOTE: DBEDT includes both self-employed and wage employees.
SOURCE: U.S. Bureau of Labor Statistics; Bank of Hawaii Economics Research Center (BOH); University of Hawaii Economic Research Organization (UHERO); Professor Leroy Laney, Hawaii Pacific University (HPU); Department of Economic Business and Economic Development and Tourism (DBEDT); Economy.com; RCLCo

Exhibit III-3A

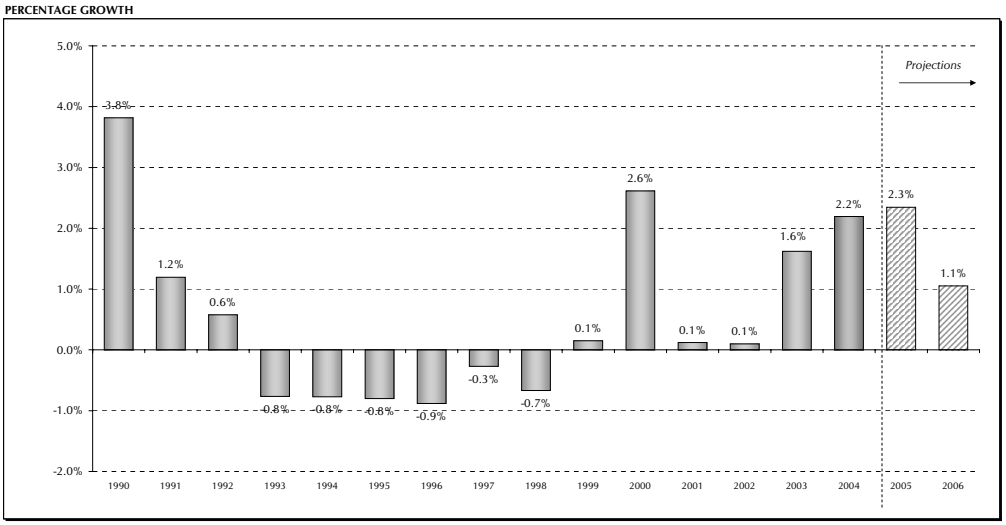
HISTORICAL AND PROJECTED NON-AGRICULTURAL EMPLOYMENT GROWTH
HONOLULU COUNTY
1990 - 2006



NOTE: BLS is used for historical data, while DBEDT is used for projections. Projections shown are in thousands.
SOURCE: BLS; DBEDT; RCLCo

Exhibit III-3B

HISTORICAL AND PROJECTED NON-AGRICULTURAL EMPLOYMENT GROWTH
HONOLULU COUNTY
1990 - 2006



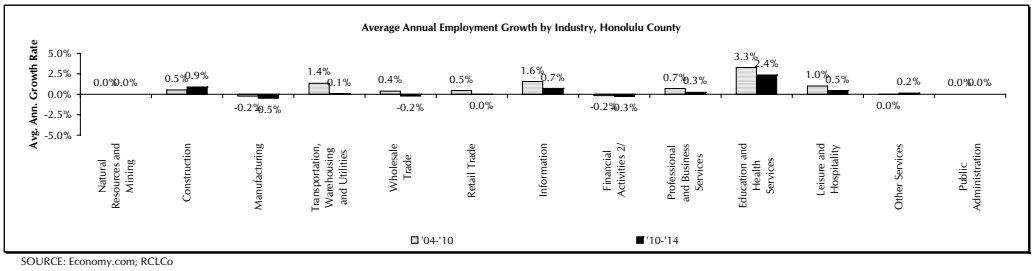
NOTE: BLS is used for historical data, while Economy.com is used for projections. Projections shown are in thousands.
SOURCE: DBEDT; Economy.com; RCLCo

AINA NUI CORPORATION

Exhibit III-4

HISTORICAL AND PROJECTED NON-AGRICULTURAL EMPLOYMENT BY INDUSTRY
HONOLULU COUNTY
1990 - 2014
(in thousands)

INDUSTRY	1990 TOTAL	1990 % TOTAL	2000 TOTAL	2000 % TOTAL	2004 TOTAL	2004 % TOTAL	2010 TOTAL	2010 % TOTAL	2014 TOTAL	2014 % TOTAL	AVE. ANNUAL GROWTH RATES '90-'00	'00-'04	'04-'10	'10-'14
GOODS PRODUCING	41.8	10.2%	30.2	7.3%	32.5	7.6%	33.0	7.3%	33.5	7.3%	-3.2%	1.9%	0.3%	0.4%
Natural Resources and Mining	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0%	0.0%	0.0%	0.0%
Construction	26.7	6.5%	17.5	4.2%	20.5	4.8%	21.2	4.7%	21.9	4.8%	-4.1%	4.0%	0.5%	0.9%
Manufacturing	15.1	3.7%	12.7	3.1%	12.0	2.8%	11.8	2.6%	11.6	2.5%	-1.7%	-1.4%	-0.2%	-0.5%
SERVICE PRODUCING	280.8	68.4%	290.1	70.4%	300.6	70.1%	322.1	71.2%	330.3	71.6%	0.3%	0.9%	1.2%	0.6%
Transportation, Warehousing and Utilities	21.8	5.3%	21.7	5.3%	20.5	4.8%	22.3	4.9%	22.4	4.8%	0.0%	-1.4%	1.4%	0.1%
Wholesale Trade	14.8	3.6%	13.4	3.2%	13.8	3.2%	14.1	3.1%	14.0	3.0%	-1.0%	0.8%	0.4%	-0.2%
Retail Trade	50.2	12.2%	46.2	11.2%	45.0	10.5%	46.2	10.2%	46.2	10.0%	-0.8%	-0.7%	0.5%	0.0%
Information	8.1	2.0%	10.2	2.5%	9.0	2.1%	9.8	2.2%	10.1	2.2%	2.3%	-3.3%	1.6%	0.7%
Financial Activities	24.9	6.1%	23.5	5.7%	22.2	5.2%	21.9	4.8%	21.7	4.7%	-0.6%	-1.5%	-0.2%	-0.3%
Professional and Business Services	42.9	10.4%	50.1	12.2%	57.2	13.3%	59.7	13.2%	60.3	13.1%	1.6%	3.4%	0.7%	0.3%
Education and Health Services	39.4	9.6%	48.1	11.7%	53.4	12.4%	64.7	14.3%	71.0	15.4%	2.0%	2.6%	3.3%	2.4%
Leisure and Hospitality	62.4	15.2%	59.2	14.4%	60.6	14.1%	64.3	14.2%	65.5	14.2%	-0.5%	0.6%	1.0%	0.5%
Other Services	16.2	3.9%	17.7	4.3%	19.0	4.4%	19.0	4.2%	19.1	4.1%	0.9%	1.9%	0.0%	0.2%
PUBLIC ADMINISTRATION	88.2	21.5%	91.6	22.2%	95.7	22.3%	97.0	21.4%	97.4	21.1%	0.4%	1.1%	0.2%	0.1%
TOTAL NON-FARM EMPLOYMENT	410.7	100.0%	411.9	100.0%	428.8	100.0%	452.0	100.0%	461.2	100.0%	0.0%	1.0%	0.9%	0.5%

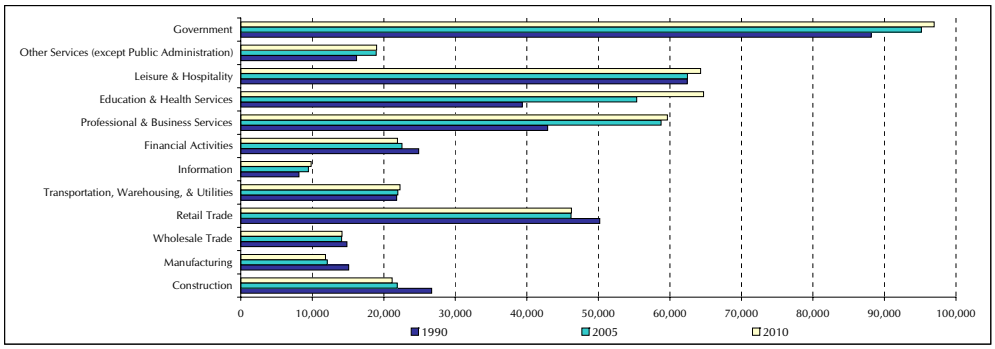


SOURCE: Economy.com; RCLCo

Exhibit III-5A

HISTORICAL AND PROJECTED CHANGE IN NON-AGRICULTURAL EMPLOYMENT BY INDUSTRY
HONOLULU COUNTY
1990 - 2010

INDUSTRY	1990	2000	2004	2005	2006	2007	2010	AVG. ANNUAL GROWTH RATE 1990-2005	AVG. ANNUAL GROWTH RATE 2005-2010
Natural Resources & Mining	0	0	0	0	0	0	0	**0.0%**	**0.0%**
Construction	26,686	17,483	20,484	21,881	21,113	20,846	21,157	**-1.5%**	**3.9%**
Manufacturing	15,102	12,699	12,000	12,105	12,069	11,959	11,843	**-1.6%**	**-1.4%**
Wholesale Trade	14,836	13,383	13,816	14,094	14,263	14,214	14,148	**-0.3%**	**1.1%**
Retail Trade	50,198	46,229	44,972	46,175	46,562	46,680	46,234	**-0.5%**	**0.0%**
Transportation, Warehousing, & Utilities	21,804	21,699	20,542	21,954	22,210	22,188	22,272	**0.1%**	**0.5%**
Information	8,139	10,235	8,962	9,448	9,494	9,578	9,835	**1.3%**	**-0.8%**
Financial Activities	24,884	23,506	22,153	22,547	22,523	22,256	21,916	**-0.8%**	**-1.4%**
Professional & Business Services	42,911	50,139	57,208	58,759	59,726	59,552	59,657	**2.2%**	**3.5%**
Education & Health Services	39,367	48,104	53,357	55,355	57,610	59,310	64,709	**3.4%**	**6.1%**
Leisure & Hospitality	62,426	59,158	60,576	62,461	63,175	63,499	64,298	**0.2%**	**1.7%**
Other Services (except Public Administration)	16,194	17,654	19,032	18,939	18,999	18,988	18,991	**1.1%**	**1.5%**
Government	88,152	91,613	95,712	95,154	95,750	96,091	96,956	**0.6%**	**1.1%**
TOTAL NON-AGRICULTURAL EMPLOYMENT	410,697	411,904	428,815	438,871	443,494	445,161	452,017	**0.6%**	**1.9%**

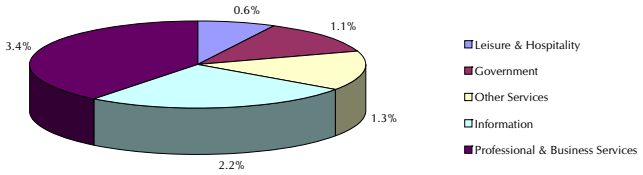


SOURCE: Economy.com; RCLCo

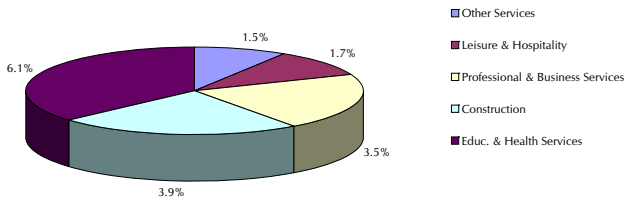
Exhibit III-5B

LARGEST GROWTH SECTORS IN NON-AGRICULTURAL EMPLOYMENT BY INDUSTRY
HONOLULU COUNTY
1990 - 2010

Percent Change 1990-2005 (Largest Growth Sectors)



Percent Change 2005-2010 (Largest Growth Sectors)



SOURCE: Economy.com; RCLCo

Appendix B
Preliminary Engineering Report

PRELIMINARY ENGINEERING REPORT

FOR

KAPOLEI HARBORSIDE CENTER

KAPOLEI, OAHU, HAWAII

Prepared for:

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June 2006

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KAPOLEI HARBORSIDE CENTER
PRELIMINARY ENGINEERING REPORT
EXECUTIVE SUMMARY

The proposed Kapolei Harborside Center in Ewa, Oahu, will encompass about 345 acres adjacent to Campbell Industrial Park and is planned to provide for a variety of industrial and commercial uses. Preliminary engineering information pertaining to infrastructure for Kapolei Harborside Center is addressed in this report.

The site is relatively flat and scattered with mounds and depressions. Elevations range from 5 to 75 feet MSL, with slopes of 0.5 to 5 percent. Current land uses include agriculture, coral mining, and a greenwaste recycling operation.

Drainage

There are no existing drainage improvements within the site. Runoff generated from the site and adjacent areas drains overland via sheet flow and small ditches to onsite depressions. With the exception of major storms, very little runoff is generated under existing conditions due to the agricultural use and infiltration characteristics of the soil. Estimated runoff for the petition area under existing conditions ranges from 393 cfs for a 10-year, 1-hour storm to 559 cfs for a 100-year, 1-hour storm.

The proposed development will alter the character of the site by replacing existing vegetative cover with buildings, pavement, landscaped areas, and other improvements normally associated with industrial developments. Consequently, peak runoff generated onsite is expected to increase. Estimated runoff for the amendment area under developed conditions ranges from 701 cfs for a 10-year, 1-hour storm to 1,250 cfs for a 100-year, 1-hour storm.

Implementation of an underground onsite drainage system of catchbasins/manholes and pipe culverts, with conveyance to a major drainage channel running through the site to the ocean, is proposed to alleviate current flooding problems and prevent flooding resulting from runoff from the proposed development. The major drainage channel will be sized to accommodate runoff from the entire watershed based on the City and County of Honolulu's Storm Drainage Standards.

Soil Erosion

Soil erosion potential for the petition area, Kapolei Business Park site, and entire watershed is estimated by the Universal Soil Loss Equation (U.S. Soil Conservation Service). Under existing conditions, soil erosion potential for the industrial in which the petition area is situated is estimated to be 718 tons per year. The estimated soil erosion potential for the entire watershed is over 480,000 tons per year in comparison. After development, a reduction of soil erosion potential is expected due to: reduction of erodible surfaces; site grading and construction of storm drain systems; and increase in landscaped areas. The resulting soil erosion potential for the developed amendment area and developed watershed is estimated to be 70 and about 265,000 tons per year, respectively.

In the short term, it is estimated that over 10,000 tons per year of soil erosion may result from grading the industrial area. Implementation of mitigation measures will reduce this short-term impact by about 50 percent. These mitigation measures include limiting grading to not more than 15 consecutive acres at a time and establishment of vegetation. Implementation of additional erosion control measures would lessen construction impacts even further.

Wastewater

There are no existing wastewater facilities within the site. Individual wastewater treatment systems service tenants in the neighboring James Campbell Industrial Park. Kapolei Business Park to the east of the site is served by an underground collection system and private sewer pump station and force main connecting to a City system along the railroad right-of-way. The existing Ko Olina Interceptor Sewer, Segment 1, serves the Ko Olina development to the north. Honouliuli Wastewater Treatment Plant (WWTP) (38 MGD capacity) is the nearest municipal treatment facility. The treatment plant currently accepts about 28 MGD of wastewater flows.

Wastewater generated from Kapolei Harborside Center is expected to be mainly of domestic composition, with some industrial discharges. Construction of pretreatment facilities will be required if industries are unable to meet City and County of Honolulu pretreatment

standards prior to disposal into municipal sewers. The Harborside Center development is expected to generate average wastewater flows of 2.9 MGD, with peak design flows expected to reach 7.4 MGD.

Management of the wastewater flows from the proposed development will be necessary to prevent negative health and environmental impacts. An underground collection system discharging to the Honouliuli WWTP is the proposed wastewater management scheme.

Water

Additional potable and nonpotable water demands will be generated by the proposed development. Preliminary hydraulic analysis indicates that the existing mains currently servicing the James Campbell Industrial Park will be adequate to accommodate the requirements of the proposed development.

To mitigate increased water demands due to development in the Ewa area, implementation of a dual water system is proposed for Kapolei Harborside Center and adjacent industrial developments, reducing its potable water requirement. The nonpotable infrastructure requirements are currently being studied and an updated nonpotable master plan will be prepared and submitted to the Board of Water Supply.

The offsite water system will be adequate to service the initial development of the project as well as the other planned developments in the Kapolei area. Ultimately, however, additional improvements to the water system will be required. Implementation of the improvements will be governed by development schedules of the proposed projects and will be coordinated with the Board of Water Supply.

Solid Waste

The tenants of the existing industrial areas are currently served by private refuse collection companies. It is expected that the Harborside Center development will also use private refuse collection companies.

The City and County is currently operating a landfill site in Waimanalo Gulch and the H-POWER waste energy recovery facility on the leeward side of Oahu. The City is currently exploring alternative means of handling solid waste as an ongoing city-wide concern. Other programs being implemented are recycling and reuse of green waste.

Power and Communications

Hawaiian Electric Company (HECO) and Hawaiian Telcom (HawTel) currently serve the areas adjacent to the proposed business-industrial park. Preliminary consultations with HECO and HawTel indicate that service can be provided. The estimated range of the electrical load requirements for the Harborside Center is approximately 43.5 to 65.2 MVA.

PRELIMINARY ENGINEERING REPORT
FOR THE
PROPOSED KAPOLEI HARBORSIDE CENTER

INTRODUCTION

Kapolei Property Development, LLC, and affiliate of The Estate of James Campbell, is proposing an industrial development adjacent to existing industrial properties in the vicinity of the James Campbell Industrial Park in Kapolei, Oahu (TMK: 9-1-14:Por. 33-35; 9-1-15:Por. 20). The development, known as Kapolei Harborside Center, will occupy an area of approximately 345 acres bounded by Malakole Road to the south, the railroad right-of-way to the north, the Barbers Point Harbor and Ko Olina to the west, and existing industrial property and Kalaeloa Boulevard to the east (Figure 1). The property is currently designated industrial on the Development Plan Land Use Maps. The property is also currently designated agriculture for zoning and State Land Use purposes. Kapolei Property Development (KPD) is proposing to amend the State Land Use classification from Agriculture to Urban.

The objective of this report is to present preliminary engineering information pertaining to infrastructure requirements for the proposed regional development in general and the petition area in particular. Specifically, this report will address–

1. Background information on the proposed project;
2. Existing conditions;
3. Modifications after development; and
4. Impacts and mitigation of the proposed development.

PROJECT BACKGROUND

The proposed Kapolei Harborside Center is an industrial park providing for industrial similar to the recently developed Kapolei Business Park to the east. In addition to the industrial uses, areas for public facilities and preservation uses have also been identified.

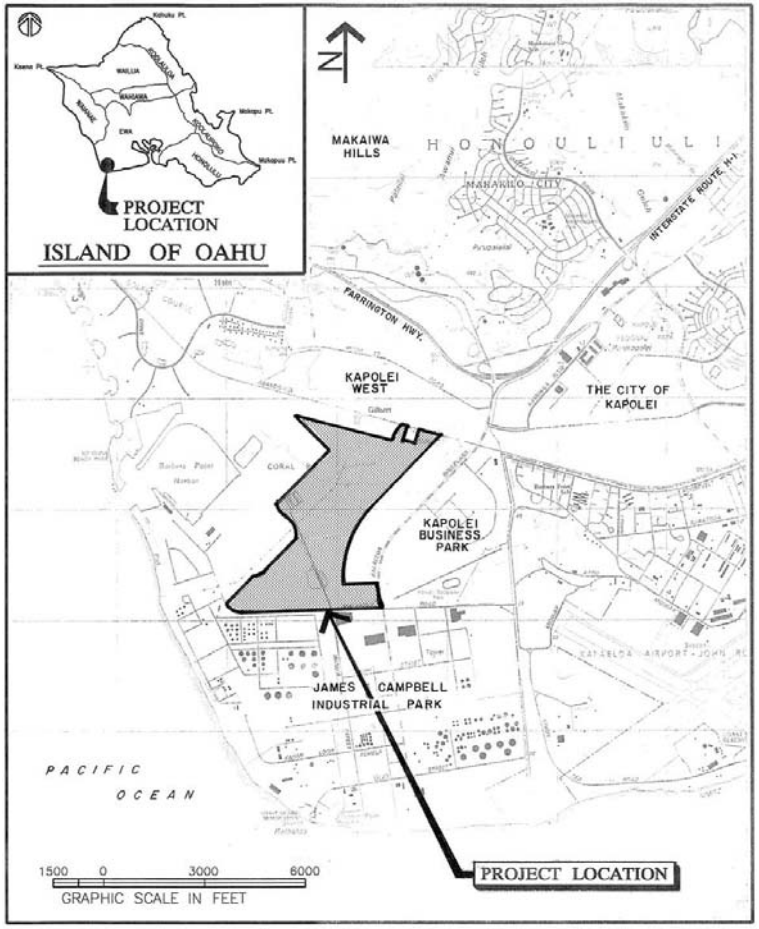

Fig. 1	Location Map	KAPOLEI HARBORSIDE CENTER EWA, OAHU, HAWAII Prepared By: ENGINEERING CONCEPTS, INC.

Land Use and Zoning

The petition area is currently designated an Agricultural District by the State. An application for land use designation change to Urban will be submitted.

The petition area is currently zoned either AG-1 or AG-2. An application for a zone change will need to be submitted to the City. Kapolei Harborside Center area is currently designated Industrial on the City's Development Plan Land Use Map.

Existing Uses

Current land uses within the petition area include agricultural uses, coral mining, and a greenwaste/compost producing operation (Figure 2). The existing JCIP is located immediately makai of the petition area. The development of the Ko Olina resort area to the west is ongoing with residential and resort components planned or under construction. Barbers Point Harbor, also to the west of the site, is in operation by the State Department of Transportation.

KPD also uses a portion of the land for agricultural purposes. A nursery covering approximately 10 acres is located near the intersection of Kalaeloa Boulevard and Malakole Road.

Coral mining operations are currently performed by Hawaiian Cement for the manufacture of cement and concrete products. The original Hawaiian Cement option area extended over approximately 267 acres in the northwest corner of the area. The Hawaiian Cement agreement is nearing termination and coral mining and cement producing operations have significantly slowed.

Climate

The climate of the Kapolei Harborside Center area is relatively warm and dry and is typical of the climate throughout the Ewa Plains. Tradewinds from the northeast occur much of the time, with occasional Kona winds.

The normal temperature range for the area is from the high 60s (Fahrenheit) to the low 90s. Rainfall is light, with an average annual rainfall of approximately 20 inches.

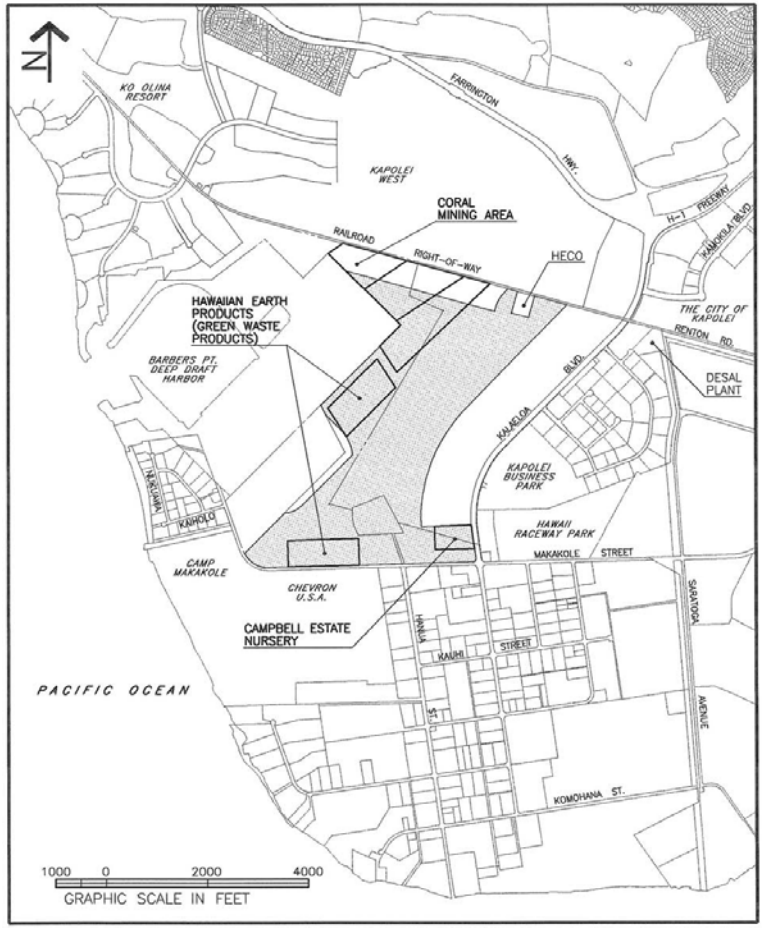

Fig. 2 Existing Uses

KAPOLEI HARBORSIDE CENTER
EWA, OAHU, HAWAII
Prepared By: ENGINEERING CONCEPTS, INC.

Topographic Features

The natural topography of the petition area is flat, with mounds and depressions scattered over the site (Figure 3). Elevations range from approximately 5 feet mean sea level (MSL) near the intersection of Kalaeloa Boulevard and Malakole Road to approximately 75 feet MSL near the northwest corner of the petition area. Slopes of less than 0.5 percent to 5 percent are found on the site. In general, the petition area slopes from the railroad right-of-way to Malakole Road, with an average slope of approximately 1 percent.

A large coral stockpile occupies an area of approximately 50 acres in the southwest corner of the property. Approximately 25 acres of the stockpile encroaches into the petition area.

The offsite watershed exhibits varying terrain, extending from the railroad right-of-way to the crest of the Waianae Range at an elevation of approximately 2,400 feet MSL. The area immediately north of the site up to the 11-1 freeway is currently vacant former sugar cane fields and is relatively flat, with slopes similar to those found in the business-industrial park site. The topography of the watershed area above the freeway ranges from gently sloping areas (1 to 10 percent) adjacent to the freeway to steep slopes in excess of 50 percent along the gulches. Several plateaus with slopes ranging from 5 to 25 percent are located in the upper watershed area. The area above the freeway is currently covered with grass, scrub brush, and trees, with bare areas of rock and pockets of erosion also evident.

Soils

According to the Soil Survey by the U.S. Department of Agriculture Soil Conservation Service, the existing soil types currently found in the petition area (Figure 4) include:

Coral Outcrop (CR) -- Coral or cemented calcareous sand with a thin layer of friable red soil material in cracks, crevices, and depressions

Ewa silty clay loam, moderately shallow, 0 to 2 percent slopes (EmA) -- Soil found on alluvial fans and terraces. Surface layer is dark reddish-brown silty clay loam about 18 inches thick. Subsoil is about 42 inches thick and is dark reddish-brown and dark-red silty clay loam.

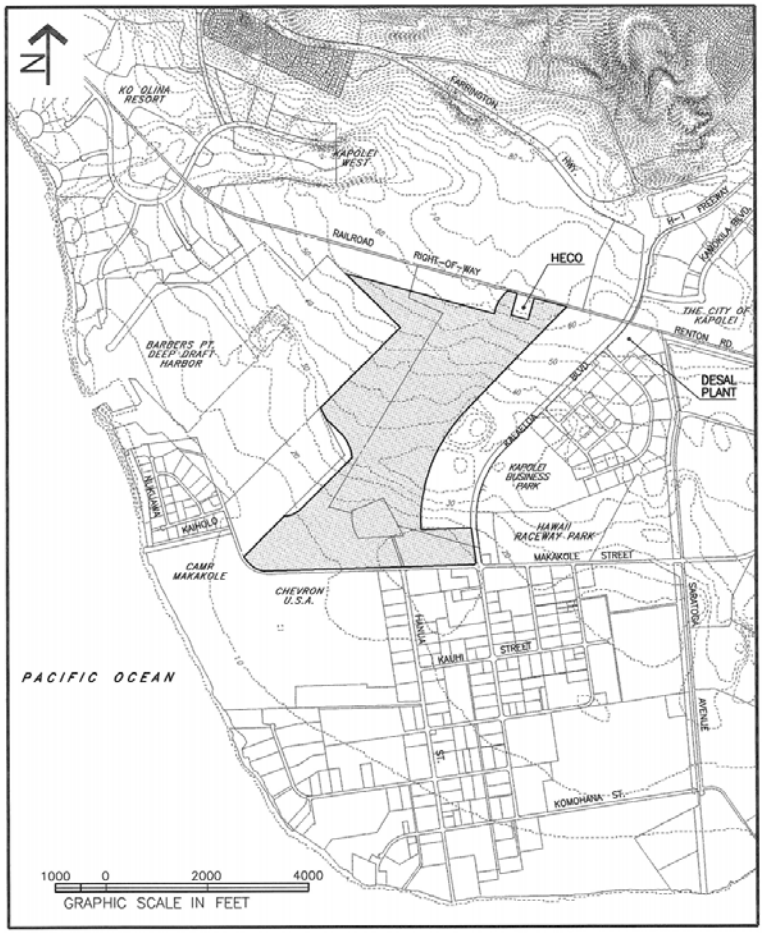

Fig. 3 Topographic Map

KAPOLEI HARBORSIDE CENTER
EWA, OAHU, HAWAII
Prepared By: ENGINEERING CONCEPTS, INC.

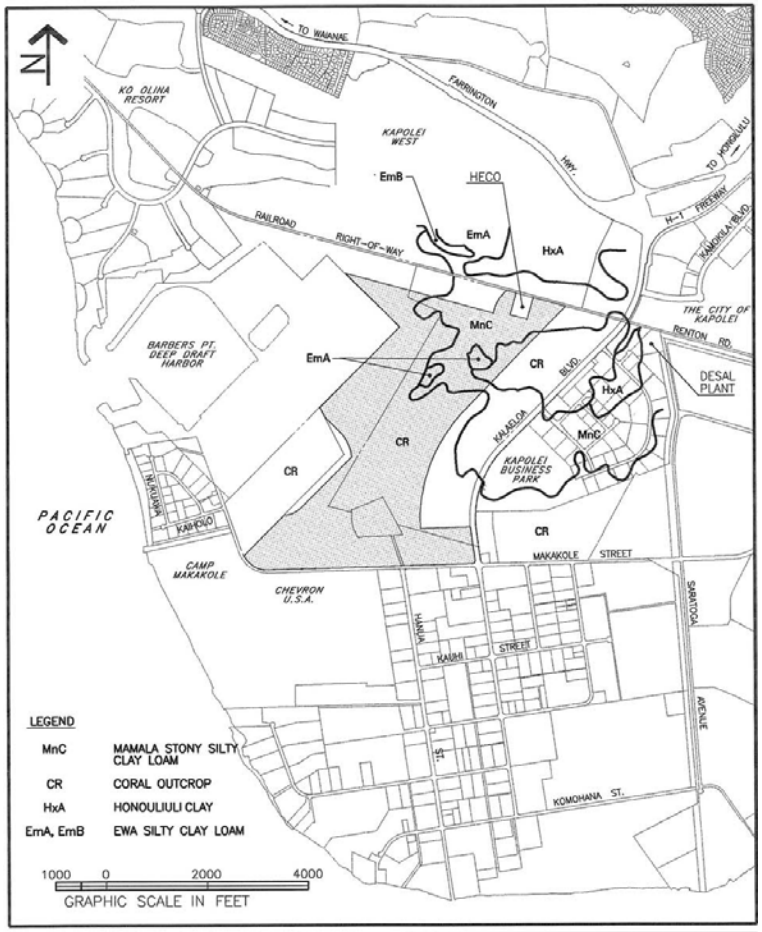

Fig. 4 **Soils**

KAPOLEI HARBORSIDE CENTER
EWA, OAHU, HAWAII
Prepared By: ENGINEERING CONCEPTS, INC.

Substratum is coral limestone, sand, or gravelly alluvium. The soil is neutral with moderate permeability. Runoff is slow and the erosion hazard is slight.

Mamala stony silty clay loam, 0 to 12 percent slopes (MnC) -- A dark reddish-brown stony silty clay loam with a surface layer of about 6 inches thick. The subsoil is a dark reddish-brown silty clay loam about 11 inches thick. The substratum is coral limestone or consolidated calcareous sand. The soil is neutral to slightly alkaline with moderate permeability. Runoff is very slow and erosion hazard is slight to moderate.

DRAINAGE

Existing Conditions

The watershed in which the petition area is located encompasses approximately 2,400 acres (Figure 5), reaching almost six miles inland.

Runoff from the area above the freeway is collected by three gulches: Awainui Gulch, Palailai Gulch, and an unnamed gulch. The three gulches converge just mauka of the freeway before crossing the H-1. The drainage way, a former sugar cane irrigation ditch, continues parallel to the freeway for a short distance before heading makai through the abandoned cane fields. The drainage way crosses under the railroad right-of-way into the proposed project site, winding its way down towards Malakole Road. The defined drainage way ends approximately halfway between the railroad tracks and Malakole Road, at an existing service road used by Hawaiian Cement.

There are no existing drainage improvements in the petition area other than the former irrigation ditch. Runoff generated on the site and from adjacent areas drains overland via sheet flow and small ditches to the depressions on the site. With the exception of major storms, very little runoff is generated under existing conditions due to the former agricultural use and infiltration characteristics of the soil. Runoff from major storms flows to the depression near the Kalaeloa Boulevard/Malakole Road intersection, flooding the low-lying area. Small culverts along Malakole Road aid to relieve the ponding of runoff.

Fig. 5 **Drainage Basin**

KAPOLEI HARBORSIDE CENTER
EWA, OAHU, HAWAII
Prepared By: ENGINEERING CONCEPTS, INC.

Kalaeloa Boulevard, Malakole Road, and the roadways in the existing industrial park contain underground drainage systems that collect and convey runoff to drainage ditches and channels, ultimately discharging into the ocean. A major drainage channel intended to serve the areas east of Kalaeloa Boulevard is located along the Barbers Point Naval Air Station boundary.

Runoff from the petition area as well as the entire watershed was estimated for 10-, 50-, and 100-year storms under existing conditions and are listed in Table 1. One-hour rainfall intensities used in the analysis were 1.9 inches per hour for the 10-year storm, 2.4 inches per hour for the 50-year storm, and 2.7 inches per hour for the 100-year storm. The petition area was divided into three subareas, as shown on Figure 6.

TABLE 1
EXISTING RUNOFF (1-HR DURATION)

Area	Acres	10-yr (cfs)	50-yr (cfs)	100-yr (cfs)
A	61	70	88	99
B	131	149	189	212
C	153	174	220	248
Total Petition Area	345	393	497	559
Total Watershed Area	2400	2000	3018	3661

Flood Hazard

The petition area is designated Zone D in the Flood Insurance Rate Map, indicating areas in which flood hazards are undetermined (Figure 7).

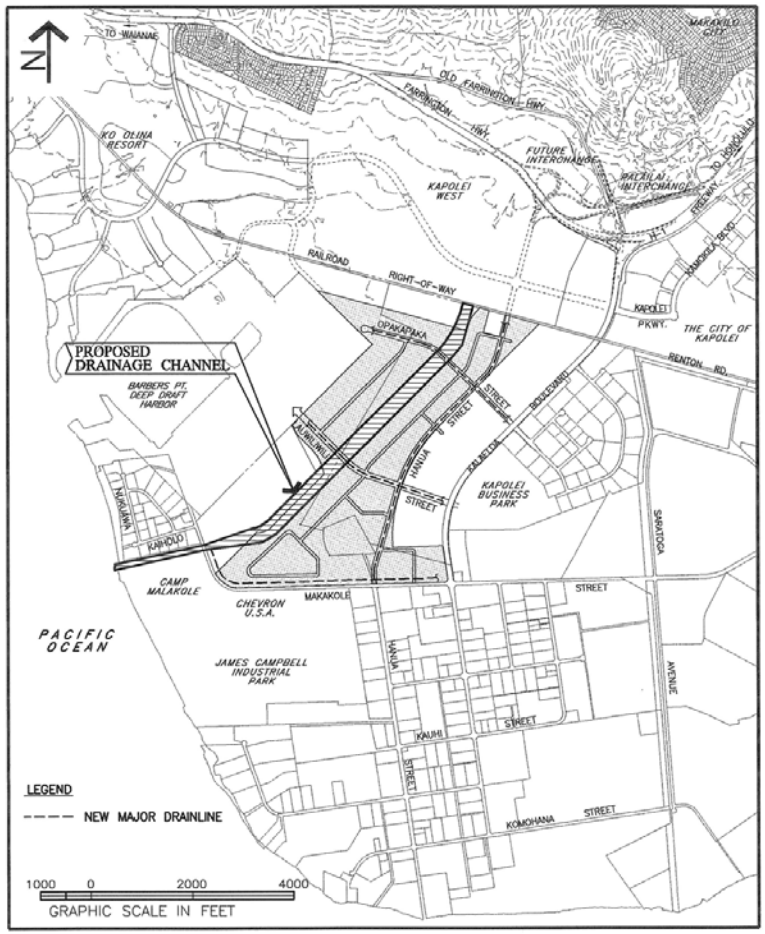

Fig. 6 Onsite Drainage System

KAPOLEI HARBORSIDE CENTER
EWA, OAHU, HAWAII
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Modifications after Development

The proposed development will alter the character of the site. The vegetative cover currently found onsite would be replaced by buildings, paved areas, formal landscaped areas, and other improvements normally associated with industrial developments. Consequently, peak runoff generated onsite will increase.

Peak runoff rates under developed conditions were estimated for the 10-, 50-, and 100-year storms with a duration of one hour. The 10- and 50-year runoff was estimated using the Soil Conservation Service's TR-20 hydrology program, while the 100-year runoff was based on Plate 6 of the Rules Relating to Storm Drainage Standards (January 2000), City and County of Honolulu, Department of Planning and Permitting. Future runoff for the entire watershed also considered the possibility of future development mauka of the Kapolei Harborside Development. Kapolei Property Development is planning for the development of its lands between the railroad right-of-way and the freeway known as Kapolei West. Also, the proposed Makaiwa Hills development mauka of the freeway has received State land use and City development plan designations for future residential and commercial development. Future runoff estimates are shown in Table 2, with the percent increase shown in Table 3.

TABLE 2
FUTURE RUNOFF (PETITION AREA)

Area	Acres	10-yr (cfs)	50-yr (cfs)	100-yr (cfs)*
A	61	108	140	200∀
B	131	293	295	610
C	153	300	392	680
Total Petition Area	345	701	827	1250
Total Watershed Area	2400	2639	3772	5200

* City and County of Honolulu Storm Drainage Standards, Plate 6

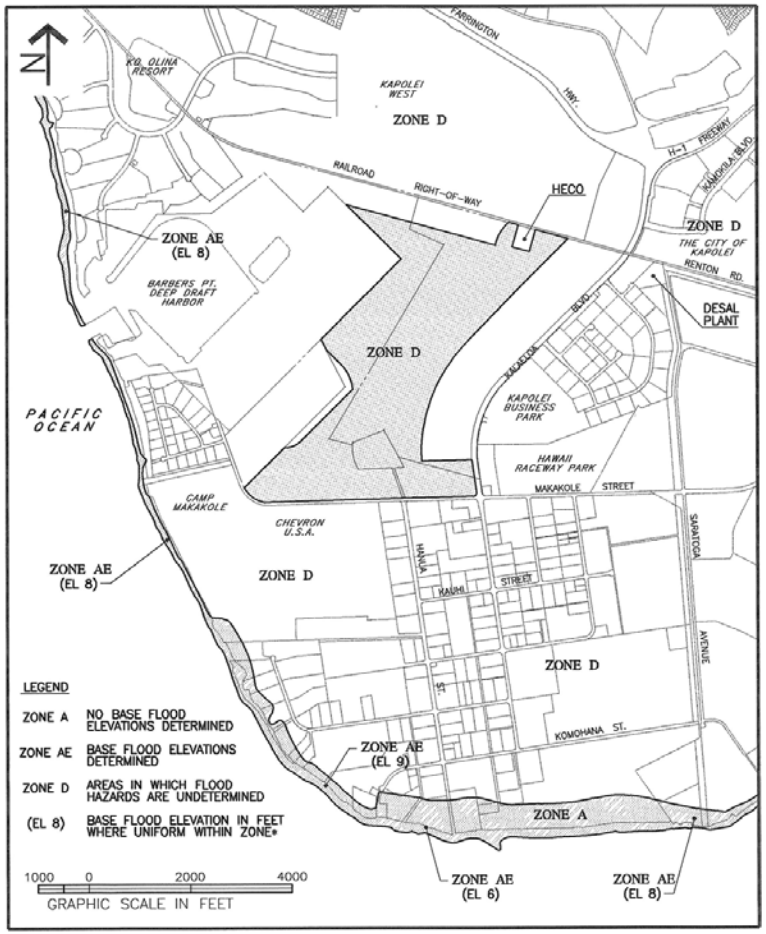

Fig. 7 **Flood Map**

KAPOLEI HARBORSIDE CENTER
EWA, OAHU, HAWAII
Prepared By: ENGINEERING CONCEPTS, INC.

TABLE 3
PERCENT INCREASE

Area	Acres	10-yr (%)	50-yr (%)	100-yr (%)
A	61	54	59	102
B	131	97	56	188
C	153	72	78	174
Total Petition Area	345	78	66	124
Total Watershed Area	2400	32	25	69

Impact and Mitigation

Development of the Kapolei Harborside Center will increase the runoff generated onsite. Without proper mitigative measures, major flooding problems will result due to the flat slopes found within the project site. Flooding may not be limited to the proposed project area but may also reach the existing industrial areas makai of the site.

Mitigative measures proposed for the Kapolei Harborside Center must also consider the overall increase in runoff for the entire watershed. Future development of the offsite watershed may significantly increase the runoff passing through the site from the mauka areas.

The major element of the proposed drainage improvements is a large drainage channel running through the Kapolei Harborside Center site, from the railroad right-of-way to the ocean (see Figure 6). The drainage channel will be sized to accommodate the peak runoff rate from Plate 6 of the City's Storm Drainage Standards. Preliminary analysis of the drainage requirements indicates that a trapezoidal channel with a bottom width of approximately 240-feet and 10-feet deep will be needed to convey runoff through the site. It is anticipated that the channel will be excavated in hard coral and will not require concrete lining through its entire

length. Concrete or rip-rap lining will be used in areas of excessive velocities or high erosion potential. A 150-foot wide strip of land below the project site has been set aside for continuation of the drainage way. This parcel runs from the shoreline to Malakole Road between the Chevron, USA property and the Kenai Industrial development. Construction of this portion of the channel will require various permits. Permit applications had been initiated previously, however, due to the economic conditions at the time, final permits were not pursued. Earlier studies addressing the channel impacts are being reviewed and updated prior to new applications for the various permits.

It is anticipated that the onsite runoff will be handled by an underground drainage system consisting of catchbasins/manholes and pipe or box culverts. Runoff would be collected and conveyed to the major drainage channel for ultimate discharge into the ocean. All onsite drainage improvements will be designed in accordance with City and County standards.

Implementation of the major drainage channel and onsite drainage system will alleviate any flooding problems currently experienced in the area as well as prevent flooding as a result of runoff from the proposed development. Runoff will be diverted away from the Barbers Point Harbor and directed to the major drainage channel.

Water Quality

In accordance with the requirements of the City's Storm Drainage Standards, individual developments within the Kapolei Harborside Center will be required to address stormwater quality. Developments may use detention, flow-through or structural methods to meet the stormwater quality requirements.

SOIL EROSION

Site Characteristics

The Harborside Center site and surrounding industrial areas are divided into six subareas for the-purpose of calculating soil erosion potential (Figure 8). These subareas represent sites that vary in soil erosion potential characteristics such as terrain and drainage network. The offsite watershed is divided into four subareas for calculation of soil erosion potential.

Calculation of Soil Erosion Potential

The U.S. Department of Agriculture, Soil Conservation Service, uses the Universal Soil Loss Equation (USLE) to estimate long-term annual soil losses from sheet and rill erosion. The equation is used to estimate erosion on forest land, farm fields, construction/development sites, and other areas. Soil losses can be estimated for present conditions or for a future condition. The soil loss equation is–

$$A = RKLS\,CP$$

where: A = soil loss (tons per acre per year)
R = rainfall factor
K = soil erodibility factor
L = slope length factor
S = slope gradient factor
C = cover and management factor
P = erosion control practice factor

The existing soil erosion potentials for each subarea, the petition area, existing industrial property, and the entire watershed are listed in Table 4.

Impact and Mitigation

Long-term Impacts. Based on the USLE, the soil erosion potential of the petition area, the adjacent developments, and the entire watershed should decrease after development. This decrease in soil erosion is due to the reduction of erodible surfaces (increase in buildings and pavement); reduction of length and slope of overland flow due to site grading and construction of the storm drain system; and increase in landscaped areas (reduction of bare ground).

Short-term Impacts. Construction will involve land disturbing activities that result in soil erosion. These land disturbing activities include removal of existing vegetation (clearing and grubbing), leveling, removing and replacing soil.

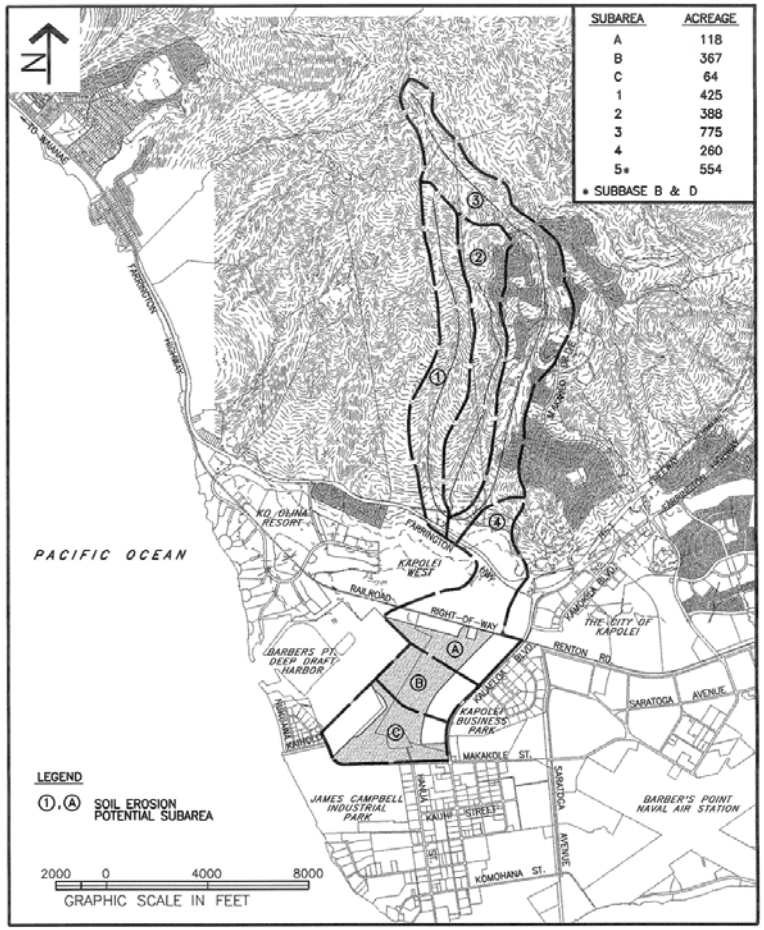

Fig. 8 Soil Erosion Potential Subareas

KAPOLEI HARBORSIDE CENTER
EWA, OAHU, HAWAII
Prepared By: ENGINEERING CONCEPTS, INC.

TABLE 4 - SOIL EROSION POTENTIAL

	Exist. Conditions (tons/yr)	After Development (tons/yr)	Reduction (%)
Subarea A	82	14	83
Subarea B	567	48	92
Subarea C	69	8	88
Subarea D	173	8	95
Subarea E	141	17	88
Subarea F	230	39	83
Subarea 1	98600	42835	57
Subarea 2	112582	45343	60
Subarea 3	255987	174360	32
Subarea 4	14477	2013	86
Subarea 5	881	73	92
Total Industrial	1262	134	89
Total Watershed	482437	264624	45

The USLE can be used to estimate soil erosion potential based on these short-term construction impacts. For purposes of calculation, it is assumed that the areas will be exposed for a period of two years.

In the short term, an estimated 10,141 tons per year of soil erosion may result from the Harborside Center development during the grading period. Mitigation measures can be implemented to reduce short-term soil erosion. For example, limiting grading to not more than 15 consecutive acres at a time and seeding half of the area will reduce estimated soil erosion potential for the site by 53 percent to 5,375 tons per year.

Additional erosion control measures would lessen construction impacts even further. These are--

1. Minimize time of construction.
2. Retain existing ground cover until latest date before construction.
3. Early construction of drainage control features.
4. Use of temporary area sprinklers in nonactive construction areas when ground cover is removed.
5. Station water truck on site during construction period to provide for immediate sprinkling, as needed, in active construction zones (weekends and holidays included).
6. Use temporary berms and cut-off ditches, where needed, for control of erosion.
7. Thorough watering of graded areas after construction activity has ceased for the day and on weekends.
8. Sod or plant all cut and fill slopes immediately after grading work has been completed.

Grading and Erosion Control Plans will be prepared in compliance with Chapter 23, Revised Ordinances of Honolulu.

WASTEWATER FACILITIES

Existing Conditions

The proposed Kapolei Harborside Center site currently remains undeveloped, with no existing wastewater facilities onsite. Tenants of the existing James Campbell Industrial Park are serviced by individual wastewater treatment systems.

The nearest municipal treatment facility, the Honouliuli Wastewater Treatment Plant (WWTP) is located approximately 2.6 miles east of the proposed project. With a design capacity of 38 MGD, the treatment plant and is currently accepting flows of about 28 MGD.

An existing force main/gravity interceptor sewer (Ko Olina Interceptor Sewer, Segment 1) runs parallel to the railroad right-of-way above the site to serve the Ko Olina development. A private sewer pump station located near the intersection of Kalaeloa Boulevard and Malakole Road and a force main along Kalaeloa Boulevard currently services the existing Kapolei Business Park.

Modifications after Development

The proposed industrial development will be developed to accommodate light industrial and maritime-related uses. The wastewater generated from the park is expected to be mainly of domestic composition, with some industrial discharges. Discharges from industrial facilities will be required to meet the City and County of Honolulu's pre-treatment standards.

The proposed development within the petition area is expected to generate average wastewater flows of 2.9 MGD with peak flows approaching 7.4 MGD.

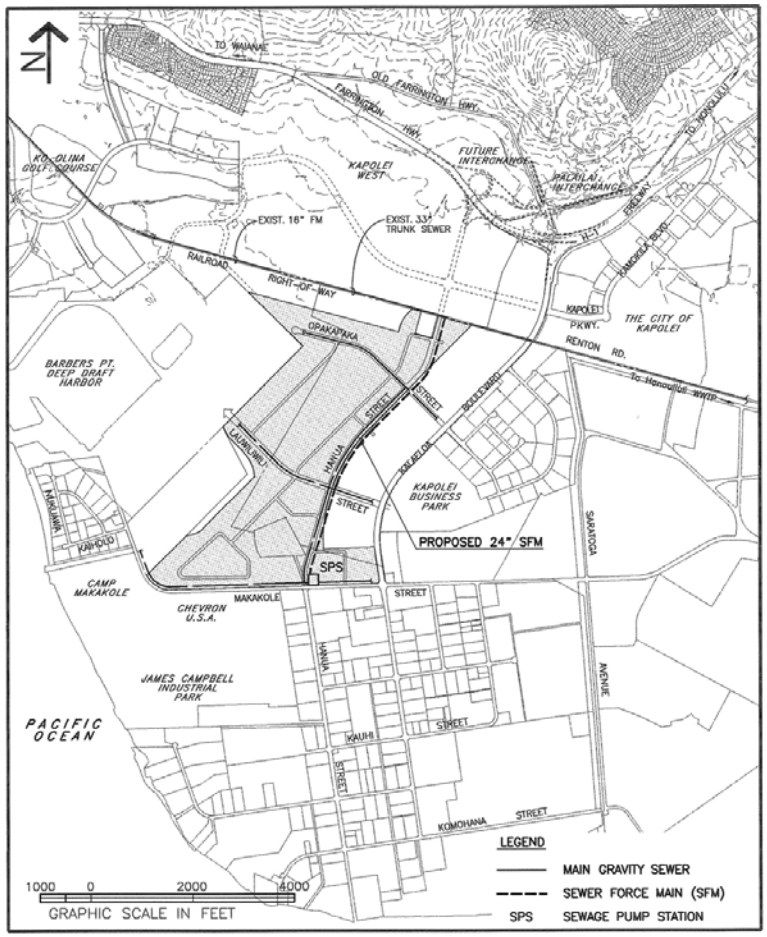

Fig. 9 **Proposed Sewer**

KAPOLEI HARBORSIDE CENTER
EWA, OAHU, HAWAII
Prepared By: ENGINEERING CONCEPTS, INC.

Impact and Mitigation

The proposed industrial park will generate wastewater flows that currently do not exist. Management of these flows will be necessary to prevent negative health and environmental impacts. Wastewater generated from the proposed development will be collected by a series of gravity sewers and conveyed to a centralized wastewater pumping station. The wastewater would then be pumped via force main to a main trunk sewer running along the railroad right-of-way for transport to Honouliuli WWTP. The onsite collection system, pump station and force main will be designed in accordance with the standards of the City and County of Honolulu, Division of Wastewater Management. It is intended that the collection system, pump station and force main be dedicated to the City. Major elements of the onsite system are conceptually shown on Figure 9.

The existing Ko Olina interceptor sewer was oversized in the design phase to accommodate some additional flows from Campbell Estate projects, mainly the flows from the City of Kapolei. At the time, it was not anticipated that the proposed business-industrial park area would be required to collect and transport its sewage to the Honouliuli WWTP. Consequently, the existing segment 1 of the Ko Olina interceptor sewer does not have the capacity to accommodate both the industrial uses and the Kapolei City projects. A parallel sewer will ultimately be required to handle the additional flows.

The existing Ko Olina interceptor sewer currently ties in to the Makakilo interceptor sewer and the recently completed Kapolei Interceptor Sewer at Barbers Point Access Road. The Kapolei interceptor sewer (formerly segment 2 of the Ko Olina interceptor) runs parallel to the Makakilo interceptor sewer from Barbers Point Access Road to Honouliuli WWTP (Figure 10) and has been planned to accommodate almost all of the proposed developments in the Kapolei area below the freeway, including the proposed petition area.

Implementation of the wastewater facilities will be done in phases, according to the development schedule of the project.

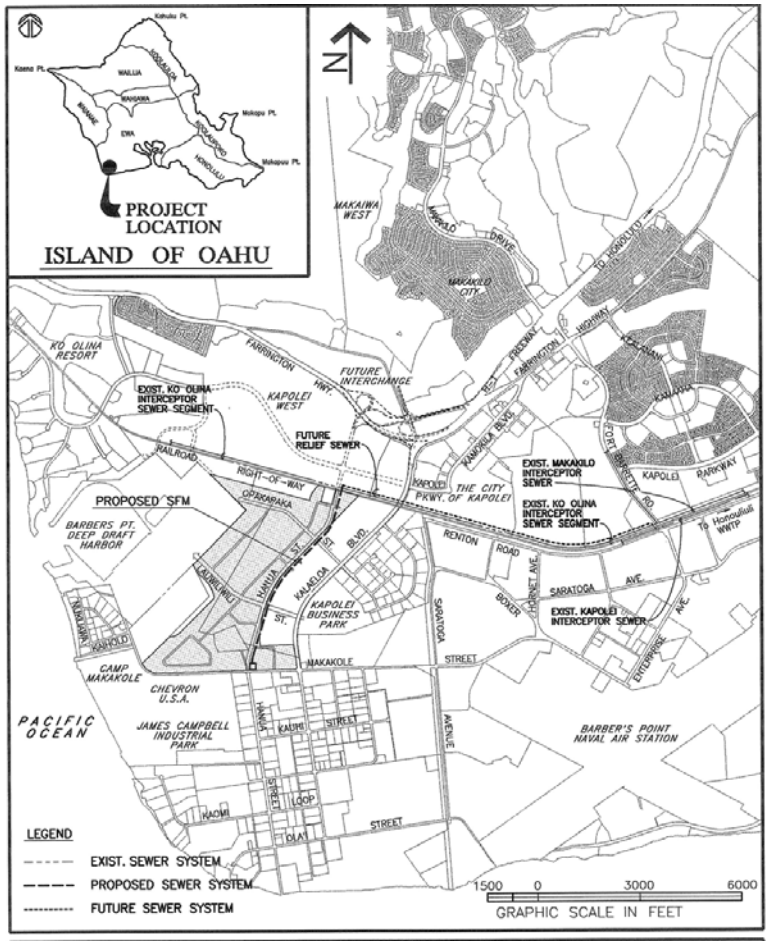

Fig. 10 Regional Wastewater

KAPOLEI HARBORSIDE CENTER
EWA, OAHU, HAWAII
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WATER FACILITIES

Existing Conditions

The existing industrial developments are currently served by 24-inch and 20-inch Board of Water Supply (BWS) mains in Kalaeloa Boulevard to Malakole Road (Figure 11). Within Malakole Road, a 20-inch main runs toward the harbor, with a 16-inch main heading toward Barbers Point Naval Air Station. The water source is found near Waipahu in the vicinity of the Kunia Interchange. The Hoaeae Wells, Kunia Wells I and II, as well as the Waipahu Wells, feed the water system serving the Ewa/Kapolei area. It is estimated that the existing industrial park has an average daily water demand of approximately 5.3 MGD, with maximum daily demands and peak hour demands of 7.1 and 12.2 MGD respectively.

Modifications after Development

The Kapolei Harborside Center will increase the area of industrial development from the existing industrial park. Buildings and paved areas will replace the existing vegetation and open areas currently found on the site. Consequently, additional water demands through the BWS system will be generated by the proposed development; however, water previously used for sugarcane cultivation is also no longer required. Campbell Estate has incorporated provisions for a dual water system in their developments in the Kapolei area. Both the City of Kapolei and Kapolei Business Park are being developed with dual water systems, although the system in the Kapolei Business Park has yet to be connected to a nonpotable water source. The dual water system will reduce the need for potable water by supplying irrigation and other potential nondomestic uses with a nonpotable water source, namely recycle effluent.

The anticipated potable and nonpotable water demands for the Harborside Center are listed below.

	Potable Water Demand (MGD)			Nonpotable Water Demand (MGD)		
	Ave.	Max.	Peak	Ave.	Max.	Peak
Harborside Center	1.17	1.76	3.52	0.49	0.74	1.48

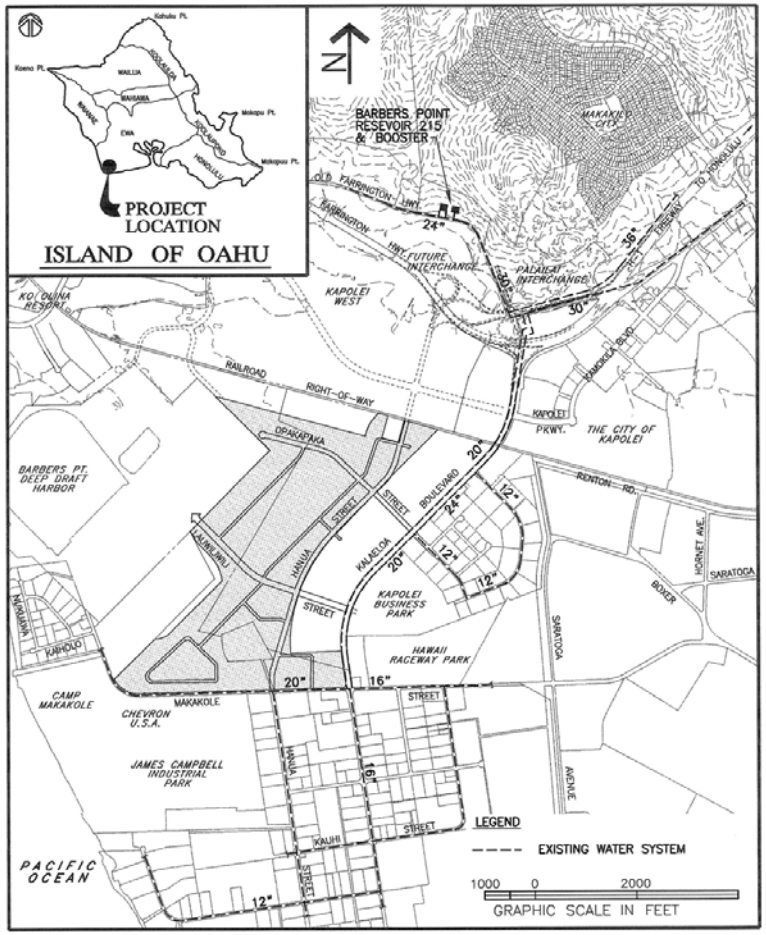

Fig. 11 **Existing Water Facilities (Partial)**

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EWA, OAHU, HAWAII
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Impacts and Mitigation

Initial review of the Ewa Water Master Plan and a preliminary hydraulic analysis using data from the master plan as the basis, indicates that the 24-inch and 20-inch potable water mains in Kalaeloa Boulevard will be able to accommodate demands from the proposed project. A water master plan for the project will be prepared and submitted to the Board of Water Supply for their review and approval.

The offsite potable water system will be adequate to service the initial development of the industrial park as well as the other planned developments in the Kapolei area. Ultimately, however, additional regional improvements such as storage tanks and source development will also be required. Development of the former Oahu Sugar Co. wells EP-15 & 16 is currently underway by the Board of Water Supply. Development of this source will benefit the entire Kapolei region, including the Harborside Center. Implementation of other improvements will be governed by development schedules of the proposed projects in the area.

The onsite potable water system for the project will connect to the mains in Kalaeloa Boulevard and will be designed in accordance with BWS standards. Preliminary analysis indicates that 12- and 16-inch water lines will be needed to serve the potable water and fire protection requirements for the business-industrial park, including the petition area.

The proposed business-industrial park, as a mitigative measure, is planning to implement a dual water system that will use potable water for domestic uses and nonpotable water for irrigation and other nonconsumptive uses. Campbell Estate is incorporating dual water systems in the City of Kapolei and the Kapolei Business Park, although the business park's nonpotable system has yet to be connected to a nonpotable water source. The nonpotable water system will be extended from the City of Kapolei, which has the BWS recycled effluent line as a source, and connected to the existing and proposed nonpotable systems in the industrial area. An updated nonpotable water master plan for the City of Kapolei and the Kapolei industrial area, including Harborside Center, is being prepared for review and approval by the Board of Water Supply.

In general, the proposed Kapolei Business-Industrial Park, including the petition area, has been provided for in the planning of the regional water systems, resulting in minimal impact to the existing system.

SOLID WASTE

Existing Conditions

The project site does not currently generate solid wastes. Tenants in the existing industrial developments are serviced by private refuse collection companies.

Impacts and Mitigation

The proposed development will be a new generator of solid waste. Generation of construction wastes due to clearing of the site will be a short term impact. The contractor will be required to remove all debris from the project site to mitigate the environmental impact. Private refuse collectors will service the development.

The City and County is currently operating a landfill site in Waimanalo Gulch and the H-POWER waste energy recovery facility on the leeward side of Oahu. The City is currently exploring alternative means of handling solid waste as an ongoing city-wide concern. Other programs being implemented are recycling and reuse of green waste.

POWER AND COMMUNICATIONS

Existing Conditions

The project site is currently not served by Hawaiian Electric Company (HECO) and Hawaiian Telcom (HawTel). However, HECO and HawTel currently provide service to the existing industrial areas as well as to the adjacent developments of Ko-Olina and Barbers Point Harbor. An existing HECO substation is located within the adjacent to the petition area, next to the railroad right-of-way and west of Kalaeloa Boulevard (Figure 12). Several overhead lines are found traversing the petition area.

Probable Impacts

The proposed Kapolei Harborside Center will place additional demands on the utility systems. For planning purposes, HECO has indicated that electrical unit loads for industrial developments may range from 100 KVA/acre to 150 KVA/acre. Based on the information provided by HECO, the projected load requirements are estimated at 43.5 to 65.2 MVA for the petition area. Preliminary consultations with HECO and HawTel indicate that service can be provided to the project.

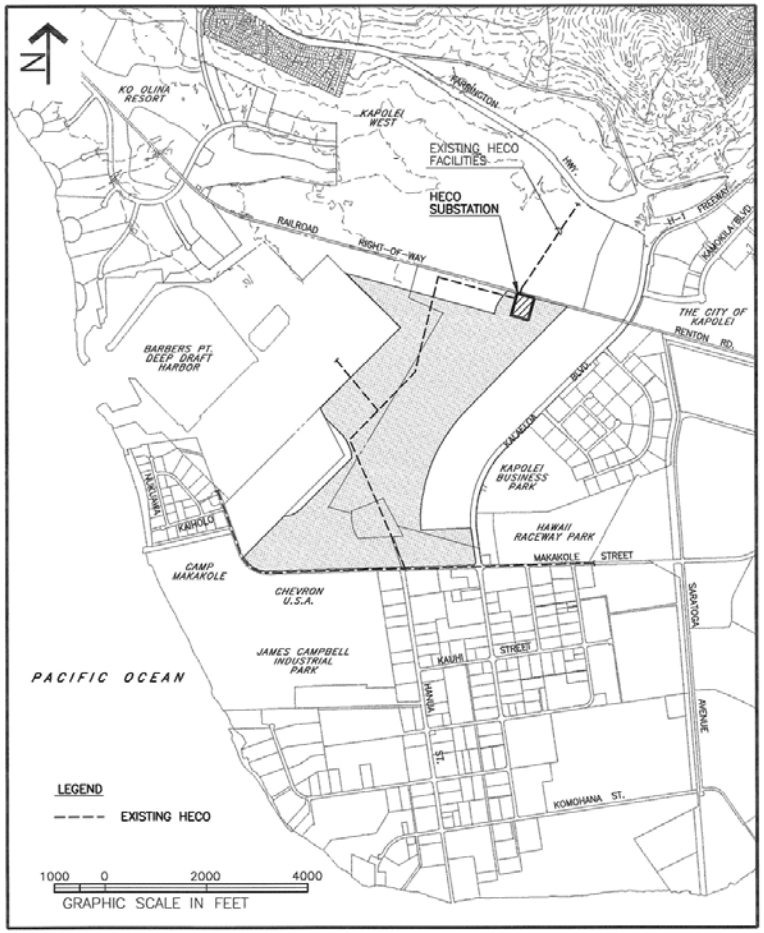

Fig. 12	Existing HECO	KAPOLEI HARBORSIDE CENTER EWA, OAHU, HAWAII Prepared By: ENGINEERING CONCEPTS, INC.

ENGINEERING CONCEPTS, INC.
Consulting Engineers

September 27, 2006

Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813

Attention: Mr. Troy Knott

Subject: Kapolei Harborside Center
Response to Agency Comments

Please find below, responses to the various comments submitted by the reviewing government agencies.

State Department of Transportation

Item 3, Lauwiliwili Street Alignment: The alignment of Lauwiliwili Street was initially coordinated with DOT Harbors Division when initial planning in the area was done over 10 years ago. The location of the entry to the Harbor, as shown, was requested by DOT at that time. The original entry point was further north of the current location. As a result of DOT's request, the entire Lauwiliwili alignment was adjusted from Kalaeloa Boulevard to the Harbor. Adjustments were also made to the Kapolei Business Park development on the east side of Kalaeloa Boulevard to accommodate this shift in the Lauwiliwili alignment.

Item 4, Drainage: Planning and initial design of the ultimate drainage improvements have begun. Also, work has begun on initiating the environment permitting process necessary for the ultimate outlet to proceed. Temporary drainage improvements are also being investigated to help alleviate the drainage concerns of the area for the interim period prior to construction of the ultimate drainage channel.

Item 5, Utility Improvements: Development of the utilities in the area will be coordinated with the DOT Harbors Division as planning of the development progresses.

Item 6, Hanua Street: Planning and initial design has begun. We have met with the Highways Division Traffic Branch to discuss requirements. A preliminary design is being prepared for initial review by the Traffic Branch.

(Issues regarding funding will need to be responded to by Kapolei Property Development).

1150 South King Street, Suite 700 • Honolulu, Hawaii 96814
Tel (808) 591-8820 • Fax (808) 591-9010 • E-Mail: eci@ecihawaii.com

Department of Environmental Services

Honouliuli Wastewater Treatment Plant Capacities:

Discussions were held with Mr. Jack Pobuk of the Department of Environmental Services regarding the treatment capacity at the Honouliuli Wasterwater Treatment Plant. The treatment plant was expanded to handle a liquid stream capacity of 38 million gallons per day, however, the solids handling capacity is limited to 27 - 29 million gallons per day. According to Mr. Pobuk, there is still a limited amount of capacity in the solids handling stream, but is not sufficient to handle a large increase in flows that could be generated by a project of this size.

The City is currently in negotiations with a contractor to implement improvements to increase the solids handling capacity. The improvements are estimated to take two years to complete. It is likely that development of the project site will begin after completion of the improvements at Honouliuli since additional entitlements are required. In the event that Honouliuli improvements are not completed as hoped, temporary means of wastewater disposal could be investigated for the initial developments with the approval of the DES and the State's Department of Health. We will continue to coordinate our efforts with the Department of Environmental Services and Department of Planning and Permitting on this issue.

Drainage:

Re Pg 4-42: Figure 5 of the Preliminary Engineering Report shows the location of the drainage channel running through the middle of the site, from the railroad right-of-way to the ocean. WE acknowledge, however, that the drain channel was not specifically identified.

Re Pg 4-42 & Pg 10, PER: Existing runoff was based on a one-hour duration for comparative purposes between areas both larger and smaller than 100 acres. Actual design of drainage systems will be based on future developed conditions and will be based on the drainage areas served in accordance with the City's "Rules Relating to Storm Drainage Standards".

Re Pg 11, PER: The drainage channel transitions from a trapezoidal unlined channel to a rectangular lined channel at Malakole Street. The channel below Malakole Street will continue the rectangular lined configuration to the shoreline. The channel below Malakole will also be tidal.

Re Pg 14, PER: Initial hydraulic analyses assumed ledge coral or limestone (Rules Relating to Storm Drainage Standards). Vegetation was not anticipated.

Re Pg 15, PER: Developments draining to the drainage channel will be required to address water quality in accordance with the requirements of the storm drainage standards. This will minimize the impacts to the coastal waters.

ENGINEERING CONCEPTS, INC.

Re Pg 16, PER: Not all of the runoff from the area is currently discharged to Barbers Point Harbor. A large portion of the area runs off to Malakole Street to the existing drainageway adjacent to Chevron U.S.A. Prior to construction of the existing coal conveyor, most of the runoff from the area made its way to Malakole Street and the drainageway. Diversion of runoff away from the harbor will follow the more historic path of previous runoff. With the implementation of water quality improvements by the individual development within the watershed, sediment discharge and resulting impacts to coastal waters should be minimized.

Department of Design and Construction

Street lighting as well as other improvements will be upgraded as required as development of the project progress.

Board of Water Supply

The necessary water improvements will be installed as development progresses. A nonpotable water system is being planned for. The nonpotable water master plan for the area is currently being updated and will be submitted to the BWS for review. All required improvements will be coordinated with the BWS and construction plans submitted to review and approval.

Hawaiian Electric Company

We will continue to work with Hawaiian Electric Company, as in the past, to ensure proper coordination of HECO's and the project's requirements.

Department of Planning and Permitting

Item No. 3: Drainage master plan shall be submitted to the Department of Planning and Permitting for review and approval.

Item No. 7:

Water Supply: An "Application for Water Use Permit", if required, will be submitted as more detailed planning of the site is completed.

Wastewater: The date of construction for the parallel sewer will depend on the rate of development of the projects in the area. Construction timetable will be coordinated with the Department as additional information on development schedules becomes available. In addition, the sewer master plan for the area will be updated and submitted to the Wastewater Branch.

(for solids handling see response to Dept. Of Env. Services)

Item No. 11, Water Quality: It is anticipated that water quality requirements will be the responsibility of the individual projects within the development rather than one large, common facility.

Department of Business, Economic Development and Tourism

Water Supply:

The project will be coordinated with the County, specifically with the Board of Water Supply, to ensure the project's needs are included in the development plan.

A nonpotable plan for the area is being updated to correspond to the BWS plans for a regional nonpotable water system.

Further investigation will be performed to determine the location of the existing monitoring well. Should the well be found to be within the project site, coordination with DOT Harbors will proceed to ensure proper procedures for closure are followed.

Please call me should you have any questions on the above.

Very truly yours,

Craig Arakaki

Craig Arakaki, P.E.

Appendix C
Traffic Impact Assessment Report

Wilbur Smith Associates
ENGINEERS
PLANNERS
ECONOMISTS

421 Fayetteville Street
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Raleigh, NC 27601
(919) 755-0583
(919) 832-8798 fax
www.wilbursmith.com

October 24, 2006

Mr. Jeffrey H. Overton
Group 70 International
925 Bethel Street, 5th Floor
Honolulu, HI 96813

SUBJECT: Kapolei Harborside Center Traffic Impact Assessment Report, City of Kapolei, Hawaii

Mr. Overton:

Please note in our traffic study there are text and exhibits that make reference to a preserve area of 7.4 acres. Since conducting our studies, it is our understanding that this preserve area has been formally surveyed, to reveal an actual area of approximately 6.0 acres. We have not modified our text or exhibits to reflect this, and our analysis and conclusions have not changed.

WILBUR SMITH ASSOCIATES

Bryant T. Brothers
Senior Transportation Engineer
Hawaii P.E. 6755

Albany NY, Atlanta GA, Auburn AL, Austin TX, Baltimore MD, Bangkok Thailand, Baton Rouge LA, Burlington VT, Ceredo WV, Charleston SC, Charleston WV Chicago IL, Cincinnati OH, Cleveland OH, Columbia SC, Columbus OH, Dallas TX, Dubai UAE, Falls Church VA, Greensboro NC, Greenville SC, Harrisburg PA, Hong Kong China, Hot Springs AR, Houston TX, Indianapolis IN, Iselin NJ, Jackson MS, Kansas City MO, Knoxville TN, Lansing MI, Lexington KY, Lisle IL, Los Angeles CA, Milwaukee WI, Bangalore India, Nashville TN, New Haven CT, Newport News VA, Orlando FL, Philadelphia PA, Pittsburgh PA, Portland ME, Poughkeepsie NY, Raleigh NC, Richmond VA Riyadh Saudi Arabia, Salt Lake City UT, San Diego CA, San Francisco CA, St. Paul MN, Tallahassee FL, Tifton GA, Trenton NJ

Employee-Owned Company

KAPOLEI HARBORSIDE CENTER
TRAFFIC IMPACT ASSESSMENT REPORT

CITY OF KAPOLEI

Prepared For:

KAPOLEI PROPERTY DEVELOPMENT LLC
1001 Kamokila Boulevard
Kapolei, Hawaii 96707

Prepared By:

WILBUR SMITH ASSOCIATES
421 Fayetteville Street, Suite 1303
Raleigh, NC 27601
(919) 755-0583

July 20, 2006

(WSA Project No. A31505)

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EXECUTIVE SUMMARY

Kapolei Property Development LLC is planning the development of approximately 345 acres of vacant lands on the Waianae side of Kalaeloa Boulevard near the City of Kapolei. This development, referred to as the Kapolei Harborside Center project, would include most of the land bounded by the future Hanua Street Extension, Malakole Street, the Barbers Point Harbor, and the Oahu Railway and Land Company (OR&L) track line. (See Figure 1-1.) The Project would also include small parcels located on the Honolulu side of the future Hanua Street Extension near Malakole Street and at the northeast corner of the site

The Kapolei Harborside Center development, hereinafter referred to as the Project, is planned for light industrial, warehouse, and related business uses. A portion of the site is planned for use as a regional drainage way, with small areas also identified for preservation and for a wastewater facility.

Development and occupancy of the Project is planned to begin in 2008, with the initial development progressing from the eastern and mauka sections of the development area. Development of the Project is expected to extend over 10 years, with full development and occupancy by the end of 2018.

The traffic impact assessment for the Kapolei Harborside Center focuses on the key intersections located near the Project as well as the freeway ramps that would provide the primary Project access to the H-1 Freeway. The study proposes roadway improvements on the adjacent roadways to accommodate 2018 traffic needs with the Project. The overall street conditions and future roadway needs in the City of Kapolei area are being reassessed in a separate on-going traffic update study for the roadway master plan study conducted in the early 1990's.

PROJECT DESCRIPTION

The Project site would allow development of approximately 250 acres of light industrial, warehousing, and service business types of uses after reductions for the drainage channel, major roadways, and preservation areas.

The Project would include the construction of Opakapaka Street as well as provide land for other major regional roadways (portions of Hanua Street and Lauwiliwili Street Makai extension) that would serve both the Project and regional traffic. Opakapaka Street would be extended as a two-lane roadway from Hanua Street Extension to the western boundary of the Project site.

PROJECT TRIP GENERATION

At full build-out, the land uses within Kapolei Harborside Center development are estimated to generate a total of about 15,750 vehicle trips to and from the site on a typical weekday. The Project is estimated to generate 2,135 and 2,207 vehicle trips in the weekday morning and afternoon peak hours, respectively. The estimated numbers of peak hour trips by area are presented for the major segments of the Project site in Table S-1.

2018 TRAFFIC CONDITONS WITHOUT THE PROJECT

The 2018 forecasts without the Project included the build-out of the Kapolei Business Park Phases 1 and 2 areas; the completion of the Kapolei Commons mixed-use development as well as the Costco and Kapolei Spectrum retail developments; and completion of the 100-acre I-2 zoned area between Kalaeloa Boulevard and Hanua Street. The forecasts reflected build-out of the City of Kapolei area east of Kalaeloa Boulevard and the occupancy of 2,000 residential units within the Kapolei West development.

The major portion of the roadway projects planned for the area was assumed to be in place by yearend 2018. Key roadways relative to this study include:

Table S-1
VEHICLE TRIP GENERATION
FOR 2018 PROJECT BUILD-OUT

Area	Morning Peak Hour			Afternoon Peak Hour		
	Total	Enter	Exit	Total	Enter	Exit
Northeast (1,2,3)	203	168	34	210	44	165
Northwest (19)	202	168	34	209	44	165
West Central (16, 17, 18)	538	448	92	557	117	440
East Central (4, 5)	350	290	59	362	76	285
Southwest (6, 7, 12, 13 14, 15)	678	563	115	701	147	554
Southeast (8, 9)	164	136	28	170	36	134
Totals	**2,135**	**1,773**	**362**	**2,207**	**464**	**1,743**

Wilbur Smith Associates; March 24, 2006

- Completion of the Kapolei Parkway, to include the planned widening of the existing four-lane section between Kalaeloa and Kamokila Boulevards to six lanes
- Widening of Kalaeloa Boulevard to six lanes between the Palailai Interchange ramps and the OR&L track line
- Completion of the improvements at the Makakilo, Kapolei, and Palailai interchanges
- Construction of Hanua Street from the Palailai Interchange makai to Malakole Street
- Extension of Malakole Street eastward to connect to the Kalaeloa Redevelopment Area roadways
- Extension of Kamokila Boulevard and Wakea Street into the Kalaeloa Redevelopment Area.

Traffic along Kalaeloa Boulevard in the morning peak hour is projected to increase from the existing 1,900 vehicles to 2,600 in 2018; the increase in the afternoon peak hour is projected to increase from 1,850 to 2,650 vehicles. With the connection to the Kalaeloa Redevelopment Area roadway system, traffic volumes in each peak hour along Malakole Street east of Kalaeloa Boulevard are forecast to increase from about 400 vehicles at present to about 1,000 vehicles in 2018.

Analyses indicate that the planned roadways should accommodate the forecast 2018 peak hour traffic volumes without the Harborside Center project at acceptable levels of capacity usage and average vehicle delays at most intersections. Long delays were indicated for side street traffic at several of the intersections assumed to have STOP sign control in 2018:

- The Malakole Street approaches to Hanua Street, with LOS F conditions and extremely long delays due to inadequate gaps in Hanua Street traffic in both afternoon and morning peak hours
- The westbound approach of the mauka intersection of Lauwiliwili Street with Kalaeloa Boulevard in both peak hours, which would affect few vehicles
- The westbound approach of the Opakapaka Street connection to Hanua Street in the morning peak hour, which would affect few vehicles.

The Hanua Street-Malakole Street intersection would merit installation of traffic signal control, which would operate at acceptable conditions with the planned lanes. The traffic volumes and conditions at the other two intersections would not satisfy traffic warrants for consideration of traffic signal controls.

2018 TRAFFIC CONDITONS WITH PROJECT BUILDOUT

The full development of the Project, with the completion of the section of Hanua Street between Lauwiliwili Street Makai and Malakole Street is estimated to increase the traffic volumes along Hanua Street on the makai side of the Kapolei Parkway to about 3,000 vehicles in the morning peak hour, versus 1,160 without the Project. In the afternoon peak hour, the volumes on this section are projected to increase from 1,030 vehicles without the Project to 3,040 with the Project and completion of Hanua Street.

Traffic volumes along Kalaeloa Boulevard just makai of the Kapolei Parkway are estimated to decrease by about 200 and 400 vehicles in the morning peak hour and afternoon peak hours, respectively, from those without the Project and completion of Hanua Street.

Key Intersection Conditions

The peak hour traffic conditions at the key intersections in the vicinity of the Project are summarized in Table S-2. The Without (No) Project conditions in the table reflect the planned roadway projects by 2018 plus the installation of traffic signal controls at the Malakole street intersection with Hanua Street.

The addition of the Project traffic would adversely impact several of the key intersections as described in the following paragraphs:

- The projected traffic would exceed capacity of the Kapolei Parkway-Kalaeloa Boulevard intersection by 8% in the afternoon peak hour, with average traffic delays at LOS E.
- The increased Project traffic along Malakole Street would result in traffic congestion and delays at the Kalaeloa Boulevard-Malakole Street intersection with the traffic volumes in the afternoon peak hour exceeding the estimated intersection capacity.
- The forecast morning peak hour traffic would exceed estimated capacity at the Hanua Street intersection with the Kapolei Parkway by 14%.
- Traffic on the Opakapaka Street approaches to Hanua Street would experience extremely long delays with STOP sign controls. The estimated peak hour volumes and delays satisfy warrants to allow consideration for installation of a traffic signal. The intersection would operate at acceptable conditions with the installation of a traffic signal.
- Traffic on the westbound approach of Lauwiliwili Street at the mauka intersection with Kalaeloa Boulevard would experience extremely long delays with STOP sign controls. The estimated peak hour volumes and delays do not satisfy warrants to allow consideration for installation of a traffic signal.

Table S-2
EXISTING AND 2018 TRAFFIC CONDITIONS AT KEY INTERSECTIONS
KAPOLEI HARBORSIDE CENTER

Intersection	Scenario	Morning Peak Hour			Afternoon Peak Hour		
		V/C	ADPV	LOS	V/C	ADPV	LOS
Kalaeloa Blvd.- Farrington Hwy.	Existing	0.42	30.6	D	1.30	185.4	F
	No Project	0.49	8.7	A	0.62	16.5	B
	Project Buildout	0.49	8.8	A	0.63	16.8	B
Kalaeloa Blvd.- Kapolei Pkwy.	Existing	0.74	35.0	D	0.94	73.2	E
	No Project	0.85	39.0	D	0.93	33.5	C
	Project Buildout	0.93	53.8	D	1.08	63.7	E
	Mitigated	0.88	36.3	D	0.97	47.6	D
Kalaeloa Blvd.- Lauwiliwili St. Makai	No Project	0.47	7.6	A	0.61	10.3	B
	Project Buildout	0.53	9.2	A	0.62	16.2	B
Kalaeloa Blvd.- Malakole St.	Existing	0.48	9.2	A	0.71	15.9	B
	No Project	0.61	44.2	D	0.74	27.5	C
	Project Buildout	0.79	25.1	C	1.26	72.1	E
	Mitigated	0.67	28.0	C	0.92	46.1	D
Hanua St.- Kapolei Pkwy.	No Project	0.65	20.1	C	0.78	23.5	C
	Project Buildout	1.14	69.8	E	0.94	62.5	E
	Mitigated	0.83	44.5	D	0.93	45.3	D
Hanua St.- Opakapaka St.	No Project	0.08	53.2	F	0.29	47.9	E
	Project Buildout	*	*	F	*	*	F
	Mitigate	0.73	8.0	A	0.86	15.6	B
Hanua St.- Lauwiliwili Makai	No Project	0.03	23.9	C	0.22	24.1	C
	Project Buildout	0.67	17.3	B	0.81	21.0	C
Hanua St.- Malakole St.	Existing	0.05	16.5	C	0.01	11.3	B
	No Project	0.44	8.8	A	0.51	9.2	A
	Project Buildout	0.88	54.4	D	1.12	94.2	F
	Mitigated	0.79	40.9	D	0.92	49.1	D
Kapolei Pkwy.- Kamokila Blvd.	No Project	0.69	13.9	B	0.83	19.8	B
	Project Buildout	0.76	14.6	A	0.83	21.9	B

V/C = Ratio of the traffic volume to the theoretical capacity of the intersection.
ADPV = Average delay per vehicle, in seconds.
LOS = Level of service.
* = Delay not calculated since unreliable where traffic substantially exceeds capacity.

Wilbur Smith Associates; July 20, 2006.

- The forecast traffic at the Malakole Street intersection with Hanua Street would exceed the estimated capacity for both peak traffic hours with traffic experiencing very long delays (LOS F) and with the volumes and delays meriting additional modifications.

Although not included in Table S-3, the traffic conditions on the proposed Areas 1 & 2 Access Road, Area 5 Access Road, and Area 6/7 Access Road connections to Hanua Street would experience very long delays, with the projected volumes and delays satisfying warrants to allow consideration of traffic signal control. All three intersections would operate at very acceptable conditions with traffic signal control and the forecast traffic volumes.

Palailai Interchange Ramp Conditions

The 2018 peak hour traffic conditions were assessed for the weaving section of the eastbound H-1 Freeway ramps on the east side of the Palailai Interchange as well as freeway merge/diverge sections for those Palailai Interchange ramps that would be used by the Project traffic. The analysis was made using the HCM procedures (Appendix A) and HCS software.

Weaving Section between Eastbound Off-Ramp to Farrington Highway/Wakea Street (Future) and On-Ramp from Kalaeloa Boulevard – Traffic conditions were analyzed for this weaving section for the eastbound on/off-ramps that would be used by some of the traffic accessing the H-1 Freeway from the Kapolei Harborside Center development to assess the Project impact. Traffic conditions for this weaving section are summarized in Table S-3.

The traffic conditions on the weaving section are projected to operate at acceptable levels both without and with the Project.

Ramp Merge/Diverge with Freeway Through Lanes – The traffic conditions along the H-1 Freeway near the entry or exit points for the Palailai Interchange ramps are summarized in Table S-4. The analysis is based on no widening of the freeway through this area.

The projected conditions for the on-ramp from Hanua Street to the eastbound freeway are estimated to worsen from LOS C without the Project to LOS D with the increased Project traffic in the afternoon peak hour. For the westbound direction, the Project traffic is estimated to result in LOS D conditions on the loop off-ramp to Hanua Street, as compared to LOS C without the Project. The estimated increase in peak hour traffic volumes on the other ramps would not be expected to change the level of service from those without the Project.

The loop off-ramp for westbound traffic exiting from the H-1 Freeway to Hanua Street would have an estimated capacity of about 1,800 vehicles per hour. The estimated morning peak hour volume of 1,154 vehicles amounts to about 64% of the potential ramp capacity versus 30% without the Project.

Table S-3
TRAFFIC CONDITIONS AT
KEY FREEWAY RAMP WEAVING SECTIONS

Year and Development Scenarios	Morning Peak Hour			Afternoon Peak Hour		
	Density	Speed	LOS	Density	Speed	LOS
Existing Eastbound Weaving Section for Off-ramp to Farrington Hwy. (Wakea St. in future) and On-Ramp from Kalaeloa Blvd.						
2006	11.1	29.2	B	23.0	25.0	C
2018 No Project	14.0	27.7	B	27.3	24.5	C
2018 with Project Buildout	14.6	27.4	B	28.0	23.9	C

Density = Passenger car equivalents per mile per lane in analyses section.
Speed = Average speed in miles per hour through weaving area.
LOS = Level of service in weaving area.

Wilbur Smith Associates; May 5, 2006.

Table S-4
FREEWAY TRAFFIC CONDITIONS AT
KEY RAMP MERGE/DIVERGE SECTIONS

Freeway Section at Ramp	Scenario	Morning Peak Hour			Afternoon Peak Hour		
		Density	Speed	LOS	Density	Speed	LOS
Eastbound Freeway							
At Off-Ramp to Kalaeloa Blvd/Hanua St	Existing	20.4	50.8	C	20.3	50.9	C
	No Project	29.8	50.3	D	28.0	50.6	D
	With Project	31.1	50.1	D	28.3	50.6	D
At On-Ramp from Hanua St.	No Project	23.2	50.8	C	26.1	50.3	C
	With Project	24.0	50.7	C	30.0	49.3	D
Westbound Freeway							
At Loop Off-Ramp to Hanua St.	No Project	24.1	50.3	C	30.4	50.7	D
	With Project	28.9	49.6	D	31.4	50.6	D
At On-Ramp from Kalaeloa Blvd./Hanua St.	Existing	14.9	51.1	B	23.2	50.6	C
	No Project	18.4	51.2	B	33.4	47.9	D
	With Project	18.6	51.2	B	34.3	47.5	D

Density = Passenger car equivalents per mile per lane in analyses section.
Speed = Average speed in miles per hour through weaving area.
LOS = Level of service in weaving area.

Wilbur Smith Associates; May 5, 2006

The on-ramp from the Eastbound Weaving Roadway has an estimated potential capacity of about 2,100 vehicles per hour. The afternoon peak hour volumes with the Project would amount to about 55% of the capacity versus 53% without the Project.

PUBLIC TRANSIT AND BICYCLE TRAVEL

The Kapolei Parkway is planned to include bicycle lanes to encourage use of bicycles for transportation purposes as well as for recreation. Bicycle lanes or a bicycle path should also be included along either Kalaeloa Boulevard or Hanua Street.

A transit center is planned within the Parcel L mixed-use development located makai of the Kapolei Parkway on the east side of Hanua Street. Once Hanua Street is extended through to connect to Malakole Street, one or more TheBus routes will likely be added along Hanua Street which would provide public transportation access to the Project area.

Actions that could encourage use of these travel modes for access to the Project are included in the list on the following page.

Public Transit

- Coordinate the potential location of bus stops with the City DTS and TheBus staffs and provide bus shelters at the stop locations.
- The Project should be designed to provide convenient and safe pedestrian linkages to the bus stop locations through a system of raised sidewalks and walkways.

Bicycles

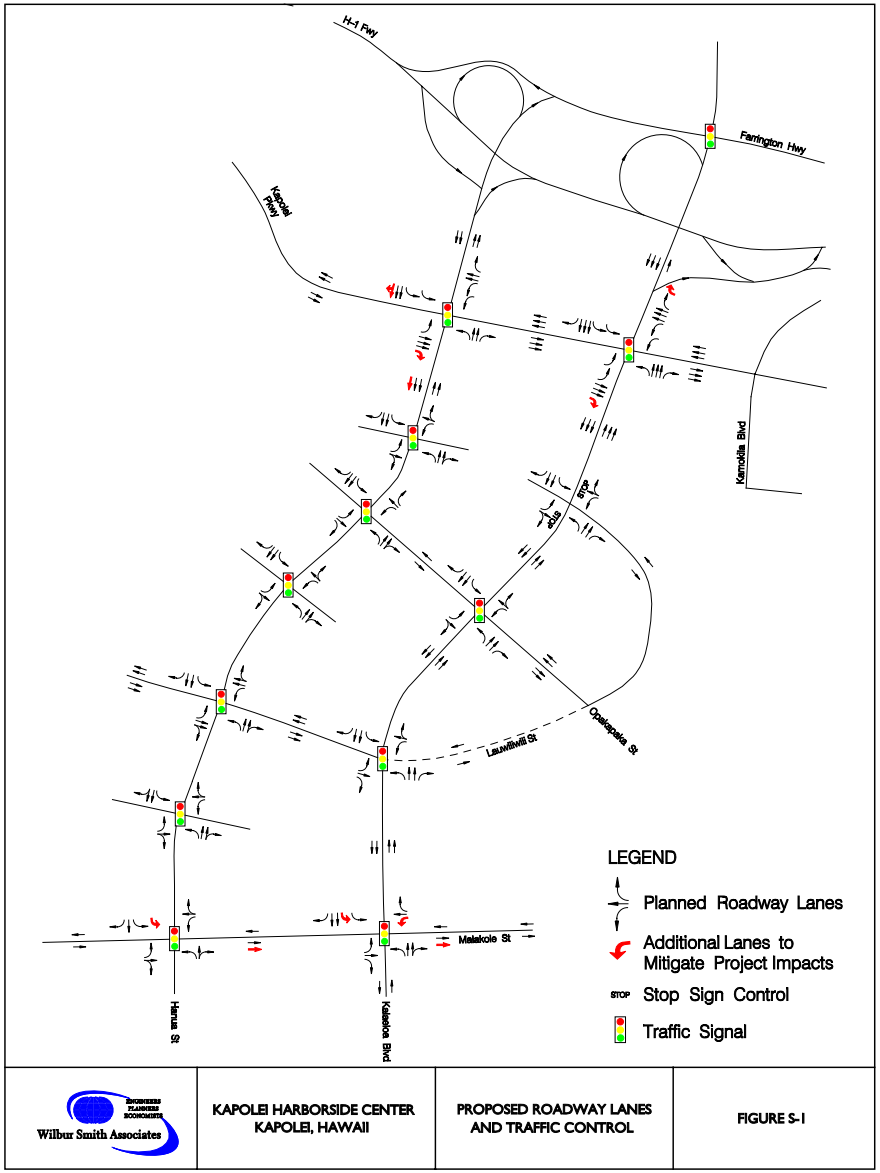
- The collector streets within the Project site should be planned to accommodate bicycle use, and should provide a network of continuous street connections to allow use for bicycle travel by those who prefer not to travel along the major streets.

PROPOSED MITIGATIVE ACTIONS

The following roadway improvements are proposed to mitigate the future traffic conditions within the study area.

Proposed to Mitigate Project Impacts

The actions proposed to mitigate Project impacts are highlighted in the Figure S-1 depiction of the roadway lanes and traffic controls in the Kalaeloa Boulevard corridor, which identified in the following listing.



Wilbur Smith Associates	KAPOLEI HARBORSIDE CENTER KAPOLEI, HAWAII	PROPOSED ROADWAY LANES AND TRAFFIC CONTROL	FIGURE S-1

Kalaeloa Boulevard-Kapolei Parkway Intersection

- Add a right-turn lane to eastbound approach
- Construct a second (double) right-turn lane if warranted by future traffic volumes and conditions

Kalaeloa Boulevard-Malakole Street Intersection

- Add westbound left-turn lane
- Add makai-bound second (double) left-turn lane
- Widen Malakole Street to provide two eastbound lanes for a distance of about 400 feet from Kalaeloa Boulevard intersection
- Modify signal phasing and timing to reflect geometric changes

Hanua Street-Kapolei Parkway Intersection

- Add right-turn lane on eastbound Kapolei Parkway approach
- Convert right-turn lane on makai-bound approach to shared through/right-turn lane to increase capacity for through traffic

Hanua Street-Malakole Street Intersection

- Provide second (double) left-turn lane on makai-bound approach
- Widen Malakole Street east of intersection for distance of about 400 feet to provide two eastbound lanes to receive double left-turn lanes

Signal Controls at Intersections
Install conduit and pull boxes for potential future signal control at

- Hanua Street and Areas 1 & 2 Access Roads
- Hanua Street and Opakapaka Street
- Hanua Street and Area 5 Access Road/I-2 Access Road
- Hanua Street and Lauwiliwili Street Makai
- Hanua Street and Area 6/7 Access Road
- Hanua Street and Malakole Street.

The conditions with these roadway improvements are indicated in Table S-2 as the "Mitigated" scenario.

The proposed mitigative actions at the Kalaeloa Boulevard-Malakole Street intersection would require widening of the east leg of Malakole Street, which is a owned by private groups unrelated to the Project developer of the Kapolei Harborside Center Project. If agreement cannot be reached with these private owners for the widening project, then the addition of a right-turn lane on the mauka-bound Kalaeloa Boulevard and a second (double) left-turn lane on eastbound Malakole Street approach are proposed as alternative mitigative actions.

Proposed Actions by Others

The following roadways and/or modifications would be needed to provide access at Project build-out and are planned as actions by others without the development of the Harborside Center Project:

- Construct Hanua Street Extension from Malakole street to Palailai Interchange
- Construct additional ramps at Palailai Interchange to accommodate Hanua Street connection to freeway
- Construct Kapolei Parkway as six-lane roadway from Hanua Street Extension to Kamokila Boulevard
- Extend Malakole Street eastward to connect to the roadway network within the Kalaeloa Redevelopment Area
- Construct the extension of the makai end of Lauwiliwili Street westward to access the Kalaeloa (Barbers Point) Harbor
- Construct Opakapaka Street between Kalaeloa Boulevard and Hanua Street.
- Install traffic signals at Kalaeloa Boulevard intersections with Opakapaka and Lauwiliwili (Makai) Streets, and at Hanua Street intersections with Malakole and Lauwiliwili (Makai) Streets.

Chapter 1
INTRODUCTION

Kapolei Property Development LLC is planning the development of approximately 345 acres of vacant lands on the Waianae side of Kalaeloa Boulevard near the City of Kapolei. This development, referred to as the Kapolei Harborside Center project, would include most of the land bounded by the future Hanua Street Extension, Malakole Street, the Barbers Point Harbor, and the Oahu Railway and Land Company (OR&L) track line. (See Figure 1-1.) The Project would also include small parcels located on the Honolulu side of the future Hanua Street Extension near Malakole Street and at the northeast corner of the site. The site is bordered by the planned Kapolei West golf course on the mauka end, by the undeveloped I-2 zoned lands (I-2 Parcel) to the east, by the Campbell Industrial Park on the makai end, and by the Harbor and related industrial lands to the west.

The Kapolei Harborside Center development, hereinafter referred to as the Project, is planned for light industrial, warehouse, and related business uses. A portion of the site is planned for use as a regional drainage way, with small areas also identified for preservation and for a wastewater facility.

Development and occupancy of the Project is planned to begin in 2008, with the initial development progressing from the eastern and mauka sections of the development area. Development of the Project is expected to extend over a 10-year period, with full development and occupancy of the area by the end of 2018.

The purpose of this study is to assess the traffic impacts of the planned development of Kapolei Harborside Center Project. The assessment addresses the following:

1. The numbers of vehicle trips that would be generated by the Project at build out.

2. Future traffic levels and traffic conditions at key intersections and freeway ramps in 2018 without the Project.

3. The traffic increases on area roadways and impact on traffic conditions at key intersections and freeway ramps as a result of the Project build out.

4. Identification of any actions that may be appropriate to mitigate Project traffic impacts.

The traffic impact assessment for the Kapolei Harborside Center development focuses primarily on the intersections located near the Project as well as the key intersections located between the Project site and the freeway access at the Palailai Interchange. The study proposes roadway improvements only where necessary to mitigate Project traffic impacts. The overall street conditions and future roadway needs in the City of Kapolei area are being reassessed in a

separate on-going traffic update study for the roadway master plan study conducted in the early 1990's.

PROJECT DESCRIPTION

The Project site would allow development of approximately 250 acres of light industrial, warehousing, and service business types of uses after reductions for the drainage channel, major roadways, and preservation areas.

The Project would include the construction of portions of several roadways that could serve both the Project and regional traffic:

- Lauwiliwili Street (Makai) would be extended as four-lane divided roadway from Hanua Street Extension to the Barbers Point Harbor boundary where it would connect with the Harbor roadway network, with this roadway intended to serve as the primary access route to the Harbor in the future. It is anticipated that this roadway will be constructed by State DOT to provide access to the Harbor once right-of-way is transferred by the Harborside Center Project.

- Opakapaka Street would be extended as a two-lane roadway from Hanua Street Extension to the western boundary of the Project site.

Traffic circulation and access would be provided by a network of local streets within the industrial site. These local roadways would connect primarily to Lauwiliwili Street, Opakapaka Street, and the planned Hanua Street extension, generally as depicted in Figure 1-1.

METHODOLOGY AND ASSUMPTIONS

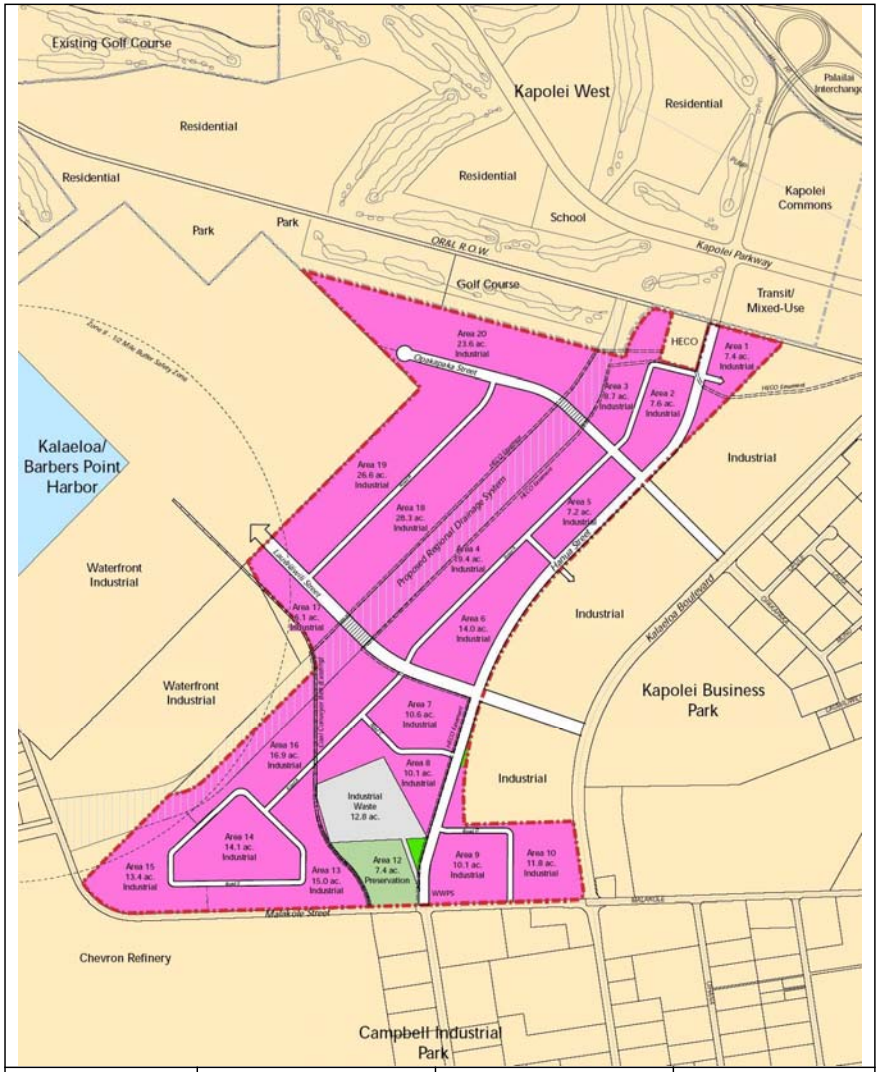
The general methodology and assumptions used in the forecasting and analysis of traffic impacts with the Project are outlined in the following sections.

Analysis Scenarios

The traffic analysis scenarios include the existing conditions and the future conditions without and with the Project.

- **Existing** – The composite traffic volumes from the 2005-2006 counts were analyzed to represent the existing traffic conditions.

- **Year 2018 Without Project** – The traffic volumes on area roadways and traffic conditions at key intersections were forecast for 2018 with the other planned development in the area but without any development within the Kapolei Harborside Center Project, with this scenario serving as a baseline to assess the Project impacts.



Wilbur Smith Associates	KAPOLEI HARBORSIDE CENTER KAPOLEI, HAWAII	PROJECT CONCEPT PLAN	FIGURE 1-1

- **Year 2018 Project Buildout Scenario** – The traffic conditions were analyzed for 2018 with full build-out and occupancy of the Kapolei Harborside Center development.

Forecast Methodology and Assumptions

The traffic growth *without* the Project was forecast for year 2018 through the use of a TRAFFIX trip generation and assignment model developed by Wilbur Smith Associates (WSA) for the City of Kapolei and the adjacent areas. The assumptions regarding the new development are outlined in the following sections. The numbers of new trips generated by new development within and near the City of Kapolei were based on standard trip generation rates compiled by the Institute of Transportation Engineers (ITE).[1] The origins and destinations of the new trips were based on the trip distribution percentages developed from the Oahu Metropolitan Planning Organization (OMPO) 2030 regional forecasts.

Non-Project Developments by 2018 – A substantial amount of new development is expected in the City of Kapolei area near the Project site between yearend 2006 and 2018. The additional development most directly affecting the roadways used for site access is expected to include the following areas:

- The build-out of the City of Kapolei commercial development east of Kalaeloa Boulevard.
- The completion of the Kapolei Commons mixed-use development mauka of the Kapolei Parkway between future Hanua Street and Kalaeloa Boulevard, as well as the Costco and Spectrum retail developments along the mauka section of Kalaeloa Boulevard.
- Development of about 110 acres of industrial park uses within the Kapolei Business Park Phases 1 and 2 areas.
- Full development of the 125-acre industrial area, referred to herein as the I-2 Parcel, located between Kalaeloa Boulevard and the future Hanua Street Extension makai of the OR&L track line, including a film studio.
- Development of about 2,000 of the planned residential units proposed for the Kapolei West area.
- Development of about 1,500 housing units, plus commercial uses, in the Makaiwa Hills development.
- Development of about one-half of the residential and commercial uses included within the OMPO 2030 regional forecasts for the Kalaeloa Redevelopment Area.

[1] *Trip Generation, Seventh Edition*, Institute of Transportation Engineers, 2003.

Roadway Improvements by 2018 Without the Project – The traffic assignments and intersection analyses for 2018 without the Project reflect the construction of a number of roadway projects that would affect traffic conditions on the study roadways. The new or improved roadways expected by 2018 that would most affect the Project area traffic conditions include:

- The widening of Kalaeloa Boulevard to a six-lane roadway from the Palailai Interchange to makai of the OR&L track line.
- Completion of the Kapolei Parkway through the City of Kapolei between Fort Barrette Road and Kamokila Boulevard, and from Kalaeloa Boulevard westward to connect to Aliinui Avenue in Ko Olina.
- Extension of Kamokila Boulevard to connect to Roosevelt Avenue.
- The construction of the Hanua Street Extension from the Palailai Interchange to Malakole Street.
- Construction of the new Kapolei Interchange and reconstruction of the ramps at the Palailai Interchange to connect the Hanua Street Extension to the freeway.
- The construction of a new interchange along Farrington Highway east of Honokai Hale to provide access to the Makaiwa Hills development, as well as the Kapolei West area.
- The extension of the Opakapaka Street westward to connect to Hanua Street Extension.
- The extension of Lauwiliwili Street (Makai) westward through the Kapolei Business Park Phase 2 and I-2 Parcel to connect to the Hanua Street Extension.
- The extension of Malakole Street eastward to connect to the planned roadway network within the Kalaeloa Redevelopment Area.

Traffic Forecasts With the Project – The numbers of new trips generated by the Project were based on standard trip generation rates for industrial parks as compiled by the Institute of Transportation Engineers (ITE).[2] The origins and destinations of the new trips were based on the trip distribution percentages developed from the OMPO 2030 regional forecasts.

Roadway Analysis Methodology

Traffic conditions at intersections controlled by traffic signals or STOP signs were analyzed using the methodology set forth in the *2000 Highway Capacity Manual*, as summarized in Appendix A. The analyses of traffic signal-controlled intersections were made using Synchro software and were based on the following operational assumptions:

[2] *Trip Generation, Seventh Edition*, Institute of Transportation Engineers, 2003.

- Use of 4-second yellow clearances and 1-second all-red intervals at most intersections.
- On major through roadways, left-turns allowed only with protected left-turn phases.

Traffic conditions on freeway ramps or weaving sections were analyzed using the methodology set forth in the *2000 Highway Capacity Manual*, as summarized in Appendix A. HCS software by McTrans was used for the analyses.

REPORT ORGANIZATION

This traffic impact analyses for the Kapolei Harborside Center Project has been organized into the following chapters:

1. Introduction
2. Existing Conditions – Describes the existing roadway facilities, public transportation services, traffic volumes, and traffic conditions in the study area.
3. 2018 Conditions without the Project – Describes the traffic increases on area roadways and traffic conditions at key intersections in year 2018 without the Project
4. 2018 With Project Buildout – Describes the traffic increases on area roadways and traffic conditions at key intersections in year 2018 with the full development of the entire Project site.

Chapter 2
EXISTING CONDITIONS

At the time of the traffic surveys in May 2005 and January 2006, the Honolulu Advertiser was the only development west of Kalaeloa Boulevard in the City of Kapolei area. East of Kalaeloa Boulevard, the Home Depot, Ace Hardware, and Outback Steakhouse facilities had each opened within the past year along Kamokila Boulevard near the Kalaeloa Boulevard intersection with the Kapolei Parkway. Construction was underway on three new facilities within the Kapolei Business Park Phase 1 development along Lauwiliwili and Opakapaka Streets.

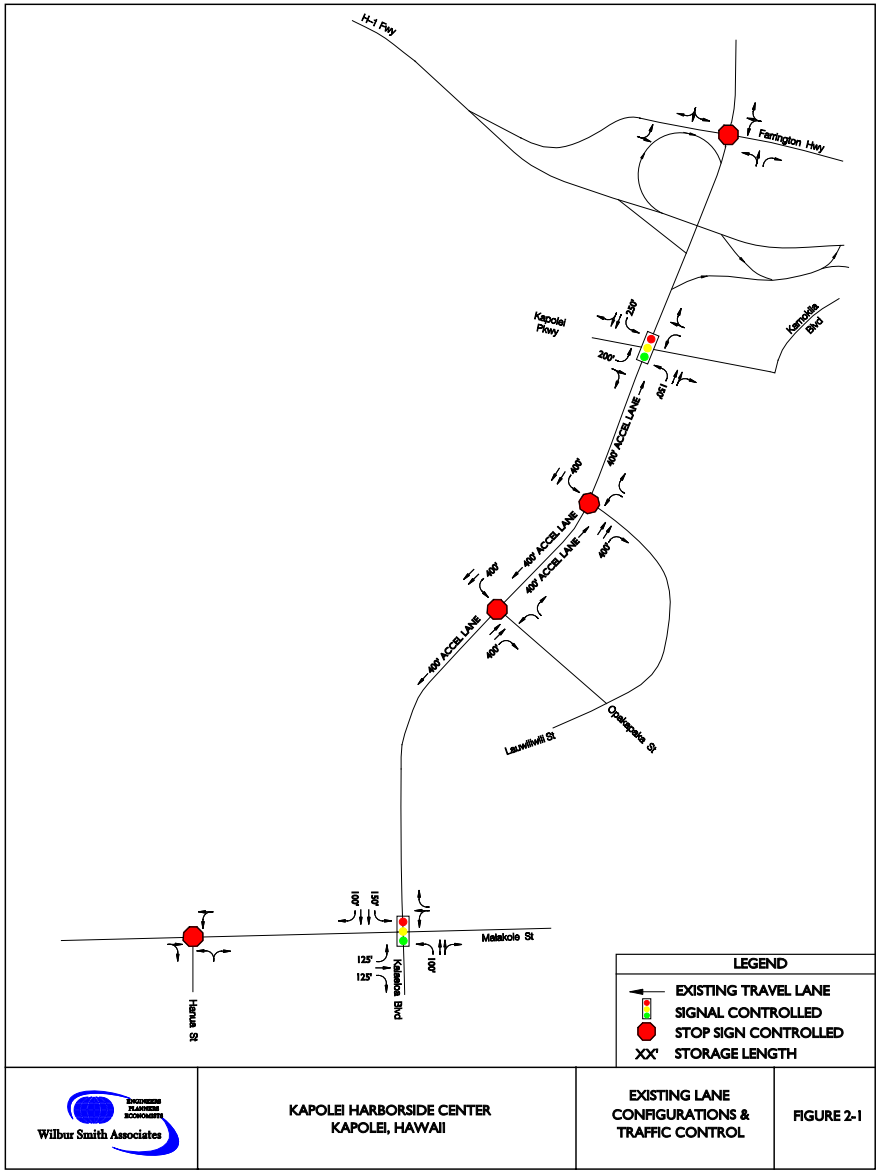
EXISTING ROADWAY SYSTEM

The major roadway system near the Kapolei Harborside Center development (the Project) area is depicted in Figure 2-1. The major roadways within the area are discussed in the following paragraphs.

- **H-1 Freeway** - This freeway is the major east-west roadway in the Ewa District and connects the Ewa area to central Honolulu and other areas of Oahu. City of Kapolei traffic access to the freeway is via the Makakilo (Makakilo Drive-Fort Barrette Road) and Palailai (Kalaeloa Boulevard) interchanges H-1 Freeway has six travel lanes east of the Palailai Interchange and four lanes west of the interchange.

- **Kalaeloa Boulevard** – This major roadway provides access from the H-1 Freeway at the Palailai Interchange to the Kapolei Business Park, Campbell Industrial Park, and Barbers Point Harbor. The roadway also provides access to the City of Kapolei area via the Kapolei Parkway connection to Kamokila Boulevard. Kalaeloa Boulevard is a four-lane divided roadway from the H-1 Freeway to Malakole Road, and is a two-lane street within the Campbell Industrial Park area makai of Malakole Street. Traffic signal controls are provided at the intersection with the Kapolei Parkway and with Malakole Street. This roadway is currently privately owned by the Estate of James Campbell.

- **Kapolei Parkway** - This major roadway is planned to be a major traffic artery connecting the City of Kapolei to the Ko Olina area to the west and to the Villages of Kapolei and other communities to the east. Within the Kapolei area, the only completed portions of the roadway are the one-block segment between Kalaeloa and Kamokila Boulevards and a short section on the Honolulu side of Fort Barrette Road that provides access to the Kapolei Middle and High Schools, as well as the Villages of Kapolei. These segments have a median-divided roadway with two or more traffic lanes and a bicycle lane in each direction.



Wilbur Smith Associates

KAPOLEI HARBORSIDE CENTER
KAPOLEI, HAWAII

EXISTING LANE CONFIGURATIONS & TRAFFIC CONTROL

FIGURE 2-1

- **Malakole Street** – This two-lane major roadway provides access to the Barbers Point Harbor and the heavy industrial area west of Kalaeloa Boulevard. East of Kalaeloa Boulevard, the street provides access to mauka-makai streets serving the eastern portion of the James Campbell Industrial Park, as well as to the Hawaii Raceway Park along the mauka side of the street. Malakole Street presently ends west of the drainage channel separating the Campbell Industrial Park from the Kalaeloa Redevelopment Area (former Barbers Point NAS), although future plans are to extend Malakole Street across the existing unsurfaced and gated causeway across the drainage channel to connect to the roadway network within the Redevelopment Area.

- **Lauwiliwili Street** – The mauka half of this two-lane collector street has been constructed to serve the Phase 1 area of the Kapolei Business Park. The street will be extended makai through the Kapolei Business Park Phase 2 area to connect with and extend west of Kalaeloa Boulevard. Separate left- and right-turn lanes at provided at the STOP sign-controlled intersection with Kalaeloa Boulevard.

- **Opakapaka Street** – This four-lane collector street extends from Kalaeloa Boulevard to the Lauwiliwili Street loop roadway. The street has a landscaped median for the block adjacent to Kalaeloa Boulevard, with the two lanes marked as separated right- and left-turn lanes at the STOP sign controlled intersection.

- **Farrington Highway** - This State highway parallels the H-1 Freeway and serves east-west travel through the Ewa District from the Waipahu area to the Palailai Interchange. Farrington Highway also serves as the major regional route westward from the terminus of the H-1 Freeway just east of the Honokai Hale residential area. The section between Kamokila Boulevard and Kalaeloa Boulevard is a two-lane roadway. Farrington Highway continues west of the terminus of the H-1 Freeway as a four-lane divided highway to connect to the Ko Olina and Waianae coast areas.

- **Kamokila Boulevard** - This major roadway connects Farrington Highway to the Kapolei Parkway and Kalaeloa Boulevard and provides access to the center of the City of Kapolei. Kamokila Boulevard provides two through lanes in each direction. The roadway has a landscaped median area for most of its length and has left-turn lanes at the intersections with cross streets and driveways.

EXISTING TRAFFIC VOLUMES

Wilbur Smith Associates (WSA) conducted special turning movement counts at the key intersections in the western City of Kapolei and along Kalaeloa Boulevard area during the weekday morning and afternoon peak commute traffic periods from mid-2005 to early 2006. Traffic counts were made for each 15-minute period between 6:00 and 8:30 AM, and between 3:30 and 6:30 PM. The 15-minute counts were used to identify the peak one-hour volumes at the study intersections in the morning and afternoon commute periods. The peak one-hour volumes

generally started at 7:00 or 7:15 AM in the morning commute period, and 4:15 to 4:30 PM in the afternoon peak period.

The dates of the various traffic counts used in this study as follows:

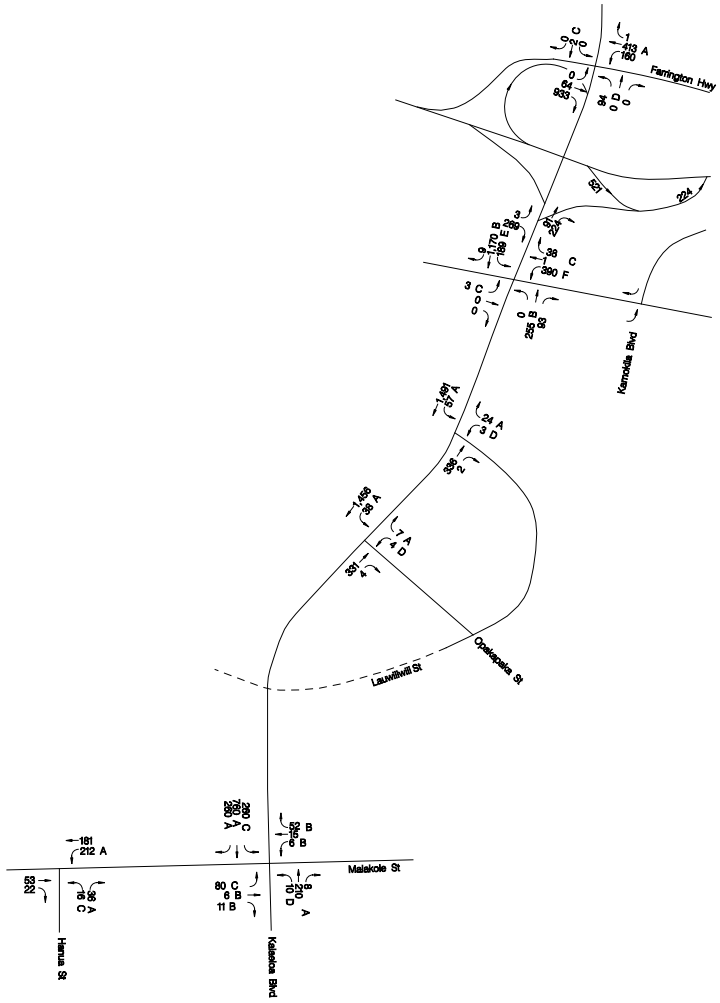
Kalaeloa Boulevard and Farrington Highway	5/24/2005
Kalaeloa Boulevard and Eastbound Off-ramp	
Kalaeloa Boulevard and Kapolei Parkway	5/24/2005
Kalaeloa Boulevard and Lauwiliwili Street (Mauka)	1/10/2006
Kalaeloa Boulevard and Opakapaka Street	1/11/2006
Kalaeloa Boulevard and Malakole Street	9/22/2005
Malakole Street and Hanua Street	10/5/05
Farrington Highway at Laaloa Street	2/3/2005

Peak hour traffic volumes on the H-1 Freeway were based on traffic counts made by WSA on Farrington Highway at the Laaloa Street intersection on February 3, 2005. The WSA May 2005 traffic survey included counts at the H-1 Freeway on- and off-ramps at the Palailai Interchanges. The Farrington Highway and H-1 Freeway ramp traffic counts were used to derive the traffic volumes along the Freeway through the City of Kapolei.

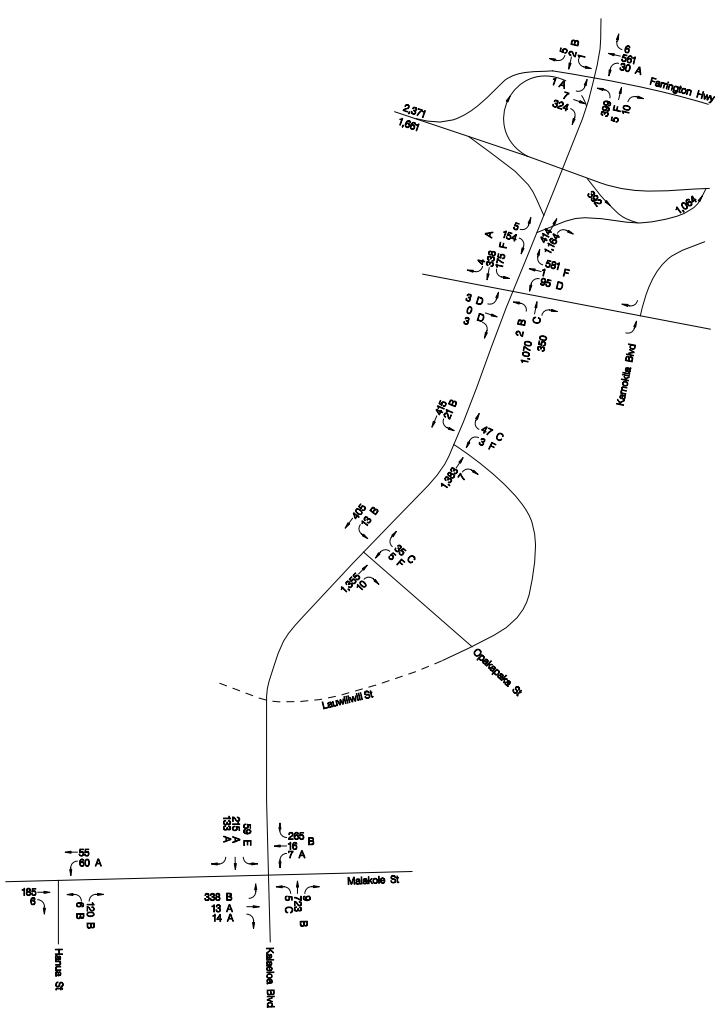
The existing weekday morning peak one-hour traffic volumes are depicted in Figure 2-2 and the peak weekday afternoon volumes are depicted in Figure 2-3. At most locations along Kapolei Parkway, the afternoon peak hour two-way traffic volumes are higher than those in the morning peak hour, while those along Kalaeloa Boulevard makai of the Kapolei Parkway are higher in the morning peak hour. The peak hour counts used in this study generally reflect the 6:30-7:30 AM and 3:30-4:30 PM periods, which are the peak hours for the traffic along most of Kalaeloa Boulevard.

Kalaeloa Boulevard accommodates high volumes of traffic in the makai-bound direction in the morning peak period and in the mauka-bound direction in the afternoon peak period. This reflects the major employment areas located along the makai section of the roadway.

Traffic for 6:30-7:30 AM is shown along Kalaeloa Boulevard for morning peak hour in Figure 2-2. This period included a high volume of left turns (189 vehicles) from makai-bound Kalaeloa Boulevard onto Kapolei Parkway. This turn volume is higher later in the morning peak (7:00-8:00 AM) when the high volume of vehicles turning left resulted in the queue of vehicles stacking from the turn lane to the H-1 Freeway eastbound off-ramp. The long queue lasted for about 20 minutes starting a little after 7:30 AM. The highest traffic volumes in the morning period were recorded from 6:15 to 7:15 AM due to the through traffic on makai-bound Kalaeloa Boulevard intersection enroute to the Campbell Industrial Park area. However, no traffic problems were observed during this period.



Wilbur Smith Associates	KAPOLEI HARBORSIDE CENTER KAPOLEI, HAWAII	EXISTING MORNING PEAK HOUR TRAFFIC	FIGURE 2-2



Wilbur Smith Associates	KAPOLEI HARBORSIDE CENTER KAPOLEI, HAWAII	EXISTING AFTERNOON PEAK HOUR TRAFFIC	FIGURE 2-3

The highest one-hour traffic at the Kalaeloa Boulevard-Kapolei Parkway intersection in the afternoon period was recorded between 3:45 and 4:45 PM. Traffic volumes in this hour include both employees leaving work in both the Campbell Industrial Park and City of Kapolei areas as well as persons traveling to the City of Kapolei commercial area.

In the afternoon peak hour, approximately 400 vehicles turn left from mauka-bound Kalaeloa Boulevard onto the H-1 Freeway westbound on-ramp. This resulted in a long queue of vehicles waiting to turn left from this STOP sign-controlled approach to the intersection.

The traffic volumes at the Palailai Interchange are highest on the Westbound and Eastbound Off-ramps in the morning peak hour and higher for the Eastbound On-ramp in the afternoon peak hour. The highest volumes on the weaving section between the Eastbound Off-ramp to Farrington Highway and the Eastbound On-ramp from Kalaeloa Boulevard occur in the afternoon peak hour.

EXISTING TRAFFIC CONDITIONS

Traffic conditions were analyzed for the weekday morning and afternoon peak one-hour traffic volumes. The analyses were made for the key intersections near the Project site, and for the key H-1 Freeway ramps at the Palailai Interchange. The methodology and criteria used in analyzing the traffic conditions at the intersection and on the freeway are described in Appendix A.

Existing Intersection Conditions

The overall traffic conditions at each of the key intersections are summarized in Table 2-1 for the weekday morning and weekday afternoon peak traffic hours.

The traffic turning left from the STOP sign-controlled Kalaeloa Boulevard approach onto the Westbound On-Ramp at the Farrington Highway intersection experienced long delays in the weekday afternoon peak hour. The traffic analysis indicates an average delay of about 3 minutes per vehicle. Field observations noted the occasional formation of queues of up to 10-12 vehicles at times in the weekday afternoon peak hour. The average delays during the weekday morning and Saturday peak hours were at acceptable levels (LOS D).

The traffic turning left from the Eastbound Off-ramp onto mauka-bound Kalaeloa Boulevard turn into an additional lane that begins at this junction, with the median-divider makai of this intersection ending to allow room for the second mauka-bound lane from this intersection to Farrington Highway. The small number of vehicles turning left from the ramp experience only short delays (LOS B or C) while waiting for a gap in the makai-bound traffic.

Table 2-1
EXISTING TRAFFIC CONDITIONS AT KEY INTERSECTIONS

Intersections	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
	V/C	ADPV	LOS	V/C	ADPV	LOS
Kalaeloa Blvd.-Farrington Hwy Mauka-bound Left Turn	0.42	30.6	D	1.30	185.4	F
Kalaeloa Blvd.-EB Off-ramp Eastbound Left Turn	0.02	23.0	C	0.01	12.7	B
Kalaeloa Blvd.-Kapolei Pkwy	0.74	35.0	D	0.94	73.2	E
Kalaeloa Blvd.-Lauwiliwili St. (Mauka) WB Left-turn	0.02	29.4	D	0.05	58.8	F
Kalaeloa Blvd.-Opakapaka St. Westbound Left Turn	0.03	27.7	D	0.07	54.7	F
Kalaeloa Blvd.-Malakole St.	0.48	9.2	A	0.71	15.9	B
Hanua St.-Malakole St. Mauka-bound Left Turn	0.05	16.5	C	0.01	11.3	B

V/C = Ratio of the traffic volume to the theoretical capacity of the intersection.
ADPV = Average delay per vehicle, in seconds.
LOS = Level of service.

Wilbur Smith Associates; March 27, 2006.

The overall traffic conditions at the signal-controlled Kalaeloa Boulevard intersection with Kapolei Parkway were at very acceptable overall levels in the weekday morning peak hour with the morning peak hour traffic approximating 74% of the intersection capacity and the average delay for all traffic passing through the intersection at an acceptable LOS D. The afternoon peak hour volumes approximated 94% of the estimated intersection capacity with the primary conflict between the high volume of mauka-bound traffic and the makai-bound left-turn along Kalaeloa Boulevard. Long queues of mauka-bound traffic were observed to form on Kalaeloa Boulevard for short periods just after 4:00 PM, with the queue extending to Opakapaka Street.

Traffic turning left from both Lauwiliwili and Opakapaka Streets experience long delay in waiting for a gap in the through traffic along Kalaeloa Boulevard. The average delay in the afternoon peak hour is at LOS F. even with the median refuge/acceleration lane that is provided for these turns. However, the low volume of vehicles turning left would not satisfy the warrants for consideration of a traffic signal at either location.

The intersection of Kalaeloa Boulevard and Malakole Street operates at very acceptable levels of capacity usage and average delays.

Palailai Interchange Ramp Conditions

Existing traffic conditions were assessed for the weaving section of the eastbound H-1 Freeway ramps on the east side of the Palailai Interchange and for the merge/diverge sections of the Palailai Interchange ramps with the H-1 Freeway through lanes.

Eastbound Weaving Roadway between Kalaeloa Boulevard and Wakea Street – The HCS weaving analysis has limited applicability for collector-distributor roadways. The assessment was made to indicate the relative level of change in the traffic conditions along the 1,200-foot long, three-lane weaving section for the single-lane exit from the freeway (Ramp PC) and the two-lane ramp from Kalaeloa Boulevard (Ramp PC-1). The off-ramp traffic must cross through the Kalaeloa Boulevard traffic to reach the lanes exiting to Wakea Street while almost all of the Kalaeloa Boulevard traffic must weave through the off-ramp traffic to access the lane exiting the weaving roadway onto the eastbound freeway.

The resulting traffic density indicates that the weaving section provides very acceptable LOS B conditions in the morning peak hour with the much higher weaving volumes in the afternoon period indicating acceptable LOS C conditions. The afternoon weaving volume amount to about 40% of the estimated capacity for the weaving section. The HCS 2000 warns that three-lane weaving sections with volume-to-capacity ratios of 0.45 or greater may encounter operational problems due to the limited usefulness of the third lane. Existing afternoon peak hour volumes are approaching this level.

Palailai Interchange Ramp Junctions with Freeway Lanes – Each on-ramp merge or off-ramp diverge area along the freeway was analyzed using HCS 2000, with the results summarized in Table 2-3. Eastbound On-ramp KC-1 from the Eastbound Weaving Roadway and westbound Off-ramp PD to Kalaeloa Boulevard are not included in the analysis since freeway through lanes are added or reduced via these ramps.

Table 2-2
2005 WEAVING SECTION TRAFFIC CONDITIONS

Peak Hour	Average Speed (mph)			Density (vplph)	Level of Service
	All Traffic	Non-Weave	Weaving		
Eastbound Separate Weaving Roadway Kalaeloa Blvd.-Wakea St. (Existing)					
Morning	29.5	42.5	29.2	11.1	B
Afternoon	25.5	37.6	25.0	23.0	C

vplph = vehicles per lane per hour

Wilbur Smith Associates; March 28, 2006

The HCS analysis estimates the average vehicle density and travel speeds along the 1,500-foot section of freeway through lanes affected by traffic entering or exiting the freeway, with the density also used to identify the level of service within this ramp influence area along the freeway mainline. The analysis is made for the two outside lanes that are most directly affected by the traffic entering/exiting the ramps and, for sections with three or more through freeway lanes, the conditions in the other lanes that are less affected by the ramp traffic.

LOS C or better conditions are estimated for each of the ramp merge/diverge areas for the Palailai Interchange for both peak hours. The merge or diverge of each of the ramps with the freeway through lanes presently operate at very acceptable densities and with little impact on traffic speeds. .

Traffic conditions are not presented for the junction of On-ramp KC-1 from Kalaeloa Boulevard since it joins the eastbound freeway as an added through lane and no merge maneuver is necessary. The on-ramp from the Eastbound Weaving Roadway has an estimated potential capacity of about 2,100 vehicles per hour. The afternoon peak hour volumes amount to about one-half of the capacity.

Table 2-3
TRAFFIC CONDITIONS ALONG FREEWAY AT RAMP MERGE AND DIVERGE AREAS

Ramp Junction	Peak Hour	Average Speed (mph)		Traffic Density (vplph)	Level of Service
		Near Ramp	Other Lanes		
Eastbound Freeway					
Off-ramp PB to Kalaeloa Blvd.	AM	50.8	NA	20.4	C
	PM	50.9	NA	20.3	C
Off-ramp PC To EB Weaving Roadway	AM	50.4	NA	17.8	B
	PM	50.6	NA	18.8	B
Westbound Freeway					
On-ramp PA from Kalaeloa Blvd.	AM	51.1	NA	14.9	B
	PM	50.6	NA	23.2	C

Near Ramp is the 1,500-foot section of the 2 lanes closest to ramp.
Other lanes are lanes closest to median if 3 or more lanes on freeway.
Vplph = vehicles per lane per hour for 2 lanes near ramp.
Level of Service is for 2 lanes near ramp.

Wilbur Smith Associates; March 28, 2006

Similarly, the westbound freeway drops from three lanes to two lanes with the drop of the outside lane as the entry to the loop Off-ramp PD. This off-ramp for westbound traffic exiting from the H-1 Freeway to Kalaeloa Boulevard and Farrington Highway has an estimated capacity of about 1,800 vehicles per hour. The morning peak hour volume of just over 900 vehicles amounts to about half of the potential ramp capacity.

PUBLIC TRANSPORTATION

The City and County of Honolulu provides public transportation services to the areas adjacent to the Kapolei West development area. These include a number of TheBus fixed route bus service that pass near the project site. TheHandiVan provides door-to-door service for persons who have difficulty in accessing the fixed route service.

TheBus Routes – The existing bus routes that provide service near the Kapolei Harborside Center project site include the following:

Route C Country Express – Route C provides an express/limited stop service through the City of Kapolei area, with the route extending to the Honolulu Downtown area and Ala Moana Center to the east and along the Waianae Coast to Makaha to the west. The service operates seven days a week from about 4:30 AM to 11:00 PM. Route C uses Kalaeloa Boulevard between the H-1 Freeway and the Kapolei Parkway.

Route 40 Honolulu-Makaha – This trunk route provides regular bus service along the same general route as Route C. Within the City of Kapolei, it provides service along surface streets between the Makakilo and Palailai Interchanges, with the route using Makakilo Drive, Farrington Highway, Kamokila Boulevard, Kapolei Parkway, and Kalaeloa Boulevard. Service is provided seven days a week from about 5:00 AM to 9:30 PM.

Route 413 Campbell Industrial Park – This local route provides service from the Kapolei Transit Center to the Campbell Industrial Park and Barbers Point Harbor areas, with the route using the Kapolei Parkway and Kalaeloa Boulevard. The route operates from 5:30 AM to 8:00 AM and from 3:00 PM to 6:00 PM.

Kapolei Transit Center – The City and County of Honolulu has recently completed development of a Transit Center on the alignment of the future extension of Wakea Street mauka of Kamokila Boulevard. The Transit Center provides a transfer site for all of TheBus local and regional routes that serve the City of Kapolei and the surrounding communities.

BICYCLES AND PEDESTRIANS

Bicycle lanes are provided along the block of Kapolei Parkway between Kamokila and Kalaeloa Boulevards. Along the other major roadways, bicycles either use paved shoulder areas, wide outside lanes, or travel within the regular traffic lane.

Sidewalk facilities are provided along both sides of the Kapolei Parkway, and along Lauwiliwili and Opakapaka Streets. No sidewalks are provided along Kalaeloa Boulevard between Malakole Street and the freeway, nor the section of Malakole Street near the Kalaeloa Boulevard intersection.

Chapter 3
2018 CONDITIONS WITHOUT PROJECT

Future travel on the area roadways without the Kapolei Harborside Center development (the Project) was forecast by estimating traffic to/from new developments in the City of Kapolei and Kalaeloa Boulevard corridor, and then adding these new trips to the existing travel volumes. Traffic was also forecast to/from new development anticipated in the other areas near the study corridor that would travel through the Project area. The overall methodology used to estimate future traffic for years 2018 without the Project was as follows:

- Estate of James Campbell staff provided the location, type and general timing of future development in the City of Kapolei and Kalaeloa Boulevard corridor.
- The property owners and/or developers in the areas near the City of Kapolei were contacted to identify the general description and timing of additional development in those areas.
- Wilbur Smith Associates (WSA) staff estimated the peak hour vehicle trip generation for each of the potential developments.
- The origin/destination of trips for the new developments were based on the trip distribution for the Kapolei area as developed from the OMPO regional model.
- The traffic to/from each of the new developments was assigned to the area roadway system using a TRAFFIX traffic model.
- An annual growth factor was used to increase through traffic along the H-1 Freeway.

Traffic conditions were then analyzed for the key intersections and roadways that would be affected by traffic generated by the Kapolei Harborside Center Project.

FUTURE DEVELOPMENT ASSUMPTIONS

Most of the lands within the City of Kapolei and the zoned properties along Kalaeloa Boulevard are expected to be developed and fully occupied by 2018. Substantial additional development is also expected to occur in the areas near the City of Kapolei by 2018.

Additional Development Along the Kalaeloa Boulevard Corridor

Most of the vacant lands that have already received zoning approval from the City and County of Honolulu are expected to be fully developed by 2018. In addition, development was assumed to be underway on several planned projects that have not yet received full zoning approval, such as the planned Kapolei West and Makaiwa Hills developments. The additional development in the corridor between 2006 and 2018 reflected in the traffic forecasts include the following:

Kapolei Business Park – Full development is anticipated for both the Phase 1 and Phase 2 areas of the Kapolei Business Park by the end of 2018. The remaining developable area amounts to:

Approximately 67 acres in the Phase 1 area
About 46.4 acres in the Phase 2 area.

Traffic was estimated based on the trip rates for industrial parks, which includes a mix of light manufacturing, distribution, warehousing, and services businesses, with ancillary office space.

I-2 Zoned Lands West of Kalaeloa Boulevard – A 125-acre strip of vacant lands along the west side of Kalaeloa Boulevard have previously been zoned for I-2 types of land uses. This strip extends from existing Kalaeloa Boulevard west to the planned alignment of the Hanua Street Extension, and from the OR&L track line makai to about 1,000 feet south of the future alignment of the Lauwiliwili Street extension to the Barbers Point Harbor.

The I-2 lands should provide about 110 acres of development area after providing for major through roads and other infrastructure. Traffic for the area north of the makai extension of Lauwiliwili Street was estimated based on the trip rates for industrial parks, which includes a mix of light manufacturing, distribution, warehousing, and services businesses, with ancillary office space. A film studio has been proposed for the approximately 25-acre portion makai of Lauwiliwili Street, with the number of vehicles trips for that area being based on the proposed studio development.

Kapolei Commons – The full mixed-use commercial development is planned for full occupancy around 2010. Current plans are to include the following uses:

Retail uses, including a discount store	490,000 square feet of building space
Movie theater complex	2,000 seats
Office uses	50,000 square feet of building space
Residential condominiums	300 units

Primary access would be to the Kapolei Parkway with secondary access to Hanua Street and Kalaeloa Boulevard.

Kapolei West – The planned Kapolei West residential area extends along both sides of the future Kapolei Parkway from the Advertiser site to the Ko Olina area. The area is proposed to include development of about 1,253 residential units in lands that have been approved for urban development and 1,117 units in lands that have been petitioned for urban development. The Kapolei West project would also include a golf course and a middle school, as well as a transit mixed used development located just west of the Advertiser. The project is planned for build-out by 2020.

The 2018 traffic forecasts reflect the completion of 2,008 of the planned 2,370 residential units as well as the golf course, middle school, and all of the commercial development.

Makaiwa Hills Development - A representative of the potential developer for this area indicated that preliminary plans are to develop approximately 4,100 housing units with an emphasis on

single-family homes. The developer plans to begin occupancy of units in 2009, with completion of the development projected for 2020, for an average of about 350 housing units per year. For 2018, it was estimated that the development would include approximately 3,400 residential units as well as completion of about 370,000 square feet of commercial building floor area.

The potential developer has indicated it would like to rely on an extension of Kalaeloa Boulevard for initial access. The longer range plans indicate additional access points to Farrington Highway east and west of the existing Honokai Hale and Nanakai Gardens residential areas. The 2018 traffic forecasts were based on the connection to the mauka end of Kalaeloa Boulevard as well as the construction of a Makaiwa Hills interchange with Farrington Highway to the east of Honokai Hale.

Campbell Waterfront Industrial Area – There is approximately 80 acres of zoned industrial lands located along Malakole Street southeast of Barbers Point Harbor. Approximately 30 acres of the area was assumed to be developed for heavy industrial uses by 2018.

Barbers Point Harbor - The Harbors Division of the State DOT indicated that there is approximately 160 acres of undeveloped land at the Harbor. WSA assumed that the development of these areas would continue to produce the same rate of traffic growth as experienced along Malakole Street near the Harbor in recent years (about 2.2% per year). This uniform rate of development and traffic growth would result in the following numbers of new vehicle trips to/from the Barbers Point Harbor:

By Yearend of	Morning Peak Hour			Afternoon Peak Hour		
	To	From	Total	To	From	Total
2018	162	38	200	52	110	162

Development Within City of Kapolei

The entire central area of the City – between Fort Barrette Road and Kalaeloa Boulevard – is expected to be completed and occupied by the 2018 forecast year. Where there are no specific plans as yet, the Campbell Estate staff has identified the types of uses anticipated for the vacant properties. The anticipated developments are listed in the following:

- **Kapolei Public Library** – Completion of the book/periodical distribution and storage area.
- **Kapolei Park Square** – Development of the 2-acre vacant parcel at the south end of Kapowai Place with office space.
- **Kapolei Senior Village** – Full occupancy of the retirement village is planned for the 40-acre area along the west side of Fort Barrette Road between the future Kamaaha Avenue and Kapolei Parkway.
- **Island Pacific Academy** – The second phase of the private school is under construction on block on the southeast corner of Haumea and Wakea Streets. The school is planned to expand from the present enrollment of 200 to 900 students by 2009.
- **Kamokila Blocks between Wakea and Uluohia Streets –** These two blocks on the makai side of Kamokila Boulevard are expected to be developed with a mix of restaurant, retail, and office uses in the next several years.
- **Kapolei Power Center** – The remaining portions of the site are expected to be developed with a mix of retail, restaurant, and office uses.
- **Costco** – A Costco store and service station is planned for the parcel on the southeast corner of the intersection of Kalaeloa Boulevard and the Kapolei Parkway.
- **Kapolei Mauka Residential Area –** A townhouse development is planned for the area just mauka of the H-1 Freeway on the west side of Makakilo Drive with about 350 townhouses. Access would be provided to the Mauka Frontage Road.
- **Kapolei Rezoning Parcel 1** – Full development of the other undeveloped areas along Kamokila Boulevard, Kamaaha Avenue and the Kapolei Parkway is anticipated to include a mix of office, commercial, and residential uses.
- **Kapolei Rezoning Parcel 2** – This retail development, located makai of the Hawaiian Water Adventures Park, is expected to include retail uses.
- **Kapolei Rezoning Parcel 3** – The commercial development located on the northeast corner of the intersection of Farrington Highway and Makakilo Drive is expected to be developed with a shopping center, potentially including a discount store.

Traffic to/from each of these developments is included in the forecast yearend 2018 volumes.

Developments Near the City of Kapolei

Additional development, or occupancy of previously completed development, is expected in several areas that would directly add traffic on the roadways and through the key intersections that are the subject of this study. The amount of development was estimated for most of these areas from telephone discussions with representatives of either the developer or property owner.

Makakilo Development - Contacts with Schuler Homes and GE Capital Hawaii indicated that most of the Makakilo area should be developed by 2010. The new development is expected to add:

- 674 single-family homes
- 236 apartments.

Villages of Kapolei and Kapolei Knolls – D. R. Horton Schuler Division and the Housing and Community Development Corporation Hawaii (HCDCH) indicated that Kapolei Knolls and most of the Villages areas should be developed by 2010, with some development possibly extending beyond 2010. All of the area is expected to be developed by the end of 2018. An estimate of the remaining housing units in Kapolei Knolls was provided by Schuler Homes. For the Villages of Kapolei, HCDCH provided the acreages and types of uses for the remaining undeveloped areas, while the numbers of housing units of each development were estimated by WSA.

Kalaeloa Redevelopment Area - Based on discussions with the Hawaii Community Development Authority (HCDA) and the Department of Hawaiian Home Lands (DHHL), very limited additional development was assumed to occur in the near term due to the availability and competition from other development areas, as well as the uncertainties regarding the potential return of Navy airfield uses.

WSA assumed that approximately one-half of the development included in the OMPO regional forecasts for year 2030 would occur by the end of 2018. This included partial development of the "downtown" commercial/residential area and other residential areas, as well as development of the regional park areas.

Ko Olina Development - Representatives of the Ko Olina Community Association and the Marriott Corporation were contacted regarding the planned general type and timing of development for the Ko Olina area. Based on available information and these discussions, WSA estimated the following levels of new development by 2018:

- 1,290 new hotel rooms
- 540 new timeshare units
- 60 additional single-family homes (Centex)
- 390 additional townhouses (Coconut Plantation and Centex)
- 174 additional low density houses (across from Fairways Villas)
- 110 additional medium density houses
- Aquarium

GROWTH OF H-1 FREEWAY THROUGH TRAFFIC

A growth factor was applied to existing traffic volumes on the H-1 Freeway to reflect increased travel to/from the Waianae Coast areas west of Ko Olina. The growth factor was determined from the traffic counts for the State DOT count station located on the H-1 Freeway west of Makakilo Drive (count station #H10-A). The historic counts indicated an average annual growth rate of 0.8% per year between January 1999 and January 2002.

The 0.8% annual growth rate was assumed to continue through the study period. With this rate, the 2005 freeway volumes are estimated to increase 10.9% by 2018. These volumes are further increased by the forecast trips to/from the new development within and near the City of Kapolei as identified in the preceding sections of this chapter.

PLANNED ROADWAYS

A number of transportation projects have been planned for the Ewa District that would affect travel to and within the City of Kapolei. Most of these projects have been identified and/or confirmed through the Oahu Metropolitan Planning Organization (OMPO) transportation

planning process[1], as well as the Ewa Highway Impact Fee Program studies and plans[2]. The OMPO process assesses the long-range transportation needs to serve forecast travel over the next 20 or more years, but also selects a high-priority short list of projects and programs for funding within the next three years as covered by the its adopted Transportation Improvement Program (TIP). The Ewa Highway Impact Fee Program (Ewa HIFP) addresses the travel needs through 2010 and establishes a developer-funded source to pay for 20% of the regional roadways needed in the Ewa District.

A number of roadway improvements are anticipated by the year 2018 analyses years, either as regional highway improvements are as part of area developments. The roadway improvements assumed to be in place *without* the Kapolei Harborside Center development are discussed in the following sections.

Roadway Improvements within the Study Corridor

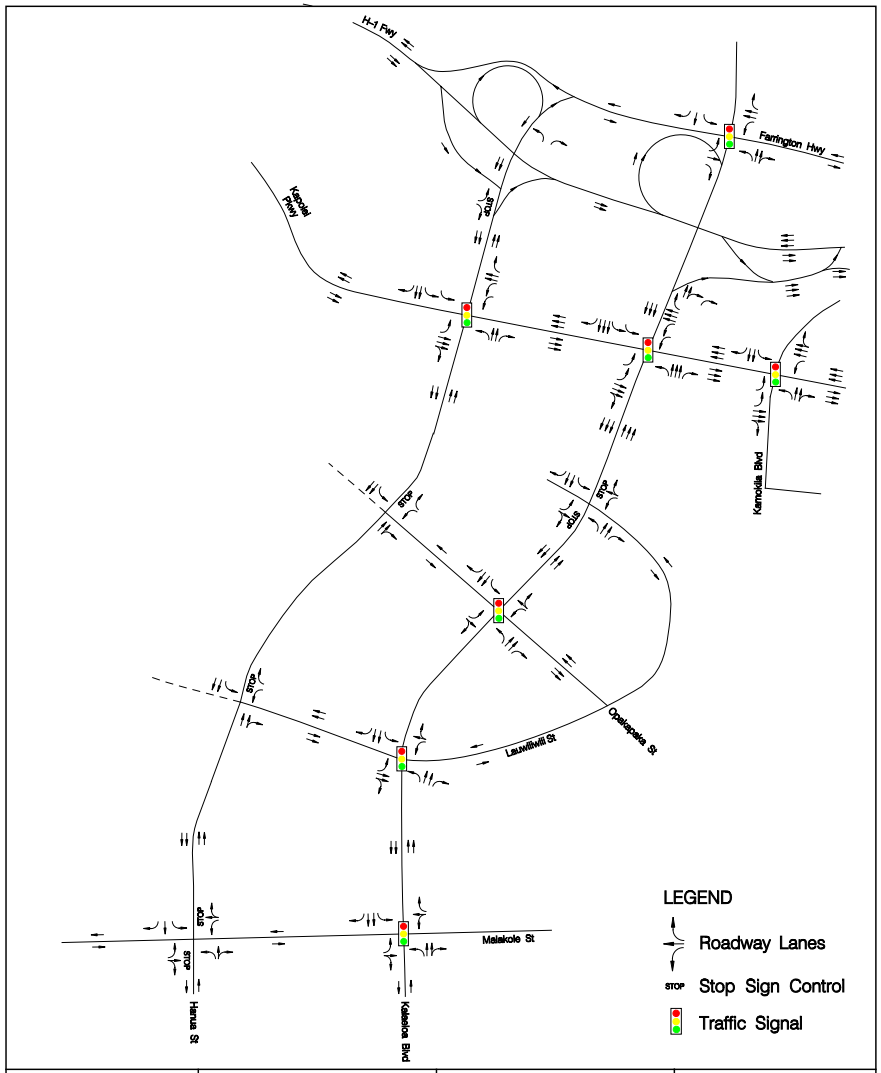
The planned changes to the Palailai Interchange, the widening of Kalaeloa Boulevard to a six-lane roadway, construction of the Hanua Street Extension, and the connection of the Kapolei Parkway between Fort Barrette Road and Kalaeloa Boulevard are the key area roadway improvements anticipated in the Kalaeloa Boulevard corridor during the 2006-2018 period. For the purposes of the Kapolei Harborside Center traffic analyses, it is assumed that the section of the Lauwiliwili Street Extension through the Project lands between Hanua Street Extension and the Harbor would not be completed by 2018 unless the Project is developed within this time frame.

The anticipated roadway network and numbers of traffic lanes near the Project site in 2018 are depicted in Figure 3-1. Descriptions of those roadway improvements that most directly affect the Kapolei Harborside Center area are included in the following paragraphs.

Kalaeloa Boulevard Improvements - The section of Kalaeloa Boulevard between the Palailai Interchange and Malakole Street is planned for improvements in the TOP 2025. This is expected to include the widening of a portion or all of this segment to a six-lane roadway with median and turn lanes, as well as the elimination of the grade differential between the northbound and southbound lanes between Opakapaka and Malakole Streets to allow full intersections to be constructed along this section.

The mauka section between the OR&L tracks and the Palailai Interchange ramps is planned for widening to six lanes in conjunction with the Kapolei Commons development. This would also include the provision of double left-turn lanes on both Kapolei Parkway approaches and on the southbound Kalaeloa Boulevard approach. A separate right-turn lane would be added to northbound Kalaeloa Boulevard at the intersection.

[1] *Transportation for Oahu Plan, TOP 2025*, prepared for OMPO by Carter-Burgess, April 6, 2001.
[2] *Ewa Highway Impact Fee Program*, prepared for State of Hawaii Department of Transportation by Kaku Associates, Inc. July, 2002.



Wilbur Smith Associates	KAPOLEI HARBORSIDE CENTER KAPOLEI, HAWAII	2018 ROADWAY LANES AND TRAFFIC CONTROLS WITHOUT PROJECT	FIGURE 3-1

The section of Kalaeloa Boulevard between the OR&L track line and Malakole Street would be improved to City and/or State standards in conjunction with the development of the I-2 lands along the west side of this section. For the purpose of this study, it is assumed that the upgrade would not include widening to six lanes to assess whether this widening would be necessary within this time frame. The improvement is assumed to include the upgrade of pavement, elimination of the grade differential between the two travel directions to permit full intersections, and the provision of sidewalks.

Kapolei Parkway – The section of the Kapolei Parkway between Kalaeloa Boulevard and the Hanua Street Extension alignment is expected to be completed by 2009 in conjunction with the Kapolei Commons development. This section would be constructed as a six-lane divided roadway with separate turn lanes.

The Kapolei Parkway is planned for westward extension to connect to Aliinui Drive in Ko Olina as the Kapolei West project is developed, with completion expected before 2015. The connection is planned as a four-lane roadway with a landscaped median and turn lanes at cross streets and major driveways.

The existing one-block section between Kalaeloa and Kamokila Boulevards is planned for widening to six lanes which is assumed to occur by 2018.

Hanua Street Extension and Palailai Interchange Modifications – Hanua Street is an existing two-lane mauka-makai roadway within the Campbell Industrial Park parallel to and one block west of Kalaeloa Boulevard, with the present street ending at Malakole Street. The TOP 2025 plans include the extension of existing Hanua Street mauka to connect to the future Kapolei Parkway and to the Palailai Interchange. The Hanua Street Extension would likely be constructed as a four-lane roadway with landscaped median and separate turn lanes at the major cross streets.

The project would include the reconstruction of the Palailai Interchange to provide an eastbound on-ramp to the freeway, and provide an overpass to connect Hanua Street to the westbound on-ramp to the freeway and to a new loop off-ramp from the westbound freeway lanes. To provide adequate merging distance for the Hanua Street eastbound on-ramp traffic, the existing eastbound off-ramp connection to Kalaeloa Boulevard would be removed and this movement accommodated by the construction of a new eastbound off-ramp connection to the Hanua Street Extension.

The Palailai Interchange modifications and the construction of Hanua Street between the Interchange and Malakole Street are expected by the 2018 analysis year.

Malakole Street Connection – The master plan[3] for the Kalaeloa Redevelopment Area (former Barbers Point NAS lands) include the extension of the east end of Malakole Street into the redevelopment area to connect with the major roadways planned within that area. Telephone

[3] *Kalaeloa Master Plan*, prepared for Hawaii Community Development Authority by Belt Collins et al, March 1, 2006.

discussions with Stanton Enemoto of the Hawaii Community Development Authority (HCDA) staff[4] indicated this extension is one of the highest priority roadway improvements within the redevelopment area and should be completed early in the Phase 1 improvements, which are planned from 2007 to 2015. The extension would use the existing culvert crossing of the major drainage channel that forms the west boundary of the Redevelopment Area, but would require right-of-way from the private business located just west of the drainage channel. Mr. Enemoto indicated that Malakole Street would likely remain a two-lane roadway during this initial connection, with the existing roadway improved to standards and turn lanes added at key cross streets and driveway connections.

Lauwiliwili Street Extension – The existing 2-lane collector street within the Kapolei Business Park Phase 1 area will be extended makai through the Phase 2 area to connect to Kalaeloa Boulevard as part of the Phase 2 development.

As part of the I-2 area development, the makai end of Lauwiliwili Street will be extended west of Kalaeloa Boulevard to the Hanua Street Extension. This section would be constructed as a four-lane roadway with median divider and left-turn lanes at cross streets. Lauwiliwili Street is planned for extension westward to provide the primary access route to the Barbers Point Harbor, with this extension expected to be constructed by the State DOT. However, State DOT would expect right-of-way to be transferred from Kapolei Harborside Center Project lands for the roadway extension to the Harbor. Therefore, this extension is unlikely to be completed without the approval and development of the Kapolei Harborside Center lands that the roadway would be built upon, and thus the section of the Lauwiliwili Street Extension west of Hanua Street is not included within the roadway system without the Project.

Opakapaka Street Extension – This collector street is planned for extension to and westward from the Hanua Street Extension. The section between Kalaeloa Boulevard and the Hanua Street Extension would be constructed as a two-lane roadway as part of the I-2 development. The section west of Hanua Street would be constructed with the development of the Kapolei Harborside Center lands.

The City Department of Planning and Permitting (DPP) have required the developer of the Kapolei Business Park (KBP) Phase 1 area to construct a street within the Phase 2 area paralleling the existing section of Opakapaka Street. The City expects to have this new KBP 2 area street extended southward to connect to Malakole Street. Extension of Opakapaka Street southward would require the taking of the KBP 1 property between the south end of the street and the property line for the Hawaii Raceway Park. This new street, referred to as KBP Road C, may eventually be extended west in lieu of Opakapaka Street. For the purposes of this analysis, it is assumed that Opakapaka Street continues as the east-west collector street. If Road A is actually extended, then the traffic volumes forecast for Opakapaka Street would actually use Road C.

[4] Telephone conversation with Stanton Enemoto, March 16, 2006.

Other Roadway Improvements near the Study Corridor

Several other key roadway improvements are anticipated by 2018 that would affect area circulation. These are expected to include the extension of the Kapolei Parkway between Kalaeloa Boulevard and Ko Olina, a new Makaiwa Hills interchange with Farrington Highway to serve the Makaiwa Hills development, and the construction of new roadways within the Kalaeloa Redevelopment Area. Descriptions of the roadway improvements that most directly affect the Kalaeloa Boulevard corridor are included in the following paragraphs.

Kamokila Boulevard Extension – The extension of Kamokila Boulevard southward from the Kapolei Parkway to connect to Roosevelt Avenue within the Kalaeloa Redevelopment Area is planned for completion by 2010. The extension would provide a four-lane median-divided roadway similar to existing Kamokila Boulevard. This roadway would divert some of the traffic between the Fort Weaver Road and Kalaeloa Boulevard corridors from traveling through the City of Kapolei commercial area along Kamokila Boulevard, Farrington Highway, and Fort Barrette Road.

Saratoga Road – The existing roadway within the Kalaeloa Redevelopment Area is planned for extension to connect to Geiger Road east of the Redevelopment Area, and to Lauwiliwili Street. The section within the former base is planned for realignment and widening to create a continuous major four-lane roadway linking the Fort Weaver Road and Kalaeloa Boulevard corridors south of and parallel to the Kapolei Parkway.

HCDA staff indicates that the section from the Kamokila Boulevard Extension to Geiger Road will be a high priority improvement and should be completed by 2015. However, the section crossing the major drainage canal along the west boundary of the Redevelopment Area and the right-of-way acquisition necessary in the KBP 1 area would make the connection at the west end expensive. The high cost may delay this connection until after 2018 and thus it is not reflected in the routing of traffic for this study.

Wakea Street Extension – Wakea Street is being extended south through the Mehana at Kapolei residential development for possible connection to Roosevelt Avenue. The Kalaeloa Redevelopment Area master plan envisions the extension of Wakea Street through the area to connect to Malakole Street. HCDA staff expects that Wakea Street may be connected to Roosevelt Avenue as part of their Phase 1 roadway improvements (2015), but the section connecting through to Malakole Street may occur between 2016 and 2030. Therefore, the study reflects an indirect connection between Malakole and Wakea Streets using Roosevelt Avenue and other local collector streets.

Kapolei Interchange - A new interchange is planned for construction between the Makakilo and Palailai Interchanges to increase the access between the City of Kapolei and the H-1 Freeway. The interchange would initially connect to existing Wakea Street, but in the future it would also connect to the planned Mauka Frontage Road along the mauka side of the freeway. The new interchange is included in the Ewa HIFP for 2010. Funds are allocated to the project for the planning and environmental process in the current TIP.

The Kapolei Interchange is planned to provide additional on- and off-ramps for travel to/from the Honolulu direction of the H-1 Freeway. The existing Farrington Highway connection across the Freeway west of the Kamokila Boulevard intersection would be abandoned and access provided via the Wakea Street Extension to the existing Waianae side on- and off-ramps.

Makakilo Interchange Westbound On-Ramp - A westbound on-ramp and an eastbound off-ramp are planned for the Makakilo Interchange to reduce traffic circulation through the City of Kapolei. Traffic between the Villages of Kapolei and Makakilo areas must currently travel through the City of Kapolei on Farrington Highway to access the H-1 Freeway at the Palailai Interchange for travel to/from areas west of the City of Kapolei. The new ramps are included in the OMPO long-range plan and within the Ewa HIFP. The Aina Nui Corporation recently approved funding for the design and construction of a westbound on-ramp for this interchange, which is assumed to be completed and open to traffic by 2010. This ramp would reduce the volume of westbound traffic along Farrington Highway through the Kalaeloa Boulevard onto the westbound on-ramp at the Palailai Interchange.

Makaiwa Hills Interchange – This planned new interchange would be located east of the Honokai Hale community. It is planned as a diamond-type interchange that would connect to and serve the Makaiwa Hills community. Past plans for the new connecting roadway between the interchange and the Makaiwa Hills community did not include any extension of the roadway makai of Farrington Highway to the Kapolei Parkway. Road D in the Kapolei West Project is planned to connect to the Makaiwa Hills Interchange to provide access to Farrington Highway/ H-1 Freeway. The interchange and this Road D connection are reflected in this study.

Kapolei Parkway – The section of the Kapolei Parkway between Fort Barrette Road and Kamokila Boulevard is expected to be completed by 2015, which would both improve east-west traffic circulation through the City of Kapolei and provide improved access to the new development within the City of Kapolei. The connection is planned as a six-lane roadway with a landscape median and turn lanes at cross streets and major driveways.

PUBLIC TRANSPORTATION

The City and County of Honolulu provides public transportation services along Kalaeloa Boulevard near the Kapolei Harborside Center development area. These include a number of TheBus fixed route bus routes from the Palailai Interchange into the City of Kapolei and one community shuttle route (413) from the Kapolei Transit Center to the Campbell Industrial Park. TheHandiVan provides door-to-door service for persons who have difficulty in accessing the fixed route service.

TheBus Routes – The bus routes for the area are expected to be modified to increase coverage west of the Kapolei area as development occurs in new areas, and service increased as the employment and number of residents increase. Candidates for new TheBus fixed-route service would include:

- The section of Kapolei Parkway between Kalaeloa Boulevard and Ko Olina once this extension has been completed
- Malakole Street into the Kalaeloa Redevelopment Area to provide connections to the City of Kapolei via Wakea Street and/or Fort Barrette Road
- Malakole Street into the Kalaeloa Redevelopment Area to provide connections to the Fort Weaver Road corridor via Saratoga and Geiger Roads
- The completed section of the Hanua Street Extension and Lauwiliwili Street.

Kapolei Transit Center – The Transit Center will be relocated when the Kapolei Interchange is constructed, as the extension of Wakea Street will be used to connect the City of Kapolei to the new interchange. The new Transit Center is planned for a site along Kapolei Parkway near Kamaaha Avenue.

A second transit facility is planned for the area immediately west of the Advertised facility. This second facility would provide a transfer center between area routes and would be implemented in conjunction with the Kapolei West development.

2018 PEAK HOUR TRAFFIC FORECASTS

The weekday peak hour traffic volumes were forecast for 2018 without the Kapolei Harborside Center development based on the new developments and roadways described in the preceding sections.

Trip Generation

The numbers of vehicle trips generated by the new development within and near the City of Kapolei were based on standard trip rates compiled by the Institute of Transportation Engineers (ITE).[5] The vehicle trip generation rates and estimated vehicle trips for the various areas and types of developments are presented in Appendix B.

The numbers of vehicle trips entering or exiting a commercial development include both new vehicle trips and additional stops by vehicles that would be traveling through the area whether or not the Project is developed. These additional stops by traffic passing the site to use the retail and services uses are referred to as "pass-by trips," which do not represent additional trips on the adjacent roadway, but do result in additional turns into and out of the development driveways by vehicles that would be passing by that site. The ITE *Trip Generation Handbook*[6] provides a methodology and pass-by rates for estimating the proportion of the Project vehicle trip ends that are pass-by trips. Pass-by trip factors are usually applied only to the afternoon peak hour since

[5] *Trip Generation, Sixth Edition*, Institute of Transportation Engineers, 1997.
[6] *Trip Generation Handbook, An ITE Proposed Recommended Practice*, Institute of Transportation Engineers, October 1998.

many retail and service businesses are not open or have low rates of trip generation during the morning peak hour. For the commercial uses, Appendix A lists the total number of vehicles entering and exiting the land use and also lists the number of "new" vehicle trips on the area roadways generated by the land use in the afternoon peak hour, excluding the pass-by trips.

The anticipated growth within the City of Kapolei by 2018 would increase the morning peak hour trips by about 5,400 trips, and the afternoon peak hour by about 7,500 new trips on area roadways. With the predominantly commercial uses, the majority of the trips in the morning peak hour are traveling to the City of Kapolei land uses, and in the afternoon the majority of trips are departing these uses.

By 2018, the new development near the City of Kapolei (Ko Olina, Kapolei Business Park, Villages of Kapolei, etc.) is estimated to generate an increase of about 8,800 and 10,900 new vehicle trips in the morning and afternoon peak hours, respectively.

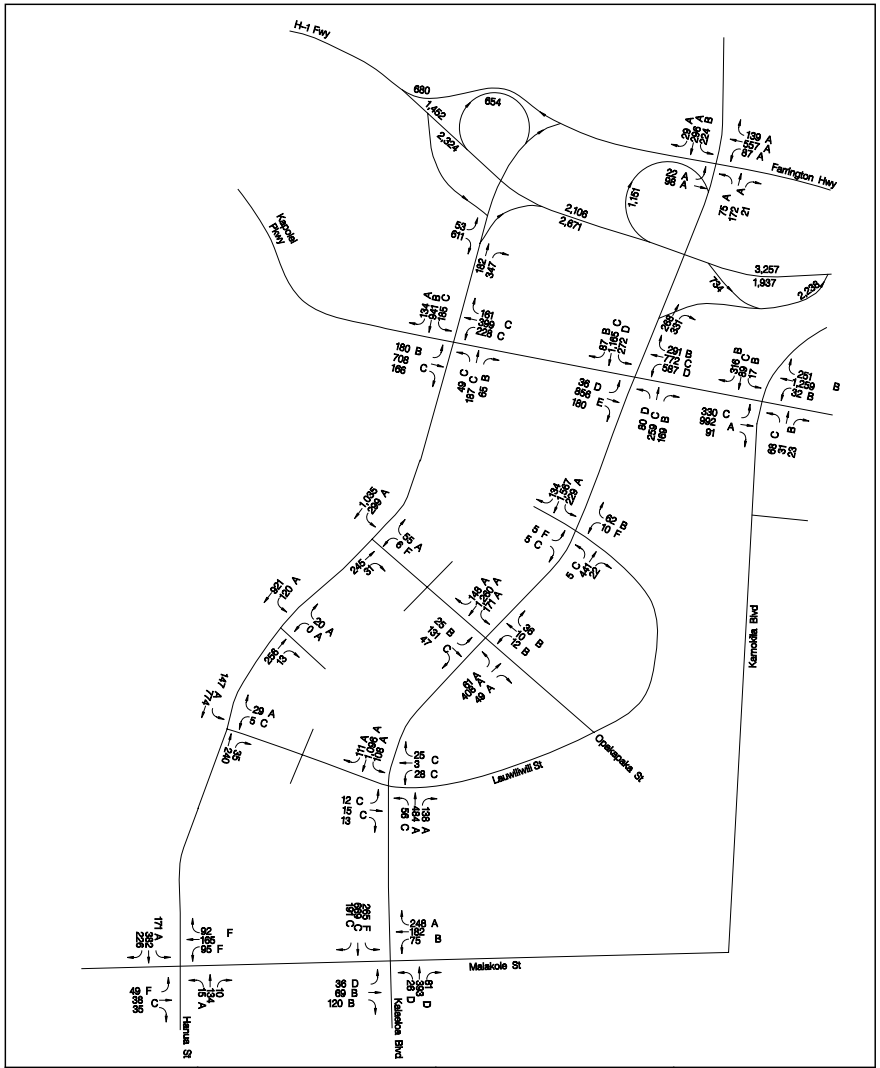
2018 Peak Hour Traffic Volumes

The origins and destinations of the additional vehicle trips were based on OMPO forecast data and assigned to the roadway system. The forecast 2018 weekday traffic volumes without the Kapolei Harborside Center development are depicted in Figures 3-2 and 3-3 for the morning and afternoon peak traffic hours, respectively. The forecasts are based on the Hanua Street Extension being open from Malakole Street to the Palailai Interchange, and the completion of the Palailai Interchange. The extension of Lauwiliwili Street Makai to the Harbor is not constructed without the development of the Kapolei Harborside Center project lands on which this section would be constructed, with Harbor trips continuing to use Malakole Street.

The forecast traffic volumes reflect several other roadway improvements that would change the present circulation patterns. The planned Kapolei Interchange will divert some traffic that currently uses the Palailai Interchange and Kalaeloa Boulevard to access the City of Kapolei. However, the eastward extension of the Kapolei Parkway to Fort Barrette Road and westward extension from Kalaeloa Boulevard to Ko Olina will increase traffic volumes along the Kapolei Parkway through the Kalaeloa Boulevard corridor. The connection of Malakole Street to the roadways within the Kalaeloa Redevelopment Area will allow some of the traffic to/from the Kalaeloa Boulevard corridor to travel through the Redevelopment Area to/from the Fort Weaver Road corridor, the City of Kapolei, and the Villages of Kapolei areas, thus reducing the traffic increases along the mauka section of Kalaeloa Boulevard.

The net result of the area growth and the roadway changes is projected to increase traffic volumes along the section of Kalaeloa Boulevard between the H-1 Freeway and the Kapolei Parkway by about 55% and 76% in the morning and afternoon peak hours, respectively, as compared to the 2006 traffic volumes. The volume of traffic on the parallel connection of the Hanua Street Extension to the freeway ramps would total approximately 1,790 and 1,720 vehicles in the morning and afternoon peak hours, respectively.

Traffic volumes along the section of Hanua Street just makai of the Kapolei Parkway would total approximately 1,630 and 1,520 vehicles in the morning and afternoon peak hours, respectively.

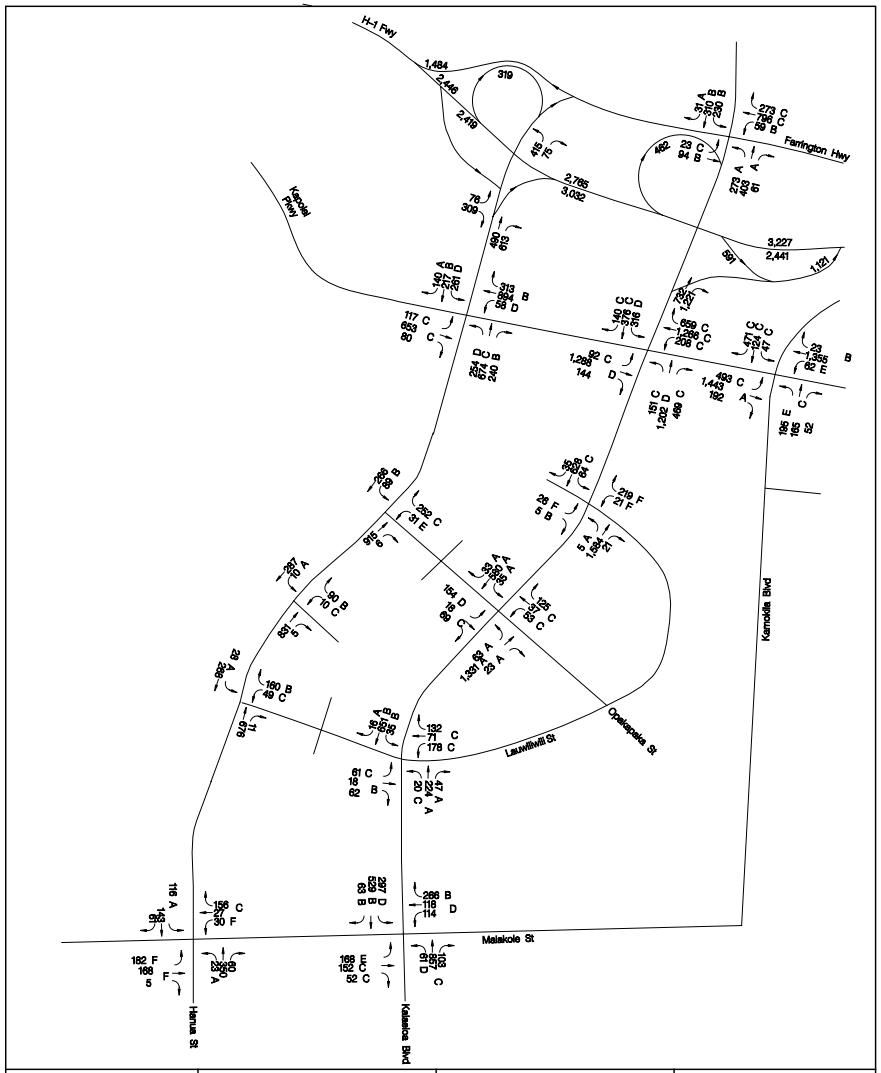


Wilbur Smith Associates

KAPOLEI HARBORSIDE CENTER
KAPOLEI, HAWAII

2018 MORNING
PEAK HOUR TRAFFIC
WITHOUT PROJECT

FIGURE 3-2



Wilbur Smith Associates	KAPOLEI HARBORSIDE CENTER KAPOLEI, HAWAII	2018 AFTERNOON PEAK HOUR TRAFFIC WITHOUT PROJECT	FIGURE 3-3

These volumes would approximate 67% and 60% of the peak hour volumes, respectively, on the parallel section of Kalaeloa Boulevard (2,440 morning and 2,550 afternoon peak hour volumes).

Traffic volumes along Malakole Street east of Kalaeloa Boulevard are expected to more than double between 2006 and 2018. Most of this increase would result from the diversion of traffic from Kalaeloa Boulevard to the new roadway connection from the Kalaeloa Boulevard corridor to the Fort Weaver Road, East Kapolei, and City of Kapolei areas through the Kalaeloa Redevelopment Area.

2018 PEAK HOUR TRAFFIC CONDITIONS

The peak hour traffic conditions were analyzed for the key locations and freeway ramps that would be affected by traffic traveling to/from the Kapolei Harborside Center development.

2018 Peak Hour Traffic Conditions at Key Intersections

Traffic conditions for the year 2018 weekday traffic peak hours without the Kapolei Harborside Center Project traffic are summarized for the key intersections in Table 3-1. Traffic conditions are given only for those key intersections that could be most directly affected by the Project traffic.

Farrington Highway-Kalaeloa Boulevard – The proposed Makaiwa Hills development would add a mauka leg to this intersection. That development and the Palailai-Makakilo Interchanges project would also add a traffic signal control and additional lanes to the intersection. With the traffic signal and additional turn lanes, the intersection would accommodate the estimated 2018 peak hour traffic volumes at very acceptable levels of capacity use and average delays per vehicle.

Kalaeloa Boulevard-Kapolei Parkway – With the increased turn lanes and widening on Kalaeloa Boulevard, the forecast 2018 traffic in the morning peak hour would approximate 85% of the estimated capacity of this intersection with overall average vehicle delay at LOS D based on optimized timing of the traffic signal. In the afternoon peak hour, the forecast traffic would amount to 93% of capacity, with overall intersection delays at LOS C.

Kalaeloa Boulevard Intersections with Kapolei Business Park Roadways – The intersections with Opakapaka Street and the makai end of Lauwiliwili Street are expected to be controlled by traffic signals with the development of the I-2 lands along the west side of Kalaeloa Boulevard. Each of these three intersections is projected to operate at acceptable levels of capacity use and average delays with Kalaeloa Boulevard as a four-lane divided roadway.

Table 3-1
2018 TRAFFIC CONDITIONS AT KEY INTERSECTIONS
WITHOUT PROJECT

Intersections	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
	V/C	ADPV	LOS	V/C	ADPV	LOS
Kalaeloa Blvd.-Farrington Hwy	0.49	8.7	A	0.62	16.5	B
Kalaeloa Blvd.-Kapolei Pkwy	0.85	39.0	D	0.93	33.5	C
Kalaeloa Blvd.-Lauwiliwili St. (Mauka) WB Left-turn	0.13	51.5	F	0.34	81.7	F
Kalaeloa Blvd.-Opakapaka St. Westbound Left Turn	0.58	6.7	A	0.65	12.1	B
Kalaeloa Blvd.-Lauwiliwili St. (Makai) WB Left-turn	0.47	7.6	A	0.61	10.3	B
Kalaeloa Blvd.-Malakole St.	0.61	44.2	D	0.74	27.5	C
Hanua St.-Kapolei Pkwy.	0.65	20.1	C	0.78	23.5	C
Hanua St. Ext.-Opakapaka St. Westbound Left Turn	0.08	53.2	F	0.29	47.9	E
Hanua St.-I-2 Parcel Access Rd. Westbound Left-turn	0.03	9.2	A	0.04	17.9	C
Hanua St.-Lauwiliwili St. Makai Westbound Left Turn	0.03	23.9	C	0.22	24.1	C
Hanua St.-Malakole St. WB AM/EB PM Left Turn	1.35	230.0	F	1.67	397.9	F
Kapolei Pkwy.-Kamokila Blvd.	0.69	13.9	B	0.83	19.8	B
Kapolei Pkwy.-Kamaaha Ave.	0.59	11.9	B	0.50	10.8	B

V/C = Ratio of the traffic volume to the theoretical capacity of the intersection.
ADPV = Average delay per vehicle, in seconds.
LOS = Level of service.
NA = Not Analyzed

Wilbur Smith Associates; July 20, 2006.

The mauka intersection of Lauwiliwili Street was assumed to retain STOP sign control. With STOP sign control, the side-street traffic would experience long delays (LOS F) in both peak hours. Federal and state highway officials have established a series of warrants for consideration of traffic signal control at an intersection, which are set forth in the MUTCD.[7] If conditions for an intersection do not satisfy one of the warrants, a signal is not appropriate for the location. If the conditions do satisfy one or more warrants, then a signal may be appropriate and could be considered based on further engineering studies.

Warrant #3, Peak Hour, is the primary criteria when considering forecast future traffic conditions at an intersection. The traffic conditions for the westbound two-lane approach of Lauwiliwili Street in the afternoon peak hour were compared to the MUTCD Warrant #3 criteria.

- **Warrant 3 Category A**
  All three conditions of these criteria must be satisfied by the same one-hour period: With the two-lane westbound approach, the requirements and forecast values for the afternoon peak hour period are as follows:

Peak Hour Criteria	Minimum Requirement	Forecast Amount	Satisfy Requirement
Minor Street Delay	5 hours	4.1 hours	No
Minor Street Volume	150 vehicles	240 vehicles	Yes
Total Intersection Volume	800 vehicles	2,610vehicles	Yes

  The forecast intersection vehicle delay in 2018 without the Project would not satisfy the requirements to allow consideration of a traffic signal at this location.

- **Warrant 3 Category B**
  For the number of lanes at this intersection and the afternoon peak hour volumes along Kalaeloa Boulevard, this warrant would require a minimum of 150 vehicles exiting one of the two side street approaches in the peak hour.

  The westbound approach of Lauwiliwili Street, with a forecast 240 vehicles in the afternoon peak hour, has more than the minimum volume requirement and satisfies this part of the warrant.

Based on the forecast volumes and conditions in the afternoon peak hour, the intersection would not merit further consideration of a traffic signal.

Kalaeloa Boulevard-Malakole Street – Traffic conditions at this intersection are projected to remain at acceptable levels based on the existing numbers of lanes at the intersection. The

[7] *Manual on Uniform Traffic Control Devices for Streets and Highways, 2003 Edition*, Federal Highway Administration, 2003.

forecast volumes would approximate 74% of intersection capacity in the afternoon peak hour with average overall delays at LOS C based on optimum signal timing.

Hanua Street Extension-Kapolei Parkway – This intersection is projected to operate at very acceptable conditions with the anticipated lanes in 2018.

Hanua Street Extension-Opakapaka Street – The small numbers of left turns on the westbound approach at this intersection would experience long delays (LOS F) in the afternoon peak hour with STOP sign control of the side street. However, the side-street volumes are too low to merit consideration of a traffic signal.

Hanua Street Extension Intersections with I-2 Parcel Access Road and Lauwiliwili Street Makai – The low volumes of side street traffic turning left form these two intersections would result in only short delays, based on the forecast traffic volumes in 2018.

Hanua Street-Malakole Street – With the assumed STOP sign control on the Malakole Street approaches, the left-turn and through traffic along Malakole Street would experience long delay at this intersection.

The traffic volumes and estimated delay (23.1 hours versus 5-hour minimum) in the afternoon peak hour would greatly exceed the MUTCD Warrant #3 criteria for consideration of a traffic signal, therefore traffic signal control is assumed for the analysis of the With Project scenario. With traffic signal control, the peak hour traffic conditions for the Without Project scenario are:

Peak Hour Conditions Without Project	Volume-to-Capacity Ratio	Ave. Delay Per Vehicle (sec.)	Level of Service
Morning	0.44	8.8	A
Afternoon	0.51	9.2	A

Kapolei Parkway-Kamokila Boulevard – This intersection would operate with acceptable levels of delay with the planned lanes and the installation of traffic signal control.

Kapolei Parkway-Kamaaha Avenue – This intersection would operate with acceptable levels of delay with the planned lanes and traffic signal control.

Palailai Interchange Ramp Conditions

The 2018 peak hour traffic conditions were assessed for the weaving section of the eastbound H-1 Freeway ramps on the east side of the Palailai Interchange as well as freeway merge/diverge sections for those Palailai Interchange ramps that would be used by the Project traffic. The analysis was made using the HCM procedures (Appendix A) and HCS software.

Eastbound Kalaeloa-Wakea Weaving Section – This weaving section would remain with the planned modifications to the Palailai Interchange. The 1,200-foot long weaving section has a

single-lane entry from the Freeway at the west end with this single-lane continuing through the weaving section to exit onto the Freeway at the east end. The entry ramp from Kalaeloa Boulevard would have two lanes with these lanes continuing through the weaving section to merge into a single lane before connecting to the southbound lanes of the planned Wakea Street extension along the east side of the Consolidated Theaters building.

The 2018 traffic volumes in this weaving section are estimated to operate at a very acceptable LOS B during the morning peak hour (Table 3-2). The afternoon peak hour volumes are estimated at an acceptable LOS C with the average speeds in the weaving lanes at about 24.5 mph.

Palailai Interchange Ramps – The estimated peak hour traffic conditions in the freeway lanes near the merge or diverge points for each of the Palailai Interchange ramps is summarized in Table 3-3. The analysis is based on no widening of the freeway through this area.

The new on-ramp from Hanua Street to the eastbound freeway is estimated to result in LOS C conditions in both peak hours for the freeway lanes. This ramp is projected with comparatively low volumes without the development of the Harborside Center lands.

The traffic conditions in the eastbound lanes approaching the new off-ramp to Hanua Street would result in average densities reflecting LOS D conditions. The other two westbound ramps are projected with LOS D conditions in the afternoon peak hour, with LOS B or C in the morning peak hour.

The loop off-ramp for westbound traffic exiting from the H-1 Freeway to Hanua Street would have an estimated capacity of about 1,800 vehicles per hour. The estimated morning peak hour volume of 529 vehicles amounts to about 30% of the potential ramp capacity.

Traffic conditions are not presented for the junction of eastbound On-ramp KC-1 from Kalaeloa Boulevard since it joins the eastbound freeway as an added through lane and no merge maneuver is necessary. The on-ramp from the Eastbound Weaving Roadway has an estimated potential capacity of about 2,100 vehicles per hour. The afternoon peak hour volumes amount to about 65% of the capacity.

Table 3-2
2018 WEAVING SECTION TRAFFIC CONDITIONS
WITHOUT PROJECT

Peak Hour	Average Speed (mph)			Density (vplph)	Level of Service
	All Traffic	Non-Weave	Weaving		
Eastbound Separate Weaving Roadway Kalaeloa Blvd.-Wakea St. (Existing)					
Morning	28.0	41.0	27.7	14.0	B
Afternoon	24.1	36.1	24.5	27.3	C

vplph = vehicles per lane per hour

Wilbur Smith Associates; May 3, 2006

Table 3-3
2018 TRAFFIC CONDITIONS ALONG FREEWAY
AT RAMP MERGE AND DIVERGE AREAS WITHOUT PROJECT

Ramp Junction	Peak Hour	Average Speed (mph)		Traffic Density (vplph)	Level of Service
		Near Ramp	Other Lanes		
Eastbound Freeway					
Off-ramp PH to Hanua St.	AM	50.3	NA	29.8	D
	PM	50.6	NA	28.0	D
On-ramp PI From Hanua St.	AM	50.8	NA	23.2	C
	PM	50.3	NA	26.1	C
Westbound Freeway					
Loop Off-ramp PE to Hanua St.	AM	50.3	NA	24.1	C
	PM	50.7	NA	30.4	D
On-ramp PA from Kalaeloa Blvd./Hanua St.	AM	51.2	NA	18.4	B
	PM	47.9	NA	33.4	D

Near Ramp is the 1,500-foot section of the 2 lanes closest to ramp.
Other lanes are lanes closest to median if 3 or more lanes on freeway.
Vplph = vehicles per lane per hour for 2 lanes near ramp.
Level of Service is for 2 lanes near ramp.
NA = Not Applicable

Wilbur Smith Associates; May 3, 2006

Chapter 4
2018 WITH PROJECT BUILD-OUT

The entire 345-acre Kapolei Harborside Center Project area is expected to be fully developed by the end of 2018. This chapter assesses the transportation impacts with the full development of the area. Most of the other areas within the Kalaeloa Boulevard corridor are also assumed to be built out by 2018 with the exception of the Hawaii Raceway Park site and the Campbell Waterfront Industrial area, both located along Malakole Street.

DESCRIPTION OF THE PROJECT

The Kapolei Harborside Center development would encompass most of the vacant lands located between the future alignment of the Hanua Street Extension and the Barbers Point Harbor, from Malakole Street mauka to the planned Kapolei West development. The Project also includes several small parcels located on the east side of the planned Hanua Street alignment, as depicted in Figure 1-1.

Land Uses

Most of the Project area is expected to be developed with the light industrial-type uses similar to those in the nearby Kapolei Business Park, which would likely include a mix of light manufacturing facilities, warehousing, base yards for service businesses, and ancillary office uses. Area is provided for a regional drainage channel which would bisect the Project area as depicted in Figure 1-1.

The Project area is divided into a number of smaller parcels reflecting the planned network of roadways and the drainage channel. These small areas have been grouped into several analysis zones for the purposes of the traffic study, with these analysis zones identified as follows:

Northeast	Includes areas 1, 2, and 3 with about 23.7 acres of development land, access provided by local street connections to Hanua Street and Opakapaka Street
Northwest	Includes area 19 with about 23.6 acres of development land, access provided by local street connections to Opakapaka Street
West Central	Includes areas 16, 17, and 18 with about 54.9 acres of development land, access provided by local street connections to Opakapaka Street and Lauwiliwili Street Makai
East Central	Includes areas 4 and 5 with about 40.9 acres of development land, access provided by local street connections to Hanua

Street, Opakapaka Street, and Lauwiliwili Street Makai

Southwest — Includes areas 6, 7, 12, 13, 14, and 15 with about 87.4 acres of development land, access provided by local street connections to Hanua Street and Lauwiliwili Street Makai

Southeast — Includes areas 8 and 9 with about 19.2 acres of development land, access provided by local street connections to Hanua Street and Malakole Street

Each of these preceding areas is expected to be developed with a mix of light industrial, warehousing, and services uses, with a total area of about 250 acres occupied with these uses.

Area 10 would be used for the wastewater pumping facility and Area 11 would be retained as a natural area for preservation purposes, with little vehicle traffic generation by each of these two areas.

Project Roadways

The Project would include construction of Opakapaka Street and provide land for other major regional roads that would serve both Project and regional traffic (Hanua Street extension and Lauwiliwili Street makai extension).

Opakapaka Street Extension – Existing Opakapaka Street (or Road A in the Kapolei Business Park) would be extended westward from Hanua Street to or near the western boundary of the Project lands. Right-of-way would be preserved to allow the future connection of this street to the Kapolei West roadways to provide access to the Kapolei West and Makaiwa Hills areas via Kapolei West Road D if and when such a connection is desired by the City.

Lauwiliwili Street (Makai) – The makai section of Lauwiliwili Street would be extended westward to connect to the Barbers Point Harbor roadways, with this roadway intended to serve as the primary access route to the Harbor in the future. The extension would be constructed as a four-lane roadway with median divider and separate left-turn lanes at cross streets and major driveways. It is anticipated that this roadway will be constructed by State DOT to provide access to the Harbor once right-of-way is transferred by the Harborside Center Project.

Access to the individual development parcels would be provided by a network of collector and local roadways, with this network depicted conceptually in Figure 1-1. The configuration of the local roadways and access locations to the regional and collector roadways will be refined during the Project planning process.

Traffic signal controls are assumed to be installed at the intersection of the Hanua Street Extension with the Opakapaka, Lauwiliwili Makai, and Malakole Streets. All other intersections

of Project roadways are assumed to be controlled by STOP signs. The planned numbers of travel lanes and lanes at key intersections are depicted in Figure 4-1.

PROJECT TRIP GENERATION

The numbers of vehicle trips generated by the Project were based on standard trip rates compiled by the Institute of Transportation Engineers (ITE).[1] The trip rates for an industrial park (ITE Land Use Category #130) were used for each of the development areas. The industrial park vehicle trip generation rate is slightly higher than rates for light industrial or manufacturing uses as it reflects inclusion of warehouse operations and service businesses.

Full development of the Project Area is estimated to generate a total of 2,135 and 2,207 vehicle trips to or from the site in the morning and afternoon peak hours, respectively, as outlined in Table 4-1. The Project would generate an estimated 15,750 vehicle trips to or from the site on a typical weekday.

PEAK HOUR TRAFFIC VOLUMES

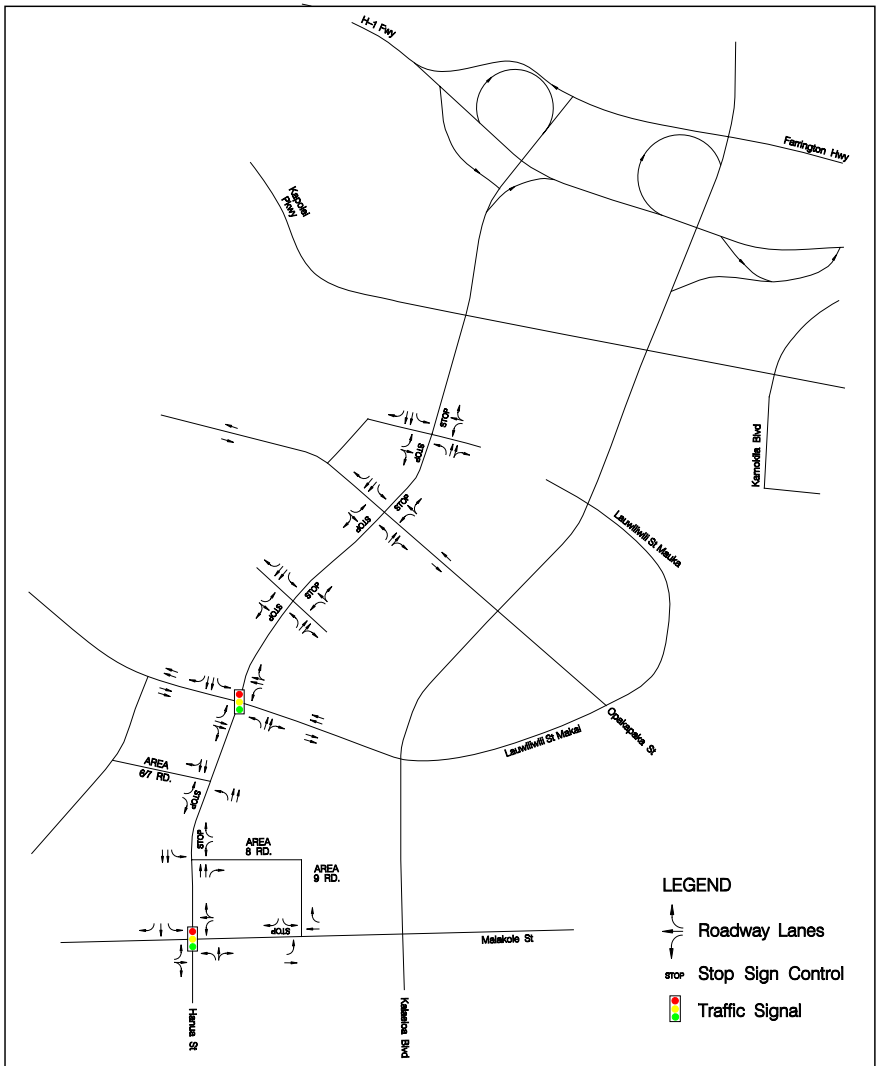
The vehicle trips to/from the Kapolei Harborside Center Project were distributed to surrounding areas based on the percentages presented in Appendix C. The resultant forecast of weekday peak hour traffic volumes on the area roadways are depicted in Figure 4-2 and 4-3 for the year 2018 morning and afternoon peak hours, respectively.

Table 4-1
VEHICLE TRIP GENERATION
FOR 2018 PROJECT BUILD-OUT

Area	Morning Peak Hour			Afternoon Peak Hour		
	Total	Enter	Exit	Total	Enter	Exit
Northeast (1,2,3)	203	168	34	210	44	165
Northwest (19)	202	168	34	209	44	165
West Central (16, 17, 18)	538	448	92	557	117	440
East Central (4, 5)	350	290	59	362	76	285
Southwest (6, 7, 12, 13 14, 15)	678	563	115	701	147	554
Southeast (8, 9)	164	136	28	170	36	134
Totals	**2,135**	**1,773**	**362**	**2,207**	**464**	**1,743**

Wilbur Smith Associates; March 24, 2006

[1] *Trip Generation, Seventh Edition*, Institute of Transportation Engineers, 2003.



Wilbur Smith Associates	KAPOLEI HARBORSIDE CENTER KAPOLEI, HAWAII	2018 ROADWAY LANES AND TRAFFIC CONTROLS WITH PROJECT	FIGURE 4-1

Traffic volumes along Hanua Street just makai of the Kapolei Parkway would total about 2,970 vehicles in the morning peak hour, or about 1,330 more vehicles than for the 2018 Without Project scenario. In the afternoon peak hour, the Project Build-Out would result in an estimated 2,830 vehicles on Hanua Street just makai of the Kapolei Parkway, or about 1,300 more vehicles than with the Without Project Scenario

The Project is not expected to add many vehicle trips along Kalaeloa Boulevard. The volumes along the section of Kalaeloa Boulevard just makai of the Kapolei Parkway are forecast to decrease with the Project by about 140 (+ 0.5%) and 110 (+0.4%) in the morning and afternoon peak hours, respectively, as compared to the forecasts for 2018 without the Project.

The Project is estimated to add about 400 vehicle trips along the eastern section of Malakole Street in the morning peak hour, and about 320 trips in the afternoon peak hour. These volumes would represent about 18% of the Project trips.

The traffic forecasts do not reflect the extension of Opakapaka Street to connect to the Kapolei Parkway and Road D to provide access to the Kapolei West, Ko Olina, and Makaiwa Hills areas. The connection of Opakapaka Street to Road D and the Kapolei Parkway would be expected to attract use about 100 to 200 of those vehicles that would otherwise use Hanua Street to travel to the Kapolei Parkway to access the Kapolei West, Makaiwa Hills, and Ko Olina areas. There would likely also be a diversion of additional trips from the other areas along the Hanua Street and Kalaeloa Boulevard corridors to this route with this connection.

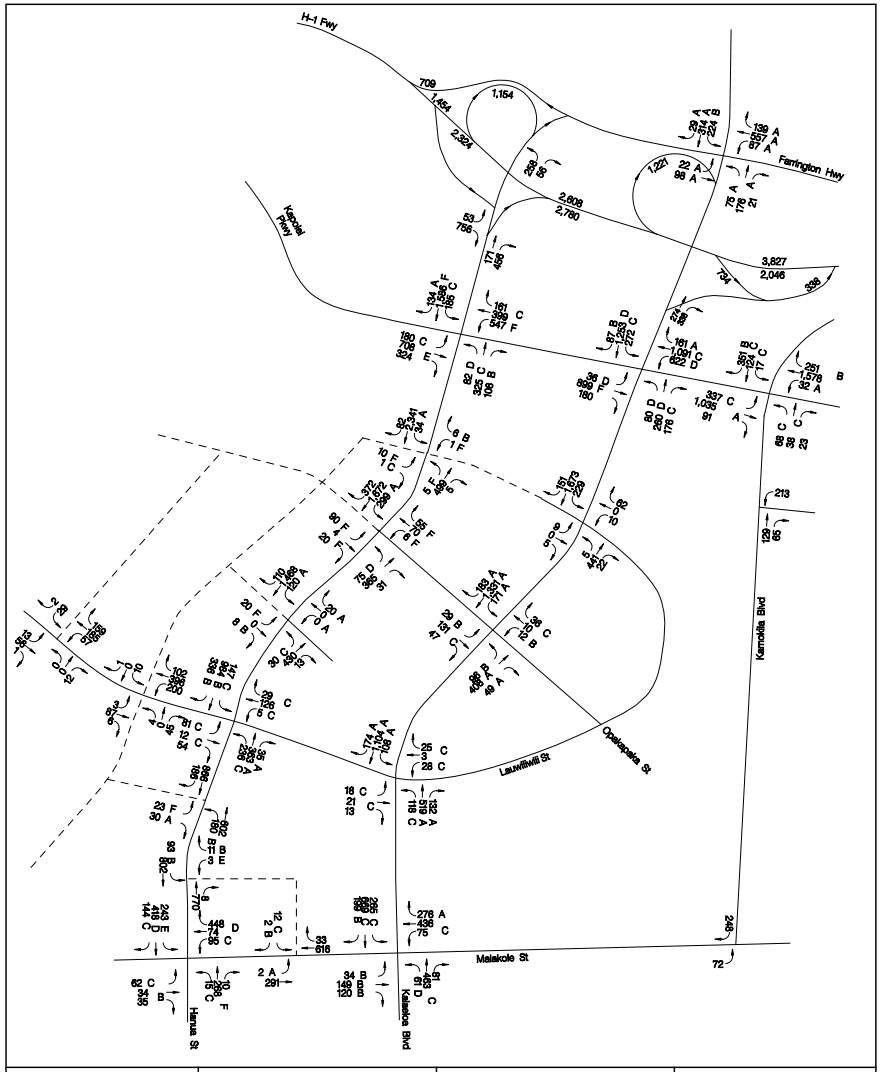
PEAK HOUR TRAFFIC CONDITIONS

Traffic conditions were analyzed for the 2018 weekday morning and afternoon peak one-hour traffic volumes with Project build-out. The analyses were made for the key intersections near the Project site, and for the key H-1 Freeway ramps at the Palailai Interchange. The methodology and criteria used in analyzing the traffic conditions at the intersection and on the freeway are described in Appendix A.

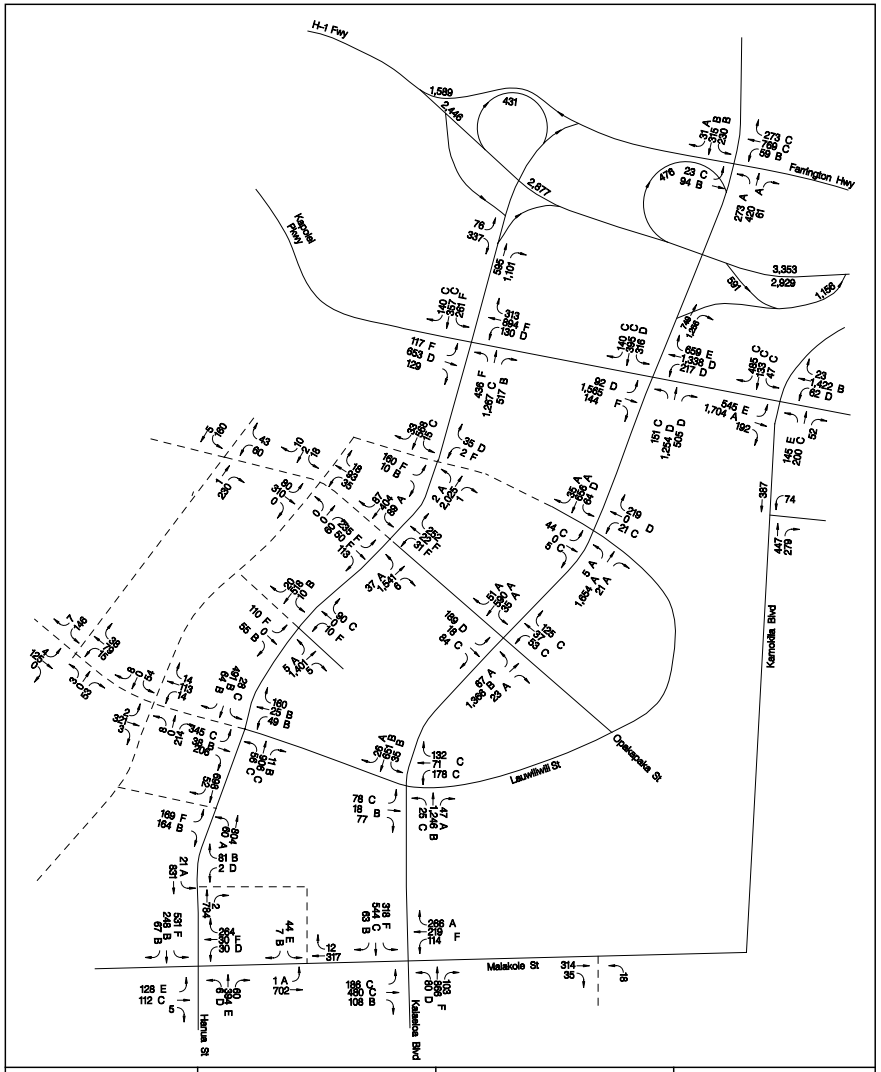
Key Intersection Conditions

Traffic conditions for the key intersections near the Project site, with the completion of the Project development, are summarized for the 2018 weekday morning and afternoon commute peak hours in Table 4-2. For comparison, year 2018 conditions without the Project are presented in Table 3-1.

Kalaeloa Boulevard-Farrington Highway – The Project would attract little additional traffic through this intersection and should not significantly affect traffic conditions.



Wilbur Smith Associates	KAPOLEI HARBORSIDE CENTER KAPOLEI, HAWAII	2018 MORNING PEAK HOUR TRAFFIC WITH PROJECT	FIGURE 4-2



Wilbur Smith Associates	KAPOLEI HARBORSIDE CENTER KAPOLEI, HAWAII	2018 AFTERNOON PEAK HOUR TRAFFIC WITH PROJECT	FIGURE 4-3

Kapolei Parkway-Kalaeloa Boulevard – The increased Project traffic along Kapolei Parkway through this intersection would exceed the estimated capacity by about 8% in the afternoon peak hour, with average delay at LOS E. The forecast traffic in the morning peak hour would approximate 93% of the estimated intersection capacity with average delays at LOS D. Based on the planned lanes and forecast 2018 traffic at this intersection, mitigative actions would be needed to address the afternoon conditions.

Kalaeloa Boulevard Intersections with Kapolei Business Park Roadways – The analysis of the intersections with Opakapaka Street and both Lauwiliwili Street intersections reflected the two through lanes in each direction along this section of Kalaeloa Boulevard. The two intersections assumed to have traffic signal controls (Opakapaka and Lauwiliwili Makai Streets) would operate at very acceptable conditions with the planned lanes and estimated volumes.

Traffic turning left out of the side street approaches at the Lauwiliwili Street (Mauka) intersection is estimated to experience long waits (LOS F) for a gap to make their turn onto Kalaeloa Boulevard, based on STOP sign control. The delay would be higher in the afternoon peak hour with the higher volume of traffic exiting the side streets.

The afternoon peak hour traffic conditions at the Lauwiliwili Street Mauka intersection was compared to the MUTCD Warrant #3 criteria to assess whether a traffic signal would be appropriate for the intersection. The traffic conditions for the westbound approach of Lauwiliwili Street were compared to the Warrant #3 criteria since the estimated volumes on the eastbound approach (driveway access to the I-2 zoned development area) are too low to satisfy the volume portion of the warrant.

- **Warrant 3 Category A**

  All three conditions of these criteria must be satisfied by the same one-hour period: With the westbound approach providing a separate right-turn lane and a shared through/left-turn lanes, the requirements and forecast values for the afternoon peak hour period are as follows:

Peak Hour Criteria	Minimum Requirement	Forecast Amount	Satisfy Requirement
Minor Street Delay	5 hours	4.8 hours	No
Minor Street Volume	150 vehicles	240 vehicles	Yes
Total Intersection Volume	800 vehicles	2,720 vehicles	Yes

  The forecast intersection delay in 2018 falls short of satisfying the Category A requirements to permit consideration of a traffic signal at this location.

Table 4-2
2018 TRAFFIC CONDITIONS AT KEY INTERSECTIONS
KAPOLEI HARBORSIDE CENTER

Intersection	Scenario	Morning Peak Hour			Afternoon Peak Hour		
		V/C	ADPV	LOS	V/C	ADPV	LOS
Kalaeloa Blvd.- Farrington Hwy.	Existing	0.42	30.6	D	1.30	185.4	F
	No Project	0.49	8.7	A	0.62	16.5	B
	Project Buildout	0.49	8.8	A	0.63	16.8	B
Kalaeloa Blvd.- Kapolei Pkwy.	Existing	0.74	35.0	D	0.94	73.2	E
	No Project	0.85	39.0	D	0.93	33.5	C
	Project Buildout	0.93	53.8	D	1.08	63.7	E
	Mitigated	0.88	36.3	D	0.97	47.6	D
Kalaeloa Blvd.- Lauwiliwili St. Makai	No Project	0.47	7.6	A	0.61	10.3	B
	Project Buildout	0.53	9.2	A	0.62	16.2	B
Kalaeloa Blvd.- Malakole St.	Existing	0.48	9.2	A	0.71	15.9	B
	No Project	0.61	44.2	D	0.74	27.5	C
	Project Buildout	0.79	25.1	C	1.26	72.1	E
	Mitigated	0.67	28.0	C	0.92	46.1	D
Hanua St.- Kapolei Pkwy.	No Project	0.65	20.1	C	0.78	23.5	C
	Project Buildout	1.14	69.8	E	0.94	62.5	E
	Mitigated	0.83	44.5	D	0.93	45.3	D
Hanua St.- Opakapaka St.	No Project	0.08	53.2	F	0.29	47.9	E
	Project Buildout	*	*	F	*	*	F
	Mitigate	0.73	8.0	A	0.86	15.6	B
Hanua St.- Lauwiliwili Makai	No Project	0.03	23.9	C	0.22	24.1	C
	Project Buildout	0.67	17.3	B	0.81	21.0	C
Hanua St.- Malakole St.	Existing	0.05	16.5	C	0.01	11.3	B
	No Project	0.44	8.8	A	0.51	9.2	A
	Project Buildout	0.88	54.4	D	1.12	94.2	F
	Mitigated	0.79	40.9	D	0.92	49.1	D
Kapolei Pkwy.- Kamokila Blvd.	No Project	0.69	13.9	B	0.83	19.8	B
	Project Buildout	0.76	14.6	A	0.83	21.9	B

V/C = Ratio of the traffic volume to the theoretical capacity of the intersection.
ADPV = Average delay per vehicle, in seconds.
LOS = Level of service.
* = Delay not calculated since unreliable where traffic substantially exceeds capacity.

Wilbur Smith Associates; July 20, 2006.

- **Warrant 3 Category B**
  For the number of lanes at this intersection and the afternoon peak hour volumes along Hanua Street, this warrant would require a minimum of 150 vehicles exiting one of the two side street approaches in the peak hour.

  The westbound approach of Lauwiliwili Street, with a forecast 240 vehicles in the afternoon peak hour, has more than the minimum volume requirement and satisfies this part of the warrant.

Based on the forecast volumes and conditions in the afternoon peak hour, a traffic signal would not be appropriate at this intersection. However, the specific land uses and internal street configuration within the I-2 Parcel are not known at this time and the actual site plan could result in much higher volumes than those in this forecast. Therefore, conditions should be monitored after the development of the I-2 parcel to assess actual conditions.

Kalaeloa Boulevard-Malakole Street – The additional Project traffic traveling along Malakole Street to, from, or through the Kalaeloa Redevelopment Area would result in congested conditions in the afternoon peak hour. The increased traffic would exceed the intersection capacity by 26% and result in long traffic delays (LOS E). The Project impacts would merit mitigative actions at this intersection.

Kapolei Parkway-Hanua Street Extension – The increased traffic along Hanua Street as a result of the Project would slightly exceed the intersection capacity in the morning peak hour with the proposed lanes, with average overall delay calculated at LOS F. Afternoon peak hour traffic would approximate 94% of intersection capacity. Further improvements would be appropriate at this intersection to accommodate forecast 2018 peak hour traffic with the Project Build-out.

Hanua Street-Opakapaka Street – The use of STOP sign control on the Opakapaka Street approaches would result in extremely long delays for traffic traveling through or turning left from both Opakapaka Street approaches.

The traffic conditions for the eastbound approach of Opakapaka Street in the afternoon peak hour were compared to the MUTCD Warrant #3 criteria for consideration of a traffic signal at this location. If the conditions do not satisfy the warrant, a traffic signal is not appropriate to address the long delays; if the conditions satisfy the warrant, a traffic signal may be considered for the intersection.

- **Warrant 3 Category A**
  All three conditions of these criteria must be satisfied by the same one-hour period: With the eastbound approach striped to provide a separate left-turn lane and a shared through/right-turn lanes, the requirements and forecast values for the afternoon peak hour period are as follows:

Peak Hour Criteria	Minimum Requirement	Forecast Amount	Satisfy Requirement
Minor Street Delay	5 hours	494 hours	Yes
Minor Street Volume	150 vehicles	395 vehicles	Yes
Total Intersection Volume	800 vehicles	2,870 vehicles	Yes

The forecast intersection conditions in 2018 would satisfy the requirements to permit installation of a traffic signal at this location.

- **Warrant 3 Category B**
  For the number of lanes at this intersection and the afternoon peak hour volumes along Hanua Street, this warrant would require a minimum of 150 vehicles exiting one of the side street approaches in the peak hour.

  The eastbound approach of Opakapaka Street, with a forecast 395 vehicles in the afternoon peak hour, has more than the minimum volume requirement and satisfies this part of the warrant.

Based on the forecast volumes and conditions in the afternoon peak hour, a traffic signal may be appropriate at this intersection. With the installation of a traffic signal and the existing lanes, the traffic conditions with the forecast 2018 traffic would be as follows:.

Peak Hour	Volume-to-Capacity Ratio	Ave. Delay Per Vehicle (sec.)	Level of Service
Morning	0.73	8.0	A
Afternoon	0.91	20.8	C

Hanua Street-Lauwiliwili Street Makai – This intersection would provide access to the Harbor as well as to the Project site. With traffic signal control, the intersection would operate at very acceptable conditions with both streets planned as four-lane divided roadways

Hanua Street-Malakole Street – The assessment of the 2018 conditions without the Project indicated that the connection of Hanua Street to the H-1 Freeway would result in traffic volumes and conditions that would merit installation of traffic signal control at the Malakole Street intersection. With the signal control, the large volumes of vehicles turning left from the makai-bound approach of Hanua Street and from the eastbound Malakole Street approach would result in congested conditions during the afternoon peak hour. The makai-bound left-turn traffic would primarily consist of Project traffic traveling to or through the Kalaeloa Redevelopment Area via Malakole Street. Mitigative actions would be needed to address the long delays.

Kapolei Parkway Intersections with Kamokila Boulevard and Kamaaha Avenue – These intersections would operate at acceptable conditions with the planned lanes and the installation of traffic signal controls.

Project Access Road Intersection Conditions

Traffic conditions were analyzed for the proposed Project access road connections to the major regional roadways (Kalaeloa Boulevard, Hanua Street, and Malakole Street) with the Project build-out traffic. The conditions are summarized for the 2018 weekday morning and afternoon commute peak hours in Table 4-3.

Hanua Street-Areas 1 & 2 Access Road – The use of STOP sign control on the proposed Area 1 and 2 Access Road approaches would result in extremely long delays for traffic traveling through or turning left from both Lauwiliwili Street approaches.

The traffic conditions for the eastbound approach to Hanua Street (access road to Project Areas 2 and 3) in the afternoon peak hour were compared to the MUTCD Warrant #3 criteria for consideration of a traffic signal at this location. If the conditions do not satisfy the warrant, a traffic signal is not appropriate to address the long delays; if the conditions satisfy the warrant, a traffic signal may be considered for the intersection.

- **Warrant 3 Category A**

  All three conditions of these criteria must be satisfied by the same one-hour period: With the eastbound approach striped to provide a separate left-turn lane and a shared through/right-turn lanes, the requirements and forecast values for the afternoon peak hour period are as follows:

Peak Hour Criteria	Minimum Requirement	Forecast Amount	Satisfy Requirement
Minor Street Delay	5 hours	444 hours	Yes
Minor Street Volume	150 vehicles	170 vehicles	Yes
Total Intersection Volume	800 vehicles	2,850 vehicles	Yes

  The forecast intersection conditions in 2018 would satisfy the requirements to permit installation of a traffic signal at this location.

- **Warrant 3 Category B**

  For the number of lanes at this intersection and the afternoon peak hour volumes along Hanua Street, this warrant would require a minimum of 150 vehicles exiting one of the two side street approaches in the peak hour.

  The eastbound approach (Area 2 Access Road), with a forecast 170 vehicles in the afternoon peak hour, has more than the minimum volume requirement and satisfies this part of the warrant.

Table 4-3
2018 TRAFFIC CONDITIONS AT INTERSECTIONS WITH PROJECT ACCESS ROADS

Intersections	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
	V/C	ADPV	LOS	V/C	ADPV	LOS
Hanua St.-Access Road Area 1 & 2 EB Left Turn	9.91	*	F	5.02	*	F
Hanua St.-Access Road Area 5 EB Left Turn	1.99	1129	F	2.07		F
Hanua St.-Access Road Areas 6/7 EB Left Turn	0.53	145.7	F	1.45	320	F
Hanua St.-Access Road Area 8 Westbound Left Turn	0.04	45.0	E	0.02	33.0	D
Malakole St.-Access Road Area 9 Makai-bound Left	0.01	9.9	A	0.30	36.3	E

V/C = Ratio of the traffic volume to the theoretical capacity of the intersection.
ADPV = Average delay per vehicle, in seconds.
LOS = Level of service.
All are based on STOP sign control of access road.
* = Delay not calculated since unreliable where traffic substantially exceeds capacity.
Wilbur Smith Associates; May 3, 2006.

Based on the forecast volumes and conditions in the afternoon peak hour, a traffic signal may be appropriate at this intersection. With the installation of a traffic signal and the existing lanes, the traffic conditions with the forecast 2018 traffic would be as follows:.

Peak Hour	Volume-to-Capacity Ratio	Ave. Delay Per Vehicle (sec.)	Level of Service
Morning	0.84	8.6	A
Afternoon	0.90	30.7	C

Hanua Street-Area 5 Access Road – The use of STOP sign control on the Area 5 and I-2 property access roads approaches would result in extremely long delays for traffic turning left from either of these approaches.

The traffic conditions for the eastbound approach of Area 5 Access Road in the afternoon peak hour were compared to the MUTCD Warrant #3 criteria for consideration of a traffic signal at

this location. If the conditions do not satisfy the warrant, a traffic signal is not appropriate to address the long delays; if the conditions satisfy the warrant, a traffic signal may be considered for the intersection.

- **Warrant 3 Category A**
  All three conditions of these criteria must be satisfied by the same one-hour period: With the eastbound approach striped to provide a separate left-turn lane and a shared through/right-turn lanes, the requirements and forecast values for the afternoon peak hour period are as follows:

Peak Hour Criteria	Minimum Requirement	Forecast Amount	Satisfy Requirement
Minor Street Delay	5 hours	20.0 hours	Yes
Minor Street Volume	150 vehicles	165 vehicles	Yes
Total Intersection Volume	800 vehicles	2,230vehicles	Yes

  The forecast intersection conditions in 2018 would satisfy the requirements to permit installation of a traffic signal at this location.

- **Warrant 3 Category B**
  For the number of lanes at this intersection and the afternoon peak hour volumes along Hanua Street, this warrant would require a minimum of 150 vehicles exiting one of the two side street approaches in the peak hour.

  The eastbound approach of the Area 5 Access Road, with a forecast 165 vehicles in the afternoon peak hour, has more than the minimum volume requirement and satisfies this part of the warrant.

Based on the forecast volumes and conditions in the afternoon peak hour, a traffic signal may be appropriate at this intersection. With the installation of a traffic signal and the existing lanes, the traffic conditions with the forecast 2018 traffic would be as follows:.

Peak Hour	Volume-to-Capacity Ratio	Ave. Delay Per Vehicle (sec.)	Level of Service
Morning	0.65	12.0	B
Afternoon	0.67	12.3	B

Hanua Street-Area 6/7 Access Road – The use of STOP sign control on the Area 6/7 Access Road approach would result in extremely long delays for traffic turning left from this approach.

The traffic conditions for the Area 6/7 Access Road in the afternoon peak hour were compared to the MUTCD Warrant #3 criteria for consideration of a traffic signal at this location. If the

conditions do not satisfy the warrant, a traffic signal is not appropriate to address the long delays; if the conditions satisfy the warrant, a traffic signal may be considered for the intersection.

- **Warrant 3 Category A**
  All three conditions of these criteria must be satisfied by the same one-hour period: With the eastbound approach striped to provide a separate left-turn lane and a shared through/right-turn lanes, the requirements and forecast values for the afternoon peak hour period are as follows:

Peak Hour Criteria	Minimum Requirement	Forecast Amount	Satisfy Requirement
Minor Street Delay	5 hours	14.8 hours	Yes
Minor Street Volume	150 vehicles	333 vehicles	Yes
Total Intersection Volume	800 vehicles	1,950 vehicles	Yes

  The forecast intersection conditions in 2018 would satisfy the requirements to permit installation of a traffic signal at this location.

- **Warrant 3 Category B**
  For the number of lanes at this intersection and the afternoon peak hour volumes along Hanua Street, this warrant would require a minimum of 150 vehicles exiting one of the two side street approaches in the peak hour.

  The eastbound approach of the Area 6/7 Access Road, with a forecast 333 vehicles in the afternoon peak hour, has more than the minimum volume requirement and satisfies this part of the warrant.

Based on the forecast volumes and conditions in the afternoon peak hour, a traffic signal may be appropriate at this intersection. With the installation of a traffic signal and the existing lanes, the traffic conditions with the forecast 2018 traffic would be as follows:.

Peak Hour	Volume-to-Capacity Ratio	Ave. Delay Per Vehicle (sec.)	Level of Service
Morning	0.52	10.4	B
Afternoon	0.51	10.8	B

Hanua Street-Area 8 Access Road – The use of STOP sign control on the Area 8 Access Road approach would result in long (LOS D) delays, but neither the estimated delay nor the estimated volume of traffic would satisfy Warrant #3 for consideration of a traffic signal.

Alternatively, the Area 8 Access Road and the Area 5 Access Road could be aligned to create a single four-leg intersection with Hanua Street. This would minimize the number of access intersections along Hanua Street and would provide a potential signal-controlled exit from both

development areas. The access road could be aligned along the makai boundary of the proposed Kapolei Studios development within the existing I-2 zoned area to provide a secondary access route for that site.

Malakole Street-Area 9 Access Road – The use of STOP sign control on the Area 9 Access Road approach would result in long (LOS D) delays, but neither the estimated delay nor the estimated volume of traffic would satisfy Warrant #3 for consideration of a traffic signal.

Palailai Interchange Ramp Conditions

The 2018 peak hour traffic conditions were assessed for the weaving section of the eastbound H-1 Freeway ramps on the east side of the Palailai Interchange as well as freeway merge/diverge sections for those Palailai Interchange ramps that would be used by the Project traffic. The analysis was made using the HCM procedures (Appendix A) and HCS software.

Eastbound Kalaeloa-Wakea Weaving Section – In the morning peak hour, the 1,200-foot long weaving roadway is projected to operate at similar conditions during the morning peak hour with or without the addition of the Project traffic. The 2018 traffic volumes in this weaving section are estimated to operate at a very acceptable LOS B (Table 4-3).

In the afternoon peak hour, the small volume of Project trips using the weaving section would have minimal effect on traffic conditions. Traffic conditions in the weaving section are estimated at LOS C with or without the Project.

Palailai Interchange Ramps – The estimated peak hour traffic conditions in the freeway lanes near the merge or diverge points for each of the Palailai Interchange ramps is summarized in Table 4-4. The analysis is based on no widening of the freeway through this area.

In the morning peak hour, the addition of Project traffic to the loop off-ramp from the westbound freeway to Hanua Street would worsen traffic conditions from LOS C (Without Project) to LOS D. The projected conditions for the on-ramp from Hanua Street to the eastbound freeway are estimated to worsen from LOS C to LOS D with the increased traffic volume in the afternoon peak hour. The HCM procedures estimate that the Project traffic should reduce average speed on the adjacent section of freeway by 0.7 mph or less.

The estimated increase in peak hour traffic volumes on the other ramps would not be expected to change the level of service from those without the Project.

The loop off-ramp for westbound traffic exiting from the H-1 Freeway to Hanua Street would have an estimated capacity of about 1,800 vehicles per hour. The estimated morning peak hour volume of 1,154 vehicles amounts to about 64% of the potential ramp capacity versus 30% without the Project.

The on-ramp from the Eastbound Weaving Roadway has an estimated potential capacity of about 2,100 vehicles per hour. The afternoon peak hour volumes with the Project would amount to about 55% of the capacity versus 53% without the Project.

Table 4-3
2018 WEAVING SECTION TRAFFIC CONDITIONS
WITH PROJECT

Peak Hour	Average Speed (mph)			Density (vplph)	Level of Service
	All Traffic	Non-Weave	Weaving		
Eastbound Separate Weaving Roadway Kalaeloa Blvd.-Wakea St. (Existing)					
Morning	27.7	40.7	27.4	14.6	B
Afternoon	24.4	35.8	23.9	28.0	C

vplph = vehicles per lane per hour

Wilbur Smith Associates; May 3, 2006

Table 4-4
2018 TRAFFIC CONDITIONS ALONG FREEWAY
AT RAMP MERGE AND DIVERGE AREAS WITH PROJECT

Ramp Junction	Peak Hour	Average Speed (mph)		Traffic Density (vplph)	Level of Service
		Near Ramp	Other Lanes		
Eastbound Freeway					
Off-ramp PH to Hanua St.	AM	50.1	NA	31.1	D
	PM	50.6	NA	28.3	D
On-ramp PI From Hanua St.	AM	50.7	NA	24.0	C
	PM	49.3	NA	30.0	D
Westbound Freeway					
Loop Off-ramp PE to Hanua St.	AM	49.6	NA	28.9	D
	PM	50.6	NA	31.4	D
On-ramp PA from Kalaeloa Blvd./Hanua St.	AM	51.2	NA	18.6	B
	PM	47.5	NA	34.3	D

Near Ramp is the 1,500-foot section of the 2 lanes closest to ramp.
Other lanes are lanes closest to median if 3 or more lanes on freeway.
Vplph = vehicles per lane per hour for 2 lanes near ramp.
Level of Service is for 2 lanes near ramp.
NA = Not Applicable

Wilbur Smith Associates; May 3, 2006

PUBLIC TRANSIT AND BICYCLE TRAVEL

The Kapolei Parkway is planned to include bicycle lanes to encourage use of bicycles for transportation purposes as well as for recreation. Bicycle lanes or a bicycle path should also be included along either Kalaeloa Boulevard or Hanua Street.

A transit center is planned within the Parcel L mixed-use development located makai of the Kapolei Parkway on the east side of Hanua Street. Once Hanua Street is extended through to connect to Malakole Street, one or more TheBus routes will likely be added along Hanua Street which would provide public transportation access to the Project area.

Actions that could encourage use of these travel modes for access to the Project are included in the list on the following page.

Public Transit

- Coordinate the potential location of bus stops with the City DTS and TheBus staffs and provide bus shelters at the stop locations.

- The Project should be designed to provide convenient and safe pedestrian linkages to the bus stop locations through a system of raised sidewalks and walkways.

Bicycles

- The collector streets within the Project site should be planned to accommodate bicycle use, and should provide a network of continuous street connections to allow use for bicycle travel by those who prefer not to travel along the major streets.

POTENTIAL MITIGATIVE ACTIONS

The following paragraphs identify potential roadway improvements to mitigate the impacts at those intersections substantially affected by the projected Kapolei Harborside Center traffic in 2018.

Kalaeloa Boulevard-Kapolei Parkway – The Project would primarily add traffic to the eastbound and westbound approaches of the Kapolei Parkway at this intersection. The addition of a separate right-turn lane on the eastbound approach of the Kapolei Parkway would improve capacity use, but the forecast volumes would exceed the capacity by 4% in the afternoon peak hour. The average delays would be improved to acceptable conditions as summarized in the following table.

Peak Hour	Volume-to-Capacity Ratio	Ave. Delay Per Vehicle (sec.)	Level of Service
Morning	0.88	37.2	D
Afternoon	1.04	51.1	D

The intersection capacity use could also be improved by the construction of a second (double) right-turn lane to accommodate the high volume of traffic projected to turn right from the westbound approach to access the H-1 Freeway and the Makaiwa Hills area. With the addition of the right-turn lanes on both approaches, the forecast afternoon peak hour traffic would amount to about 97% of capacity.

Peak Hour	Volume-to-Capacity Ratio	Ave. Delay Per Vehicle (sec.)	Level of Service
Morning	0.88	36.3	D
Afternoon	0.97	47.6	D

These mitigative actions may be unnecessary if additional capacity were to be provided from the Kalaeloa Boulevard corridor to and through the Kalaeloa Redevelopment area to provide alternative routes for corridor traffic use in traveling to/from the Villages of Kapolei, East Kapolei, and Fort Weaver Road areas. The increased capacity connections could be provided by either of the following:

1. Widen Malakole Street between Kalaeloa Boulevard and the Kalaeloa Redevelopment Area roadways to a four-lane roadway; or
2. Provide the planned new roadway connection between Lauwiliwili Street and the Kalaeloa Redevelopment Area roadways in the Kapolei Business Park area, which would require a new crossing of the drainage channel separating the two areas.

Either of the above improvements should allow and encourage more travel by Project and non-Project traffic through the Redevelopment Area roadways and reduce the traffic volumes passing through the Kapolei Parkway intersections with both Hanua Street and Kalaeloa Boulevard.

Kalaeloa Boulevard-Malakole Street – Traffic conditions at this intersection are projected to worsen in the afternoon peak hour with the addition of the Project traffic, based on the existing numbers of lanes at the intersection. The forecast volumes would exceed the intersection capacity by an estimated 26% with average overall delays at LOS E, as a result of the Project traffic using Malakole Street to travel through the Kalaeloa Redevelopment Area to/from the Fort Weaver Road corridor and the City of Kapolei/East Kapolei area.

Several alternative modifications were considered for the intersection, with the effect on 2018 afternoon peak hour conditions summarized in the following table.

Potential Modification	Volume-to-Capacity Ratio	Ave. Delay Per Vehicle (sec.)	Level of Service
1. Add WB Left-turn lane	1.08	66.6	E
2. Item 1 + stripe second EB through lane	0.94	48.0	D
3. Item 1 + add EB (double) left-turn lane	1.01	65.5	E
4. Item 1 + add NB right-turn lane	0.98	56.2	E
5. Item 3 + Item 4	0.96	55.1	E
6. Item 1 + add SB second left turn lane	0.92	46.1	D

- Adding a left-turn lane on eastbound Malakole Street would offset much of the Project impacts, although the projected traffic would exceed the intersection capacity by 8% with average overall delay at LOS E.

- Adding a left-turn lane on eastbound Malakole Street plus re-striping the right-turn lane on eastbound Malakole Street as a second through lane (Item 2) would result in estimated traffic at 94% of capacity with average overall delay at LOS D. Malakole Street would have to be widened on the east side of the intersection to provide two eastbound lanes for at least 400 feet from the intersection to receive the two through lanes.

- The adding of either a second (double) left-turn lane on eastbound Malakole Street (Item 3) or a right-turn lane on mauka-bound Kalaeloa Boulevard (Item 4) at the intersection would increase capacity to approximate the estimated traffic volumes, but with average delay remaining at LOS E. The combination of these two lanes with the westbound left-turn lane would improve to 96% of capacity with traffic delay just above the borderline (55 seconds) between LOS D and E.

- Adding a left-turn lane on eastbound Malakole Street plus adding a second (double) left-turn lane on the makai-bound Kalaeloa Boulevard approach (Item 6) would improve the volume-to-capacity ratio to 0.92, with average overall delay at LOS D. Malakole Street would have to be widened on the east side of the intersection to provide two eastbound lanes for at least 400 feet from the intersection to receive the two lanes of traffic turning left.

The addition of a second (double) left-turn lane on the makai-bound Kalaeloa Boulevard approach (Option 6) would be the most effective improvement option, with the provision of two westbound through lanes on Malakole Street (Option 2) slightly less effective. However, the implementation of either of these is affected by right-of-way ownership at the intersection:

- A related party (The Estate of James Campbell) of the Kapolei Harborside Center property owner controls the section of Kalaeloa Boulevard north of the intersection, as well as the intersection area and a small parcel on the northeast corner.

- The City and County of Honolulu owns the south leg of Kalaeloa Boulevard and the west leg of Malakole Street.

- Private landowner groups unrelated to the Harborside Center owner own both the roadway right-of-way and the adjacent properties along the east leg of Malakole Street, with the exception of about the first 100 feet of property along the north side of the street at the intersection, owned by the Campbell Estate.

A short left-turn lane (75-foot storage) on the westbound approach of Malakole Street in Option 1 could be implemented using the Campbell property in the northeast corner. Options 3, 4, and 5 could be implemented using Campbell and/or City right-of-way. However, Options 2 and 6, the two most effective improvement approaches would require use of right-of-way owned by unrelated private parties.

Therefore, the preferred improvement approach would be Option 6 if the independent property owners of the east leg of Malakole Street would agree to the widening of this section to receive the two lanes of makai-bound traffic that would be turning left onto Malakole Street. This improvement would also likely be needed for access to any future redevelopment of the Hawaii Raceway property. If an agreement cannot be reached with the owners of the east leg of Malakole Street, then Option 5 is proposed as the mitigative action. This mitigative action would only be needed if and when Malakole Street is connected to the Kalaeloa Redevelopment Area roadway network, which would allow use by Project traffic as an alternative to the Kapolei Parkway.

Kapolei Parkway-Hanua Street Extension – The forecast Project traffic would exceed intersection capacity by 14% in the morning peak hour. The addition of a right-turn lane to the eastbound approach of the Kapolei Parkway and/or the conversion of the planned right-turn lane on makai-bound Kapolei Parkway to a shared through/right-turn lane in order to allow through traffic in three lanes were evaluated to mitigate the Project impacts during the morning peak hour.

Potential Modification	Volume-to-Capacity Ratio	Ave. Delay Per Vehicle (sec.)	Level of Service
1. Add Right-turn lane to EB Kapolei Pkwy.	0.96	73.7	E
2. Convert Makai-bound Right-turn lane to shared Through Lane	0.96	59.7	E
3. Item 1 + Item 2	0.83	44.5	D

The analysis of the 2018 morning peak hour traffic with the potential mitigative modifications indicates:

- The increased capacity of the added right-turn lane on the eastbound approach would in the morning peak traffic at 96% of capacity, although the average overall delay per vehicle would be at LOS E.

- The projected morning peak hour traffic can also be accommodated by the conversion of the planned right-turn-only lane on the makai-bound approach to a shared through/right-turn lane, which also results in a volume-to-capacity ratio of 0.96 and LOS E conditions. The outside lane would have to be extended makai of the intersection for 500 feet or more to allow the outside lane traffic to merge into the two continuing through lanes.

- The combination of the two modifications would improve average delay to LOS D, with traffic amounting to 83% of capacity.

The afternoon traffic conditions would be improved to 93% of capacity with average delay at LOS D by the combined eastbound right-turn lane and the third makai-bound through lane.

Hanua Street-Malakole Street – The installation of traffic signal control at this intersection would require additional lanes to accommodate the forecast afternoon peak hour traffic with the Project. The critical movement contributing to the deficiency would be the left-turn from makai-bound Hanua Street which is estimated at over 500 vehicles in the afternoon peak hour, as well as about 240 in the morning peak hour. Double left-turn lanes are usually needed to efficiently accommodate traffic when left-turn volumes reach 250 to 300 vehicles per hour. The peak hour conditions with this modification would be as follows:

Peak Hour	Volume-to-Capacity Ratio	Ave. Delay Per Vehicle (sec.)	Level of Service
Morning	0.79	40.9	D
Afternoon	0.92	49.1	D

The provision of double left-turn lanes would require widening eastbound Malakole Street for about 400 or more feet east of the intersection to receive the two lanes of traffic turning left.

Provision for Traffic Signal Installation at Intersections – As indicated in the analyses of 2018 traffic conditions, several intersections along Hanua Street may merit the installation of traffic signals as traffic volumes increase. It is proposed that any underground detection loops, conduit, and pull-boxes be provided at the following intersections as part of the roadway construction to minimize any future disruption of traffic when the traffic signals are warranted by future conditions:

- Hanua Street and Areas 1 & 2 Access Roads

- Hanua Street and Opakapaka Street
- Hanua Street and Area 5 Access Road/I-2 Access Road
- Hanua Street and Lauwiliwili Street Makai
- Hanua Street and Area 6/7 Access Road
- Hanua Street and Malakole Street.

Traffic conditions should be monitored at these locations and traffic signals installed when warranted by future traffic conditions.

PROPOSED MITIGATIVE ACTIONS

The following roadway improvements are proposed to mitigate the future traffic conditions within the study area.

Proposed to Mitigate Project Impacts

The actions proposed to mitigate Project impacts are highlighted in the Figure 4-4 depiction of the roadway lanes and traffic controls in the Kalaeloa Boulevard corridor, which include the following:

Kalaeloa Boulevard-Kapolei Parkway Intersection

- Add a right-turn lane to eastbound approach
- Construct a second (double) right-turn lane if warranted by future traffic volumes and conditions

Kalaeloa Boulevard-Malakole Street Intersection

- Add westbound left-turn lane
- Add makai-bound second (double) left-turn lane
- Widen Malakole Street to provide two eastbound lanes for a distance of about 400 feet from Kalaeloa Boulevard intersection
- Modify signal phasing and timing to reflect geometric changes

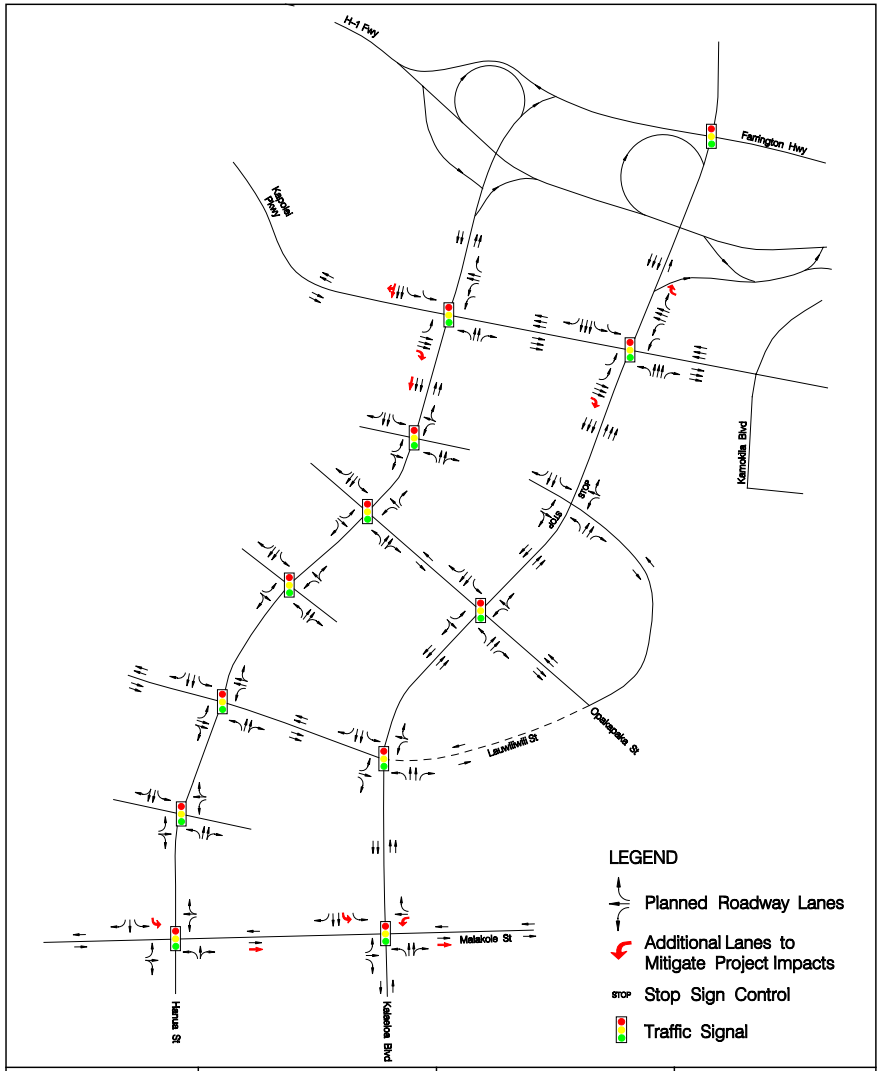
Hanua Street-Kapolei Parkway Intersection

- Add right-turn lane to eastbound Kapolei Parkway approach
- Convert planned makai-bound right-turn lane on Hanua Street to shared through/right-turn lane through the intersection.

Hanua Street-Malakole Street Intersection

- Provide second (double) left-turn lane on makai-bound approach
- Widen Malakole Street east of intersection for distance of about 400 feet to provide two eastbound lanes to receive double left-turn lanes

Signal Controls at Intersections
Install conduit and pull boxes for potential future signal control at



Wilbur Smith Associates	KAPOLEI HARBORSIDE CENTER KAPOLEI, HAWAII	PROPOSED ROADWAY LANES AND TRAFFIC CONTROL	FIGURE 4-4

- Hanua Street and Areas 1 & 2 Access Roads
- Hanua Street and Opakapaka Street
- Hanua Street and Area 5 Access Road/I-2 Access Road
- Hanua Street and Lauwiliwili Street Makai
- Hanua Street and Area 6/7 Access Road
- Hanua Street and Malakole Street.

Proposed Actions by Others

The following roadways and/or modifications would be needed to access the Project and are planned as actions by others without the development of the Kapolei Harborside Center Project:

- Construct Hanua Street Extension from Malakole street to Palailai Interchange
- Construct additional ramps at Palailai Interchange to accommodate Hanua Street connection to the freeway
- Construct Kapolei Parkway as six-lane roadway from Hanua Street Extension to Kamokila Boulevard
- Extend Malakole Street eastward to connect to the roadway network within the Kalaeloa Redevelopment Area
- Construct the extension of the makai end of Lauwiliwili Street westward to access the Kalaeloa (Barbers Point) Harbor
- Construct Opakapaka Street between Kalaeloa Boulevard and Hanua Street.
- Install traffic signals at Kalaeloa Boulevard intersections with Opakapaka and Lauwiliwili (Makai) Streets, and at Hanua Street intersections with Malakole and Lauwiliwili (Makai) Streets.

APPENDICES

Appendix A
Methodology for Analyzing Traffic Conditions

The Transportation Research Board (TRB), a division of the National Science Foundation, has developed standardized methods for use in evaluating the effectiveness and quality of service for roadways and streets. Different methodologies are available for analyzing traffic signal-controlled intersections and other types of roadways.

The TRB evaluation methods use concepts referred to as volume-to-capacity ratio and level-of-service (LOS). The volume-to-capacity ratio (V/C) compares the existing or projected traffic volumes on a facility to the facility's theoretical capacity and, as such, indicates the relative adequacy of the facility to accommodate the traffic volumes. Capacity is estimated primarily from the facility's physical characteristics (e.g. number and widths of lanes), and to a lesser extent by the traffic characteristics (e.g. types of vehicles) and type of traffic controls. The level of service concept describes facility traffic conditions in terms of travel delays or travel speeds, with the service quality expressed on a letter basis from A to F, which signify excellent to unacceptable conditions, respectively.

Signal-Controlled Intersections--Traffic conditions at traffic signal-controlled intersections were evaluated using the Operations Analysis methodology described in the *2000 Highway Capacity Manual (HCM).*[1] The methodology calculates a ratio of actual or estimated peak hour traffic volumes to the theoretical capacity of the intersection. This volume-to-capacity ratio (V/C) reflects the physical characteristics of the intersection and the traffic characteristics, and is somewhat independent of the efficiency of the traffic signal phasing/timing. This ratio indicates the proportion of available capacity being used by traffic volumes and where there is unused capacity available for future traffic increases.

With the 2000 HCM method, the level-of-service is based on the average delay per vehicle for the various movements within the intersection as a result of the traffic signal control. This total delay is the difference between the travel time experienced with the traffic signal and the reference travel time that would result under ideal conditions, in the absence of the traffic control and geometric delay. This delay, referred to as control delay, includes initial deceleration delay, stop delay, queue move-up delay, and final acceleration delay. Average delay time and level-of-service is estimated for the entire intersection, for each roadway approach, and for each traffic movement or lane group. A description of the criteria associated with LOS A through LOS F is provided in Table A-1.

In the assessment of traffic signal-controlled intersections, it is usually most appropriate to relate the adequacy of the geometric design features (such as numbers and use of lanes, lane widths, etc.) to the V/C. Delay and LOS are most relevant to assessing modifications to the traffic signal controls, since these are most directly related to the signal design features, such as cycle length, number and arrangement of phases, and allocation of green time.

[1] *2000 Highway Capacity Manual,* Transportation Research Board, October 2000.

Table A-1
LEVEL OF SERVICE CRITERIA FOR INTERSECTIONS WITH TRAFFIC SIGNAL CONTROL

Level of Service	Average Control Delay (seconds per vehicle)
A	10 or Less
B	10.1 – 20.0
C	20.1 – 35.0
D	35.1 – 55.0
E	55.1 – 80.0
F	More than 80.0

Source: Highway Capacity Manual 2000, Transportation Research Board, Chapter 16, 2000.

Unsignalized Intersections—At intersections with STOP sign controls, the level of service was calculated using the 2000 HCM procedures for intersections with STOP or YIELD signs. In this methodology, the six levels of service, A through F, are used to describe traffic conditions for those movements that must yield to other movements:

- Left-turn out of the side street or driveway;
- Through movement from the side street,
- Right-turn out of the side street or driveway; and
- Left-turn into the side street.

Through vehicles on the major streets are not required to yield to other movements at two-way STOP controlled intersections.

The general indicator of intersection delay is determined by calculating the one-hour capacity for each key movement, based on the conflicting traffic volumes, and then comparing the number of vehicles making that maneuver to the calculated capacity. The unused or "reserve" capacity for the movement is then used to identify a delay time and a level-of-service for that movement. Unlike analysis at signalized intersections, an overall intersection level-of-service is not calculated, but a level-of-service is calculated for each lane group subject to the STOP or YIELD condition.

The level-of-service criteria for unsignalized intersections with STOP or YIELD controls are defined in Table A-2.

Table A-2
LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

Level of Service	Average Stopped Delay (seconds per vehicle)
A	10 or Less
B	10.1 – 15.0
C	15.1 – 25.0
D	25.0 – 35.0
E	35.1 – 50.0
F	More than 50.0

Source: Highway Capacity Manual 2000, Transportation Research Board, Chapter 17, 2000.

Freeway Sections – Speed and the freedom to maneuver are primary indicators of operating conditions on freeway sections. Both of these are related to the density of vehicles in the traffic stream, which the 2000 HCM uses to define conditions on freeway sections. Table A-3 presents the maximum vehicle density, minimum speed, and maximum volume-to-capacity ratio for Level of Service A through F for freeways designed for free flow speeds of 65 mph. The criteria for the 65 mph free flow speed are used in this study since this represents the posted speed limit, even though the design speed is likely higher. The maximum capacity is considered to be 2,400 vehicles per lane per hour under average conditions for six- and eight-lane freeways.

With these guidelines and assumptions, the H-1 Freeway is assumed to provide capacities of 2,350 vehicles per hour for normal use lanes.

Roadway or Freeway Ramp Weaving Sections – Weaving sections are formed where a merge area is followed by a diverge area with the two joined by an auxiliary lane with intense lane-change maneuvers taking place. The conditions within a weaving section is a factor of the length of the weaving section, the number of lanes, and the configuration of the entry leg, weaving section, and exit leg, as well as the volumes of the various traffic movements. The HCM 2000 relates the level of service to the vehicle density within the weaving section as presented in Table A-4.

Table A-3
LEVEL OF SERVICE CRITERIA FOR BASIC FREEWAY SEGMENTS

Level of Service	Maximum Density (PC/Mi/Ln)	Minimum Speed (mph)	Maximum Service Flow Rate (PC/Hr/Ln)	Maximum Volume/Capacity Ratio
A	11.0	65.0	710	0.30
B	18.0	65.0	1,170	0.50
C	26.0	64.6	1,680	0.71
D	35.0	59.7	2,090	0.89
E	45.0	52.2	2,350	1.00
F	*	*	*	*

Criteria based on free flow speed of 65 miles per hour (mph)
PC/Mi/Ln = Passenger cars per mile per lane
PC/Hr/Ln = Passenger cars per hour per lane
* = An unstable operation, demand exceeds capacity.

Source: Highway Capacity Manual 2000, Transportation Research Board, Chapter 23, 2000.

Table A-4
LEVEL OF SERVICE CRITERIA FOR WEAVING SEGMENTS

Level of Service	Density (pc/mi/ln)	
	Freeway Weaving Segment	Multilane and Collector-Distributor Segments
A	10 or less	12 or less
B	10-20	12-24
C	20-28	24-32
D	28-35	32-36
E	35-43	36-40
F	Over 43	Over 40

PC/Mi/Ln = Passenger cars per mile per lane

Source: Highway Capacity Manual 2000, Transportation Research Board, Chapter 24, 2000.

Ramp Merge and Diverge Areas – Traffic conditions in the freeway through lanes are affected by vehicles entering from or exiting onto ramps. The influence area of a ramp junction with the freeway generally encompasses the two freeway through lanes closest to the ramp with the influence area extending for a length of about 1,500 feet along the ramp entry/exit point and slightly upstream of the exit or downstream of the entry. The impact of the ramp junction on traffic flow is based on the traffic density within this influence area. Table A-5 lists the range of traffic densities associated with each level of service within the ramp merge or diverge influence area.

Table A-5
LEVEL OF SERVICE CRITERIA
FOR RAMP MERGE AND DIVERGE AREAS

Level of Service	Density (pc/mi/ln)
A	10 or Less
B	10-20
C	20-28
D	28-35
E	35 or More
F	Demand Exceeds Capacity

PC/Mi/Ln = Passenger cars per mile per lane

Source: Highway Capacity Manual 2000, Transportation Research Board, Chapter 25, 2000.

Appendix Table B-1

VEHICLE TRIP GENERATION FOR 2018
NON-PROJECT LAND USES WITHIN CITY OF KAPOLEI

					Trip Generation Rates							Vehicle Trips To/From Area							Trips Less Passbys			
				ITE	AM Peak Hour			PM Peak Hour				AM Peak Hour			PM Peak Hour				PM Peak Hour			
ZONE	Activity	Quantity	Units	Use	Total	In	Out	Total	In	Out	Daily	Total	In	Out	Total	In	Out	Daily	%	Total	In	Out
4	Kapowai Place	17	TSF	710	1.56	1.37	0.19	1.49	0.25	1.24		27	23	3	25	4	21	0	1	25	4	21
10	Kalaeloa West Retail		TSF	820	1.03	0.63	0.4	3.75	1.8	1.95		0	0	0	0	0	0	0	0.65	0	0	0
11	Advertiser Printing		Emp Trips		0.5	0.4	0.11	1	0.25	0.75		0	0	0	0	0	0	0	1	0	0	0
12	Kapolei Power Ctr Central	130	TSF	820	1.03	0.63	0.4	3.75	1.8	1.95		134	82	52	488	234	254	0	0.65	317	152	165
	FHB Branch Bank		TSF	911	4.07	2.28	1.79	33.14	16.57	16.6		0	0	0	0	0	0	0	0.53	0	0	0
	FHB Office	7	TSF	710	1.56	1.37	0.19	1.49	0.25	1.24		11	10	1	10	2	9	0	1			
15	Library																					
	Public Library		TSF	590	1	0.72	0.28	7.09	3.4	3.69		0	0	0	0	0	0	0	1	0	0	0
	Library Distribution	5	TSF	590	1	0.82	0.18	4.76	2.19	2.57		5	4	1	24	11	13	0	1	24	11	13
16	Civic Center	50	Emp	710	0.48	0.42	0.06	0.46	0.08	0.38		24	21	3	23	4	19	0	1	23	4	19
17	Ai / Chun Retail	25	TSF	814	0.71	0.43	0.28	2.59	1.11	1.48		18	11	7	65	28	37	0	0.35	23	10	13
18	Uluohia																					
	Retail	6	TSF	814	0.71	0.43	0.28	2.59	1.11	1.48		4	3	2	16	7	9	0	0.3	5	2	3
	Quality Resturant		TSF	931	0	0	0	7.49	5.02	2.47		0	0	0	0	0	0	0	0.56	0	0	0
	Lot 56 Restaurant	6	TSF	931	0	0	0	7.49	5.02	2.47		0	0	0	45	30	15	0	0.56	25	17	8
30	Sr Village Ph I/ Ph II	424	Veh. Trips		0.61	0.23	0.38	1	0.56	0.44		259	98	161	424	237	187	0	1	424	237	187
38	Generic A5 Office	36	TSF	710	1.56	1.37	0.19	1.49	0.25	1.24		56	49	7	54	9	45	0	1	54	9	45
41	Kamaaha N2 Office	39	TSF	710	1.56	1.37	0.19	1.49	0.25	1.24		61	53	7	58	10	48	0	1	58	10	48
42	Kamaaha N3																					
	Office	39	TSF	710	1.56	1.37	0.19	1.49	0.25	1.24		61	53	7	58	10	48	0	1	58	10	48
	Private School	700	Students	521	0.92	0.55	0.37	0.2	0.08	0.12		644	385	259	140	56	84	0	1	140	56	84
43	YMCA	40	TSF	495	1.32	0.87	0.45	1.75	0.6	1.15		53	35	18	70	24	46	0	0.9	63	22	41
44	Block 58 Road E Office	40	TSF	710	1.56	1.37	0.19	1.49	0.25	1.24		62	55	8	60	10	50	0	1	60	10	50
45	Block 59 Road E Ofice	48	TSF	710	1.56	1.37	0.19	1.49	0.25	1.24		75	66	9	72	12	60	0	1	72	12	60
46	Pad A Bank Drive-thru	3	TSF	912	12.63	7.07	5.56	54.78	27.39	27.4		38	21	17	164	82	82		0.53	87	44	44
48	Kapolei Power Ctr West																					
	Home Depot		TSF	862	1.48	0.8	0.68	2.87	1.35	1.52		0	0	0	0	0	0	0	0.52	0	0	0
	Ace Hardware		TSF	816	1.08	0.5	0.58	4.42	2.12	2.3		0	0	0	0	0	0	0	0.35	0	0	0
	Retail	15	TSF	814	0.71	0.43	0.28	2.59	1.11	1.48		11	6	4	39	17	22	0	0.35	14	6	8
	Theme Steak House		TSF	831	0	0	0	7.49	5.02	2.47		0	0	0	0	0	0	0	0.56	0	0	0
69	Kapolei Mauka Residential																					
	Low Density	350	DU	231	0.67	0.17	0.5	0.62	0.42	0.2		235	60	175	217	147	70	0	1	217	147	70
	Total											**1776**	**1034**	**742**	**2050**	**933**	**1117**	**0**		**1687**	**762**	**925**

3/23/2006

Appendix Table B-2

VEHICLE TRIP GENERATION FOR 2018
NON-PROJECT EAST AND SOUTH AREAS

					Trip Generation Rates							Vehicle Trips To/From Area							Trips Less Passbys			
				ITE	AM Peak Hour			PM Peak Hour				AM Peak Hour			PM Peak Hour				PM Peak Hour			
ZONE	Activity	Quantity	Units	Use	Total	In	Out	Total	In	Out	Daily	Total	In	Out	Total	In	Out	Daily	%	Total	In	Out
	Villages of Kapolei																					
23	Village Center																					
	Church	67	TSF	560	0.72	0.39	0.33	0.66	0.36	0.3		48	26	22	44	24	20	0	1	44	24	20
	Shopping Center	67	TSF	820	1.03	0.63	0.4	3.75	1.8	1.95		69	42	27	251	121	131	0	0.58	146	70	76
	Medium Density Apts	290	DU	230	0.44	0.07	0.37	0.54	0.36	0.18		128	20	107	157	104	52	0	1	157	104	52
27	Kapolei Village																					
	Single Family	314	DU	210	0.75	0.19	0.56	1.01	0.65	0.36		236	60	176	317	204	113	0	1	317	204	113
32	NW Commercial																					
	Shopping Center	199.5	TSF	820	1.03	0.63	0.4	3.75	1.8	1.95		205	126	80	748	359	389	0	0.68	509	244	265
	Medium Density Apts	200	DU	230	0.44	0.07	0.37	0.54	0.36	0.18		88	14	74	108	72	36	0	1	108	72	36
33	Kapolei Knolls																					
	Single Family	50	DU	210	0.75	0.19	0.56	1.01	0.65	0.36		38	10	28	51	33	18	0	1	51	33	18
	Total											**811**	**297**	**514**	**1676**	**917**	**759**	**0**		**1331**	**751**	**580**
	Kalaeloa Redevelopment Area																					
56	Central Saratoga Area																					
	Lt. Ind.	10	Acres	110	7.51	6.23	1.28	7.26	1.6	5.66		75	62	13	73	16	57	0	1	73	16	57
	Office	10	TSF	710	1.56	1.37	0.19	1.49	0.25	1.24		16	14	2	15	3	12	0	1	15	3	12
	Specialty Retail	15	TSF	814	0.71	0.43	0.28	2.59	1.11	1.48		11	6	4	39	17	22	0	0.55	21	9	12
	Mid Rise Apt. -	300	DU	223	0.3	0.09	0.21	0.39	0.23	0.16		90	27	63	117	69	48	0	1	117	69	48
58	Regional Park	250	Acres	417	0.12	0.07	0.05	0.2	0.09	0.11		30	18	13	50	23	28	0	1	50	23	28
	Mid Rise Apt.	100	DU	223	0.3	0.09	0.21	0.39	0.23	0.16		30	9	21	39	23	16	0	1	39	23	16
57	Enterprise Voc Sch	25	Emp	540	2.85	2.28	0.57	3.12	1.78	1.34		71	57	14	78	45	34	0	1	78	45	34
84	NW Lt Ind																					
	Lt Ind	0	Acres	110	7.51	6.23	1.28	7.26	1.6	5.66		0	0	0	0	0	0	0	1	0	0	0
	Total											**323**	**193**	**130**	**410**	**194**	**216**	**0**		**393**	**187**	**206**
24	**Makakilo**																					
	Condominiums	329	DU	230	0.44	0.07	0.37	0.54	0.36	0.18		145	23	122	178	118	59	0	1	178	118	59
	Apartments	64	DU	220	0.51	0.1	0.41	0.62	0.4	0.22		33	6	26	40	26	14	0	1	40	26	14
	Single Family	746	DU	210	0.75	0.19	0.56	1.01	0.65	0.36		560	142	418	753	485	269	0	1	753	485	269
	Easter Seals Office	20	TSF	710	1.56	1.37	0.19	1.49	0.25	1.24		31	27	4	30	5	25	0	1	30	5	25
	Total											**768**	**199**	**570**	**1001**	**634**	**367**	**0**		**1001**	**634**	**367**
	Mehana at Kapolei (Schuler)																					
52	Mehana West																					
	Low Density	344	DU	231	0.67	0.17	0.5	0.83	0.47	0.36		230	58	172	286	162	124	0	1	286	162	124
	Medium Density	282	DU	230	0.44	0.07	0.37	0.54	0.36	0.18		124	20	104	152	102	51	0	1.00	152	102	51
	Neighborhood Commercial	10	TSF	814	0.71	0.43	0.28	2.59	1.11	1.48		7	4	3	26	11	15	0	0.30	8	3	4
	Apartments	30	DU	220	0.3	0.09	0.21	0.39	0.23	0.16		9	3	6	12	7	5	0	1	12	7	5
53	Mehana East																					
	Low Density	270	DU	231	0.67	0.17	0.5	0.83	0.47	0.36		181	46	135	224	127	97	0	1	224	127	97
	Medium Density	230	DU	230	0.44	0.07	0.37	0.54	0.36	0.18		101	16	85	124	83	41	0	1	124	83	41
54	Elementary School	650	Studen	520	0.29	0.17	0.12	0.07	0.04	0.03		189	111	78	46	26	20	0	1	46	26	20
	Total											**841**	**258**	**583.4**	**870**	**517**	**353**	**0**		**851.3**	**509**	**342**
	Grand Total											**2743**	**947**	**1796**	**3956**	**2262**	**1695**	**0**		**3576**	**2081**	**1494**

2/28/2006

Appendix Table B-3

VEHICLE TRIP GENERATION FOR 2018
OTHER AREAS WEST OF KAPOLEI

				Trip Generation Rates							Vehicle Trips To/From Area							Trips Less Passbys				
				ITE	I Peak Hour			PM Peak Hour				AM Peak Hour			PM Peak Hour				PM Peak Hour			
ZONE	Activity	Quantity	Units	Use	Total	In	Out	Total	In	Out	Daily	Total	In	Out	Total	In	Out	Daily	%	Total	In	Out
	Kapolei Business Park																					
25	Ind. Park Phase 1	67	Acres	130	8.55	7.1	1.45	8.84	1.86	6.98	63.1	573	476	97	592	125	468	4228	1.00	592	125	468
91	Ind. Park Phase 2	46.4	Acres	130	8.55	7.1	1.45	8.84	1.86	6.98	63.1	397	329	67	410	86	324	2928	1.00	410	86	324
	Total											970	805	164	1002	211	792	7157 0		1002	211	792
	Barbers Pt. Harbor																					
28	Lt. Ind.	200	Veh Trips	110	1	0.81	0.19	0	0	0		200	162	38	0	0	0	0	1.00	0	0	0
		162	Veh Trips	110	0	0	0	1	0.32	0.68		0	0	0	162	52	110	0	1.00	162	52	110
	Kalaeloa Blvd West																					
92	Kalaeloa W Mauka I-2	33	Acres	130	8.55	7.1	1.45	8.84	1.86	6.98	63.1	282	234	48	292	61	230	2083	1.00	292	61	230
70	Studios	360	Employees		0.87	0.82	0.05	1.11	0.17	0.94		313	295	18	400	61	338	0	1.00	400	61	338
	Kalaeloa W Center I-2	27	Acres	130	8.55	7.1	1.45	8.84	1.86	6.98	63.1	231	192	39	239	50	188	1704	1.00	239	50	188
	Total											826	721	105	930	173	757	3787 0		930	173	757
	Kalaeloa West Ind Area																					
88	Northeast 1,2,3	23.7	Acres	130	8.55	7.1	1.45	8.84	1.86	6.98	63.1	203	168	34	210	44	165	1496	1.00	210	44	165
88	Northwest 19	23.6	Acres	130	8.55	7.1	1.45	8.84	1.86	6.98	63.1	202	168	34	209	44	165	1489	1.00	209	44	165
78	East Central 4,5	40.9	Acres	130	8.55	7.1	1.45	8.84	1.86	6.98	63.1	350	290	59	362	76	285	2581	1.00	362	76	285
78	West Central 17, 18	54.9	Acres	130	8.55	7.1	1.45	8.84	1.86	6.98	63.1	469	390	80	485	102	383	3465	1.00	485	102	383
89	Southwest 6, 7, 12-15	79.3	Acres	130	8.55	7.1	1.45	8.84	1.86	6.98	63.1	678	563	115	701	147	554	5005	1.00	701	147	554
89	West Central 16	8.1	Acres	130	8.55	7.1	1.45	8.84	1.86	6.98	63.1	69	58	12	72	15	57	511	1.00	72	15	57
90	Southeast 8, 9	19.2	Acres	130	8.55	7.1	1.45	8.84	1.86	6.98	63.1	164	136	28	170	36	134	1212	1.00	170	36	134
	Total	249.7										2135	1773	362	2207	464	1743	15759 0	7	2207	464	1743
83	Maritime Ind	30	Acres	120	1.98	1.64	0.34	2.16	0.48	1.68	6.75	59	49	10	65	14	50	203	1.00	65	14	50
	Total Kalaeloa Blvd Area											**4190**	**3510**	**680**	**4367**	**914**	**3452**	**26904 0**		**4367**	**914**	**3452**
	Ko Olina																					
61	Resort Beach Areas																					
	Hotel	990	Rooms	330	0.31	0.22	0.09	0.42	0.18	0.24		307	218	89	416	178	238	0	1.00	416	178	238
62	Olani St Hotel	300	Rooms	330	0.31	0.22	0.09	0.42	0.18	0.24		93	66	27	126	54	72	0	1.00	126	54	72
63	Coconut Plantation/Centex																					
	Single Family	60	DU	210	0.75	0.19	0.56	1.01	0.65	0.36		45	11	34	61	39	22	0	1.00	61	39	22
	Medium Density	390	DU	230	0.44	0.07	0.37	0.54	0.36	0.18		172	27	144	211	140	70	0	1.00	211	140	70
64	Medium Density	110	DU	230	0.44	0.07	0.37	0.54	0.36	0.18		48	8	41	59	40	20	0	1.00	59	40	20
65	Marina Area																					
	Marriott Timeshares	540	DU	330	0.31	0.22	0.09	0.42	0.18	0.24		167	119	49	227	97	130	0	1.00	227	97	130
	Aquarium	25	Veh Trips		1	0.87	0.13	0	0	0		25	22	3	0	0	0	0	1.00	0	0	0
		180	Veh Trips		0	0	0	1	0.44	0.56		0	0	0	180	79	101	0	1.00	180	79	101
67	Hillside Villas Low D	174	DU	230	0.44	0.07	0.37	0.54	0.36	0.18		77	12	64	94	63	31	0	1.00	94	63	31
	Total											**934**	**483**	**451**	**1373**	**690**	**683**	**0 0**		**1373**	**690**	**683**
	Grand Total											**5124**	**3993**	**1131**	**5740**	**1605**	**4135**	**26904 0**		**5740**	**1605**	**4135**

3/23/2006

Appendix Table B-4

VEHICLE TRIP GENERATION FOR 2018
KAPOLEI CCOMMONS AND WEST KAPOLEI AREAS

					Trip Generation Rates							Vehicle Trips To/From Area							Trips Less Passbys			
				ITE	AM Peak Hour			PM Peak Hour				AM Peak Hour			PM Peak Hour				PM Peak Hour			
ZONE	Activity	Quantity	Units	Use	Total	In	Out	Total	In	Out	Daily	Total	In	Out	Total	In	Out	Daily	%	Total	In	Out
	Kapolei Commons																					
10	Kap Commons Zoned Area																					
	Shopping Center	207	TSF	820	1.03	0.63	0.4	3.75	1.8	1.95	42.9	213	130	83	776	373	404	8884	0.72	559	268	291
	Office	0	TSF	710	1.56	1.37	0.19	1.49	0.25	1.24	11	0	0	0	0	0	0	0	1.00	0	0	0
	Theater	0	Seats	445	0	0	0	0.08	0.03	0.05	1.76	0	0	0	0	0	0	0	1.00	0	0	0
	Subtotal Zoned Land											213	130	83	776	373	404	8884		559	268	291
66	Kapolei Commons Unzoned																					
	Shopping Center	159.4	TSF	820	1.03	0.63	0.4	3.75	1.8	1.95	42.9	164	100	64	598	287	311	6841	0.72	430	207	224
	Discount Store	123.8	TSF	815	0.84	0.57	0.27	5.06	2.53	2.53	56	104	71	33	626	313	313	6935	0.72	451	226	226
	Office	50	TSF	710	1.56	1.37	0.19	1.49	0.25	1.24	11	78	69	10	75	13	62	551	0.75	56	9	47
	Theater	2000	Seats	445	0	0	0	0.08	0.03	0.05	1.76	0	0	0	160	60	100	3520	1.00	160	60	100
	Med Density Condos	300	DU	230	0.44	0.07	0.37	0.54	0.36	0.18	5.86	132	21	111	162	108	54	1758	0.61	99	66	33
	Subtotal Unzoned Land											478	260	218	1621	781	840	19605		1196	567	629
	Totals Kapolei Commons											**691**	**391**	**300**	**2397**	**1153**	**1244**	**28490**		**1755**	**836**	**919**
	Kapolei West																					
71	"L" Transit/Mixed Use																					
	Med Density Resident	150	DU	230	0.44	0.07	0.37	0.54	0.36	0.18		66	11	56	81	54	27	0	1.00	81	54	27
	Commercial	100	TSF	814	0.71	0.43	0.28	2.59	1.11	1.48		71	43	28	259	111	148	0	0.60	155	67	89
72	"A" Residential																					
	Primary Resident SF Homes	162	DU	210	0.75	0.19	0.56	1.01	0.65	0.36		122	31	91	164	105	58	0	1.00	164	105	58
	Non-Resident Homes	29	DU	260	0.3	0.15	0.15	0.31	0.14	0.17		9	4	4	9	4	5	0	1.00	9	4	5
73	"C" Residential																					
	Primary Resident SF Homes	113	DU	210	0.75	0.19	0.56	1.01	0.65	0.36		85	21	63	114	73	41	0	1.00	114	73	41
	Non-Resident Homes	38	DU	260	0.3	0.15	0.15	0.31	0.14	0.17		11	6	6	12	5	6	0	1.00	12	5	6
74	"B" Residential																					
	Primary Resident Med Density	208	DU	230	0.44	0.07	0.37	0.54	0.36	0.18		92	15	77	112	75	37	0	1.00	112	75	37
	Non-Resident Homes	37	DU	260	0.3	0.15	0.15	0.31	0.14	0.17		11	6	6	11	5	6	0	1.00	11	5	6
	Middle School	600	Student	522	0.53	0.29	0.24	0.15	0.08	0.07		318	174	144	90	48	42	0	0.75	68	36	32
75	Golf Course	18	Holes	430	3.01	1.41	1.6	3.56	1.53	2.03		54	25	29	64	28	37	0	1.00	64	28	37
76	"I,J,D" + Neighborhood Com.																					
	Primary Resident SF Homes	245	DU	210	0.75	0.19	0.56	1.01	0.65	0.36		184	47	137	247	159	88	0	1.00	247	159	88
	Non-Resident Homes	160	DU	260	0.3	0.15	0.15	0.31	0.14	0.17		48	24	24	50	22	27	0	1.00	50	22	27
	Neighborhood Commercial	22	TSF	814	0.71	0.43	0.28	2.59	1.11	1.48		7	4	3	26	11	15	0	0.30	8	3	4
77	"E, F, G, H, K" Residential																					
	Med Density Primary Resident Hom	131	DU	230	0.44	0.07	0.37	0.54	0.36	0.18		58	9	48	71	47	24	0	1.00	71	47	24
	Med Density Non-Resident Homes	450	DU	260	0.3	0.15	0.15	0.31	0.14	0.17		135	68	68	140	63	77	0	1.00	140	63	77
	Low Dens Primary Resident Homes	237	DU	231	0.67	0.17	0.5	0.83	0.47	0.36		159	40	119	197	111	85	0	1.00	197	111	85
	Low Dens Non-Resident Homes	48	DU	260	0.3	0.15	0.15	0.31	0.14	0.17		14	7	7	15	7	8	0	1.00	15	7	8
	Total											**1443**	**534**	**909**	**1661**	**930**	**732**	**0**		**1518**	**865**	**651**
	Grand Total											**2134**	**925**	**1209**	**4058**	**2083**	**1975**	**28490**		**3273**	**1701**	**1571**

2/27/2006

Appendix Table B-5

VEHICLE TRIP GENERATION FOR 2018
KAPOLEI REZONING PARCELS 1, 2 & 3

					Trip Generation Rates							Vehicle Trips To/From Area							Trips Less Passbys			
				ITE	AM Peak Hour			PM Peak Hour				AM Peak Hour			PM Peak Hour				PM Peak Hour			
ZONE	Activity	Quantity	Units	Use	Total	In	Out	Total	In	Out	Daily	Total	In	Out	Total	In	Out	Daily	%	Total	In	Out
	Parcel 1																					
8	Civic Center																					
	Office	205	TSF	710	1.56	1.37	0.19	1.49	0.25	1.24		320	281	39	305	51	254	0	1	305	51	254
20	South Kalaeloa Costco	160	TSF	815	0.84	0.57	0.27	5.06	2.53	2.53		134	91	43	810	405	405	0	0.65	526	263	263
34	Generic A1 Office	45	TSF	710	1.56	1.37	0.19	1.49	0.25	1.24		70	62	9	67	11	56	0	1	67	11	56
35	Generic A2 Office	39	TSF	710	1.56	1.37	0.19	1.49	0.25	1.24		61	53	7	58	10	48	0	1	58	10	48
36	Generic A3 Office	130	TSF	710	1.56	1.37	0.19	1.49	0.25	1.24		203	178	25	194	33	161	0	1	194	33	161
	Mid rise Apts	300	DU	223	0.3	0.09	0.21	0.39	0.23	0.16		90	27	63	117	69	48	0	1	117	69	48
37	Generic A4 Office	36	TSF	710	1.56	1.37	0.19	1.49	0.25	1.24		56	49	7	54	9	45	0	1	54	9	45
39	Generic A6 Office	36	TSF	710	1.56	1.37	0.19	1.49	0.25	1.24		56	49	7	54	9	45	0	1	54	9	45
40	Kamaaha N1 Office	39	TSF	710	1.56	1.37	0.19	1.49	0.25	1.24		61	53	7	58	10	48	0	1	58	10	48
49	Generic D3 Office	100	TSF	710	1.56	1.37	0.19	1.49	0.25	1.24		156	137	19	149	25	124	0	1	149	25	124
50	Generic B1 Retail	65	TSF	814	0.71	0.43	0.28	2.59	1.11	1.48		46	28	18	168	72	96	0	0.6	101	43	58
51	Generic B2 Retail	65	TSF	814	0.71	0.43	0.28	2.59	1.11	1.48		46	28	18	168	72	96	0	0.6	101	43	58
55	Generic B3 Retail	70	TSF	814	0.71	0.43	0.28	2.59	1.11	1.48		50	30	20	181	78	104	0	0.6	109	47	62
60	Generic D1 Office	250	TSF	710	1.56	1.37	0.19	1.49	0.25	1.24		390	343	48	373	63	310	0	1	373	63	310
	Total											**1739**	**1410**	**329.4**	**2756**	**916**	**1840**	**0**		**2265**	**685**	**1580**
	Parcel 2																					
21	North Kalaeloa Retail	120	TSF	820	1.03	0.63	0.4	3.75	1.8	1.95		124	76	48	450	216	234	0	0.62	279	134	145
	Total											**124**	**76**	**48**	**450**	**216**	**234**	**0**		**279**	**134**	**145**
	Parcel 3 Farrington																					
31	NE Discount Store	150	TSF	815	0.84	0.57	0.27	5.06	2.53	2.53		126	86	41	759	380	380	0	0.68	516	258	258
	Shopping Ctr Retail	68	TSF	820	1.03	0.63	0.4	3.75	1.8	1.95		70	43	27	255	122	133	0	0.68	173	83	90
	Total											**196**	**128**	**68**	**1014**	**502**	**512**			**690**	**341**	**348**
	Grand Total											**2059**	**1614**	**445.1**	**4220**	**1634**	**2586**	**0**		**3234**	**1161**	**2073**

3/23/2005

Appendix Table B-6

VEHICLE TRIP GENERATION FOR 2018
MAKAIWA HILLS

					Trip Generation Rates							Vehicle Trips To/From Area							Trips Less Passbys			
				ITE	AM Peak Hour			PM Peak Hour				AM Peak Hour			PM Peak Hour				PM Peak Hour			
ZONE	Activity	Quantity	Units	Use	Total	In	Out	Total	In	Out	Daily	Total	In	Out	Total	In	Out	Daily	%	Total	In	Out
	Makaiwa																					
68	**Makaiwa Central Res**																					
	Low Density	510	DU	231	0.67	0.17	0.5	0.83	0.47	0.36	7.9	342	87	255	423	240	184	4029	1	423	240	184
												342	**87**	**255**	**423**	**240**	**184**	**4029**		**423**	**240**	**184**
79	**Makaiwa E Mauka**																					
	Single Family	122	DU	210	0.75	0.19	0.56	1.01	0.65	0.36	9.57	92	23	68	123	79	44	1168	1	123	79	44
	Low Density	0	DU	231	0.67	0.17	0.5	0.83	0.47	0.36	7.9	0	0	0	0	0	0	0	1	0	0	0
	Total											**92**	**23**	**68**	**123**	**79**	**44**	**1168**		**123**	**79**	**44**
80	**Makaiwa Commercial**																					
	Offices	50	TSF	710	1.56	1.37	0.19	1.49	0.25	1.24	11.01	78	69	10	75	13	62	551	1	75	13	62
	Shopping Center	220	TSF	820	1.03	0.63	0.4	3.75	1.8	1.95	42.92	227	139	88	825	396	429	9442	0.70	578	277	300
	High Rise Condo	193	DU	232	0.34	0.07	0.27	0.38	0.25	0.13	4.18	66	14	52	73	48	25	807	1	73	48	25
	Elementary School	650	Student	520	0.29	0.17	0.12	0.07	0.04	0.03	1.29	189	111	78	46	26	20	839	1	46	26	20
	Total											**559**	**331**	**228**	**1018**	**483**	**536**	**11638**		**771**	**364**	**407**
81	**Makaiwa SE Res**																					
	Low Density	201	DU	231	0.67	0.17	0.5	0.83	0.47	0.36	7.9	135	34	101	167	94	72	1588	1	167	94	72
	Medium Density	247	DU	230	0.44	0.07	0.37	0.54	0.36	0.18	5.86	109	17	91	133	89	44	1447	1	133	88.92	44.5
	Total											**243**	**51**	**192**	**300**	**183**	**117**	**3035**		**300**	**183**	**117**
82	**Makaiwa SW Res**																					
	Medium Density	961	DU	230	0.44	0.07	0.37	0.54	0.36	0.18	5.86	423	67	356	519	346	173	5631	1	519	346	173
	Single Family	23	DU	210	0.75	0.19	0.56	1.01	0.65	0.36	9.57	17	4	13	23	15	8	220	1	23	15	8
	Quality Restaurants	10	TSF	931	0.81	0.66	0.15	7.49	5.02	2.47	89.95	8	7	2	75	50	25	900	1	75	50	25
	Neighborhood Commercia	10	TSF	814	0.71	0.43	0.28	2.59	1.11	1.48	44.32	7	4	3	26	11	15	443	0.25	6	3	4
	Total											**455**	**83**	**373**	**643**	**422**	**221**	**7194**		**624**	**414**	**210**
85	**Makaiwa E Midlevel Res**																					
	Low Density	223	DU	231	0.67	0.17	0.5	0.83	0.47	0.36	7.9	149	38	112	185	105	80	1762	1	185	105	80
	Medium Density	24	DU	230	0.44	0.07	0.37	0.54	0.36	0.18	5.86	11	2	9	13	9	4	141	1	13	9	4
	Total											**160**	**40**	**120**	**198**	**113**	**85**	**1902**		**198**	**113**	**85**
86	**Makaiwa Village Ctr**																					
	High Rise Condo	504	DU	232	0.34	0.07	0.27	0.38	0.25	0.13	4.18	171	35	136	192	126	66	2107	1	192	126	66
	Medium Density	412	DU	230	0.44	0.07	0.37	0.54	0.36	0.18	5.86	181	29	152	222	148	74	2414	1	222	148	74
	Village Offices	20	TSF	710	1.56	1.37	0.19	1.49	0.25	1.24	11.01	31	27	4	30	5	25	220	1	30	5	25
	Village Commercial	80	TSF	820	1.03	0.63	0.4	3.75	1.8	1.95	42.92	82	50	32	300	144	156	3434	0.5	150	72	78
	Total											**466**	**142**	**324**	**744**	**423**	**320**	**8175**		**594**	**351**	**242**
87	**Makaiwa W Mauka**																					
	Single Family	0	DU	210	0.75	0.19	0.56	1.01	0.65	0.36	9.57	0	0	0	0	0	0	0	1	0	0	0
	Low Density	0	DU	231	0.67	0.17	0.5	0.83	0.47	0.36	7.9	0	0	0	0	0	0	0	1	0	0	0
	Total											**0**	**0**	**0**	**0**	**0**	**0**	**0**		**0**	**0**	**0**
	Grand Total											**2317**	**757**	**1560**	**3450**	**1944**	**1506**	**37141**		**3033**	**1745**	**1288**

2/16/2006

Appendix Table C-1

DISTRIBUTION OF VEHICLE TRIPS
2020-2030

		Commercial		Residential		Recreation Facilities		Industrial/Harbor	
Location	Gate	AM	PM	AM	PM	Employees	Visitors	AM	PM
H-1 Fwy West	1	11.5	10.5	8.5	8.5	11.5	7.9	20.0	21.0
H-1 Fwy East	2	29.5	23.5	39.8	39.8	29.5	79.4	51.0	55.0
Makakilo Dr	3	11.0	14.0	4.0	4.0	11.0	2.0	5.5	5.0
Farrington Hwy East	5	2.0	2.0	3.5	3.5	2.0	1.6	1.0	1.0
Kapolei Pkwy East	6	10.0	9.0	3.9	3.9	10.0	0.0	5.5	3.5
Kalaeloa Blvd South	7	4.0	4.0	2.8	2.8	4.0	0.0	2.0	2.0
Kapolei West	9								
Villages of Kapolei	10	14.0	13.5	5.0	5.0	14.0	3.7	7.5	5.0
Kapolei Power Ctr	11								
Kapolei Shop Ctr	12								
Roosevelt East	14	3.5	3.0	3.0	3.0	3.5	0.9	2.0	1.0
Kalaeloa Redev.	15	1.0	3.5	2.0	2.0	1.0	0.0	0.5	1.0
Kapolei Office Core	16								
Ko Olina	17	4.5	3.5	3.5	3.5	4.5	2.0	0.0	0.0
Makaiwa Hills	20								
City of Kapolei		9.0	13.5	24.0	24.0	9.0	2.5	5.0	5.5
Totals		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

8/29/2005

Appendix D
Impact on Agricultural

DECISION ANALYSTS HAWAII, INC.
BRUCE STEVEN PLASCH, President

QUANTITATIVE CONSULTING SERVICES: Economic • Financial • Demographic • Statistical

October 23, 2006

Mr. Jeff Overton
GROUP 70 INTERNATIONAL, INC.
925 Bethel Street, Fifth Floor
Honolulu, HI 96813

Re: KAPOLEI HARBORSIDE CENTER

Dear Jeff:

In our studies for Kapolei Harborside Center, there are text and exhibits that make reference to a preserve area of 7.4 acres. Since conducting our studies, it is our understanding that this preserve area has been formally surveyed to reveal an actual area of approximately 6.0 acres. Although we have not modified our text or exhibits to reflect this change, the substance of our analysis and conclusions remain unchanged.

Sincerely,

Bruce S. Plasch

Bruce S. Plasch
President

1655 Kamole St. • Honolulu, HI 96821 • Office: (808) 373-9364 • Fax: (808) 373-9590 • E-mail: bplasch@hawaii.rr.com

PROPOSED KAPOLEI HARBORSIDE CENTER: IMPACT ON AGRICULTURE

DECISION ANALYSTS HAWAI'I, INC.

PROPOSED KAPOLEI HARBORSIDE CENTER: IMPACT ON AGRICULTURE

PREPARED FOR:

Kapolei Property Development

PREPARED BY:

Decision Analysts Hawai'i, Inc.

July 2006

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EXECUTIVE SUMMARY

1. PROPOSED DEVELOPMENT

Kapolei Property Development proposes to develop Kapolei Harborside Center ("the Project"), an industrial park on 344.519 acres in Kapolei, City and County of Honolulu. The entire Project Area is currently within the State Agricultural District and is zoned "Agricultural." However, the Project site is designated for Industrial development in the City's 'Ewa Development Plan. The Project will require a State Land Use District Boundary Amendment to Urban, and a change in zoning to Industrial.

2. AGRICULTURAL CONDITIONS

About 54 to 171 acres (16 to 50%) in the Project Area are good or suitable for growing low-elevation crops; the higher figure reflects the fill material that was added in the past to allow cultivation of sugarcane. The remaining land is poorly suited for farming, largely because most of it is coral outcrop.

3. LOCATIONAL ADVANTAGES AND DISADVANTAGES FOR CROP PRODUCTION

The Project Area is well-located for serving the Honolulu consumer market and export markets. This is due to the short trucking distance to the Honolulu markets, the Honolulu International Airport, and Honolulu Harbor.

4. SURROUNDING LAND USES

All of the current and planned land uses surrounding the Project Area are urban, with no adjacent or nearby agricultural activities. Thus, the Project Area is an agricultural remnant.

5. IMPACT ON EXISTING AGRICULTURAL OPERATIONS

a. Milo Nursery & Landscape Maintenance

Milo Nursery leases about 32.1 acres within the Project area. The company is a wholesale nursery that sells to various landowners, companies, landscapers, and contractors. Services include landscaping of building grounds, landscape maintenance, and street sweeping. Milo Nursery is a family operation that has about 10 employees.

The impact of the Project on Milo Nursery will depend on whether suitable land with water can be obtained. If it can, then Milo Nursery will relocate with no significant impact on revenues, employment, or payroll.

If suitable land with water cannot be obtained, then Milo Nursery will close. In turn, other nurseries, landscapers, and yard-maintenance companies will increase their operations to compensate for the loss. Thus, there will likely be a shift in operations, but no significant island-wide loss of revenues, employment, or payroll.

b. Menehune Green

Menehune Green is a new company that purchased the State's largest composting operation in late 2005. It is affiliated with other Hawai'i companies involved in commercial waste disposal, and with a mainland company that operates the largest yard-waste composting site in the United States.

Its current volume of green waste is about 60,000 tons per year which is composted at two locations: the leeward location on about 52 acres of leased land within the Project Area and a windward location near Kailua. The volume of green waste is high because the City bans truckloads of waste containing more than 10% yard trimmings from its landfill and H-Power. The windward location eventually will be converted to a transfer station, with all of the green waste composted at the leeward location. Also, the City's new policy of curb-side collection of green waste will double the volume of green waste delivered to Menehune Green, with the pace of growth determined by the City's implementation of curb-side collection. Thus, the volume composted at the leeward location will increase from about 36,000 tons per year to more than 120,000 tons per year. The current operation employs about 35 workers, of whom about 30 are located at the leeward facility.

In addition to centralizing operations at a single location, Menehune Green plans a number of related technical improvements that will reduce composting time from about 12 weeks to about 8 weeks, eliminate the need for some equipment, reduce water requirements per ton of green waste processed, and

increase labor productivity. Even though the volume of green waste is expected to more than double, little change is expected in employment.

Menehune Green purchased Hawaiian Earth Products in November 2005 with plans to move the composting operation from the Project Area to some undetermined new location where the changes in composting technology would be introduced. Assuming that Menehune Green will be successful in finding a suitable new site for its composting operation, the Project will have no significant impact on the future volume of green waste processed by Menehune Green, or its revenues, employment, or payroll.

About 30 to 50 acres will be required in a centrally located and dry area. Also, the site should offer level or gently sloping terrain, good road access, and access to water. However, the composting site does not have to be located near the City's H-Power facility or the City's landfill.

The new location for composting is likely to be on land zoned Agricultural since it is less expensive than Urban land, and composting is categorized by the City as an agricultural use. A major composting operation and related activities (e.g., packaging) are allowed on land zoned Agricultural (Ag-1 Restricted or Ag-2 General), subject to a conditional use permit that specifies the standards for composting.

Lease rents for the existing composting operation indicate that Menehune Green should be able to outbid most other uses for leased agricultural land at a new location. Or, if the company purchases agricultural land outside the City's Urban Growth Boundary, it should be able to service a mortgage.

6. GROWTH OF DIVERSIFIED CROPS

a. Potential Acreage Requirements for Diversified Crops

Crops to Replace Imports of Fruits and Vegetables

For low-elevation fruits and vegetables that have a history of profitable production in Hawai'i, potential land requirements in 2010 for 100% import substitution for the Hawai'i and O'ahu markets are estimated at 12,700 acres and 8,600 acres, respectively, plus additional acreage for fallowing land between crop plantings. When allowing for competition from imports, these estimates drop to about half.

Export Crops

The many entrepreneurial agricultural efforts being undertaken on former plantation lands may lead to one or more major new export crops over the next 20+ years. However, the history of agricultural efforts in Hawai'i reveals that

developing major new export crops that are successful in overseas markets is difficult. For example, over the past 50 years in Hawai'i, farmers have explored numerous possibilities for export crops, but they have developed overseas markets for just one diversified crop that requires more than 10,000 acres (macadamia nuts at 18,000 acres in 2003); one additional crop that requires more than 5,000 acres (coffee at 7,300 acres); and only five additional crops or crop categories that require more than 1,000 acres each.

Feed Crops

If feed crops could be grown in Hawai'i and priced competitively against mainland imports, they could replace a portion of the large volumes of grains and hay that are now being imported to the State. Unfortunately, a number of commercial attempts in Hawai'i to grow grains and alfalfa have been unsuccessful.

Biofuel Crops

Crops can be grown to produce biomass to fuel a boiler, or as feedstock to produce fuels. In Hawai'i, the common practice is to produce biomass as a by-product of some principal crop. However, O'ahu Ethanol Corporation plans to build an ethanol plant at Campbell Industrial Park using conventional technology but, at least initially, using imported molasses as the feedstock. For the longer term, this company is exploring the economics of growing sweet sorghum on O'ahu to supply feedstock to its ethanol plant. Acreage requirements for a new sorghum biofuel plantation on O'ahu would range from about 6,000 acres for viability to 15,000 to replace all imported molasses.

However, a number of substantial difficulties must be overcome to develop a sorghum biofuel plantation on O'ahu. For example, it will be difficult to lease the 6,000+ acres required for economic viability. Most major landowners will be reluctant to lease their land at comparatively low rents for the approximately 30-year period desired by O'ahu Ethanol. Also, emerging technology that is in its early stage of commercialization promises a more plentiful and cheaper source of feedstock for ethanol. Instead of producing ethanol using sugars from conventional sources, the sugar would come from "cellulosic" sources. This would include green waste for which there would be no land rent and no growing costs, but there could be a disposal fee paid to the processor. In the long term, this less expensive source of feedstock could result in an unprofitable biofuel plantation.

These and other difficulties and risks suggest that the probability of successfully developing and sustaining a sorghum biofuel plantation on Oahu is low.

Recent Crop-acreage Trends

For all diversified crops—i.e., all crops other than sugarcane and pineapple, including crops to replace imports and crops for export—Statewide land requirements grew by an average of less than 300 acres per year from 1983 through 2003, or less than 3,000 acres per decade.

b. Land Availability for Diversified Crops

A vast amount of land has been released from plantation agriculture on O'ahu and the Neighbor Islands, and most of this land remains available for diversified crops. By 2009, about 15,300 acres of farm land will be available on O'ahu. This includes about 9,600 acres on the North Shore plus about 5,700 acres in Kunia that will be available following the closure of the Del Monte pineapple plantation, but it excludes any adjustment for the farm land in 'Ewa and Kunia land that is already leased for diversified crops but is not farmed intensively. Statewide, an estimated 160,000+ acres remain available for diversified crops. Cultivating crops on the Neighbor Islands for the Honolulu market, and vice versa, will become more economically feasible once the Superferry begins its scheduled operations in 2007.

The above information indicates that ample land is available in Hawai'i to accommodate the growth of diversified crops, whether demand is based on potential or recent trends. In other words, the limiting factor to the growth of diversified crops is *not* the *land supply*, but rather the *size of the market* for crops that can be grown *profitably* in Hawai'i.

c. Impact on the Growth of Diversified Crops

The Project will commit 344.5 acres of agricultural land to a non-agricultural use, of which about 54 to 171 acres are good or suitable for farming. If this much land were used to grow a typical vegetable or fruit crop, it could support about 21 jobs.

More realistically, the development of this agricultural land—combined with other developments in Hawai'i—involves the loss of too little good agricultural land to affect (1) the availability of land to farmers in Hawai'i, (2) agricultural land rents, (3) the growth of diversified crops, or (4) potential agricultural employment. This conclusion is based on the finding that ample land is available for diversified crops, with the available supply far exceeding likely or potential demand.

More to the point, the Project Area has already been lost to farming because it is an agricultural remnant surrounded by existing and planned urban development.

7. OFFSETTING BENEFITS

The loss of 344.5 acres of agricultural land, of which about 54 to 171 acres are good or suitable for farming, will be offset by the following benefits of the Project:

— jobs supported by development activity, including (1) direct construction jobs and other jobs involved with development, and (2) indirect jobs supported by purchases of goods and services by construction companies and their employees;

— over 3,800 jobs at full development of the Project, or over 90 times as many as the 40 jobs currently provided by agricultural actives;

— jobs supported by purchases of goods and services by the companies that locate within the Project Area, and by the families of their employees; and

— tax revenues (excise taxes, personal income taxes, corporate income taxes, property taxes, etc.) paid by companies and employees directly and indirectly supported by development activities and by on-going operations of companies that locate within the Project Area.

8. CONSISTENCY WITH STATE AND CITY POLICIES

a. Availability of Lands for Agriculture

The *Hawaii State Constitution*, the *Hawaii State Plan*, the *State Agriculture Functional Plan*, and the *General Plan of the City and County of Honolulu* call directly or implicitly for preserving the economic viability of plantation agriculture and promoting the growth of diversified crops. To accomplish this, an adequate supply of agriculturally suitable lands and water must be assured.

With regard to plantation agriculture, the Project Area is no longer part of a sugar plantation since the plantation closed in 1995 for reasons unrelated to the Project.

With regard to diversified crops, development of the Project Area will result in a small loss of good farm land, but this loss will not limit the growth of diversified crops since ample agricultural land is available on O'ahu and on other islands. This is due to the enormous supply of agricultural land that is now available due to the contraction of plantation agriculture.

b. Conservation of Agricultural Lands

In addition to the above, State policies call for conserving and protecting prime agricultural lands, including protecting agricultural lands from urban development.

However, these policies—which were written before the major contraction of plantation agriculture in the 1990s—assume implicitly that profitable agricultural activities eventually will be available to utilize all available agricultural lands. This has proven to be a questionable assumption in view of the enormity of the contraction of plantation agriculture, the abundant supply of land that came available for diversified agriculture, and the slow growth in the amount of land being utilized for diversified agriculture.

Furthermore, discussions in the Agriculture portion of the *State Functional Plan* recognize that redesignation of lands from Agricultural to Urban should be allowed "… upon a demonstrated change in economic or social conditions, and where the requested redesignation will provide greater benefits to the general public than its retention in …agriculture;" that is, when an "overriding public interest exists." The enormous contraction in plantation agriculture, resulting in the supply of agricultural land far exceeding demand, constitutes a major change in economic conditions. Moreover, development in the Project Area will provide community benefits (over 3,800 jobs at full development) that far exceed that provided by diversified agriculture (about 40 jobs with current nursery and composting operations, and about 21 jobs if farmed). In practice, however, development of the Project Area is expected to have no significant impact on existing or potential agricultural employment.

c. 'Ewa Development Plan

The Project Area is within the City's designated Urban Growth Boundary of the 'Ewa Development Plan in an area designated Industrial. Thus, the Project—along with the change in use from Agricultural to Industrial—is consistent with the 'Ewa Development Plan.

Proposed Kapolei Harborside Center: Impact on Agriculture

1. Introduction

Kapolei Property Development proposes to develop Kapolei Harborside Center ("the Project"), an industrial park on 344.519 acres in Kapolei, City and County of Honolulu (see Figure 1 at the end of this report for the location of the Project, Figure 2 for the Tax Map Keys (TMKs), and Figure 3 for the proposed development).[1]

The entire Project Area is currently within the State Agricultural District and is zoned "Agricultural" (Figures 4 and 5). However, the Project site is designated for Industrial development in the City's 'Ewa Development Plan (Figure 6). The Project will require a State Land Use District Boundary Amendment to Urban, and a change in zoning to Industrial.

This report addresses the impacts on agriculture of developing the Project. The material below gives the following information on the Project: its location; a description of the Project; the agricultural conditions of the Project Area, along with supporting Figures 7, 8 and 9; potential crops; locational advantages and disadvantages for crop production; surrounding land uses; past and current agricultural land uses; the impact of the Project on existing agricultural operations; the impact the Project on the growth of diversified crops, along with supporting Figure 10 that shows the release of land from plantation agriculture and the increase in acreage in diversified crops; benefits of the Project that will offset adverse agricultural impacts; and consistency of the Project with State and City agricultural policies. Following the ten figures at the end of the report, an Appendix provides a summary of State and City goals, objectives, policies, and guidelines related to agricultural lands.

2. Location of the Project [1]

As shown in Figure 1, Kapolei Harborside Center is located in Kapolei near the southwest corner of O'ahu.

As shown in Figure 2, the Project Area is also defined by four TMK parcels:

— TMK 9-1-014-033 (por), 137.529 acres

— TMK 9-1-014-034 (por), 19.947 acres

— TMK 9-1-014-035 (por), 12.845 acres

— TMK 9-1-015-020 (por), 174.198 acres

3. Project Description[1]

Kapolei Harborside Center will offer about 248 acres for industrial development for companies engaged in light manufacturing, warehousing, and industrial services. The remaining acreage will be used for roads, drainage, and a wastewater pumping station (WWPS). In addition, a preservation area will protect sinkholes having scientific value.

4. Agricultural Conditions

a. Soil Types[2]

As shown in Figure 7, the Project Area contains three soil types. Their acreages are listed in Table 1 by their quality as rated by the Natural Resources Conservation Service (NRCS), formerly known as the Soil Conservation Service.

For each of the three soil types, the complete name, range of slopes, and soil descriptions are:

— EmA: 'Ewa silty clay loam, moderately shallow, 0 to 2% slopes

These are well-drained soils derived from basic igneous rock and, in 'Ewa, deposited on alluvial fans.

— MnC: Mamala stony silty clay loam, 0 to 2% slopes

These soils consist of shallow, well-drained soils along the coastal plains. They formed in alluvium deposited over coral limestone and consolidated calcareous sand. Stones, mostly coral rock fragments, are common in the surface layer and in the profile.

— CR: Coral Outcrop

Coral outcrop consists of coral or cemented calcareous sand.

As indicated in Table 1, CR (coral outcrop) is the predominant soil type, comprising 82.6% of the Project Area. Although this soil is poorly suited for agriculture, portions of the land were covered with fill to allow for the cultivation of sugarcane.

Table 1. Kapolei Harborside Center Project Area: Soil Types and NRCS Ratings

Soil Types	Acres		NRCS Ratings
Higher-quality			
EmA	6.0	1.7%	IIs
Moderate-quality			
MnC	54.0	15.7%	IIIs
Lower-quality			
CR	285.0	82.6%	VIIIs
Adjustment	–0.5	-	
Total	344.5	100.0%	

b. Soil Ratings

Three classification systems are commonly used to rate Hawai'i soils: (1) Land Capability Grouping, (2) Agricultural Lands of Importance to the State of Hawai'i, and (3) Overall Productivity Rating.

Land Capability Grouping (NRCS Rating)[2]

The 1972 Land Capability Grouping by the U.S. Department of Agriculture, NRCS rates soils according to eight levels, ranging from the highest classification level "I" to the lowest "VIII."

As shown in Table 2, about 6 acres (1.7%) of the Project Area have soils that are rated IIs. Class II soils have moderate limitations that reduce the choice of plants or require moderate conservation practices. The subclassification "s" indicates that the limitation is due to stoniness.

About 54 acres (15.7%) have soils rated IIIs. Class III soils have severe limitations that reduce the choice of plants, require special conservation practices, or both.

About 285 acres (82.6%) have soils rated VIIIs. Class VIII soils have very severe limitations that preclude commercial crop production.

Agricultural Lands of Importance in the State of Hawai'i (ALISH)[3]

ALISH ratings were developed in 1977 by the NRCS, the UH College of Tropical Agriculture and Human Resources, and the State of Hawai'i, Department of Agriculture. This system classifies land into three broad categories: (a) "Prime" agricultural land which is land that is best suited for the production of crops because of its ability to sustain high yields with relatively little input and with the least damage to the environment; (b) "Unique" agricultural land which is non-Prime agricultural land used for the production of specific high-value crops; and (c) "Other" agricultural land which is non-Prime and non-Unique agricultural land that is important to the production of crops.

About 4 acres (1.2%) of the Project Area have soils that are rated Prime; about 50.3 acres (14.6%) are rated Other; and about 290.7 acres (84.3%) are unclassified (Figure 8). The Other rating was ascribed to MnC soils which, in 1977, were used for growing sugarcane.

Overall Productivity Rating (LSB Rating)[4]

In 1972, the University of Hawai'i (UH) Land Study Bureau (LSB) developed the Overall Productivity Rating, which classifies soils according to five levels, with "A" representing the class of highest productivity and "E" the lowest.

When irrigated, about 65.7 acres (19%) of the Project Area have soils rated B, about 105.6 acres (30.6%) of the Project Area are rated C, and about 173.7 acres (50.3%) are rated E (see Figure 9). The B and C ratings reflect the addition of fill material and areas where sugarcane was grown in 1972.

Summary Evaluation of Soil Quality

The NRCS and ALISH soil-rating systems indicate that about 4 to 6 acres of the Project Area are good for cultivating crops (II or better under the NRCS rating, and Prime under the ALISH rating). Another 50 to 54 acres are suitable for farming (III under the NRCS rating, and Other under the ALISH rating). When fill material is taken into account, the LSB ratings indicated that about 66 acres of the Project Area are good for cultivating crops (B rating), and another 106 acres are suitable for farming (C rating).

c. Soil Characteristics[2,4]

Consistent with the above soil ratings, the small amount of land in the Project Area that could be used for farming exhibits a number of favorable characteristics: the soils are moderately deep to deep (over 30 inches), the texture is moderately fine although stony, the soils have moderate tillability, soils

are well drained, the slopes are gentle (see below), the erosion hazard is slight, and the soil pH is neutral to mildly alkaline.

d. Elevation[1]

The ground elevation of the Project Area ranges from about 5 feet near the intersection of Kalaeloa Boulevard and Malakole Road to about 70 feet near the northeast corner of the site.

e. Topography[1]

The Project Area is relatively flat to gently sloping, with slopes generally ranging from 0 to 2%. Mounds and depressions are scattered across the site, and a large stockpile of coralline material from the excavation of Kalaeloa/Barbers Point Harbor occupies approximately 50 acres in the southwestern corner of the Project Area.

f. Climatic Conditions

Like other areas in Hawai'i, the 'Ewa plain has a mild *semi*tropical climate which is due primarily to three factors: (1) Hawai'i's mid-Pacific location near the Tropic of Cancer, (2) the surrounding warm ocean waters that vary little in temperature between the winter and summer seasons, and (3) the prevailing northeasterly tradewinds that bring air having temperatures that are close to those of the surrounding waters.

Solar Radiation[5]

The Ewa region of O'ahu is one of the sunniest areas on the island. It is semi-arid, with a relatively warm and dry climate, and an average daily insolation of 500 calories per square centimeter.

Rainfall[6]

Rainfall in the Project Area is low: an average of about 20 inches per year. Most of this rainfall occurs during the winter rainy season (October through April), while the summer months (May through September) are hot and dry.

Temperatures[6]

Average low temperatures range from about 61° Fahrenheit in the winter to about 70° in the summer. Average high temperatures range from about 80° in the winter to 88° in the summer.

Winds and Storms[6]

The prevailing surface winds are tradewinds that blow from a northeasterly direction, with occasional southerly winds. Low-velocity surface winds of less than 10 miles per hour occur frequently. The tradewinds tend to break down during the fall, giving way to lighter, more variable wind conditions through the winter and into the early spring. Storms are infrequent, occurring mostly from the south in the winter months.

g. Irrigation Water[7]

Historically, the sugarcane fields within the Project Area were irrigated with groundwater.

h. Road Access

Fields in the Project Area are reached via plantation roads that connect to Malakole Road and Kalaeloa Boulevard. In turn, Kalaeloa Boulevard connects to the H-1 Freeway.

i. Summary

About 54 to 171 acres (16 to 50%) in the Project Area are good or suitable for growing low-elevation crops; the higher figure reflects the fill material that was added in the past to allow cultivation of sugarcane. The remaining land is poorly suited for farming, largely because most of it is coral outcrop.

5. POTENTIAL CROPS[8]

Based on the above agronomic conditions, the Project Area is suitable for low-elevation crops commercially grown in Hawai'i, including but not limited to: asparagus, beans (green, bush, and snap), bell peppers, bittermelon, cantaloupe, Chinese peas, cucumbers, daikon, dry onions, eggplant, flowers/nursery products, ginger root, green onions, green peppers, head and semi-head lettuces, herbs, honeydew melons, limes, lotus root, lychee, Manoa lettuce, mango, mustard cabbage, Oriental squash, parsley, pumpkins, seed crops, sweet corn, sweet potatoes, tangerines and watermelons.

6. LOCATIONAL ADVANTAGES AND DISADVANTAGES FOR CROP PRODUCTION

The Project Area is well-located for serving the Honolulu consumer market and export markets. This is due to the short trucking distance to the Honolulu markets, the Honolulu International Airport, and Honolulu Harbor.

In the U.S. mainland market, farmers in Hawai'i must compete against farmers on the mainland and in Mexico, Central and South America, the Caribbean, Australia, New Zealand, Southeast Asia, etc. Most of the competing farm areas have lower production and delivery costs than Hawai'i does. Competing against Mexico is particularly difficult given the North America Free Trade Agreement (NAFTA) and Mexico's proximity to major U.S. markets.

7. SURROUNDING LAND USES

Existing and planned land uses surrounding the Project Area are shown in Figures 1 through 6, and include: (1) to the north, the vacant lands of the planned Kapolei West project; (2) to the east, vacant industrial land and Kapolei Business Park; (3) to the south, Campbell Industrial Park; and (4) to the west, Kalaeloa/Barbers Point Harbor and its related activities.

As indicated, all of the current and planned land uses surrounding the Project Area are urban, with no adjacent or nearby agricultural activities. Thus, the Project Area is an agricultural remnant.

8. PAST AND CURRENT AGRICULTURAL LAND USES

a. Historic Agricultural Uses[4,7,9-11]

Following the Mahele of 1848, the Project Area was part of a 43,250-acre grant which, from 1871 to 1877, was leased for cattle grazing. In 1877, James Campbell purchased most of the property (including the Project Area) for cattle ranching—an activity that lasted until 1899.

Campbell then leased the property to Benjamin Dillingham in 1889 who, in turn, subleased the land to the 'Ewa Plantation Company to cultivate sugarcane. The 'Ewa Plantation Company grew quickly and continued operating until 1970 when the O'ahu Sugar Company (OSCo) took over operations. Sugarcane cultivation was continued until 1995 when OSCo closed.

About 167 acres (49%) of the Project Area were used for growing sugarcane. The remaining acreage was unsuitable for cultivation.

b. Recent Agricultural Uses[11,12]

Until the end of May 2006, Aloun Farms held a lease to about 261 acres within the Project Area. The lease expired at the end of 2007 but the land was returned early. Because of the poor quality of the land, the annual rent was only $50 per acre.

On this land, Aloun Farms occasionally grew corn interspersed with watermelon. The last such crop was grown in the fall of 2004. In recent years, the land was not farmed actively because of its poor quality and because it is an agricultural remnant surrounded by urban activities that make operations more difficult. Also, Aloun Farms has access to about 2,500 acres of higher quality farm lands that it leases in the central portion of the 'Ewa plain and in Central O'ahu. Averaged over time, about one-third of these fields are in crop.

c. Current Agricultural Uses[11]

Currently, two agricultural operations lease land within the Project Area: (1) (2) Milo Nursery & Landscape Maintenance, Inc. (Milo Nursery) leases about 32 acres for its nursery operations and (3) Menehune Green, LLC (Menehune Green) leases about 52 acres for composting green waste.

9. IMPACT ON EXISTING AGRICULTURAL OPERATIONS

a. Milo Nursery & Landscape Maintenance

Milo Nursery Operations

Milo Nursery leases about 32.1 acres at the corner of Malakole Street and Kalaeloa Boulevard. The company has been in the Kapolei area for about 30 years and at its current location for about 17 years. The current rent is about $419 per acre per year, and the lease expires in 2009, subject to early termination with 90-days notice.

The company is a wholesale nursery that sells to various landowners, companies, landscapers, and contractors. Services include landscaping of building grounds, landscape maintenance, and street sweeping. On-site improvements include an open shop, an office, and facilities for employees.

Milo Nursery is a family operation owned and managed by a retired fireman. The company has about 10 employees with an annual payroll of about $300,000.

Impact on Milo Nursery

The impact of the Project on Milo Nursery will depend on whether suitable land with water can be obtained. If it can, then Milo Nursery will relocate with no significant impact on revenues, employment, or payroll. Continued operations will be possible because of its existing contacts and contracts, equipment, and good reputation. In the long-term, the nursery will be operated by the owner's sons who also work at the nursery.

If suitable land with water cannot be obtained, then Milo Nursery will close. In turn, other nurseries, landscapers, and yard-maintenance companies will increase their operations to compensate for the loss. Thus, there will likely be a shift in operations, but no significant island-wide loss of revenues, employment, or payroll.

b. Menehune Green

Menehune Green Operations

Menehune Green operates a composting business on about 52 acres within the Project Area, recently increased from about 39.3 acres.[11] About 14.3 acres front Makakole Street, while the remaining 37.7 acres are located *mauka*. Most of the equipment and facilities are located on the 14.3-acre site where rents are higher than they are for the larger area. For the 39.3-acre area, the recent base-plus-percentage rent was nearly $2,700 per acre per year, which is high compared to most other agricultural activities on O'ahu. The lease expires in 2009, subject to early termination with 90-days notice.

Menehune Green is a new Hawai'i company organized in June 2005, and affiliated with Honolulu Disposal Services, Alii Refuse, Horizon Waste Services, and Reynolds Recycling.[13] These affiliates control a large share of the commercial waste disposal business on O'ahu. Menehune Green is also affiliated with Cedar Grove Composting, Inc. near Seattle, Washington.[14] This company operates the largest yard-waste composting site in the United States.[15]

The composting operation in the Project Area was started in 1992 by Hawaiian Earth Products.[14] Menehune Green took over the operation when it purchased Hawaiian Earth Products in November 2005.

Green waste is delivered to Menehune Green by the City, the State, commercial refuse collectors, tree trimers, yard services, and homeowners.[14] The volume of green waste is high because the City bans truckloads of waste containing more than 10% yard trimmings from its landfill and H-Power. In effect, organizations that generate or haul waste must sort out the green waste and deliver it for composting.

The Menehune Green composting operation is the largest in the State.[14] Its current volume of green waste is about 60,000 tons per year which is composted at two locations: the leeward location within the Project Area and a windward location near Kailua. The leeward volume is about 36,000 tons per year (about 60% of the total). The windward location eventually will be converted to a transfer station, with all of the green waste composted at the leeward location. Also, the City's new policy of curb-side collection of green waste will double the volume of green waste delivered to Menehune Green, with the pace of growth

determined by the City's implementation of curb-side collection. Thus, the volume composted at the leeward location will increase from about 36,000 tons per year to more than 120,000 tons per year.

Menehune Green accepts yard trimmings, fruit and vegetable waste, wood waste (unless it is treated or painted with lead paints), and borate-treated lumber.[14] After the loads are weighed and sorted to remove plastics and other items, the green waste is shredded into mulch, placed in windrows (piles about 8 feet wide, 10 feet high, and 400 to 800 feet long), and allowed to decompose. The piles are kept moist and turned every 3 to 7 days, depending on the temperature. The maximum daily water requirement is about 100,000 gallons per day, or about 2,500 gallons per acre per day; this is as much water as is used to irrigate some diversified crops. The composting process takes about 12 weeks. The high temperatures generated by composting kills weed seeds and pathogens.

The resulting compost may be blended with other materials, including manure, topsoil, black cinders, and silica sand.[14] The products are sold in bulk and bags, and distributed throughout the State under the brand-name "Menehune Magic." Buyers include homeowners, gardeners, landscapers, farmers, and building contractors. Since the volume of green waste composted by Menehune Green is projected to more than double, the volume of compost sold will increase by a proportional amount. This will require marketing to sell more local compost in place of imports, and to sell more compost to farmers and other buyers.

Revenues are derived from tipping fees ($37 per ton for green waste) and from selling the compost soil conditioner ($30 per cubic yard in bulk, unblended, course 1/2" screen).[14]

The current operation employs about 35 workers, of whom about 30 are located at the leeward facility.[14] Payroll for the entire workforce amounts to about $1 million per year.

Facilities and equipment include trailers used for offices, grinders, a windrow turner, screens for sorting compost by size, and a bagging shed.[14]

In addition to centralizing operations at a single location, Menehune Green plans a number of related changes that will allow better control of the composting process.[14] First, composting will be done on concrete pads studded with air holes that allow better aeration than composting done on the ground. Second, compost piles will be covered with Gore-Tex to protect the piles from wind and rain, and reduce the volume of water lost to evaporation. Third, high-efficiency blowers will provide aeration when computerized monitoring indicates that temperatures are too hot, thereby eliminating the need to turn the compost mechanically. These changes will reduce composting time from about 12 weeks

to about 8 weeks, eliminate the need for equipment to turn the compost, reduce water requirements per ton of green waste processed, and increase labor productivity. Even though the volume of green waste is expected to more than double, little change is expected in employment.

Impact on Menehune Green

Menehune Green purchased Hawaiian Earth Products in November 2005 with plans to move the composting operation from the Project Area to some undetermined new location where the changes in composting technology would be introduced.[14] Assuming that Menehune Green will be successful in finding a suitable new site for its composting operation, the Project will have no significant impact on the future volume of green waste processed by Menehune Green, or its revenues, employment, or payroll.

About 30 to 50 acres will be required in a centrally located and dry area.[14] Also, the site should offer level or gently sloping terrain, good road access, and access to water. However, the composting site does not have to be located near the City's H-Power facility or the City's landfill.

The new location for composting is likely to be on land zoned Agricultural since it is less expensive than Urban land, and composting is categorized by the City as an agricultural use. A major composting operation and related activities (e.g., packaging) are allowed on land zoned Agricultural (Ag-1 Restricted or Ag-2 General), subject to a conditional use permit that specifies the standards for composting: deliveries to and from the site are allowed only between 7 a.m. and 5 p.m.; trucks entering and leaving the site must be covered to prevent material from falling onto the ground and to mitigate odors; composting areas must be at least 50 feet from surface-water sources; major composting facilities must be at least 1,500 feet from lots zoned for homes or resort use, subject to a reduction to no less than 500 feet with proper mitigation; green waste and compost must be covered to prevent fugitive material from leaving the site; odors and vectors must be controlled; and contamination of surface and groundwater must be prevented.[16] Land used for composting is eligible for an agricultural dedication which lowers the property-tax assessment and resulting property taxes. And if City water is used to keep the compost wet, the Honolulu Board of Water Supply charges the low agricultural rate for the water.

Lease rents for the existing composting operation (nearly $2,700 per acre per year) indicate that Menehune Green should be able to outbid most other uses for leased agricultural land at a new location (major farmers on O'ahu pay about $200 per acre per year).[17] Or, if the company purchases agricultural land outside the City's Urban Growth Boundary, it should be able to service a mortgage. A mortgage payment of $2,700 per acre per year would finance land cost-

ing about $43,700 per acre, assuming a 30-year loan at 6% interest and 15% down. Most large parcels of agricultural land on O'ahu outside the City's Urban Growth Boundary sell at per-acre values of about half this amount.

10. GROWTH OF DIVERSIFIED CROPS

The Project will commit agricultural land to a non-agricultural use. The impact of this commitment on the growth of diversified crops is addressed below. The material covers the (1) amount of land required for the future growth of diversified crops, (2) availability of land for diversified crops, and (3) impact of the Project on the growth of diversified crops.

a. Potential Acreage Requirements for Diversified Crops

Crops to Replace Imports of Fruits and Vegetables

For low-elevation fruits and vegetables that have a history of profitable production in Hawai'i, potential land requirements in 2010 for 100% import substitution for the Hawai'i and O'ahu markets are estimated at 12,700 acres and 8,600 acres, respectively, plus additional acreage for fallowing land between crop plantings.[18] When allowing for competition from imports, these estimates drop to about half. These estimates take into account estimated consumption, production trends, seasonal and annual market shares, yields, and the number of crops per year. Also, these figures are for acreage in crop—not harvested acreage as is typically reported in government publications.

Market shares for Hawai'i growers are limited by the following factors: (1) local varieties are not perfect substitutes for all imports (e.g., premium-priced sweet Maui onions versus inexpensive storage onions); (2) some crops cannot be produced profitably in the summer due to competition from low-cost imports of fruits and vegetables from California, other states, and Mexico; and (3) overproduction must be avoided in order to maintain profitable price levels.

Since Hawai'i farmers already supply a portion of the Hawai'i market, land requirements for increased import substitution are a fraction of the above estimates.

Export Crops

The potential market for export crops is far larger than the Hawai'i market. In 2004, the U.S. population was 293.66 million, compared to Hawai'i's resident-plus-visitor population of 1.38 million.[19,20] To take advantage of this large potential, Hawai'i farmers are exploring various export crops on lands released from plantation agriculture. Over the next 20+ years, one or more of these crops may prove to be successful and may grow into a major export crop.

However, the history of agricultural efforts in Hawai'i reveals that the successful development of major new export crops requiring large amounts of land is infrequent. For example, over the past 50 years in Hawai'i, farmers have explored numerous possibilities for export crops, but they have developed overseas markets for just one diversified crop that requires more than 10,000 acres (macadamia nuts at 18,000 acres in 2003); one additional crop that requires more than 5,000 acres (coffee at 7,300 acres); and only five additional crops or crop categories that require more than 1,000 acres each (papaya at 2,240 acres, bananas at 1,560 acres, tropical specialty fruits at 1,250 acres, flowers/nursery products at 3,373 acres, and seed crops at 4,080 acres).[8] Tropical specialty fruits include longan, lychee, mango, rambutan, star-fruit, etc.

Feed Crops

If feed crops could be grown in Hawai'i and priced competitively against mainland imports, they could replace a portion of the large volumes of grains and hay that are now being imported to the State. Unfortunately, a number of commercial attempts in Hawai'i to grow grains and alfalfa have been unsuccessful. The major problems have been (1) pests, particularly birds that eat the grains before they are harvested; (2) humidity that is too high for drying alfalfa properly; and (3) high production costs compared to those of mainland farms.[21]

Biofuel Crops

Crops can be grown to produce biomass to fuel a boiler, or as feedstock to produce fuels. Examples of the latter include sugarcane, corn or sorghum used to produce ethanol. In turn, the ethanol is used to produce E-10 gasohol (90% gasoline and 10% ethanol).

In Hawai'i, the common practice is to produce biomass as a by-product of some principal crop. For example, at HC&S on Maui and at Gay & Robinson on Kaua'i, the sugarcane by-product bagasse is burned to help fuel their respective power plants. In addition, the biofuel company Maui Ethanol plans to use the sugarcane by-product molasses from the two sugarcane plantations as a feedstock to produce ethanol.[22,23] Using conventional technology, the sugar in the molasses will be fermented to produce ethanol, followed by distillation to extract the alcohol.

However, O'ahu Ethanol Corporation plans to build an ethanol plant at Campbell Industrial Park using conventional technology but, at least initially, using imported molasses as the feedstock.[23] The rated capacity will be 15 million gallons of ethanol per year. For the longer term, this company is exploring

the economics of growing sweet sorghum to supply feedstock to its ethanol plant. The sorghum would have to be grown on O'ahu because it would be too expensive to ship the sorghum juice from a Neighbor Island to O'ahu. Sorghum juice is mostly water having a low concentration of sugar compared to molasses.

Acreage requirements for a new sorghum biofuel plantation on O'ahu would range from about 6,000 acres for viability to 15,000 to replace all imported molasses.[24] This acreage comprises a substantial share of the estimated 15,300 acres of crop land that will be available on O'ahu following the closure of Del Monte in 2008, but a small share of the 160,000+ acres of crop land that will be available Statewide (see Section 10.b.).

Also, substantial investment capital will be required to cover the cost of a mill to extract the juice from the sorghum, a generating plant to provide power, improvements and upgrades to irrigation systems that are in disrepair, trucks and equipment to harvest and haul the sorghum to the mill and haul the sorghum juice to the ethanol plant, etc.

Annual revenues from selling the ethanol plus direct subsidies are estimated by the consultant at about $2,100 per acre (based on an estimated 900 gallons per acre per year of ethanol at about $2.35 per gallon). Even with subsidies, this is low compared to revenues from other crops in Hawai'i.

A number of substantial difficulties must be overcome to develop a sorghum biofuel plantation on O'ahu for supplying feedstock for ethanol production. First, it will be difficult to lease the 6,000+ acres required for economic viability. With the possible exception of Kamehameha Schools, major landowners will be reluctant to lease their land at comparatively low rents for the approximately 30-year period desired by O'ahu Ethanol.[17] A long lease period is needed to capitalize the substantial investment in a new plantation. Over time, other farmers—including those displaced from areas designated by the City for eventual urban development—and other users of land are likely to make higher offers for lease rents or land purchases. In view of this potential, the current market value of available agricultural lands is likely to be higher if the lands are not committed long-term at rents that would be low enough to be affordable for a biofuel plantation.

A second difficulty will be the cost of growing a sorghum biofuel crop on O'ahu compared to the cost of importing molasses. For similar crops (e.g., feed crops), importing has proven to be less expensive than growing and processing crops locally.

A third difficulty will be attracting the capital investment required to develop a plantation given the long-term risks. For example, the current high subsidies for ethanol could eventually be reduced. When Hawai'i users are

paying about $3 per gallon for gasoline, Federal and State ethanol subsidies amount to over $2 per gallon, of which about $1.46 comes from the State.[25] Reduced subsidies could seriously compromise the profitability of a biofuel crop.

Another long-term risk for potential investors in a biofuel plantation arises from emerging technology that promises a cheaper source of feedstock for ethanol. Instead of producing ethanol using sugars from conventional sources (e.g., molasses, sugarcane, grains, fruits, etc.), the sugar would come from "cellulosic" sources. Using new technology that is in its early stage of commercialization, sugar that is locked in complex carbohydrates of plants is separated into fermentable sugars. Feedstock would include agricultural wastes, yard clippings, discarded paper, wood waste, etc.—i.e., the green waste that is now used for composting. This new technology promises (1) much higher ethanol yields per ton of biomass because the entire plant can be used as feedstock, and (2) lower costs, particularly if there are no growing costs when waste product is used, and if the operator is paid a fee to dispose of municipal and agricultural waste. O'ahu's municipal waste could produce an estimated 160 million gallons of ethanol compared to annual consumption of about 400 million gallons of gasoline.[26] This would allow far higher use of ethanol in gasohol than is needed in E-10. In Hawai'i, this new technology is being explored by ClearFuels Technology Inc. In the long term, this less expensive source of feedstock could result in an unprofitable sorghum biofuel plantation.

The above difficulties and risks suggest that the probability of successfully developing and sustaining a sorghum biofuel plantation on Oahu is low.

Recent Crop-acreage Trends[8]

For all diversified crops—i.e., all crops other than sugarcane and pineapple, including crops to replace imports and crops for export—Statewide land requirements grew by an average of less than 300 acres per year from 1983 through 2003, or less than 3,000 acres per decade (see Figure 10).[1]

During the 5-year period from 1999 to 2003, acreage increased for just three of the major export crop categories: tropical specialty fruits up 340 acres, flowers/nursery products up 661 acres, and seed crops up 1,630 acres. During this same period, acreage declined for four of the major export crops: macadamia nuts down 1,900 acres, coffee down 400 acres, papaya down 1,260 acres, and bananas down 200 acres. The net change was a decrease of 1,130 acres.

1. In Figure 10, the temporary bump in diversified-crop acreage that occurred in the late 1990s reflects the fact that some former sugarcane fields were newly planted with grasses for future cattle grazing. After cattle grazing began in 2000, much of this acreage was recategorized from crop land to grazing land.

Factors Limiting the Growth of Diversified Crops

A great many crops can be grown in Hawai'i's year-round subtropical climate, and a number of them can be grown profitably in volumes that require a few hundred acres. However, the modest growth in land requirements for diversified crops reflects the fact that few crops can be grown profitably on a large scale. The primary factors that have limited the growth of diversified agriculture in Hawai'i are given below.[7,18]

— Hawai'i's subtropical climate is not well-suited to the commercial production of major crops that grow better in the temperate mainland climates.

— For certain crops, special hybrids adapted to Hawai'i's subtropical climate are yet to be developed.

— Crop pests are more prevalent and more expensive to control in Hawai'i than they are on the mainland where the cold winters kill many pests.

— Fruit-fly infestations prevent exports of many crops, or require expensive treatment.

— Most soils in Hawai'i have low nutrient levels and therefore require high expenditures for fertilizer.

— Hawai'i suffers from high farm-labor costs, largely because the agriculture industry must compete against the visitor industry and related industries for its labor.

— Compared to many other farm areas that supply U.S. markets, the cost of shipping agricultural supplies and equipment to Hawai'i is high, as is the cost of exporting produce from Hawai'i to mainland markets. High shipping costs are due to Hawai'i's remote location and to Federal regulations that require use of American-built ships and U.S. crews between U.S. ports.

— For a number of crops, consumption volumes in Hawai'i are too small to support large, efficient farms (i.e., the volumes are too small to realize economies of scale).

— Trends towards crops that are certified as safe and towards a single supplier of many food items favor large farms.

— Hawai'i farmers must compete against highly efficient mainland and foreign farms which, in a number of cases, can deliver produce to Hawai'i more cheaply than it can be produced locally. This is due to economies of scale and, in comparison to Hawai'i, low costs for land, labor, supplies, fertilizer, pest control, equipment, etc.

b. Land Available for Diversified Crops

State

Statewide, a vast amount of land has been released from plantation agriculture: about 242,100 acres since 1968—an average decrease of over 6,900 acres per year over a period of 35 years (see Figure 10).[8,27] The recent announcement of the closure of Del Monte's pineapple plantation in Kunia, O'ahu will increase this acreage by an additional 5,700 acres, resulting in a total release of at least 247,800 acres by plantation agriculture between 1968 and 2009.[28]

This release of land from plantation agriculture has far outpaced the demand for land for diversified crops—an increase of about 25,500 acres over this same period, or an average of about 730 acres per year. Since 1983, the growth has slowed to less than 300 acres per year, as previously mentioned.

The net decrease in crop land amounted to 216,600 acres, and will amount to 222,300 acres after adding the land to be fallowed by Del Monte. While some of the released land has been converted or is scheduled to be converted to urban uses and tree plantations, an estimated 160,000+ acres remain available for diversified crops.[25] Cultivating crops on the Neighbor Islands for the Honolulu market, and vice versa, will become more economically feasible once the Superferry begins its scheduled operations in 2007.[29] For a full load carried in a large pick-up truck, the one-way fare will be about 2¢ per pound.

Because of the increased availability of agricultural land, a number of landowners report lower per-acre land rents on O'ahu and the Neighbor Islands compared to rents that were charged before the major contraction in plantation agriculture.[17]

The above information indicates that ample land is available in Hawai'i to accommodate the growth of diversified crops, whether demand is based on potential or recent trends. In other words, the limiting factor to the growth of diversified crops is *not* the *land supply*, but rather the *size of the market* for crops that can be grown *profitably* in Hawai'i.

O'ahu

A similar release of land occurred on O'ahu. Since 1968, about 47,500 acres were released from plantation agriculture due to the contractions of three sugar plantations and their eventual closures, and the contractions of two pineapple plantations.[8,9] By 2009, this figure will increase to 52,600 acres after the Del Monte pineapple plantation closes. Using the more recent date of 1990, the release of land from plantation agriculture on O'ahu totaled about 28,300 acres—a figure which will increase to 34,000 acres by 2009 after the Del Monte pineapple plantation closes.

Much of this 34,000 acres released or to be released from sugar and pineapple production since 1990 remains available. Fields in Kunia and 'Ewa are regarded as being among the best farm land in the State, based on the high solar radiation, high-quality soils, and the short trucking distance to the large Honolulu market and, for export markets, to the Honolulu International Airport and Honolulu Harbor.[21] Except for the Del Monte fields, these lands have been leased for diversified agriculture. However, on average, only about one-third to one-half of this land is in crop.[30] The large amount of fallowing reflects best management practices when farm land is abundant and land rents are low. Fallowing increases soil fertility and helps control unwanted volunteers, weeds, insects and disease. When demand for farm land is strong and rents are high in response to a strong demand for agricultural products, then more intensive farming of the land is warranted even if this increases farmers' costs for pest control and soil additives.

On the North Shore, various crops are being grown, but about 9,600 acres of the former sugarcane and pineapple lands remain fallow or are in a low-value use.[17,31] However, portions of the North Shore water systems need repair, and the types of crops on fields irrigated with water from Lake Wilson will be restricted so long as partially-treated waste water is discharged into the lake. Even though the water is disinfected, water from Lake Wilson cannot be used to irrigate certain crops (e.g., vegetable crops) unless they are processed sufficiently to kill pathogens.

By 2009, about 15,300 acres of farm land will be available on O'ahu. This includes the 9,600 acres on the North Shore plus the 5,700 acres that will be available following the closure of the Del Monte pineapple plantation, but it excludes any adjustment for the farm land in 'Ewa and Kunia land that is already leased for diversified crops but is not farmed intensively.

c. Impact on the Growth of Diversified Crops

The Project will commit 344.5 acres of agricultural land to a non-agricultural use, of which about 54 to 171 acres are good or suitable for farming. If this much land were used to grow a typical vegetable or fruit crop, it could support about 21 jobs (based on 171 acres and about 12.5 jobs per 100 acres).

More realistically, the development of this agricultural land—combined with other developments in Hawai'i—involves the loss of too little good agricultural land to affect (1) the availability of land to farmers in Hawai'i, (2) agricultural land rents, (3) the growth of diversified crops, or (4) potential agricultural employment. This conclusion is based on the above finding that ample land is available for diversified crops, with the available supply far exceeding likely or potential demand.

More to the point, the Project Area has already been lost to farming because it is an agricultural remnant surrounded by existing and planned urban development.

11. OFFSETTING BENEFITS

The loss of 344.5 acres of agricultural land, of which about 54 to 171 acres are good or suitable for farming, will be offset by the following benefits of the Project:

— jobs supported by development activity, including (1) direct construction jobs and other jobs involved with development, and (2) indirect jobs supported by purchases of goods and services by construction companies and their employees;

— over 3,800 jobs at full development of the Project, or over 90 times as many as the 40 jobs currently provided by agricultural actives;[32]

— jobs supported by purchases of goods and services by the companies that locate within the Project Area, and by the families of their employees; and

— tax revenues (excise taxes, personal income taxes, corporate income taxes, property taxes, etc.) paid by companies and employees directly and indirectly supported by development activities and by on-going operations of companies that locate within the Project Area.

12. CONSISTENCY WITH STATE AND CITY POLICIES[33]

a. Availability of Lands for Agriculture

The *Hawaii State Constitution*, the *Hawaii State Plan*, the *State Agriculture Functional Plan*, and the *General Plan of the City and County of Honolulu* call directly or implicitly for preserving the economic viability of plantation agriculture and promoting the growth of diversified crops. To accomplish this, an adequate supply of agriculturally suitable lands and water must be assured.

With regard to plantation agriculture, the Project Area is no longer part of a sugar plantation since the plantation closed in 1995 for reasons unrelated to the Project.

With regard to diversified crops, development of the Project Area will result in a small loss of good farm land, but this loss will not limit the growth of diversified crops since ample agricultural land is available on O'ahu and on other islands. This is due to the enormous supply of agricultural land that is now available due to the contraction of plantation agriculture (see Section 10 and Figure 10).

b. Conservation of Agricultural Lands

In addition to the above, State policies call for conserving and protecting prime agricultural lands, including protecting agricultural lands from urban development.

However, these policies—which were written before the major contraction of plantation agriculture in the 1990s—assume implicitly that profitable agricultural activities eventually will be available to utilize all available agricultural lands. This has proven to be a questionable assumption in view of the enormity of the contraction of plantation agriculture, the abundant supply of land that came available for diversified agriculture, and the slow growth in the amount of land being utilized for diversified agriculture (see Section 10 and Figure 10).

Furthermore, discussions in the Agriculture portion of the *State Functional Plan* recognize that redesignation of lands from Agricultural to Urban should be allowed "… upon a demonstrated change in economic or social conditions, and where the requested redesignation will provide greater benefits to the general public than its retention in …agriculture;" that is, when an "overriding public interest exists." The enormous contraction in plantation agriculture, resulting in the supply of agricultural land far exceeding demand, constitutes a major change in economic conditions. Moreover, development in the Project Area will provide community benefits (over 3,800 jobs at full development) that far exceed that provided by diversified agriculture (about 40 jobs with current nursery and composting operations, and about 21 jobs if farmed). In practice, however, development of the Project Area is expected to have no significant impact on existing or potential agricultural employment.

c. 'Ewa Development Plan

As shown in Figure 6, the Project Area is within the City's designated Urban Growth Boundary of the 'Ewa Development Plan in an area designated Industrial. Thus, the Project—along with the change in use from Agricultural to Industrial—is consistent with the 'Ewa Development Plan.

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[33] Appendix A. "Selected State and City Goals, Objectives, Policies and Guidelines Related to Agricultural Lands."

FIGURES

Figure 1. Location Map

0 1,250 2,500 5,000 Feet NORTH

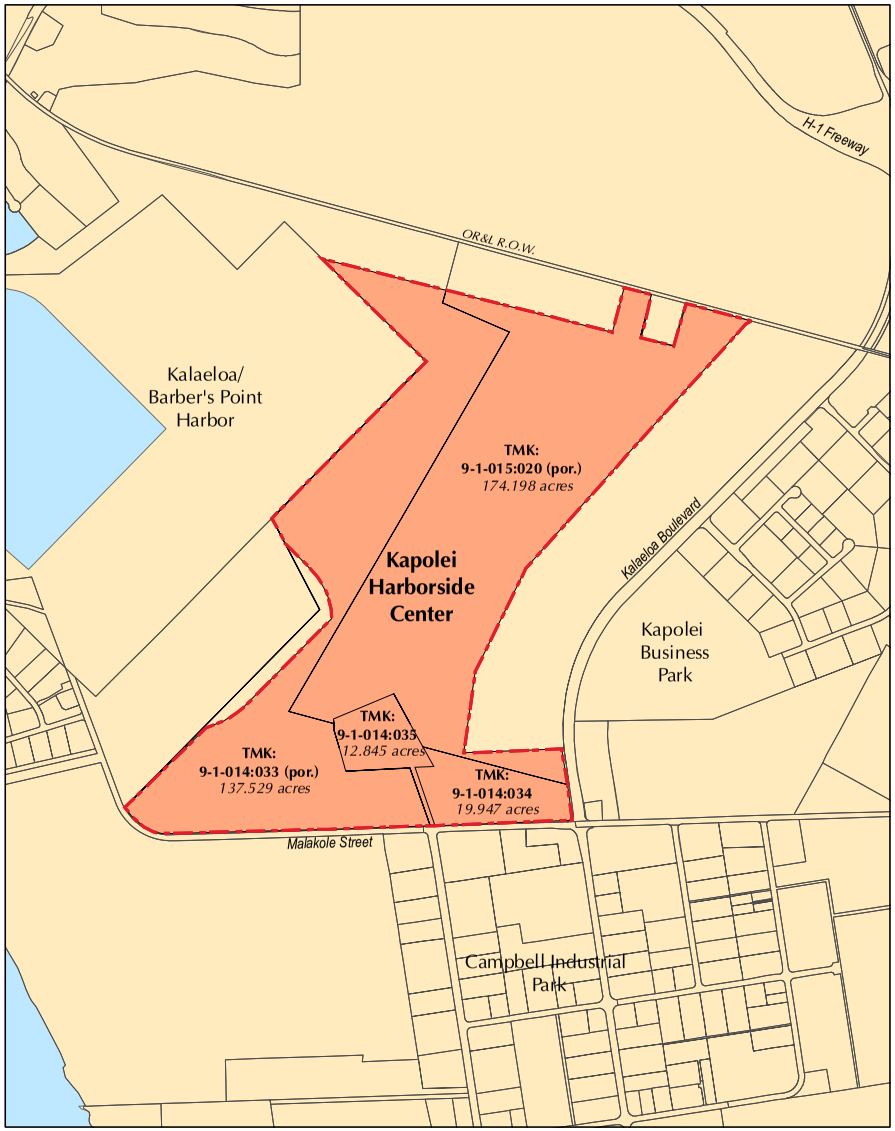
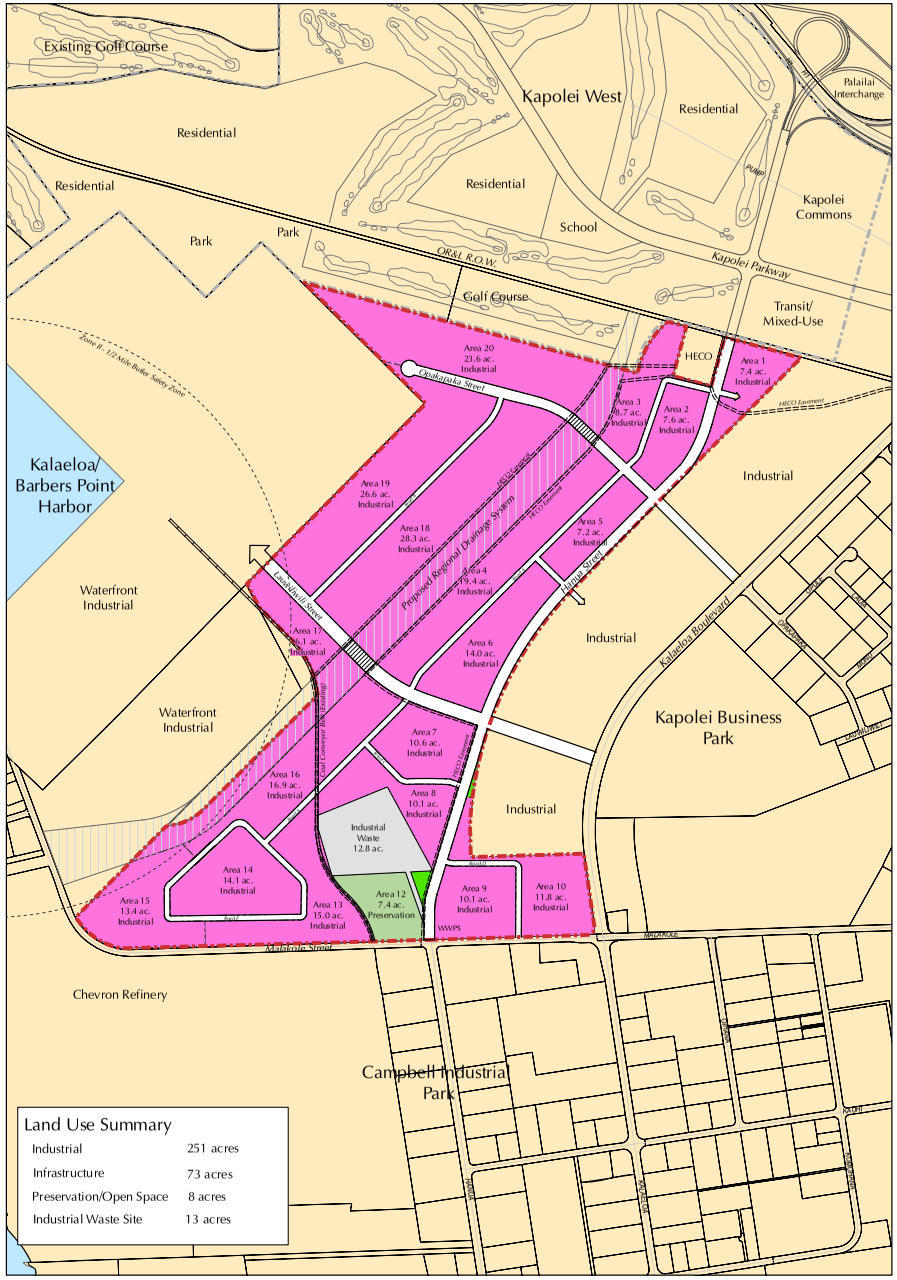


Figure 2. TMK Map

0 600 1,200 2,400 Feet NORTH



Kapolei Harborside Center
Figure 3. Project Master Plan

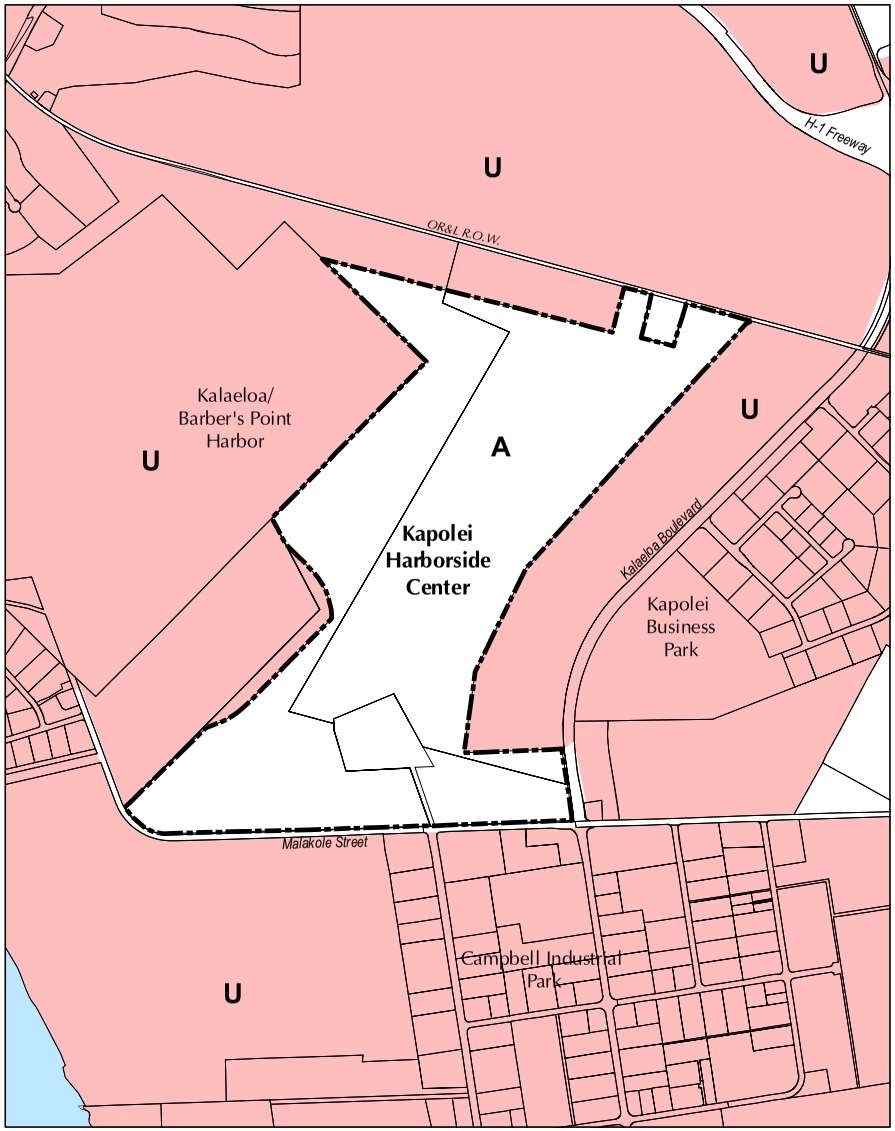


Figure 4. State Land Use District Classifications

0 600 1,200 2,400 Feet NORTH

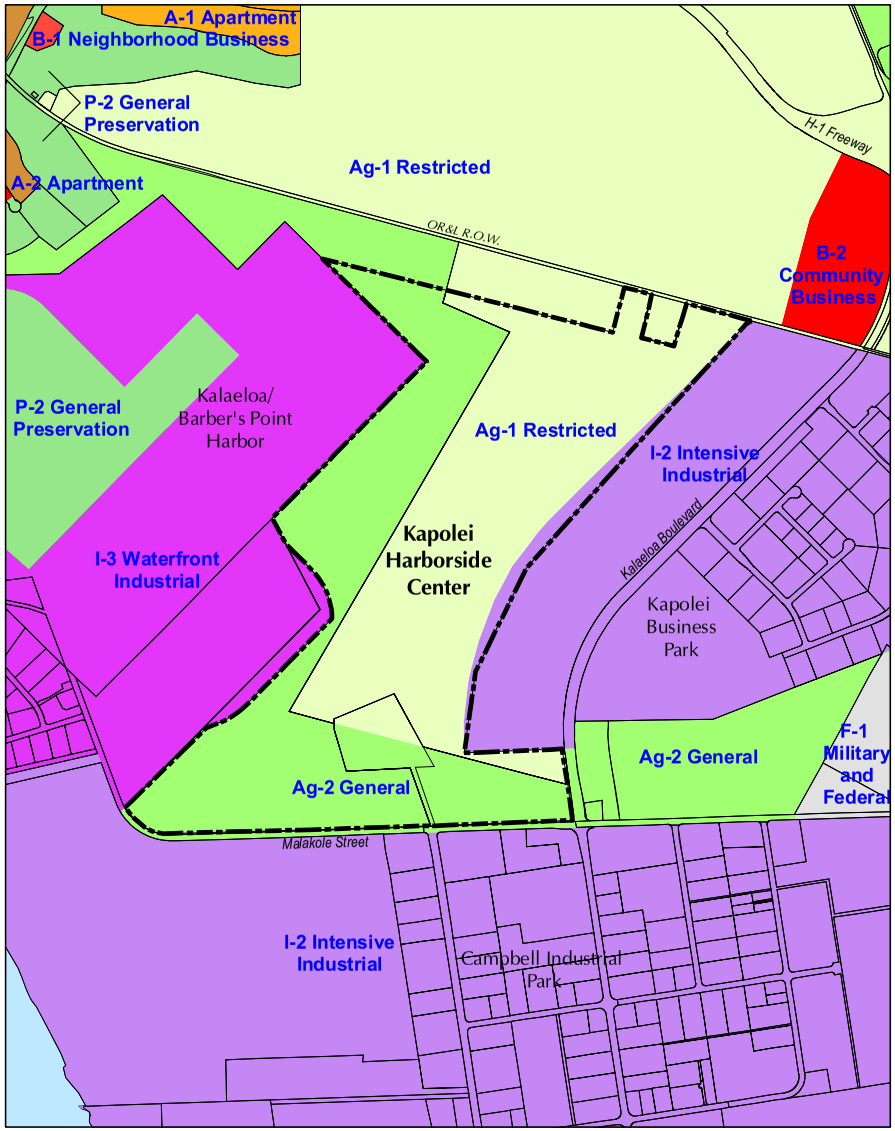
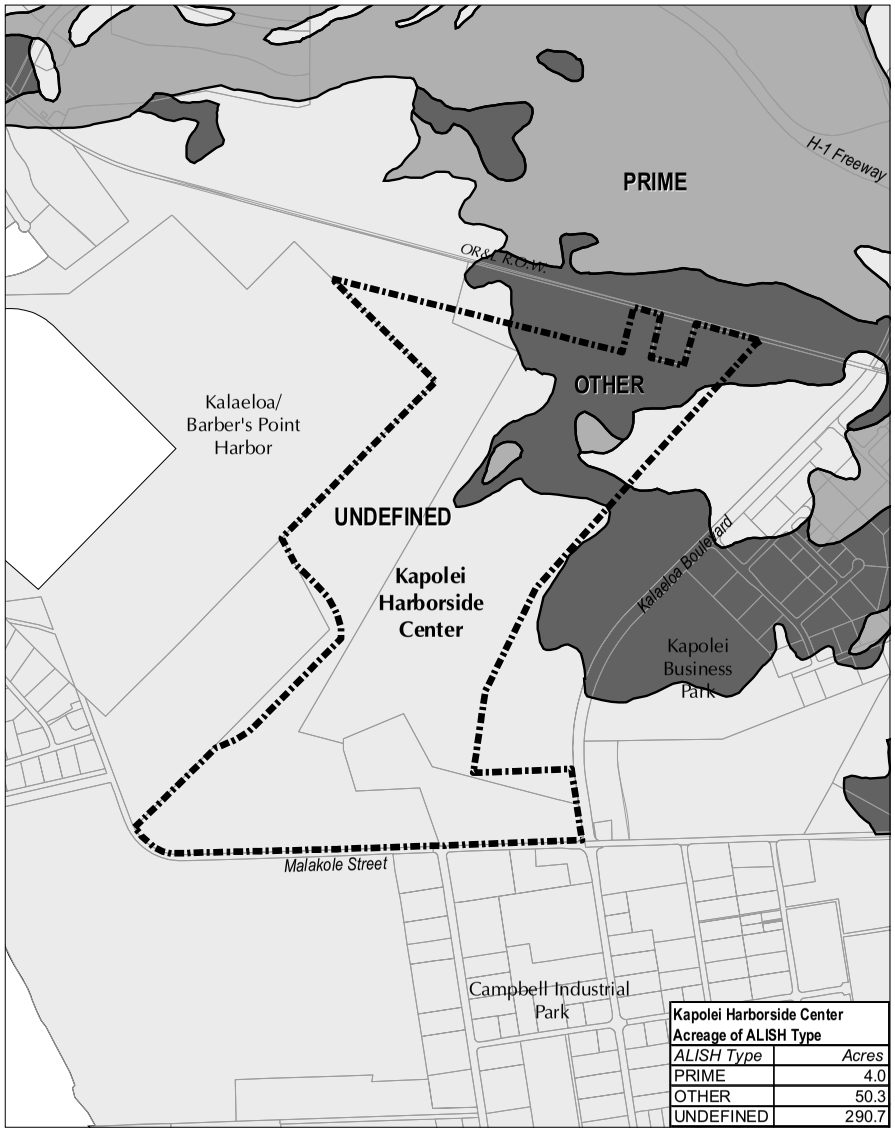


Figure 5. City & County Zoning

0 600 1,200 2,400 Feet NORTH

Figure 7. Soils Map

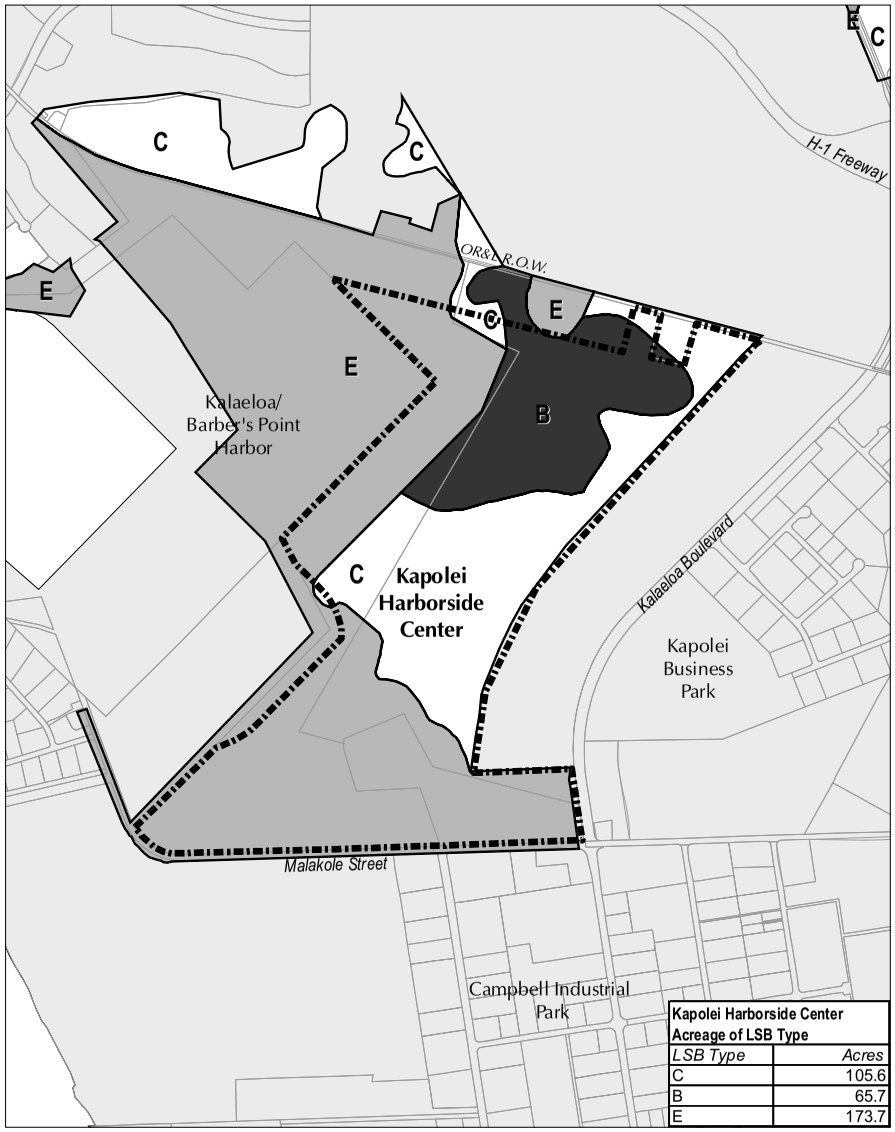
Figure 6. Ewa Development Plan



Kapolei Harborside Center Acreage of ALISH Type	
ALISH Type	*Acres*
PRIME	4.0
OTHER	50.3
UNDEFINED	290.7

Figure 8. ALISH Map

0 600 1,200 2,400 Feet NORTH

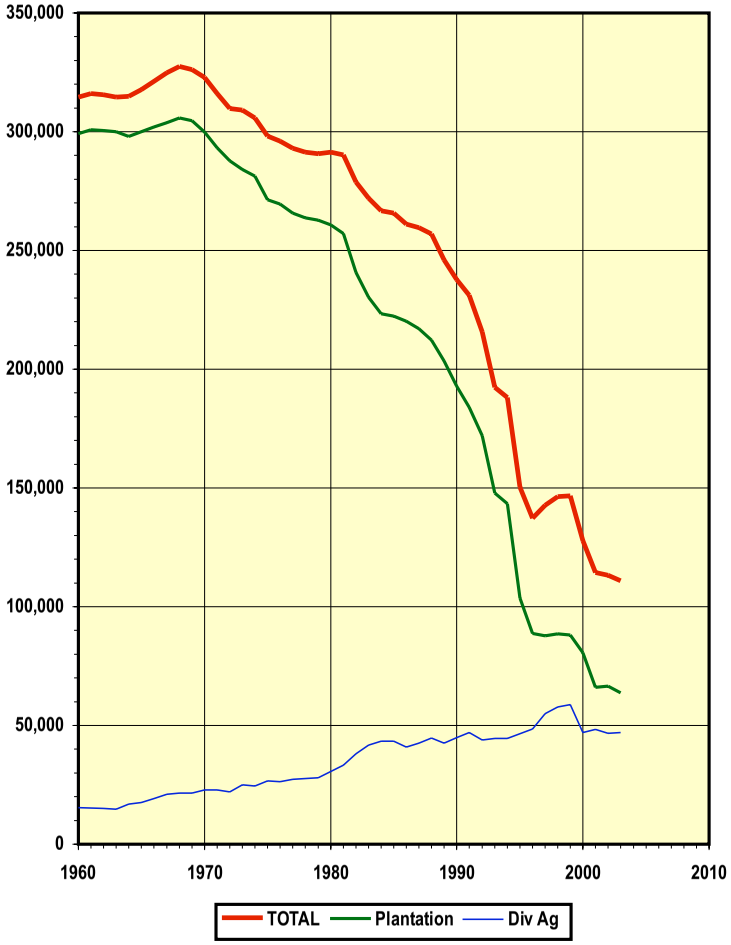


Kapolei Harborside Center Acreage of LSB Type	
LSB Type	*Acres*
C	105.6
B	65.7
E	173.7

Figure 9. LSB Map

0 600 1,200 2,400 Feet NORTH

Figure 10. Statewide Acreage in Crop: 1960 to 2003



APPENDIX

APPENDIX A:
SELECTED STATE AND CITY GOALS, OBJECTIVES, POLICIES AND GUIDELINES RELATED TO AGRICULTURAL LANDS

1. HAWAI'I STATE CONSTITUTION (Article XI, Section 3):

> …to conserve and protect agricultural lands, promote diversified agriculture, increase agricultural self-sufficiency and assure the availability of agriculturally suitable lands…

2. HAWAI'I STATE PLAN (Chapter 226, Hawaii Revised Statutes, as amended):[1,2]

Section 226-7 Objectives and policies for the economy--agriculture.

(a) Planning for the State's economy with regard to agriculture shall be directed towards achievement of the following objectives:

(1) Viability in Hawaii's sugar and pineapple industries.

(2) Growth and development of diversified agriculture throughout the State.

(3) An agriculture industry that continues to constitute a dynamic and essential component of Hawaii's strategic, economic, and social well-being.

(b) To achieve the agricultural objectives, it shall be the policy of the State to:

(2) Encourage agriculture by making best use of natural resources.

(10) Assure the availability of agriculturally suitable lands with adequate water to accommodate present and future needs.

(16) Facilitate the transition of agricultural lands in economically nonfeasible agricultural production to economically viable agricultural uses.

Section 226-103 Economic priority guidelines.

(c) Priority guidelines to promote the continued viability of the sugar and pineapple industries:

(1) Provide adequate agricultural lands to support the economic viability of the sugar and pineapple industries.

(d) Priority guidelines to promote the growth and development of diversified agriculture and aquaculture:

(1) Identify, conserve, and protect agricultural and aquacultural lands of importance and initiate affirmative and comprehensive programs to promote economically productive agricultural and aquacultural uses of such lands.

(10) Support the continuation of land currently in use for diversified agriculture.

Section 226-104 Population growth and land resources priority guidelines.

(b) Priority guidelines for regional growth distribution and land resource utilization:

(2) Make available marginal or non-essential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the agricultural district.

Section 226-106 Affordable Housing

Priority guidelines for the provision of affordable housing:

(1) Seek to use marginal or nonessential agricultural land and public land to meet housing needs of low- and moderate-income and gap-group households.

3. AGRICULTURAL STATE FUNCTIONAL PLAN (1991)[3]
(Functional plans are guidelines for implementing the State Plan. They are approved by the Governor, but not adopted by the State Legislature.)

Objective H: Achievement of Productive Agricultural Use of Lands Most Suitable and Needed for Agriculture.

Policy H(2): Conserve and protect important agricultural lands in accordance with the Hawaii State Constitution.

Action H(2)(a): Propose enactment of standards and criteria to identify, conserve, and protect important agricultural lands and lands in agricultural use.

Action H(2)(c): Administer land use district boundary amendments, permitted land uses, infrastructure standards, and other planning and regulatory functions on important agricultural lands and lands in agricultural use, so as to ensure the availability of agriculturally suitable lands and promote diversified agriculture.

4. CITY AND COUNTY OF HONOLULU GENERAL PLAN, Objectives and Policies (Resolution No. 87-211)[4]

Economic Activity

Objective C. To maintain the viability of agriculture on Oahu.

Policy 1. Assist the agricultural industry to ensure the continuation of agriculture as an important source of income and employment.

Policy 2. Support agricultural diversification in all agricultural areas on Oahu.

Policy 3. Support the development of markets for local products, particularly those with the potential for economic growth.

Policy 4. Provide sufficient agricultural land in Ewa, Central Oahu, and the North Shore to encourage the continuation of sugar and pineapple as viable industries.

Policy 5. Maintain agricultural land along the Windward, North Shore, and Waianae coasts for truck farming, flower growing, aquaculture, livestock production, and other types of diversified agriculture.

Policy 6. Encourage the more intensive use of productive agricultural land.

Policy 7. Encourage the use of more efficient production practices by agriculture, including the efficient use of water.

Policy 8. Encourage the more efficient use of nonpotable water for agricultural use.

5. CITY AND COUNTY OF HONOLULU 'EWA DEVELOPMENT PLAN[5]

3.1. Open Space Preservation and Development

3.1.1 General Policies

Open space will be used to:

- Provide long range protection for diversified agriculture on lands outside the Urban Growth Boundary.

6. REFERENCES

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[3] Hawaii Department of Agriculture. *The Hawaii State Plan: Agriculture, State Functional Plan.* Honolulu, Hawaii. 1991.

[4] City and County of Honolulu, Department of General Planning. *General Plan Objectives and Policies.* Honolulu, Hawaii. 1992.

[5] City and County of Honolulu, Planning Department. *'Ewa Development Plan.* Honolulu, Hawaii. August 1997 (Revised May 2000).

Appendix E
Economic Impact Assessment

DECISION ANALYSTS HAWAII, INC.
BRUCE STEVEN PLASCH, President

QUANTITATIVE CONSULTING SERVICES: Economic • Financial • Demographic • Statistical

October 23, 2006

Mr. Jeff Overton
GROUP 70 INTERNATIONAL, INC.
925 Bethel Street, Fifth Floor
Honolulu, HI 96813

Re: KAPOLEI HARBORSIDE CENTER

Dear Jeff:

In our studies for Kapolei Harborside Center, there are text and exhibits that make reference to a preserve area of 7.4 acres. Since conducting our studies, it is our understanding that this preserve area has been formally surveyed to reveal an actual area of approximately 6.0 acres. Although we have not modified our text or exhibits to reflect this change, the substance of our analysis and conclusions remain unchanged.

Sincerely,

Bruce S. Plasch

Bruce S. Plasch
President

1655 Kamole St. • Honolulu, HI 96821 • Office: (808) 373-9364 • Fax: (808) 373-9590 • E-mail: bplasch@hawaii.rr.com

PROPOSED KAPOLEI HARBORSIDE CENTER: ECONOMIC AND FISCAL IMPACTS

DECISION ANALYSTS HAWAI'I, INC.

PROPOSED KAPOLEI HARBORSIDE CENTER: ECONOMIC AND FISCAL IMPACTS

PREPARED FOR:

Kapolei Property Development

PREPARED BY:

Decision Analysts Hawai'i, Inc.

July 2006

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EXECUTIVE SUMMARY

1. PROPOSED DEVELOPMENT

Kapolei Property Development proposes to develop Kapolei Harborside Center ("the Project"), an industrial park on 344.519 acres in Kapolei, City and County of Honolulu. The Project will offer about 251 acres for industrial development, which translates to about 5.5 million square feet of floor space at full development. The remaining 94 acres will be used for roads, drainage, a wastewater pumping station, and a preservation area to protect sinkholes having scientific value.

Tenants will include companies engaged in light manufacturing, maritime support services, warehousing, and other industrial services.

2. MAJOR IMPACTS AND BENEFITS

a. Employment

Kapolei Harborside Center will provide the following employment impacts and benefits:

— Development Activities

- Average employment for about 450 construction workers during the 10-year development period, along with a payroll of about $29.6 million per year.
- Average employment of about 640 additional workers dependent on construction activities, along with a payroll of about $24.5 million per year.
- An average of about 710 direct and indirect jobs in the Kapolei/'Ewa Region.

— Industrial Operations at Full Development

- About 3,830 new industrial jobs, along with a payroll of about $176 million per year (versus about 40 jobs for current activities on the property that will relocate).

- About 2,300 additional jobs dependent on the industrial operations, along with a payroll of about $88.4 million per year.
- About 4,630 new jobs in the Kapolei/'Ewa Region.

The new jobs provided by the Project will contribute to the ongoing transformation of 'Ewa from being largely a suburb from which workers commute to jobs outside the region, to being O'ahu's second full-service urban center that provides jobs for those living in the Kapolei/'Ewa region and surrounding communities. Correspondingly, the new jobs provided by the Project will result in less commuting by Kapolei/Ewa residents to jobs outside the region.

b. Fiscal

Kapolei Harborside Center will provide the following fiscal impacts and benefits:

— City

- Revenues of about $6.1 million for transportation improvements generated by the 10 years of development activities.
- Net revenues of about $8 million per year derived from the industrial operations after full development of the Project.

— State

- A net of about $45.1 million in revenues generated by the 10 years of development activities.
- In addition, about $7.9 million for highway improvements generated by development activities.
- Net revenues of at least $8.4 million per year derived from the industrial operations after full development of the Project.

These increases in net revenues will allow the City and State to help fund various government facilities and services that will benefit communities throughout O'ahu and the State.

PROPOSED KAPOLEI HARBORSIDE CENTER:
ECONOMIC AND FISCAL IMPACTS

1. INTRODUCTION

a. Content and Purpose

Kapolei Property Development proposes to develop Kapolei Harborside Center ("the Project"), an industrial park on 344.519 acres in Kapolei, City and County of Honolulu (see Figure 1 at the end of this report for the location of the Project, Figure 2 for the Tax Map Keys (TMKs), and Figure 3 for the proposed development).[1]

The entire Project Area is currently within the State Agricultural District and is zoned Agricultural (Figures 4 and 5). However, the Project site is designated for Industrial development in the City's 'Ewa Development Plan (Figure 6). The Project will require a State Land Use District Boundary Amendment to Urban, and a change in zoning to Industrial.

This report addresses the economic and fiscal impacts of the Project, along with associated benefits. Its purpose is to provide government officials with information relevant to their decisions about State redistricting and City zoning.

The economic impacts cover sales and expenditures, profits, employment, and payroll related to the (1) development activities and (2) industrial operations at full development of the Project. The material also includes the number of residents and homes that will be supported by the development activities and by operations at full development.

Fiscal impacts address the impact of the Project on City and State revenues and expenditures. The material covers the increase in City and State tax revenues, the increase in government support expenditures, and the resulting net revenues to the City and State.

b. Methodology

1) Multipliers

Planned development is translated into economic and fiscal impacts based on a number of multipliers (for example, floor-area ratios (FAR) that give the

amount of industrial space as a percentage of the land area, construction costs per square foot of industrial space, sales per square foot, indirect sales per direct sales, jobs per 1,000 square feet of industrial space, indirect jobs per direct jobs, tax rates.

The multipliers used reflect the professional judgment of the consultant, and were derived based on information from the following sources: 'Ewa developers; Hawai'i projects similar to the proposed Project; U.S. Census data for O'ahu and 'Ewa; the *State of Hawai'i Data Book; The Hawai'i Input-Output Study*; employment and labor rates from the State Department of Labor and Industrial Relations (DLIR); research reports on industrial parks; and revenue and expenditure data from the City and the State.[2-7]

2) 2006 Dollars

Throughout the report, dollar amounts are expressed in terms of 2006 purchasing power and market conditions. Values, prices, costs and dollar amounts for prior years are adjusted for inflation to 2006 dollars based on the Honolulu Consumer Price Index (CPI) for Urban Consumers.[4] Dollar amounts after 2006 are not increased to account for inflation, appreciation in property values, changes in labor rates, changes in building costs, or other changes in market conditions.

3) Accuracy of Estimates

Much of the economic analysis contained in this report is quantitative in nature, where numbers are used to help communicate anticipated impacts. However, these numbers should not be interpreted as precise predictions. Rather, they represent the best estimates of what is expected to occur based on available information about future development, market conditions, and tax rates. As a general rule, economic and fiscal impact estimates in this report are accurate within about 20%.

c. Organization of the Report

The material below gives the following information on the Project and the economic environment: the Project's location and surrounding land uses; a description of the Project; evolving changes in Kapolei/'Ewa region; current economic activities within the Project Area; the economic impacts of development activities, the economic impacts of the industrial operations at full development, assistance programs for new workers and businesses; the impact on City revenues and expenditures, the impact on State revenues and expenditures, and a summary of major economic and fiscal impacts and benefits.

The detailed assumptions, multipliers, and calculations are shown in five tables at the end of the report. These tables cover the following:

— Table 1: Proposed Development

— Table 2: Economic Impacts of Development Activities

— Table 3: Economic Impacts of Industrial Operations at Full Development

— Table 4: Impacts on City Revenues and Expenditures

— Table 5: Impacts on State Revenues and Expenditures

Figures in the table that are in **bold** highlight the more significant economic and fiscal impacts.

d. Economic Consultant

The analysis was conducted by Decision Analysts Hawai'i, Inc., a Hawai'i-based economic-consulting firm established in 1979, and specializing in economic development, land and housing economics, feasibility studies, valuations, market analysis, public policy analysis, and the economic and fiscal impacts of projects.

2. LOCATION OF THE PROJECT AND SURROUNDING LAND USES[1]

As shown in Figure 1, Kapolei Harborside Center is located in Kapolei near the southwest corner of O'ahu. And as shown in Figure 2, the Project Area is also defined by four TMK parcels:

— TMK 9-1-014-033 (por), 137.529 acres

— TMK 9-1-014-034 (por), 19.947 acres

— TMK 9-1-014-035 (por), 12.845 acres

— TMK 9-1-015-020 (por), 174.198 acres

The Project Area is bounded on the east, west and south by existing industrial areas and on the north by currently vacant land proposed for the master planned community of Kapolei West.

3. PROJECT DESCRIPTION AND ADVANTAGES[1]

As indicated in Figure 2 and Table 1, Kapolei Harborside Center will offer about 251 acres for industrial development, which translates to about 5.5 million square feet of floor space at full development. The remaining 94 acres will

be used for roads, drainage, a wastewater pumping station (WWPS), and a preservation area to protect sinkholes having scientific value.

Tenants will include companies engaged in light manufacturing, maritime support services, warehousing, and other industrial services. The Project will be similar to other industrial parks on O'ahu, and will complement the existing Campbell Industrial Park and Kapolei Business Park.

The Project will offer many advantages, including: (1) a strategic location between Kalaeloa/Barbers Point Harbor, the City of Kapolei, and the existing industrial areas of Campbell Industrial Park and Kapolei Business Park; (2) proximity to a large and growing regional market, (3) a large workforce drawn from a growing population and from workers who now have long commutes to jobs outside the region, and (4) costs for industrial space that are expected to be lower than those near downtown Honolulu.

These advantages will entice a number of new businesses to locate in Kapolei and will also entice a number of existing business to relocate to Kapolei. Such has been the history of many urban areas across the country: to remain competitive, businesses follow the customers and workers to locations that do not require long commutes and offer lower costs for industrial space. As the Kapolei population and business community grow, even more businesses will be attracted there because the market will become sufficiently large to support activities that require large markets and/or need specialized support services. In addition to serving regional markets, industrial companies in Kapolei will increasingly serve island-wide, Statewide and overseas markets. An additional advantage for businesses that locate in Kapolei Harborside Center is that goods can be shipped via nearby Kalaeloa Barbers Point Harbor. This will become an even greater advantage for these businesses as the harbor is improved.

4. EVOLVING CHANGES IN THE KAPOLEI/'EWA REGION

Considerable residential, resort, commercial, industrial, and government development has occurred in the City of Kapolei and the surrounding Kapolei/'Ewa region, and far more is planned.

This large amount and wide variety of development in the Kapolei/'Ewa region reflects a major transformation of 'Ewa from its past role as largely a suburb of Honolulu's Primary Urban Center (PUC), to its current and future role as O'ahu's second full-service urban center.

As a suburb or bedroom community, 'Ewa has been providing workers who commute to jobs in the PUC and elsewhere, and shoppers who purchase many of their goods and services outside 'Ewa.

As a full-service urban center, the City of Kapolei and the Kapolei/'Ewa region will increasingly become a major supplier of (1) jobs for those who live in 'Ewa and surrounding communities, and (2) a full range of goods and services (both private and public) to residents, visitors, and businesses in Kapolei and beyond. When measured by population, the Kapolei/'Ewa region already exceeds the population of Kaua'i County.[8] By about 2025, it will exceed the current population of Maui County and also of Hawai'i County.[9] This transformation is a direct result of City and State economic and population growth policies for 'Ewa and O'ahu.

The Project will contribute to the transformation of Kapolei becoming O'ahu's second full-service urban center. Specifically, the Project will offer additional space for companies that (1) supply industrial goods and services, and (2) provide jobs for the region's growing population.

5. CURRENT ECONOMIC ACTIVITIES

Currently, two agricultural operations lease land within the Project Area: (1) (2) Milo Nursery & Landscape Maintenance, Inc. leases about 32 acres for its nursery operations and (2) Menehune Green, LLC leases about 52 acres for composting green waste.[10] Most of the remaining property is covered by a coral stockpile that was created by the dredging of Barbers Point Harbor. Also, a conveyor belt transports coal from Kalaeloa/Barbers Point Harbor, across the property, to a HECO power plant to the south of the Project site.

The two agricultural companies provide about 40 jobs.[10] Development of the Project will result in the relocation or replacement of the two agricultural activities, but will result in no significant change in the number of agricultural jobs provided on O'ahu.[10]

6. ECONOMIC IMPACTS OF DEVELOPMENT ACTIVITIES

The development of Kapolei Harborside Center will include (1) construction of internal roads, water delivery systems, sewer systems, utilities systems, etc.; (2) sales of improved lots to various industrial companies; and (3) construction of buildings by these companies. Table 2 summarizes the direct and indirect economic impacts of these development activities. The material in the table gives the development period, average annual development, construction expenditures and related sales, profits, employment and payroll, and the number of residents and homes supported by the development activities.

a. Development Period and Average Annual Development

Based on a market study by Robert Charles Lesser and Co., LLC (Lesser), development is expected to occur over a 10-year period starting in about 2009 (Table 2, Section 2.a).[1] Thus, an annual average of about 550,000 sq. ft. of industrial space will be built over the 10 years (Table 2, Section 2.b). However, development in some years may be much higher or lower than the average, depending on market conditions.

b. Expenditures, Sales and Profits

Construction expenditures for infrastructure and building space are estimated at about $600 million, or an average of about $60 million per year (Table 2, Section 2.c).

In addition to construction expenditures, development activities will generate indirect sales associated with supplying goods and services to construction companies and to the families of the employees of these companies. In turn, the companies supplying goods and services, and the families of the employees of these companies will purchase goods and services from other companies, and so on. The indirect sales will include sales by companies that supply building materials (cement, steel, lumber, roofing materials, plumbing equipment, electrical equipment, hardware supplies, lighting, flooring, etc.); rent out construction equipment; repair equipment; provide warehousing services; provide shipping and trucking services; etc. Indirect sales also include sales by grocery stores, drug stores, restaurants, service stations, hair salons; providers of medical services, insurance providers, etc. Based on State economic multipliers, these indirect sales are expected to average about $63 million per year.

Although not estimated, additional development costs include planning, permitting, design, financing, City and State exactions, and marketing and sales (see footnote for Table 2, Section 2.e).

Lot sales, construction expenditures and indirect sales related to development activities are expected to total about $148 million per year during the 10-year development period (Table 2, Section 2.f). About $114.5 million per year will be subject to the 4.5% excise tax on final sales, while about $33.5 million per year will be subject to the 0.5% excise tax on intermediate sales.

Profits on these sales are estimated at about $16.5 million per year (Table 2, Section 2.g).

c. Employment

Construction employment is expected to average about 450 jobs (Table 2, Section 2.h). These jobs will include supervisors, heavy-equipment operators (grading, roads, water mains, sewer lines, etc.), cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, glass and window installers, cabinet makers, carpet and tile layers, painters, equipment installers, interior decorators, landscapers, etc. Other jobs related to construction will include architects, civil engineers, draftsmen, government inspectors, etc. These jobs will range over a variety of skills, including entry-level, semi-skilled, skilled, management, and professional positions.

As with indirect sales, development activities will generate indirect jobs associated with supplying goods and services to construction companies and to the families of the employees of these companies. In turn, the companies supplying goods and services, and the families of the employees of these companies will purchase goods and services from other companies, and so on. Indirect jobs will include those at companies that supply building materials (cement, steel, lumber, roofing materials, plumbing equipment, electrical equipment, hardware supplies, lighting, flooring, etc.); rent construction equipment; repair equipment; provide warehousing services; provide shipping and trucking services; etc. Other indirect jobs will include those involved with supplying goods and services to employees and their families: grocery workers, store clerks, restaurant workers, service-station workers, beauty technicians, barbers, bankers, druggists, veterinarians, computer technicians, medical workers, accountants attorneys, etc. The jobs will range over a variety of skills, including entry-level, semi-skilled, skilled, and management positions.

Based on State employment multipliers, indirect employment related to Project development is expected to average nearly 640 jobs. Thus, total direct-plus-indirect employment associated with Project development activities will average about 1,090 jobs. It is estimated that about 710 of these jobs will be in the Kapolei/'Ewa region. The actual job count will fluctuate over time, depending on the pace of construction.

Development activities will provide jobs to construction workers and other workers who already live on O'ahu. As other construction projects are completed on the island, O'ahu construction workers will be hired to work on the various components of the Project.

d. Payroll

Development activities are expected to generate a total payroll of about $54.1 million per year, of which about $29.6 million will be for construction workers and $24.5 million for indirect employment (Table 2, Section 2.i). These

estimates are based on the average number of direct and indirect jobs that will be supported and average wages as reported to the DLIR.

Wages will range from about $25,000 annually to over $100,000, and are expected to average about $65,000 per year for construction jobs, and about $38,500 for indirect jobs.

e. Population and Housing

During the 10-year development period, jobs provided by the Project development will support about 2,400 residents housed in about 720 homes (Table 2, Sections 2.j and 2.k). About 1,000 residents and 300 homes will be supported by construction jobs, and the remainder will be supported by indirect jobs. Development activities will support the families of many construction workers and other workers who already live on O'ahu.

Most of the residents are expected to live in the Kapolei/'Ewa region: estimated at about 1,490 residents housed in about 450 homes.

7. ECONOMIC IMPACTS OF INDUSTRIAL OPERATIONS AT FULL DEVELOPMENT

Table 3 summarizes the direct and indirect economic impacts of the industrial operations at Kapolei Harborside Center after the Project reaches full development. The material covers sales and rents, profits, employment and payroll, and the number of residents and homes supported by operations.

a. Sales, Rents and Profits

At full development, industrial companies at Kapolei Harborside Center are projected to generate sales revenues of about $683 million per year (Table 3, Section 3.a). In turn, their purchases of goods and services from other companies, along with purchases by the families of their employees, will generate additional sales amounting to about $478 million per year. Thus, direct-plus-indirect sales by the industrial operations at full development are expected to reach about $1.16 billion per year at full development of the Project. Most of the on-site sales will be subject to the 0.5% excise tax on intermediate sales.

A few of the buildings within the Project Area and portions of others will be rented. As indicated in Section 3.a of Table, A-3, total rents are estimated at about $8.2 million per year. These rents will be subject to the 4.5% excise tax on final sales.

As shown in Section 3.b of Table 3, corresponding profits will amount to about $117 million per year at full development of the Project, of which about $69 million per year is estimated for on-site activities and about $48 million per year for off-site activities.

b. Employment

On-site operating employment is expected to total about 3,830 jobs (Table 3, Section 3.c). These jobs will range over a variety of industrial skills, including entry-level, semi-skilled, skilled, management, and professional positions. Indirect employment associated with supplying goods and services to on-site companies and to the families of the employees of these companies is estimated at about 2,300 jobs. Thus, total direct-plus-indirect employment associated with the industrial operations at full development is expected to exceed 6,100 jobs. Over 4,600 of these jobs are expected to be in the Kapolei/'Ewa region.

The new jobs will provide employment to (1) workers who already live in the Kapolei/'Ewa region and nearby communities but who must commute to distant jobs, and (2) workers who will be new residents of the Kapolei/'Ewa region and nearby communities.

c. Payroll

At full development of the Project, the industrial operations are expected to generate a total payroll of over $260 million per year, of which about $176 million will be for on-site industrial workers and $88 million for indirect employment (Table 3, Section 3.d).

Wages will range from about $25,000 annually to over $100,000, and are expected to average about $46,000 per year for industrial jobs, and about $38,500 for indirect jobs.

d. Population and Housing

At full development, direct-plus-indirect jobs provided by the industrial operations will support about 13,470 residents housed in about 4,040 homes (Table 3, Sections 3.e and 3.f). About 8,420 residents and 2,530 homes will be supported by on-site jobs, and the remainder will be supported by indirect jobs.

Most of the residents supported by the Project are expected to live in the Kapolei/'Ewa region: estimated at about 9,180 residents housed in about 2,750 homes.

8. ASSISTANCE PROGRAMS

a. Education, Job-Training and Placement Programs

Job training for construction and industrial workers include formal education and training programs, apprenticeship programs, and on-the-job training. In particular, Honolulu Community College offers a large selection of work-training programs for various trades and professions, including courses in carpentry, electrical installation, cement finishing, tile work, drywall installation, sheet metal work, floor installation, window installation, ironworks, steel fabrication, plastering, plumbing, pipe-fitting, refrigeration and air conditioning, roofing, heavy equipment operation, welding, plastic fabrication, machine operation, power technology, automotive technology, aeronautics technology, drafting, computers, boat fabrication, business, etc.

Since existing programs to increase the number of construction and industrial workers are already in place or can be expanded as needed, special education and job-training programs for construction and industrial workers appear to be warranted.

Job-placement programs for construction and industrial workers are offered by high schools, Honolulu Community College and DLIR. Also, trade unions and informal networks already exist to inform available workers of employment opportunities. Thus, special job placement programs are not warranted.

b. Business Assistance Programs

Some businesses that locate at Kapolei Harborside Center or plan to locate there might benefit from business assistance programs. Public and private organizations offering assistance to businesses are listed below, along with brief descriptions of their programs.

— Alu Like Inc.

Alu Like helps Hawaiians interested in starting a business or in expanding their current operations. The Entrepreneurship Training Program provides classroom training in general business concepts, business planning, marketing and record keeping. The Management & Technical Assistance Program, underwritten by the Office of Hawaiian Affairs, offers individual consulting services by various specialists.

Alu Like also provides a wide range of office-support services and technical assistance, including bookkeeping and payroll support.

— Business Consulting Resources

Business Consulting Resources provides consulting services on managing businesses.

— Business Information and Counseling Center

The Business Information and Counseling Center combines one-on-one counseling with an up-to-date reference library that includes computer and audio-visual training facilities. Its focus is to guide prospective and present small business owners and managers in researching and preparing business plans, marketing plans, and loan applications. In addition, the Small Business Learning Center introduces business owners to computers and their business applications.

— Chamber of Commerce of Hawaii

The Small Business Center of the Chamber of Commerce in Honolulu provides business information, consulting services, referrals, networking opportunities, seminars, workshops, and training programs to entrepreneurs and established businesses.

— Department of Business, Economic Development and Tourism, State of Hawai'i

The Business Action Center of the Department of Business, Economic Development and Tourism (DBEDT) is a "one-stop" office for obtaining a General Excise Tax (GET) license, registering a new business and/or trade name, registering as an employer, obtaining information on required licenses and permits, and obtaining information on services offered by other organizations.

In addition, DBEDT has a number of programs to help businesses of all types. Programs cover loan guarantees; business loans to assist small businesses that are unable to secure private financing; assistance in applying for grants and loans; marketing assistance; information on Federal, State and County regulations; and referrals.

— Department of Labor and Industrial Relations, State of Hawaii

The Employment and Training Fund Program, administered by DLIR, works with employers to customize training programs to meet the specific needs of employers and of individuals who have become unemployed or are likely to become unemployed. Emphasis is given to jobs where a shortage of skilled workers exists, or where high growth is anticipated.

— Hawaii Business League

The Hawaii Business League interprets and provides information on laws, rules, and regulations that affect small businesses. Other services include business counseling and seminars.

— Hawaii Employers Council

The Hawaii Employers Council in Honolulu offers workshops, seminars and assistance on labor relations, collective bargaining procedures, and labor laws.

— The Immigrant Center

The Immigrant Center's Resource for Enterprise Development Manini program provides business training, loans and technical support for people who would like to start or expand "micro-businesses."

— Management Advisory Services, Inc.

Management Advisory Services, Inc. provides management consulting services to small businesses.

— Maui Community College

Maui Community College offers courses in business, business law, accounting, and entrepreneurship.

— Maui Economic Development Board

The Maui Economic Development Board engages in activities to strengthen existing industry on Maui and to diversify the economy, including a strong emphasis on developing high-technology and technology-related industries. The Board participates in projects to improve education, infrastructure, communications, and workforce development.

— Minority Business Development Center

The Minority Business Development Center in Honolulu provides business consulting and technical assistance to businesses owned by ethnic minorities.

— National Federal of Independent Business

The Hawai'i branch of the National Federation of Independent Business is involved in legislation relating to small business and promoting the positions of its members. Its education and research department prepares studies on special problems of small businesses.

— Office of Hawaiian Affairs

Through its Native Hawaiian Revolving Loan Fund, the Office of Hawaiian Affairs offers low-interest loans for business start-ups or expansion of existing businesses that are owned entirely by native Hawaiians.

— Pacific Business Center Program, UH Manoa

The Pacific Business Center Program, University of Hawaii at Manoa, provides a wide range of business consulting services utilizing faculty and students at the University of Hawaii. The Center also provides workshops, training programs, and management audits.

— Small Business Administration, U.S. Department of Commerce

The Small Business Administration provides loan guarantees, loans, bonding assistance, business counseling, training, workshops, seminars, publications and educational materials.

— Small Business Development Center Network, UH Hilo

The Small Business Development Center Network provides management and technical assistance to small businesses and prospective businesses; consulting in business planning, loan proposals, marketing research, etc.; counseling; referrals; workshops; and management-training seminars. Teams of advanced business students perform management analysis and consultation.

— Small Business Hawaii

Small Business Hawaii in Honolulu provides business advisory and consulting services, seminars, a referral program, and other services.

In view of the many business assistance programs that are available, additional programs appear to be unwarranted.

9. IMPACTS ON CITY REVENUES AND EXPENDITURES

The impact of the Project on City finances is shown in Table 4. This table summarizes: (1) changes in the City's tax and expenditure base that is used to calculate revenues and expenditures, (2) revenues and expenditures related to development activities, and (3) revenues and expenditures related to the industrial operations at full development. The analysis covers only the fiscal impacts of direct on-site activities, and so excludes the impact of indirect off-site activities associated with other projects.

a. Development Activities

Most City revenues derived from Project development activities will come from (1) the City's share of the excise tax on final sales that will be used to fund mass transit, (2) the highway impact fee on projects in the Kapolei/'Ewa region, and (3) other connect changes and user fees for funding infrastructure. The first two items will generate about $610,000 per year in revenues, or about $6.1 million over the 10-year development period (Table 4, Section 4.b).

As with other major projects on O'ahu, the developer and companies that will construct and occupy buildings at Kapolei Harborside Center will provide or finance their fair shares of infrastructure and facilities to support the Project. This will include mass transit, highways, interior roads, water source development, interior water distribution, drainage systems, sewer connections, collector sewers and trunks, a wastewater treatment plant, etc. As indicated in Table 4, Section 4.b, the City's expenditures on mass transit and highways to support the Project are assumed to equal the corresponding excise-tax/mass transit revenues and highway-impact fees generated by the Project development activities.

Construction activities require few on-site services from the City. Furthermore, the services that will be required (security, sanitation, transportation, etc.) will be provided by construction companies.

Thus, Project development activities will have a small impact on City finances.

b. Industrial Operations at Full Development

At full development, the Project will generate increased revenues to the City of about $11.1 million per year (Table 4, Section 4.c). Most of this increase will come from property taxes: an increase of about $9.3 million per year in property taxes over the current $65,500 currently collected on the property.[11] Additional revenues will be derived from the City's share of the excise tax on final sales that will be used to fund mass transit, and from other business-related taxes and user fees which are assumed to be proportional to the number of new jobs. Other revenues include: fuel taxes; motor vehicle weight taxes; water and sewer fees; solid-waste disposal fees; other departmental earnings; public service company taxes; other licenses, permits and fees; and fines, forfeits and penalties.

Expenditures in support of the industrial operations are estimated at about $3 million per year, most of which will be for services. These services, which are assumed to be proportional to the number of new jobs, include: police, fire, road maintenance, bus service, operations and maintenance (O&M) of water delivery, O&M of sewer systems and the wastewater treatment plant, solid waste disposal, etc.

At full development, net revenues to the City are expected to reach about $8 million per year.

10. IMPACTS ON STATE REVENUES AND EXPENDITURES

The impact of the Project on State finances is shown in Table 5. This table summarizes: (1) changes in the State's tax and expenditure base that is used to calculate revenues and expenditures, (2) revenues and expenditures related to development activities, and (3) revenues and expenditures related to operations at full development. The analysis covers only the fiscal impacts of direct on-site activities, and so excludes the impacts of indirect off-site activities associated with other projects.

a. Development Activities

State revenues derived from Project development activities will average about $5.3 million per year, resulting in about $53.1 million collected over the 10-year development period (Table 5, Section 5.b). Most of the revenues will be derived from the highway impact fee for the Kapolei/'Ewa Region, excise taxes on lot sales and construction expenditures, and income taxes.

Based on revenues generated from the highway impact fee, State expenditures on highways to support the Project will be about $7.9 million. Other infrastructure and facilities to support the Project are primarily a City responsibility, with most of the fair share provided or financed by the developer or companies that will occupy buildings at Kapolei Harborside Center.

Construction activities will require few on-site services from the State. Furthermore, most required services will be provided by construction companies.

The State will net an average of about $4.5 million per year from development activities, or about $45.1 million over the 10-year construction period.

b. Industrial Operations at Full Development

At full development of the Project, the industrial operations will generate revenues to the State of at least $12.6 million per year (Table 5, Section 5.c). State revenues will include excise taxes, income taxes, and other revenues which are assumed to be proportional to the number of new jobs. Other revenues include: the public service companies tax; fuel tax; motor vehicle weight tax; charges for various licenses, permits, and services; departmental earnings; etc. The estimate of revenues is low in that all industrial companies within the Project are assumed to pay excise tax at 0.5% on intermediate sales while, in practice, some will pay at 4% on final sales.

Expenditures in support of the industrial operations are estimated at $4.1 million per year. These services, which are assumed to be proportional to the number of new jobs, include highway maintenance, government administration, and other expenditures. This estimate is probably high because it includes

"unallocable" expenditures, many of which may not be required to support the industrial operations.

At full development, net revenues to the State are expected to reach at least $8.4 million per year.

11. SUMMARY OF MAJOR IMPACTS AND BENEFITS

a. Employment

Kapolei Harborside Center will provide the follow employment impacts and benefits:

— Development Activities

- Average employment for about 450 construction workers during the 10-year development period, along with a payroll of about $29.6 million per year.
- Average employment of about 640 additional workers dependent on construction activities, along with a payroll of about $24.5 million per year.
- An average of about 710 direct and indirect jobs in the Kapolei/'Ewa Region.

— Industrial Operations at Full Development

- About 3,830 new industrial jobs, along with a payroll of about $176 million per year (versus about 40 jobs for current activities on the property that will relocate).
- About 2,300 additional jobs dependent on the industrial operations, along with a payroll of about $88.4 million per year.
- About 4,630 new jobs in the Kapolei/'Ewa Region.

The new jobs provided by the Project will contribute to the ongoing transformation of 'Ewa from being largely a suburb from which workers commute to jobs outside the region, to being O'ahu's second full-service urban center that provides jobs for those living in the Kapolei/'Ewa region and surrounding communities. Correspondingly, the new jobs provided by the Project will result in less commuting by Kapolei/Ewa residents to jobs outside the region.

b. Fiscal

Kapolei Harborside Center will provide the following fiscal impacts and benefits:

— City

- Revenues of about $6.1 million for transportation improvements generated by the 10 years of development activities.
- Net revenues of about $8 million per year derived from the industrial operations after full development of the Project.

— State

- A net of about $45.1 million in revenues generated by the 10 years of development activities.
- In addition, about $7.9 million for highway improvements generated by development activities.
- Net revenues of at least $8.4 million per year derived from the industrial operations after full development of the Project.

These increases in net revenues will allow the City and State to help fund various government facilities and services that will benefit communities throughout O'ahu and the State.

12. REFERENCES

[1] Group 70. "Kapolei Harborside Center, Environmental Impact Statement Preparation Notice." April 2006.

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[3] U.S. Census.

[4] Department of Business, Economic Development & Tourism, State of Hawai'i. *The State of Hawai'i Data Book.* Annual.

[5] Department of Business, Economic Development & Tourism, State of Hawai'i. *The Hawai'i Input-Output Study:* 1997 Benchmark Report. March 2002.

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[7] Tax Foundation of Hawai'i. "Taxes in Hawai'i." Annual.

[8] U.S. Census.

[9] Decision Analysts Hawai'i, Inc. "'Ewa Development, 2006 to 2025: Economic, Population, and Fiscal Impacts." September 2005.

[10] Decision Analysts Hawai'i, Inc. "Proposed Kapolei Harborside Center: Impact on Agriculture." May 2006.

[11] Real Property Office, City and County of Honolulu. 2006.

FIGURES

Figure 1. Location Map

0 1,250 2,500 5,000 Feet NORTH

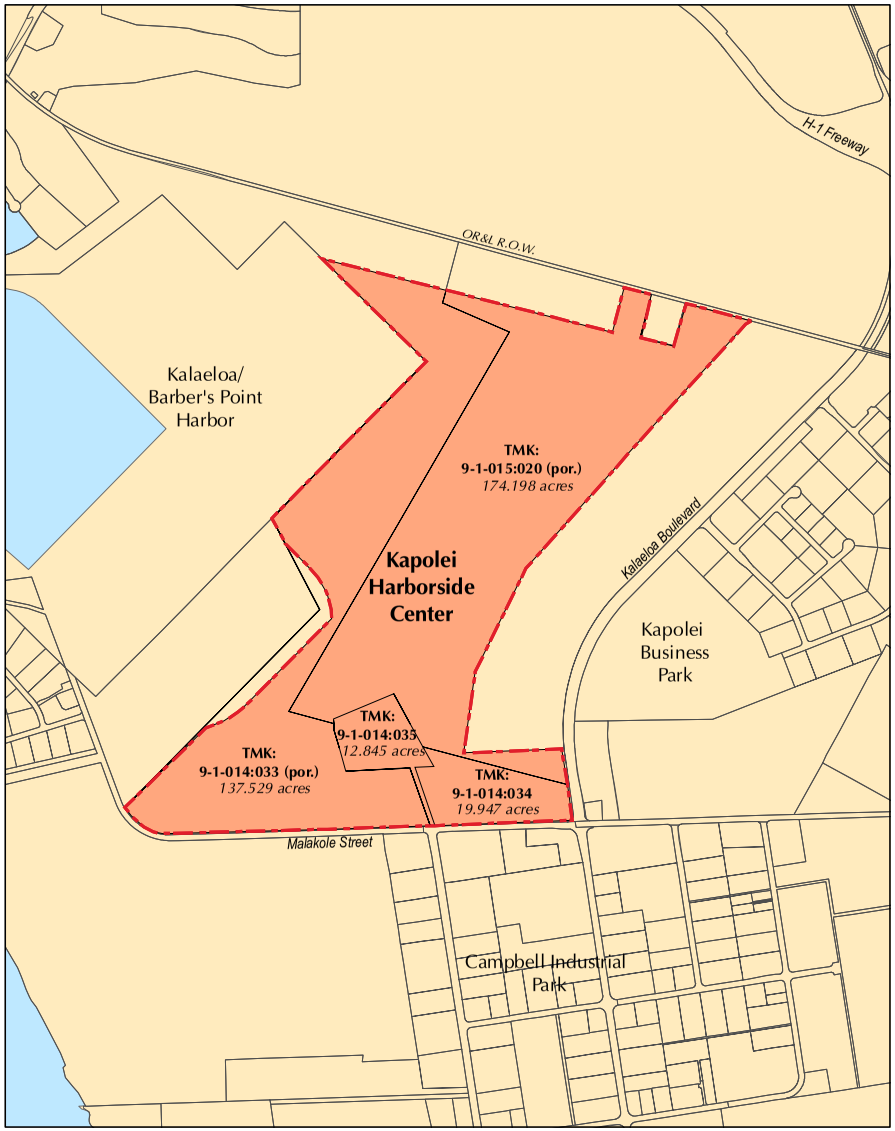
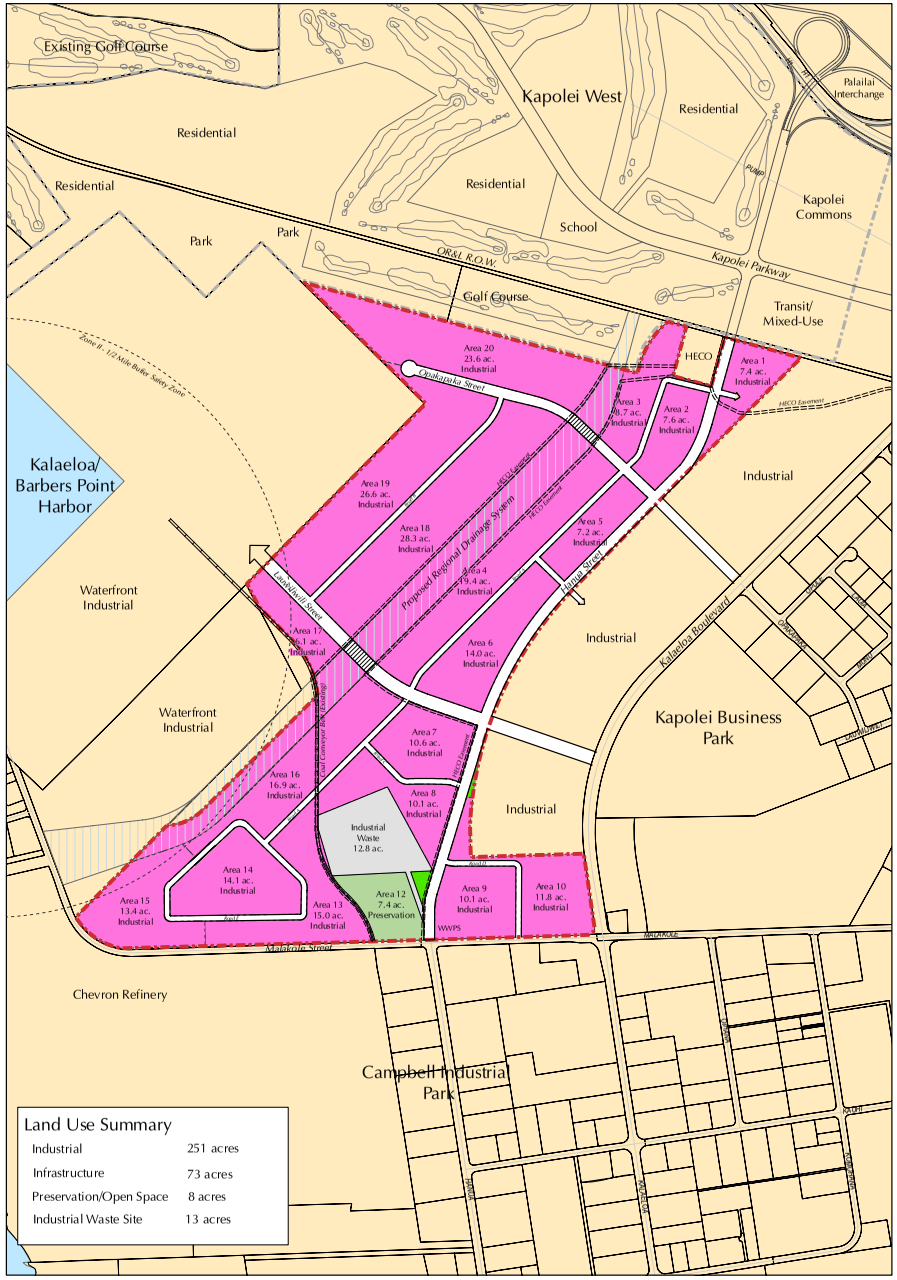


Figure 2. TMK Map

0 600 1,200 2,400 Feet NORTH



Kapolei Harborside Center
Figure 3. Project Master Plan

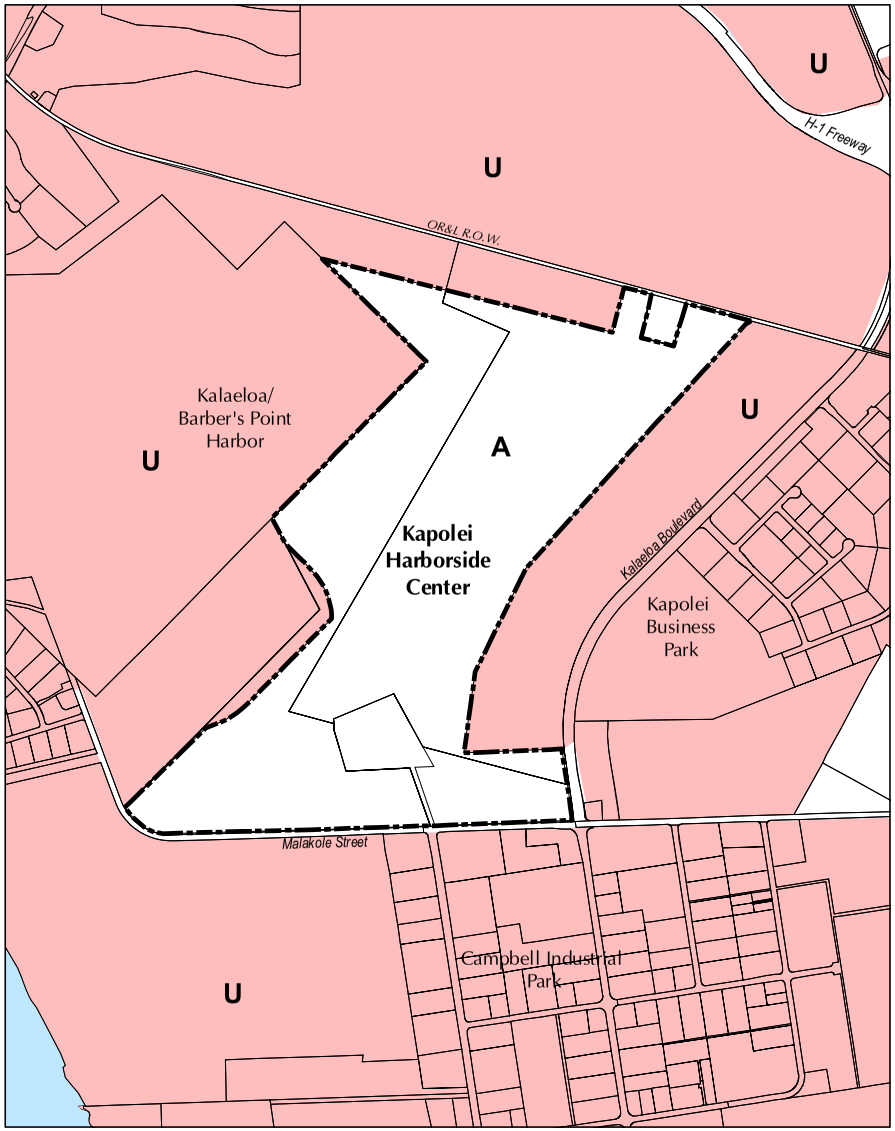


Figure 4. State Land Use District Classifications

0 600 1,200 2,400 Feet NORTH

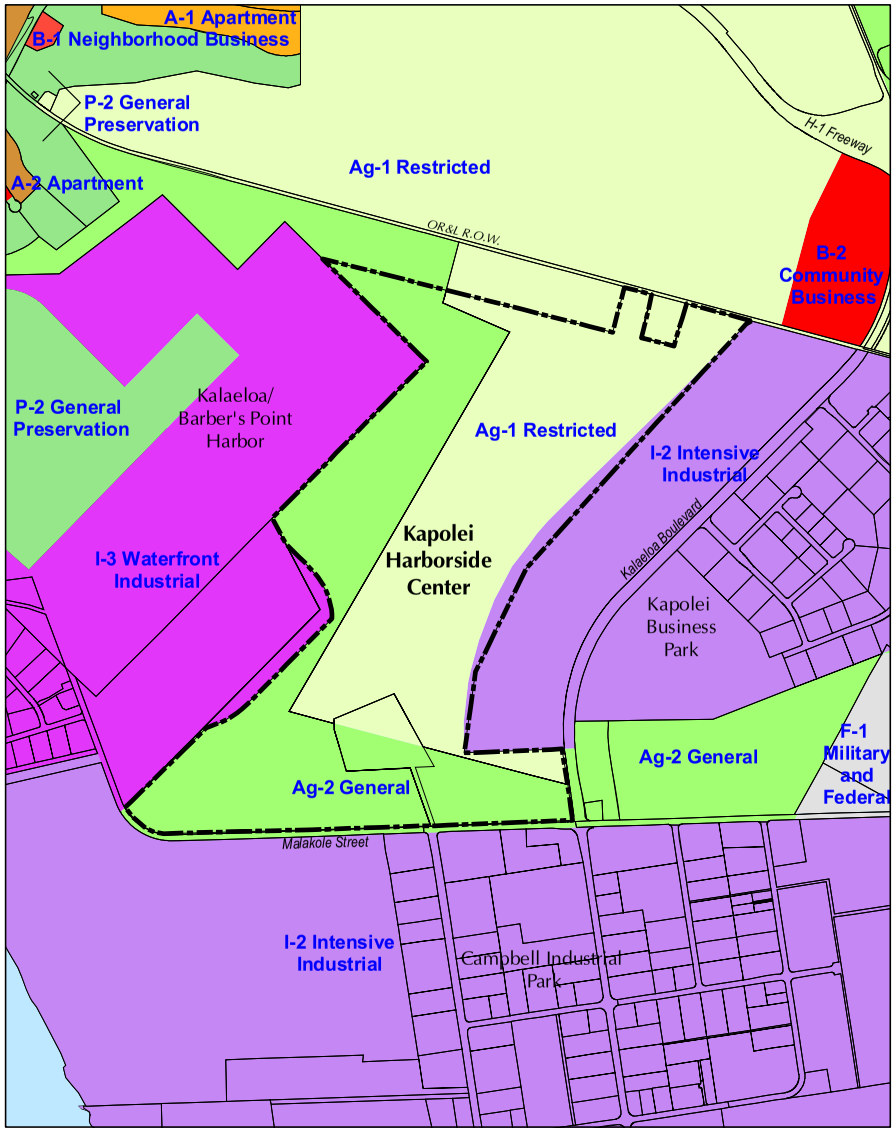


Figure 5. City & County Zoning

0 600 1,200 2,400 Feet NORTH

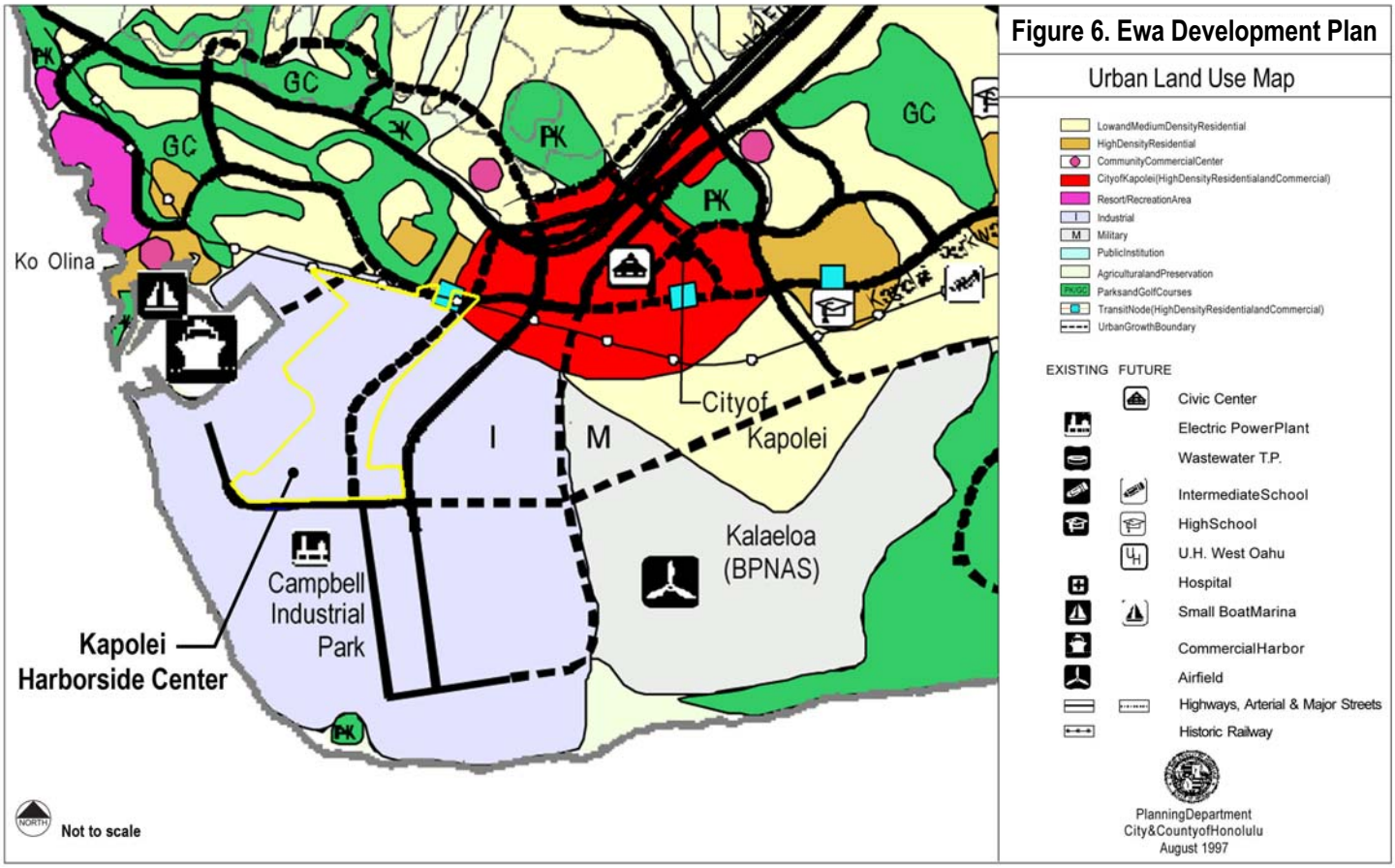


Figure 6. Ewa Development Plan

Table 1. Proposed Development
(Values in 2006 dollars)

Item	Source or Multiplier	Amount at Full Development	Units
1.a. LAND USE			
Light industry	Group 70	**251**	**acres**
Other (infrastructure and preservation)	"	94	"
Total		**345**	**acres**
1.b. INDUSTRIAL SPACE	50% FAR	**5,466,780**	**sq. ft.**

Table 2. Economic Impacts of Development Activities
(Values in 2006 dollars)

Item	Source or Multiplier	Amount or Annual Average	Units
2.a. DEVELOPMENT PERIOD			
First Year of Construction	Group 70	**2009**	**year**
Last Year of Construction	"	2018	"
Duration of Construction	"	**10**	**years**
2.b. AVERAGE ANNUAL DEVELOPMENT, INDUSTRIAL SPACE		**546,678**	**sq. ft. per year**
2.c. CONSTRUCTION EXPENDITURES			
Additional Infrastructure	Campbell Estate	$ 50,000,000	
Interior Roads			
Interior Water Distribution			
Drainage Systems			
Sewer Connections			
Collector Sewers & Trunks			
Buildings	$ 100 per sq. ft.	$ 546,678,000	
Total Construction Expenditures	70% of sales	**$ 596,678,000**	
Average Annual Construction Expenditures		**$ 59,667,800**	**per year**
2.d. INDIRECT SALES GENERATED BY CONSTRUCTION ACTIVITIES	106% of construction expenditures	**$ 63,247,868**	**per year**
2.e. OTHER DEVELOPMENT COSTS [1]		n.e.	
2.f. EXPENDITURES & SALES			
Final Sales (taxed at 4.5%)			
Lot Sales	$ 1,000,000 per acre	**$ 25,100,000**	**per year**
Construction Expenditures	Section 2.c	**$ 59,667,800**	"
Consumption	55% of Payroll Section 2.l	$ 29,754,725	"
Total Final Sales		**$ 114,522,525**	**per year**
Intermediate Sales (taxed at 0.5%)			
Indirect Sales	Section 2.c	**$ 63,247,868**	"
Less Consumption	Section 2.f	$ (29,754,725)	"
Total Intermediate Sales		**$ 33,493,143**	**per year**
Total Sales		**$ 148,015,668**	**per year**

[1] Before realizing profits, developers must pay a number of development-related costs in addition to construction costs. These "Other Development Costs" include planning, permitting, design, financing, City and State exactions, and marketing and sales commissions.

Table 2. Economic Impacts of Development Activities

(Values in 2006 dollars)
(continued)

Item	Source or Multiplier	Amount or Annual Average	Units
2.g. PROFITS			
Lot Sales	12% of sales	$ 3,012,000	per year
Construction	12% "	$ 7,160,136	"
Indirect Sales	10% "	$ 6,324,787	"
Total Profits		**$ 16,496,923**	per year
2.h. EMPLOYMENT			
Construction Jobs	7.67 x sales/$1 mil	**455**	**jobs**
Indirect Employment	1.40 x direct jobs	**637**	**"**
Total Employment		**1,092**	**jobs**
In 'Ewa	residual	**710**	**"**
Outside 'Ewa	60% of indirect jobs	382	"
2.i. PAYROLL			
Construction	$ 65,000 per job	**$ 29,575,000**	**per year**
Indirect Employment	$ 38,500 "	**$ 24,524,500**	**"**
Total Payroll		**$ 54,099,500**	**per year**
2.j. POPULATION SUPPORTED BY DEVELOPMENT ACTIVITIES			
Residents			
Supported by Construction Jobs	2.2 per job	**1,001**	**residents**
Supported by Indirect Jobs	2.2 "	1,401	"
Total Residents Supported by Jobs		**2,402**	**residents**
Residents in 'Ewa			
Supported by Construction Jobs	65%	**651**	**residents**
Supported by Indirect Jobs	60%	841	"
Total Residents in 'Ewa		**1,492**	**residents**
2.k. HOUSING FOR SUPPORTED POPULATION			
Homes			
Supported by Construction Jobs	0.3 per resident	**300**	**homes**
Supported by Indirect Jobs	0.3 "	420	"
Total Homes		**720**	**homes**
Homes in 'Ewa			
Supported by Construction Jobs	0.3 per resident	**195**	**homes**
Supported by Indirect Jobs	0.3 "	252	"
Total Homes in 'Ewa		**447**	**homes**

Table 3. Economic Impacts of Industrial Operations at Full Development

(Values in 2006 dollars)

Item	Source or Multiplier	Amount at Full Development	Units
3.a. SALES & RENTS			
Sales (taxed at 0.5%)			
Direct Sales, On-site Activities	$ 125 per sq. ft.	**$ 683,347,500**	**per year**
Indirect Sales, Off-site Activities	0.70 "	**$ 478,343,250**	**"**
Less Consumption	Section 3.a	$ (145,440,900)	
Total Sales		$ 1,016,249,850	**per year**
Consumption (taxed at 4.5%)	55% of Payroll	$ 145,440,900	"
	Section 3.d		
Total Sales		**$ 1,161,690,750**	**per year**
Rents, on Site (taxed at 4.5%)	$ 10 per sf	**$ 8,200,170**	**"**
	15% rented		
3.b. PROFITS			
On-site Activities (Direct Sales and Rents)	10.0% of revenues	$ 69,154,767	per year
Off-site Activities (Indirect Sales)	10.0% "	$ 47,834,325	"
Total Profits		**$ 116,989,092**	**per year**
3.c. EMPLOYMENT AND PAYROLL			
Direct Jobs, On-site	0.7 per 1000 sq. ft.	**3,827**	**jobs**
Indirect Jobs, Off-site	0.6	**2,296**	**"**
Total Jobs		**6,123**	**jobs**
In 'Ewa	residual	**4,631**	**"**
Outside 'Ewa	65% of indirect jobs	1,492	"
3.d. PAYROLL			
Direct Jobs, On-site	$ 46,000 per job	**$ 176,042,000**	**per year**
Indirect Jobs, Off-site	$ 38,500 "	**$ 88,396,000**	**"**
Total Jobs		**$ 264,438,000**	**per year**
3.e. POPULATION SUPPORTED BY OPERATIONS			
Residents			
Supported by Direct Jobs	2.2 per job	**8,419**	**residents**
Supported by Indirect Jobs	2.2 "	5,051	"
Total Residents Supported by Jobs		**13,470**	**residents**
Residents in 'Ewa			
Supported by Direct Jobs	70%	**5,893**	**residents**
Supported by Indirect Jobs	65%	3,283	"
Total Residents in 'Ewa		**9,176**	**residents**

Table 3. Economic Impacts of Industrial Operations at Full Development

(Values in 2006 dollars)
(continued)

Item	Source or Multiplier	Amount at Full Development	Units
3.f. HOUSING FOR SUPPORTED POPULATION			
Homes			
Supported by Direct Jobs	0.3 per resident	**2,526**	**homes**
Supported by Indirect Jobs	0.3 "	1,515	"
Total Homes		**4,041**	**homes**
Homes in 'Ewa			
Supported by Construction Jobs	0.3 per resident	**1,768**	**homes**
Supported by Indirect Jobs	0.3 "	985	"
Total Homes in 'Ewa		**2,753**	**homes**

Table 4. Impacts on City Revenues and Expenditures

(Values in 2006 dollars)

Item	Source or Multiplier	Amount or Annual Average	Units
4.a. TAX & EXPENDITURE BASE			
Development Activities			
Duration	Table 2, Section 2.a	10	years
Industrial Space	Table 2, Section 2.b	546,678	sq. ft. per year
Construction Expenditures	Table 2, Section 2.f	$ 59,667,800	per year
Industrial Operations at Full Development			
Property Value, Industrial Space	$ 150 per sq. ft.	$ 820,017,000	
Rents, Taxed at 4.5%	Table 3, Section 3.a	$ 8,200,170	per year
Employment	Table 3, Section 3.c	$ 3,827	jobs
4.b. DEVELOPMENT ACTIVITIES			
Revenues			
Excise-tax Surcharge (Mass Transit)	0.5% of final sales	**$ 298,339**	**per year**
Highway Impact Fee, Industrial Space	$ 2,019 per 1000 sq. ft. 28% City Share	**$ 309,048**	**"**
Other Fees [1]		n.e.	
Total Revenues		**$ 607,387**	**per year**
Cumulative Revenues	10 x annual amt	**$ 6,073,870**	
Expenditures			
Infrastructure			
Mass Transit Fund	Section 4.b	$ (298,339)	per year
Highway Fund	"	$ (309,048)	"
Other Infrastructure [1]			
Interior Roads		n.e.	
Water Source Development		"	
Interior Water Distribution		"	
Drainage Systems		"	
Sewer Connections		"	
Collector Sewers & Trunks		"	
Wastewater Treatment Plant		"	
Services		"	
Total Expenditures		**$ (607,387)**	**per year**
Cumulative Expenditures	10 x annual amt	**$ (6,073,870)**	
Net Revenues		**$ -**	**per year**
Cumulative Net Revenues	10 x annual amt	**$ -**	

[1] Most infrastructure will be built by the developer, or the Project's fair-share will be financed via connect charges and user fees.

Table 4. Impacts on City Revenues and Expenditures

(Values in 2006 dollars)

(continued)

Item	Source or Multiplier	Amount or Annual Average	Units
4.c. INDUSTRIAL OPERATIONS AT FULL DEVELOPMENT			
Revenues			
Property Taxes			
Industrial	$ 11.37 per $1,000	$ 9,323,593	per year
Less Current Taxes	City	$ (65,500)	"
Total Property Taxes		$ 9,258,093	per year
Excise-tax Surcharge (Mass Transit)	0.5% of final sales	$ 41,001	"
Other Revenues	$ 460 per job	$ 1,760,420	"
Total Revenues		**$ 11,059,514**	**per year**
Expenditures			
Mass Transit Fund	Section 4.c	$ (41,001)	per year
Services	$ 780 per job	$ (2,985,060)	"
Total Expenditures		**$ (3,026,061)**	**per year**
Net Revenues		**$ 8,033,453**	**per year**

Table 5. Impacts on State Revenues and Expenditures

(Values in 2006 dollars)

Item	Source or Multiplier	Amount or Annual Average	Units
5.a. TAX & EXPENDITURE BASE			
Development Activities			
Duration	Table 2, Section 2.a	10	years
Industrial Space	Table 2, Section 2.b	546,678	sq. ft. per year
Lot Sales	Table 2, Section 2.f	$ 25,100,000	per year
Construction Expenditures	"	$ 59,667,800	"
Profits, Lot Sales and Construction	Table 2, Section 2.g	$ 10,172,136	"
Payroll, Construction Jobs	Table 2, Section 2.l	$ 29,575,000	"
Industrial Operations at Full Development			
Direct Sales, Taxed at 0.5%	Table 3, Section 3.a	$ 683,347,500	"
Rents, Taxed at 4.5%	"	$ 8,200,170	"
Profits, On-site Activities	Table 3, Section 3.b	$ 69,154,767	"
Jobs, On-site	Table 3, Section 3.c	3,827	
Payroll, Direct Jobs	Table 3, Section 3.d	$ 176,042,000	per year
5.b. DEVELOPMENT ACTIVITIES			
Revenues			
Highway Impact Fee, Industrial Space	$ 2,019 per 1000 sq. ft. 72% State Share	$ 794,695	per year
Conveyance Tax, Lot Sales	0.3% of sales	$ 75,300	"
Excise Tax, State Share			
Lot Sales	4% "	$ 1,004,000	"
Construction Expenditures	4% "	$ 2,386,712	"
Corporate Income Taxes	1.0% of profits	$ 101,721	"
Personal Income Taxes	3.2% of income	$ 946,400	"
Total State Tax Revenues		**$ 5,308,828**	**per year**
Cumulative Revenues	10 x annual amt	**$ 53,088,280**	
Expenditures			
Highway Fund		**$ (794,695)**	**per year**
Services		**n.e.**	
Total Expenditures		**$ (794,695)**	**per year**
Cumulative Expenditures	10 x annual amt	**$ (7,946,950)**	
Net Revenues		**$ 4,514,133**	**per year**
Cumulative Net Revenues	10 x annual amt	**$ 45,141,330**	

Table 5. Impacts on State Revenues and Expenditures
(Values in 2006 dollars)
(continued)

Item	Source or Multiplier	Amount or Annual Average	Units
5.c. INDUSTRIAL OPERATIONS AT FULL DEVELOPMENT		**(increase)**	
Revenues			
Excise Tax, State Share			
Direct Sales	0.5% of inter. sales	$ 3,416,738	per year
Rents	4.0% of final sales	$ 328,007	"
Corporate Income Tax	1.0% of profit	$ 691,548	"
Personal Income Tax	3.2% of payroll	$ 5,633,344	"
Other Revenues	$ 650 per job	$ 2,487,550	"
Total Revenues		**$ 12,557,187**	per year
Expenditures			
Services	$ 1,080 per job	**$ (4,133,160)**	**per year**
Net Revenues		**$ 8,424,027**	**per year**

KAPOLEI HARBORSIDE CENTER: ECONOMIC AND FISCAL IMPACTS

RESPONSES TO COMMENTS

Prepared by
Decision Analysts Hawai'i, Inc.

October 5, 2006

1. City & County of Honolulu, Department of Planning and Permitting

a. Comment: Housing

Section 4.16.1 Population and Affordable Housing on page 4-51: Please include the reference/source and basis of the data to support the following statements cited in the DEIS: (a) The 'Ewa Development Plan region "has offered approximately 7% to 10% more affordable housing units for sale than the island as a whole in recent years"; and (2) "the 'Ewa region has been satisfying an increasing share of Oahu's affordable housing needs, well in excess of its 'fair share'." A table summarizing the data supporting these statements would be helpful.

Response

The findings on housing are from the report: "'Ewa and O'ahu's Affordable For-sale Housing: Summary of Recent Market Conditions," by Mikiko Corporation, dated September 29, 2005. Relevant data from this report are presented in Table 1.

The table present housing statistics for 'Ewa and O'ahu for the years 2000 and 2004/05 (8/1/04 to 7/31/05). The material includes: (1) the number of existing homes; (2) the number of home sales by type (multi-family and single-family) and by price affordable to families earning a given percentage of median income; (3) median sales price; and (4) average sales price. Sales reflect Multiple Listings Service (MLS) data. As such, new homes that are sold outside the MLS are not included in the data, while resales of older homes are included. Thus, the statistics on sales reflect the general housing market rather than the market for just new homes or homes that are sold at specified prices designed to satisfy development approvals (i.e., 30% of the new units to be sold at "affordable" prices). Also, the 2004/05 statistics include expensive resort-residential condominiums at Ko

'Olina that are sold largely to wealthy retirees who are new to Hawai'i, and to wealthy buyers of second homes.

In the DPP comment, the quoted statements about the 'Ewa housing market are based on the number of "all homes" sold at prices that are affordable to families earning "80% to 140% of median income"—the relevant row is highlighted in ***bold italics*** in Table 1. In 2000, 57% of the homes sold in 'Ewa were at this price versus 47% for the entire island—a difference of 10%. In 2004/05, 51% of the homes sold in 'Ewa were at this price versus 44% for the entire island—a difference of 7%. This is the basis for the statement: the 'Ewa Development Plan region "has offered approximately 7% to 10% more affordable housing units for sale than the island as a whole in recent years."

In 2000, 18% of the O'ahu homes that sold at prices which were affordable to families earning "80% to 140% of median income" were located in 'Ewa. By 20004/05, this percentage had increased to 22%. These sales percentages were far higher than the percentages of homes that were already built in 'Ewa: 7% in 2000 and 8% in 2005. This is the basis for the statement: "the 'Ewa region has been satisfying an increasing share of Oahu's affordable housing needs, well in excess of its 'fair share'."

2. Department of Business, Economic Development & Tourism

a. Comment: Housing

The proposed project does not intend to provide any housing as part of its development. The DEIS discusses the probable impacts due to direct and indirect employment during both the 10-year development period and at full buildout. During the 10-year development period the study estimated employment due to the project will result in 1,480 persons expected to reside in 440 homes just in the Kapolei/'Ewa region; and at full buildout 9,180 residents in 2,750 homes in the Kapolei/'Ewa region. As stated in the DEIS "… the increase in employment opportunities in the 'Ewa region is likely to encourage more residential growth in the region …"

The supply of affordable housing to meet the needs of Hawaii's working families is critical to both the State and County. Inasmuch as this project will not supply any housing but will contribute to demand within the region, the final EIS should discuss to what extent anticipated wages for the projected employment, during both the10-year development period and at full buildout, will be sufficient for those employed to afford housing within the region.

Response

Economic impacts of the Project are addressed in the report: "Proposed Kapolei Harborside Center: Economic and Fiscal Impacts, by Decision Analysts Hawai'i, Inc., dated July 2006 (the DAHI report, Appendix D of the DEIS). As noted on pages 5 and 6 of the DAHI report, the Project contributes to the on-going transformation of the Kapolei/'Ewa region from its past role as largely a suburb of Honolulu's Primary Urban Center, to its current and future role as O'ahu's second full-service urban center. As a past suburb of the Primary Urban Center, population and housing growth in the region outpaced employment growth, thereby requiring many residents to commute to jobs outside the region. More balanced growth will require more job creation in the Kapolei/'Ewa region, which is one of the major benefits of the proposed Project.

Regarding the supply of housing in the Kapolei/'Ewa region, nearly 38,000 homes are planned or proposed, of which about 10,000 or more (30% for most projects) of the new homes will be sold at "affordable" prices. This accounting includes the following projects:

Project	Homes
East Kapolei	1,403
Ewa by Gentry	1,950
Franciscan Vistas 'Ewa	328
Ho'opili	12,000
Kapolei Mauka	750
Kapolei Mixed Use	300
Kapolei West	2,370
Ko 'Olina Resort & Marina	3,455
Leihano Senior Living Village	650
Makaiwa Hills	4,100
Mehuna	1,150
Mokulola Vista	70
Ocean Pointe	2,750
Plantation Apartments	330
Schuler Makakilo	453
UH West Oahu	4,041
Villages of Kapolei	1,330
Waikoloi	308

In terms of the general market, 64% of the MLS home sales and resales in the Kapolei/'Ewa region in 2004/05 were at "affordable" prices: 13% of the homes were sold at prices affordable to families earning "less than 80% of median income," and 51% were sold at prices affordable to families earning "80% to 140% of median income" (see Table 1).

For 2006, O'ahu's median family income for a family of four was estimated by the U.S. Department of Housing (HUD) to be about $71,300 per year. This translates into family incomes of about $57,050 per year at 80% of median, and about $99,820 per year at 140% of median. These family incomes indicate two wage-earners for most families, as Oahu's average annual wage was about $38,500 per year in 2006 (based on data from the Hawai'i Department of Labor and Industrial Relations).

Economic impacts related to Project development activity are addressed on pages 5 to 8 and in Table 2 of the DAHI report. As indicated in this table, direct employment is expected to average about 450 construction jobs during the 10-year construction period. In turn, these jobs will support about 1,000 residents living in about 300 homes, of which about 200 homes are expected to be in 'Ewa. While these will be new construction jobs, this does not imply an increase in construction employment since construction workers move from project to project. As stated on page 8 of the DAHI report: "Development activities will support the families of many construction workers and other workers who already live on O'ahu." Thus, development activity is not expected to contribute to significant demand for more housing in 'Ewa or in nearby communities.

Also on page 8, wages of construction workers are expected to average about $65,000 per year. This is nearly 70% higher than the average wage of about $38,500 for all O'ahu jobs. Assuming a second wage-earner at the average O'ahu wage of $38,5000, the family income of construction workers will exceed $100,000 per year. Thus, most construction workers are able to purchase homes that are priced for families earning more than 140% of median family income for a family of four. However, some entry-level construction workers earn less than the average wage, so their initial ability to afford housing will be less.

Economic impacts related to Project operations at full development are addressed on pages 8 and 9 and in Table 3 of the DAHI report. As indicated in this table, operations are expected to provide about 3,830 on-site industrial jobs. In turn, these jobs will support about 8,420 residents living in about 2,530 homes, of which about 1,770 homes are estimated to be in 'Ewa. As stated on page 9 of the DAHI report: "The new jobs will provide employment to (1) workers who already live in the Kapolei/'Ewa region and nearby communities but who must commute to distant jobs, and (2) workers who will be new residents of the Kapolei/'Ewa region and nearby communities." Without the Project, many of these workers would still be

attracted to 'Ewa because of the availability of housing at attractive prices, but they would commute to jobs outside the region. With the Project, some additional workers will be enticed to live in 'Ewa instead of some other community on O'ahu.

Also on page 9, wages of industrial workers are expected to average about $46,000 per year. This is nearly 20% higher than the average wage of about $38,500 for all O'ahu jobs. Assuming a second wage-earner at the average O'ahu wage of $38,5000, family income of industrial workers will reach about $84,500 per year. Thus, most industrial workers will be able to purchase homes that are priced for families earning about 118.5% of median family income for a family of four. However, some entry-level workers earn less than the average wage, so their initial ability to afford housing will be less. This assumes that entry-level workers are no longer living with their parents, the spouse does not have a high income, their savings for a down payment are limited, and relatives do not help with a down payment.

b. Comment: Transportation

The Traffic Impact Analysis Report (TIAR) included in the DEIS computes the amount of the anticipated impact fees for highways pursuant to the County's 'Ewa Impact Fee Ordinance (Ordinance 02-52). The figure contained in Table 4, section 4.b., provides a figure of $309,048 based upon a projected total square footage for the Harborside Center of 546,678 square feet. Applying the formula found in the Ordinance's impact fee for industrial uses of $2,019 per 1,000 square feet, the correct figure appears to be approximately $1.1 million (547 x $2,019). The discrepancy appears to be related to a "28% City Share" factor. The final EIS and TIAR should explain the rationale for this apparent discrepancy in the calculation of the highway impact fees anticipated from this project.

Response

The DEIS is based on the the DAHI report, Table 5 (Impact on City Revenues and Expenditures) and Table 6 (Impact on State Revenues and Expenditures). As indicated by the following, there is no discrepancy between this report and the TIAR:

City share of highway impact fee (28%)	$ 309,048
State share of highway impact fee (72%)	$ 794,695
Total highway impact fee (100%)	$ 1,103,743

The percentage split of the highway impact fee is based on the estimated cost of City and State highway improvements in 'Ewa.

3. State of Hawai'i, Land Use Commission

a. Comment: Housing

As we pointed out in or April 4, 2006 letter on the Petition for Land Use District Boundary Amendment, the Land Use Commission (LUC) has required petitioners of industrial developments to complete and submit a housing study to address, among other things, the type of employee/affordable housing demands that will be created by the proposed use. In light of the LUC's concerns, we suggested that the petitioner address the affordable housing impact of the proposed use upon the low income, low-moderate income, and gap groups, and the potential measures that may be employed to mitigate such impact. Although the manner in which this issue ultimately is addressed was left to the petitioner's discretion, we believe that it would be appropriate to include discussion on this matter in the EIS in the interest of full environmental disclosure.

Response

Housing and related issues are addressed in the response to the first DBEDT comment (Item 2.a). As noted in the response, most of the construction workers who will be employed during the development activity already have homes and, as a result, will not contribute significantly to the demand for more homes in 'Ewa or on O'ahu. Also, their wages are nearly 70% higher than the average wage on O'ahu. Assuming a second wage-earner in the family, most of these workers will be able to afford homes priced for families earning more than 140% of median income for a family of four.

Regarding operations, new industrial jobs will provide employment to some workers who already live in the Kapolei/'Ewa region and nearby communities but who now commute to distant jobs. These workers will not contribute to the demand for more homes. However, a large number of the new industrial jobs will be filled by workers who will be new to the region, and these workers will require new homes in 'Ewa or nearby communities. The anticipated island-wide demand at full development of the Project (in approximately 2018) will total less than 2,500 homes, with less than 1,700 of them being in 'Ewa. With regard to industrial workers being able to afford these homes, on average, they earn nearly 20% above the average wage on O'ahu. Assuming a second wage-earner, most of these workers will be able to afford homes priced for families earning about 18.5% of median family income for a family of four. Furthermore, if they can afford a large down payment on a home—because of selling an existing homes that has appreciated in value, or past savings, or financial help from relatives—then they will be able to afford even more expensive homes.

Unfortunately, data are not readily available on the wage distribution of construction or industrial workers on O'ahu, and how this translates to (1) the distribution of family incomes and (2) the demand for homes at various price levels (i.e., prices that are affordable for low-income families, low-moderate income families, gap-group income families, and higher income families). Nor is there a simple relationship between wages, family incomes, and the ability to afford a given price for a home. For example, a young worker who holds a low-paying entry-level job may live at home until he or she advances to a higher level and higher paying position. In the mean time, this person will not generated demand for an additional home. Also, his or her wages will contribute to family income that may already be high due to two working parents who have advanced careers. When this persons does enter the market for homes, his or her ability to afford housing will reflect higher pay due to career advancement, the income of his or her spouse, savings for a down payment, possible help from parents with the down payment, etc.

As previously noted, the planned and proposed supply of homes in 'Ewa is large: nearly 37,000 new homes, about 10,000 of which will be sold at "affordable" prices.

The primary contribution that the Project will make to affordable housing is jobs that pay higher than average wages, thereby contributing to higher family incomes and greater ability to afford housing. In view of these higher paying jobs and the large supply of new homes at various prices that are planned and proposed for 'Ewa—including homes at "affordable prices"—mitigation measures to improve housing affordability by further increasing incomes or by increasing the supply of homes at "affordable" prices are not recommended.

b. Comment: Expenditure/Revenue Assumptions

In the Economic and Fiscal Impacts study, it is assumed that the excise-tax/mass transit revenues, highway impact fees, and other revenue sources generated by the proposed action, as applicable, will (i) negate the City's expenditures on mass transit and highways; and (ii) far exceed the State's expenditures on highways. The bases upon which these assumptions rest are unclear as there are no data on the specific types of governmental expenditures and their corresponding amounts that will be necessary to support the proposed action. In order to clearly document the economic and fiscal impacts of the proposed action, the information should be provided.

Response

The impacts of the Project on City and State finances are summarized on pages 13 to 16 of the DAHI report, while the detailed analysis is presented in the accompanying Tables 4 and 5. For both development activity and operations at full development, the analysis covers the anticipated changes in the tax and expenditure base, revenues from taxes and fees, support expenditures, and net revenues. The tables also show the multipliers (i.e., assumptions) that were used in the analysis (e.g., applicable tax rates, government support expenditures per job, etc.).

Regarding the City's planned mass transit system, details are not yet available on the final route and transit stops, anticipated capital and operating costs, total ridership, fares, how the system will be financed, etc. Given this lack of information, it was assumed that the length of the route will reflect what the City can afford, with this being based primarily on capital improvements financed from the excise-tax surcharge and from Federal subsidies: the higher the cost per mile the shorter the system, and vice versa. Thus, revenues from the excise tax surcharge should approximately equal the City's share of capital expenditures. And since information is not available on projected ridership associated with the proposed Project, it was assumed that the fair share of the capital cost will equal the amount of the excise-tax surcharge generated by the Project.

Regarding City and State highway improvements, highway impact fees for 'Ewa were established to (1) generate sufficient funds to cover the entire local share of highway improvements in 'Ewa, and (2) have each development pay its fair share based on estimated traffic generated. Thus, highway impact fees generated by the Project should approximately equal City and State expenditures on highway improvements to support the Project. This relationship was assumed for the fiscal analysis. Although not addressed in the DAHI report, it appears that the highway impact fees are set too high, indicating that the Project will actually pay more than its fair-share of highway improvements. This is based on the following estimates (in 2005 dollars): about $400 million for highway improvements in 'Ewa; about $80 million for the local share (20%); about $100 million in impact fees generated by projected development over the next 20 years; resulting in about $20 million collected in excess of the local share of highway costs ($100 million – $80 million).

As indicated in the text of the DAHI report and in Table 4, most support infrastructure is a City responsibility, including roads, delivery of drinking water, drainage, wastewater collection and disposal, etc. However, most of the infrastructure will be built by the developer, or the Project's fair-share will be financed via connect charges and user fees. Furthermore, development activity requires few support services from the City. Thus, the finding

in the DAHI report is that the Project's development activity will have a negligible impact on City finances.

However, as shown in Table 4, operations are expected to generate net revenues to the City of about $8 million per year once the Project reaches full development. As indicated in the DAHI report, most of the revenues will come from property taxes. Other revenues (fuel taxes; motor vehicle weight taxes; water and sewer fees; solid-waste disposal fees; other departmental earnings; public service company taxes; other licenses, permits and fees; and fines, forfeits and penalties) and expenditures on support services (police, fire, road maintenance, bus service, water delivery, O&M of sewer systems and the wastewater treatment plant, solid waste disposal, etc.) were assumed to be proportional to the number of new jobs generated by the Project: annual revenues of about $460 per job and annual expenditures of about $780 per job as shown in Table 4 of the DAHI report. These multipliers are based on an analysis of the City budget.

Unlike the City, the State derives substantial revenues from development activity, including conveyance taxes on property sales, excise taxes on lot sales and construction expenditures, and income taxes. However, State services in support of development activity are minor. Thus, as shown in Table 5 of the DAHI report, net revenues to the State during the 10 years of development activity are estimated to average about $4.5 million per year.

As shown in Table 5, operations are expected to generate net revenues to the State of about $8.4 million per year once the Project reaches full development, including excise taxes on sales (mostly taxed at 0.5%), income taxes and other revenues. Other revenues (public service companies tax; fuel tax; motor vehicle weight tax; charges for various licenses, permits, and services; departmental earnings; etc.) and expenditures on support services (highway maintenance, government administration, and other expenditures) were assumed to be proportional to the number of new jobs: annual revenues of about $650 per job and annual expenditures of $1,080 per job as shown in Table 5 of the DAHI report. These multipliers are based on an analysis of the State budget.

4. University of Hawai'i at Manoa, Environmental Center

a. Comment: Expenditure/Revenue Assumptions

On page 3-1, the last paragraph states that the Kapolei Harborside Center "will accommodate future industrial growth by providing additional industrial [space], including maritime related lease space." It would be helpful to know how much industrial development is planned for this area and much of the demand this project will satisfy.

Response

The DAHI report summarizes the nature and competitive advantages of the Project:

> … Kapolei Harborside Center will offer about 251 acres for industrial development … Tenants will include companies engaged in light manufacturing, maritime support services, warehousing, and other industrial services. The Project will be similar to other industrial parks on O'ahu, and will complement the existing Campbell Industrial Park and Kapolei Business Park.
>
> The Project will offer many advantages, including: (1) a strategic location between Kalaeloa/Barbers Point Harbor, the City of Kapolei, and the existing industrial areas of Campbell Industrial Park and Kapolei Business Park; (2) proximity to a large and growing regional market, (3) a large workforce drawn from a growing population and from workers who now have long commutes to jobs outside the region, and (4) costs for industrial space that are expected to be lower than those near downtown Honolulu.
>
> These advantages will entice a number of new businesses to locate in Kapolei and will also entice a number of existing business to relocate to Kapolei. Such has been the history of many urban areas across the country: to remain competitive, businesses follow the customers and workers to locations that do not require long commutes and offer lower costs for industrial space. As the Kapolei population and business community grow, even more businesses will be attracted there because the market will become sufficiently large to support activities that require large markets and/or need specialized support services. In addition to serving regional markets, industrial companies in Kapolei will increasingly serve island-wide, Statewide and overseas markets. An additional advantage for businesses that locate in Kapolei Harborside Center is that goods can be shipped via nearby Kalaeloa Barbers Point Harbor. This will become an even greater advantage for these businesses as the harbor is improved.

The industrial market study for the Project by Robert Charles Lesser & Co. (Appendix A of the DEIS) contains the following findings regarding the anticipated market for industrial space:

— Demand for Industrial Land

- Pent-up demand that will restore vacancy rates to 5%: about 73 acres.

- Growth in the island-wide demand for industrial land due to economic growth: about 25 acres per year based on over 5,000 new jobs per year, a low estimate of 80 square feet per worker, and a FAR of 40%.
- Anticipated relocation of tenants from existing industrial areas to West O'ahu: about 11 acres per year.

— Supply of Industrial Land

- Island-wide supply of undeveloped industrial land, 2005: about 729 acres, of which about 485 acres are likely to be developed for industrial users (includes the proposed Project at 240 acres).
- Projected island-wide supply of undeveloped industrial land, year-end 2008: about 729 acres, of which about 338 acres are likely to be developed for industrial users (485 acres – 73 acres of pent-up demand – 3 years of demand at about 25 acres per year + 1 acre adjustment).
- Projected West O'ahu supply of undeveloped industrial land that is likely to be developed for industrial users, year-end 2008: about 294 acres (87% of the total supply of 338 acres).
- Projected supply of undeveloped industrial land to be provided by the Project, year-end 2008: about 240 acres (about 82% of the West O'ahu supply of 294 acres, or about 71% of the island-wide supply of 338 acres).

— Demand for Industrial Land Supplied by the Project

- Pent-up demand for industrial land that will be supplied by the Project: none (by 2009, pent-up demand will be fully absorbed by other industrial parks).
- Demand for industrial land due to island-wide economic growth, and which will be supplied by the Project: about 17 acres per year (based on island-wide growth in demand of about 25 acres per year, of which about 71% will be supplied by the Project, rounded down).
- Demand for industrial land due to the relocation of tenants from other industrial areas, and which will be supplied by the Project: about 9 acres per year (based on demand for about 11 additional acres per year of industrial land in West O'ahu, of which about 82% will be supplied by the Project).
- Total Project demand: about 26 acres per year (17 acres + 9 acres).
- Absorption period for the Project: about 10 years (251 acres ÷ 26 acres/year).

Table 1. 'Ewa and O'ahu Housing Statistics: 2000 and 2004/05*

Item	Price Range		'Ewa						O'ahu			
			2000			2004/05			2000		2004/05	
	2000	2004/05	Number	Distribution	% of O'ahu	Number	Distribution	% of O'ahu	Number	Distribution	Number	Distribution
Existing Homes			20,804		7%	25,657		8%	315,988		330,141	
Number of Home Sales by Type and Price Affordable to Families Earning % of Median Income												
Multi-family Homes												
Less than 80% of median income	Below $150,000	Below $200,000	265	21%	15%	308	12%	14%	1,775	21%	2,204	17%
80% to 140% of median income	$150,000 to $320,000	$200,000 to $440,000	229	18%	13%	780	31%	19%	1,818	21%	4,119	32%
140% to 170% of median income	$320,000 to $390,000	$440,000 to $540,000	6	0%	3%	98	4%	15%	198	2%	645	5%
170% to 200% of median income	$390,000 to $470,000	$540,000 to $640,000	-	0%	0%	46	2%	14%	109	1%	319	2%
Over 200% of median income	Over $470,000	Over $640,000	-	0%	0%	83	3%	19%	259	3%	430	3%
Total mf-homes			500	40%	12%	1,315	53%	17%	4,159	49%	7,717	59%
Single-family Homes												
Less than 80% of median income	see above	see above	67	5%	18%	20	1%	14%	368	4%	144	1%
80% to 140% of median income	"	"	483	39%	22%	478	19%	30%	2,183	26%	1,606	12%
140% to 170% of median income	"	"	199	16%	29%	345	14%	32%	679	8%	1,069	8%
170% to 200% of median income	"	"	1	0%	0%	204	8%	25%	456	5%	824	6%
Over 200% of median income	"	"	1	0%	0%	119	5%	7%	705	8%	1,694	13%
Total sf-homes			751	60%	17%	1,166	47%	22%	4,391	51%	5,337	41%
All Homes												
Less than 80% of median income	see above	see above	332	27%	15%	328	13%	14%	2,143	25%	2,348	18%
80% to 140% of median income	** " **	"	***712***	***57%***	***18%***	***1,258***	***51%***	***22%***	***4,001***	***47%***	***5,725***	***44%***
140% to 170% of median income	"	"	205	16%	23%	443	18%	26%	877	10%	1,714	13%
170% to 200% of median income	"	"	1	0%	0%	250	10%	22%	565	7%	1,143	9%
Over 200% of median income	"	"	1	0%	0%	202	8%	10%	964	11%	2,124	16%
Total Home Sales			1,251	100%	15%	2,481	100%	19%	8,550	100%	13,054	100%
Median Sales Price												
Multi-family Homes			$125,450		74%	$284,466		107%	$170,000		$265,000	
Single-family Homes			$238,100		81%	$460,000		88%	$293,000		$525,000	
All Homes			$199,500		86%	$384,858		104%	$232,000		$369,000	
Average Sales Price												
Multi-family Homes			$144,881		72%	$328,137		103%	$201,548		$317,383	
Single-family Homes			$237,617		64%	$478,403		75%	$369,880		$634,357	
All Homes			$200,552		70%	$398,758		89%	$287,998		$446,975	

* Year 2004/05 = 8/1/04 to 7/31/05

Sources:

Mikiko Corporation. "Ewa and Oahu's Affordable For-sale Housing: Summary of Recent Market Conditions." September 29, 2005.

City & County of Honolulu, 2006.

As indicated by the above, the demand for industrial land that will be supplied by the Project is based on percentages of total available land. Given the strong locational advantages of the Project, market absorption could be faster than that estimated in the market study.

Kapolei Harborside Center: Economic and Fiscal Impacts
Responses to Comments

Prepared by
Decision Analysts Hawai'i, Inc.

October 5, 2006

Industrial Land, Insert

The market study for the Project was conducted by Robert Charles Lesser & Co. (the Lesser report, Appendix A of the DEIS). This study determined that, in 2005, O'ahu had a supply of undeveloped industrial land of about 729 acres, of which about 485 acres are likely to be developed for industrial users. By the beginning of 2009, this supply is expected to decrease to about 582 acres, of which about 338 acres are likely to be developed for industrial users. The decrease in available industrial land reflects (1) about 73 acres to supply pent-up demand (i.e., development that will restore vacancy rates to about 5%) and (2) about 74 acres to supply demand associated with economic growth (about 25 acres per year over a 3-year period, based on over 5,000 new jobs per year, a low estimate of 80 square feet per worker, and a FAR of 40%).

At the beginning of 2009, this projected supply of about 338 acres will be comprised of the following: about 240 acres (since revised to 251 acres) for the Project, about 54 acres elsewhere in West O'ahu, and about 44 acres for the remainder of the island. Thus, the Project accounts for about 82% of the West O'ahu supply of undeveloped industrial land that is likely to be developed for industrial users, and about 71% of the island-wide supply.

Over the 10-year life of the Project, the Lesser report anticipates that about 250 acres of industrial land will be developed on O'ahu—about 74% of the available supply, with development based on about 25 acres per year over a period of 10 years. The Project is expected to capture about 157 acres (about 63%) of the total development, based on an absorption rate of about 17 acres per year for a period of slightly more than 9 years.

In addition, about 110 additional acres will be developed in West O'ahu for tenants relocating from other industrial areas on O'ahu, based on about 11 acres per year for a period of 10 years. The Project is expected to capture about 83 acres (about 76%) of the additional 110 acres, based on an absorption rate of about 9 acres per year for a period of slightly more than 9 years.

Thus, the Project is expected to be absorbed at a rate of about 26 acres per year.

Appendix F
Cultural Impact Assessment

Cultural Impact Assessment for the Proposed 345-Acre Kapolei Harborside Center, Honouliuli *Ahupua'a*, 'Ewa District, O'ahu Island

[TMK: (1) 9-1-14:027 & 034,035 & 9-1-15:001]

Prepared for

Group 70 International, Inc.

Kēhaulani E. Souza, B.A.,

and

Hallett H.Hammatt, Ph.D.

Prepared by

Cultural Surveys Hawai'i, Inc.

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(CSH Job Code: HONO 70)

May 2006

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Management Summary

Reference	Cultural Impact Assessment for the Proposed 345-Acre Kapolei Harborside Center, Honouliuli *Ahupua'a*, 'Ewa District, O'ahu Island
Date	May 2006
Project Number	Cultural Surveys Hawai'i Inc. (CSH) Job Code: HONO 70
Project Agencies	SHPD, possibly the U. S. Army Corps of Engineers (USACE) (related to drainage improvements) and/or other federal agencies
Project Funding and Land Jurisdiction	Private, Kalaeloa Property Development, LLC
Project Location	TMK: (1) 9-1-14: 027, 034, 035 & 9-1-15: 001 in Kalaeloa (Barbers Point), Honouliuli *Ahupua'a*, 'Ewa District, Island of O'ahu. This area is depicted on the 1998 'Ewa USGS 7.5-minute topographic quadrangle. Generally, the project area lies south of the O'ahu Railway and Land Company (O. R. & L.) Railway right-of-way, north of Malakole Road, west of Kalaeloa Boulevard, and east of the Kalaeloa Harbor.
Project Acreage and Description	The 345-acre project area is proposed predominantly for industrial development. Minimally, this development would include grading, building and structure construction, street and utility installation, and landscaping. Additionally, the installation of a substantial drainage conduit through the central portion of the project area may be part of the proposed project.
Document Purpose	The cultural impact assessment provides information pertinent to the assessment of the proposed project's cultural impacts [per Hawai'i Revised Statutes (HRS) Act 50, Chapter 343 and the Office of Environmental Quality's *Guidelines for Assessing Cultural Impacts*). This document was prepared to support the project's environmental review under HRS Chapter 343. The process for evaluating cultural impacts is constantly evolving. There continues to be gray areas and unresolved matters pertaining to traditional access, gathering rights, and other cultural issues. Act 50 is an attempt to balance between traditional lifestyles, development, and economic growth.

Identified Cultural Resources and Significance Evaluations[2]	This investigation identified the following cultural resources/historic properties[3] within or near the project area. These sites likely, or potentially, will be affected by the proposed project: State Inventory of Historic Properties (SIHP) # 50-80-12-6679, historic plantation-era drainage channel, a portion of which has already been determined Hawai‘i Register-eligible under Criterion D. Numerous sinkhole features within the project area's archaeological/paleontological preserve area, likely National/Hawai‘i Registers eligible under Criterion D, and, because of the potential for human burials, Criterion E (Hawai‘i Register only) Stacked stone prehistoric or early historic enclosures and mounds, perhaps previously recorded, likely eligible to the National/Hawai‘i Registers under Criterion D. SIHP # 50-80-12-2888, the Barbers Point Harbor Archaeological District, listed on the National Register. The O. R. & L. right-of-way, SIHP # 50-80-12-9714, immediately adjacent to the project area, currently listed on the National Register under Criteria A, B, and C.
Recommend-ations	It should be noted that significant cultural resources/historic properties will likely be affected by the proposed industrial development despite the extensive past disturbance within the project area. As a precautionary measure, personnel involved in future development should be informed of the possibility of inadvertent cultural finds, and should be made aware of the appropriate notification measures to follow. We also recommend that through out the duration of this project that you continue to consult with the community especially those mentioned in this report. We also feel that the project should incorporate the traditional place names of the surrounding area into the proposed development to sustain a connection to the past. Additionally, it was recommended in the Cultural Resource Literature Review and Field Inspection for this project (O'Leary and Hammatt 2006) that project proponents consult with the State Historic Preservation Division/Department of Land and Natural Resources (SHPD/DLNR) and develop an appropriate scope of work for an archaeological inventory survey.

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Section 1 Introduction

1.1 Project Background

At the request of Group 70 International, Inc., Cultural Surveys Hawai‘i, Inc. (CSH) completed this cultural impact assessment for the proposed 345-acre Kapolei Harborside Center. The irregularly-shaped project area is located in the Kapolei area of Honouliuli Ahupua‘a, ‘Ewa District, in the southwestern portion of the Island of O‘ahu. Generally the project area is located south of the O‘ahu Land and Railway Company (O.R. & L.) railway alignment, north of Malakole Road, west of Kalaeloa Boulevard, and east of the Barbers Point Harbor [TMK: (1) 9-1-14: 027, 034, & 9-1-15: 001]. This area is depicted on the 1998 ‘Ewa USGS 7.5-minute topographic quadrangle. (Figure 1, Figure 2, Figure 3, and Figure 4).

The 345-acre project area is proposed predominantly for industrial development. Minimally, this development would include grading, building and structure construction, street and utility installation, and landscaping. Additionally, the installation of a substantial concrete-lined drainage conduit through the central portion of the project area may be part of the proposed industrial development (refer to Figure 4).

The cultural impact assessment provides information pertinent to the assessment of the proposed project’s cultural impacts [per Hawai‘i Revised Statutes (HRS) Act 50, Chapter 343 and the Office of Environmental Quality’s Guidelines for Assessing Cultural Impacts]. This document was prepared to support the proposed project’s environmental review under HRS Chapter 343.

The process for evaluating cultural impacts is constantly evolving. There continues to be gray areas and unresolved matters pertaining to traditional access, gathering rights, and other cultural issues. Act 50 is an attempt to balance between traditional lifestyles, development, and economic growth.

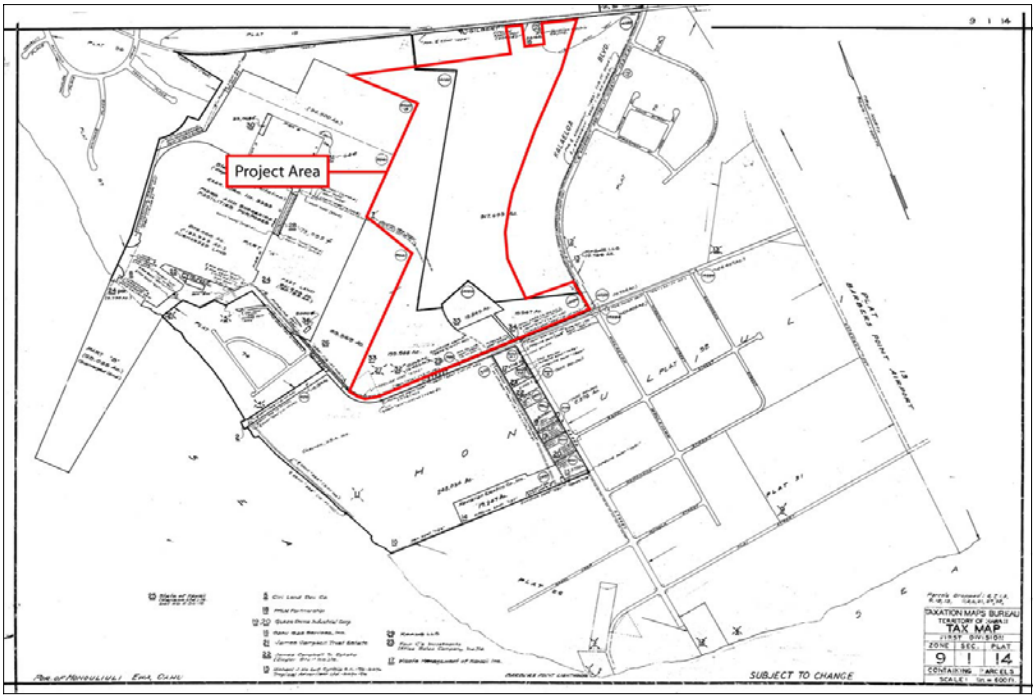

Figure 2. TMK 9-1-14 showing the location of the project area

Figure 1. 2002 'Ewa USGS 7.5-minute topographic quadrangle, showing location of project area

Figure 3. Aerial photograph (2000) showing the location of the project area

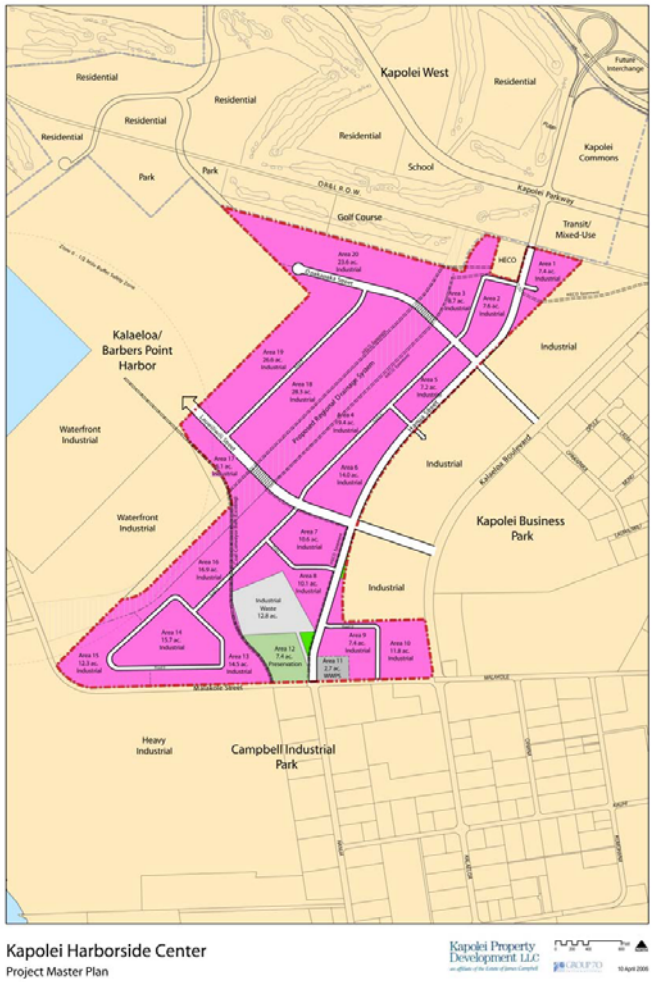

Figure 4. Kapolei Harborside Center Plan

1.2 Scope of Work

The suggested scope for the Cultural Impact Assessment is summarized as follows:

1) Examination of historical documents, Land Commission Awards, historic maps, with the specific purpose of identifying traditional Hawaiian activities including gathering of plant, animal and other resources or agricultural pursuits, as may be indicated in the historic record.
2) A review of the existing archaeological information pertaining to the sites on the property as they may allow us to reconstruct traditional land use activities and identify and describe the cultural resources, practices, and beliefs associated with the parcel and identify present uses, if appropriate.
3) Conduct oral interviews with persons knowledgeable about the historic and traditional practices in the project area and region. We anticipate both formal and informal interviews.
4) Preparation of a report on items 1-3 summarizing the information gathered related to traditional practices and land use. The report will assess the impact of the proposed action on the cultural practices and features identified.

1.3 Environmental Setting

1.3.1 Natural Environment

The project area is located on the ‘Ewa plain, south of the Wai‘anae Mountain Range in the southwest corner of O‘ahu. The terrain is limestone and alluvial deposits, overlying flows of the Wai‘anae volcanic series (Macdonald et al. 1983:423). The project area is generally quite level varying between 10 feet at the southern end of the project area and 70 feet elevation above sea level at the project area’s northern (*mauka*) end.

Lying in the lee of the Wai‘anae mountain range, the project area is one of the driest areas of O‘ahu with most of the area averaging about 18 inches of rainfall annually (Juvik and Juvik 1998:56). In pre-contact Hawai‘i the project area would have been mostly lowland dry shrub and grassland, but this area has been extensively disturbed and transformed by human activity with a variety of exotic grasses, weeds, and shrubs now dominating. These grasses and shrubs, along with pockets of *kiawe* forest, and a few scattered banyan trees are characteristic of the vegetation of the project area.

Based on USGS soil survey data, the project area is largely covered with thin clay soils including a moderately shallow ‘Ewa silty clay loam, and Mamala stony silty clay loam overlying coral (limestone) outcrop (Foote et al. 1972). The surface of the Pleistocene limestone outcrop, where not covered by alluvium or stockpiled quarry material, has characteristic dissolution “pit caves” (Mylroie and Carew 1995), which are nearly universally, but erroneously, referred to as “sink holes” (Halliday 2005). These pit caves, or sink holes, vary widely in area extent and depth, with some of the more modest features comparable in volume to five-gallon buckets, while some of the larger features, although usually irregularly shaped, are several

meters wide and several meters deep. The clay and silty clay loam deposits that overly the sink hole-pocked Pleistocene limestone outcrop are likely of historic deposition, resulting from a combination of increased erosion from introduced grazing animals and deliberately induced erosion to augment the portions of the ’Ewa Plain that were suitable for intensive agriculture. In traditional Hawaiian times, the areas of exposed coral outcrop were undoubtedly more extensive.

1.3.2 Built Environment

The current project area has been drastically altered by historic and modern land use, including intensive sugar cane cultivation, large-scale limestone quarrying operations, quarry material stockpiling, a commercial plant nursery, and green waste processing. Figure 5 is a circa 1980s aerial photograph of the project area showing these areas of past disturbance. The in-use sugar can fields are visible in the central and northeastern portions of the project area. As mentioned above, in the late 19th and early 20th centuries, arable land in Honouliuli was expanded through a program of sediment relocation from the higher, volcanic, soil-rich slopes of the Wai‘anae Range down onto the soil-poor Pleistocene limestone plains of the Kalaeloa area. This was accomplished through plowing and scarification of the terrigenous slopes to increase sediment erosion and transport during heavy rains down onto the adjacent limestone plain. The agricultural lands in the project area likely resulted, at least partially, from this arable land expansion program.

On Figure 5, the quarrying and quarry-stockpiling activity is visible as the white areas along the project area’s western side. These quarrying operations are more clearly visible in Figure 3.

The only portions of the current project area that have not been greatly altered by past land use are the approximately 7-acre archaeological/paleontological preserve of limestone sinkholes, located along the project area’s southern boundary, and the northwestern tip of the project area. Both these areas have been moderately affected by *kiawe*-wood cutting activity and minor bulldozing in the past, but they still have the characteristic limestone land surface and *kiawe* thicket vegetation. The preserve area is enclosed within a chain-link fence, and contains scores of limestone sink holes

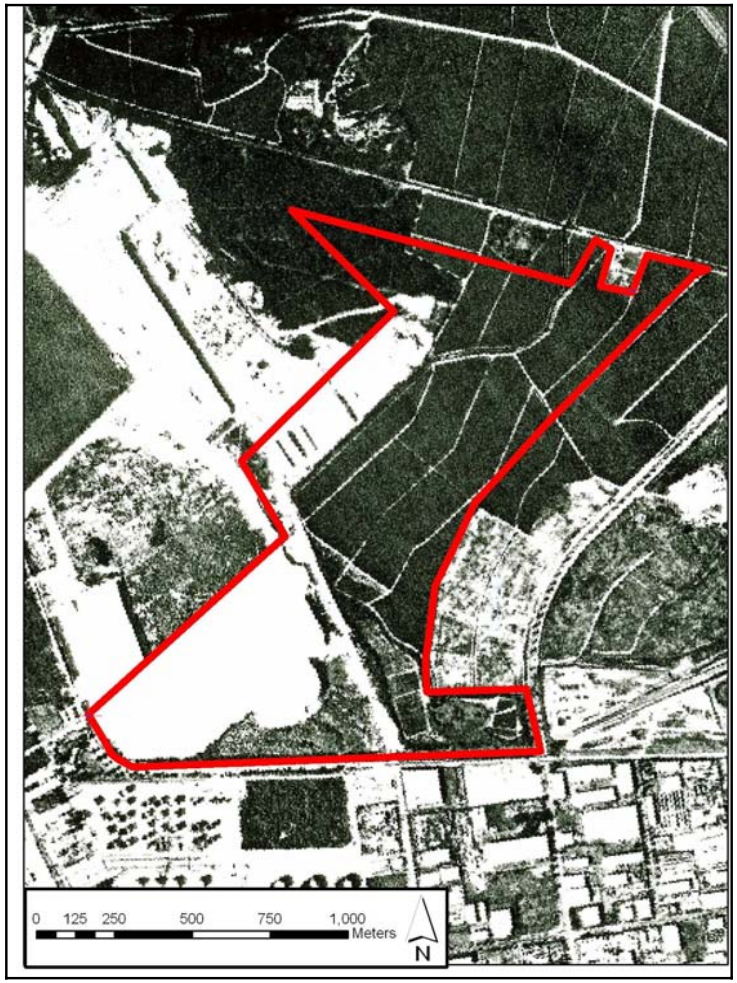

Figure 5. 1980s aerial photograph of the project area showing extensive modification from historic and modern land use

1.4 Methodology

1.4.1 Documentary Research

Background research included a review of previous archaeological studies on file at the State Historic Preservation Division, and a review of geology and cultural history documents at Hamilton Library at the University of Hawai‘i, the Hawai‘i State Archives, the Mission House Museum Library, the Hawai‘i Public Library, and the Archives of the Bishop Museum. Further research included a study of historic photographs at the Hawai‘i State Archives and the Archives of the Bishop Museum, a study of historic maps at the Hawai‘i State Archives and the Archives of the Bishop Museum, and a study of historic maps at the Survey Office of the Department of Accounting and General Services. Information on LCAs was accessed through Waihona ‘Āina Corporation’s Māhele Data Base (www.waihona.com).

1.4.2 Identification of Knowledgeable Informants

As partial fulfillment for the Scope of Work (SOW), consultation with organizations and the community were conducted to identify *kūpuna* and other individuals with knowledge of the history of the project area and its surroundings. The organizations consulted included the Office of Hawaiian Affairs, the O‘ahu Island Burial Council, ‘Ahahui Siwila Hawai‘i O Kapolei Hawaiian Civic Club, ‘Ewa Neighborhood Board.

Based on recommendations from organizations and the community, the following individuals were contacted for information gathering sessions Arline Eaton, Rubellite Kawena Johnson, Shad Kane, Kawika McKeaque and many other talk story sessions. These sessions were conducted in-person or by telephone.

Section 2 Mythological and Traditional Accounts

Various legends and early historical accounts indicate that the *ahupua‘a* of Honouliuli (Figure 6) was once heavily populated by pre-contact Hawaiians. This substantial settlement is attributable for the most part to the plentiful marine and estuarine resources available at the coast, as well as lowlands fronting the west loch of Pearl Harbor (Kaihuopala‘ai) suitable for wetland taro cultivation. In addition, forest resources along the slopes of the Wai‘anae Range, as suggested by E.S. and E.G. Handy, probably acted as a viable subsistence alternative during times of famine and/or low rainfall.

> The length or depth of the valleys and the gradual slope of the ridges made the inhabited lowlands much more distant from the *‘wao*, or upland jungle, than was the case on the windward coast. Yet the *‘wao* here was more extensive, giving greater opportunity to forage for wild foods during famine time [Handy and Handy 1972:469-470].

The upper valley slopes may have also been a resource for sporadic quarrying of basalt for the manufacturing of stone tools. At least one probable quarrying site (SIHP # 50-80-12-4322) is present in Makaīwa Gulch at 152 m (500 ft.) above mean sea level (Hammatt et al. 1991).

Some of the traditional themes associated with this area include connections with Kahiki, the traditional homeland of Hawaiians in central Polynesia. There are several versions of the chief Kaha‘i leaving from Kalaeloa for a trip to Kahiki; on his return to the Hawaiian Islands he brought back the first breadfruit (Kamakau 1991a:110) and planted it at Pu‘uloa, near Pearl Harbor in ‘Ewa (Beckwith 1940:97). Several stories associate places in Honouliuli to the gods Kāne and Kanaloa, with the Hawaiian pig god Kamapua‘a and the Hina family, and with the sisters of Pele, the Hawaiian volcano goddess, all of whom have strong connections with Kahiki (Kamakau 1991a:111; Pukui et al. 1974:200). The locations of traditional places names for Honouliuli are illustrated in (Figure 7).

2.1 The Naming of ‘Ewa and Honouliuli

Honouliuli is the largest *ahupua‘a* in the *moku* (district) of ‘Ewa. One translation of the name for this district is given as “unequal” (*Saturday Press* Aug. 11, 1883). Others translate the word as “strayed” and associate it with the legends of the gods, Kāne and Kanaloa.

> When Kane and Kanaloa were surveying the islands they came to Oahu and when they reached Red Hill saw below them the broad plains of what is now Ewa. To mark boundaries of the land they would throw a stone and where the stone fell would be the boundary line. When they saw the beautiful land lying below them, it was their thought to include as much of the flat level land as possible. They hurled the stone as far as the Waianae range and it landed somewhere, in the Waimanalo section. When they went to find it, they could not locate the spot where it fell. So Ewa (strayed) became known by the name. The stone that strayed [Told to E.S. by Simeon Nawaa, March 22, 1954; cited in Sterling and Summers 1978:1].

Honouliuli means “dark water,” “dark bay,” or “blue harbor” and was named for the waters of Pearl Harbor (Jarrett 1930:22), which marks the eastern boundary of the *ahupua‘a*. The Hawaiians called Pearl Harbor, Pu‘uloa (*lit*. long hill). Another explanation for the names comes from the “Legend of Lepeamoa”, the chicken-girl of Pālama. In this legend, Honouliuli is the name of the husband of the chiefess Kapālama and grandfather of Lepeamoa (Thrum 1923:164-184). “Her grandfather gave his name, Honouliuli to a land district west of Honolulu . . .” (Thrum 1923:170). Westervelt (1963:209) gives an almost identical account.

It seems likely the boundaries of the western-most *ahupua‘a* of ‘Ewa were often contested with Wai‘anae people. The ‘Ewa people could cite divine sanction that the dividing point was between two hills at Pili o Kahe:

> Eventually the stone was found at Pili o Kahe. This is a spot where two small hills of the Wai‘anae Range come down parallel on the boundary between Honouliuli and Nānākuli (‘Ewa and Wai‘anae). The ancient Hawaiians said the hill on the ‘Ewa side was the male and the hill on the Wai‘anae side was female. The stone was found on the Waianae side hill and the place is known as Pili o Kahe Pili=cling to, Kahe=flow). The name refers, therefore, to the female or Waianae side hill. And that is where the boundary between the two districts runs [Told to E.S. by Simeon Nawaa, March 22, 1954; cited in Sterling and Summers 1978:1].

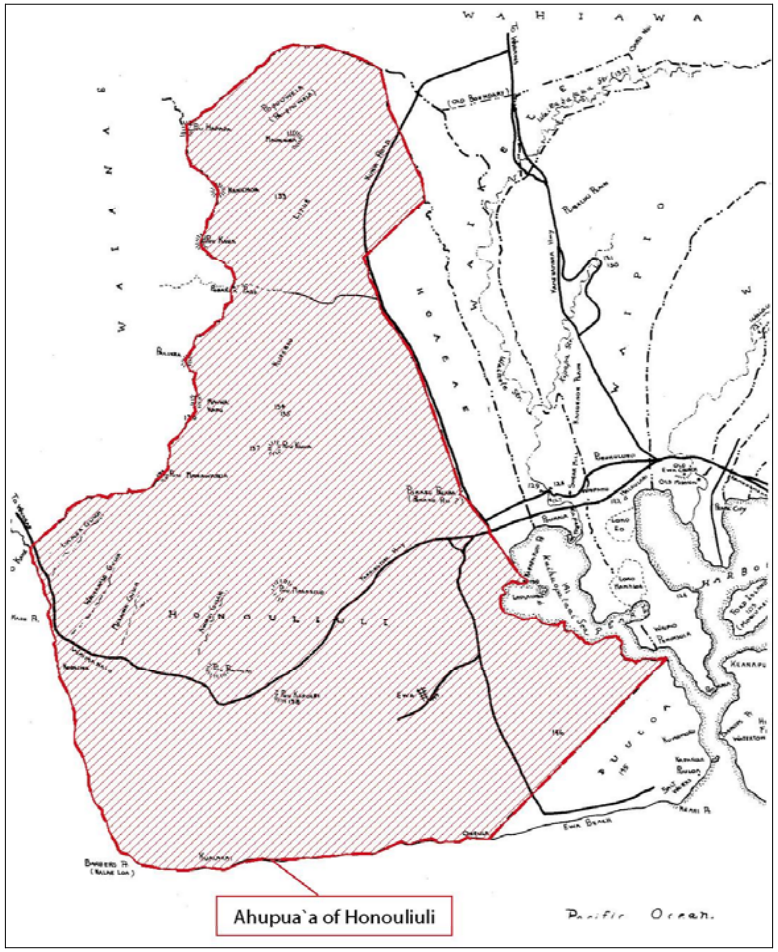

Figure 6. Map showing location of Honouliuli Ahupua‘a in west O‘ahu (adapted from Sterling and Summers 1978)

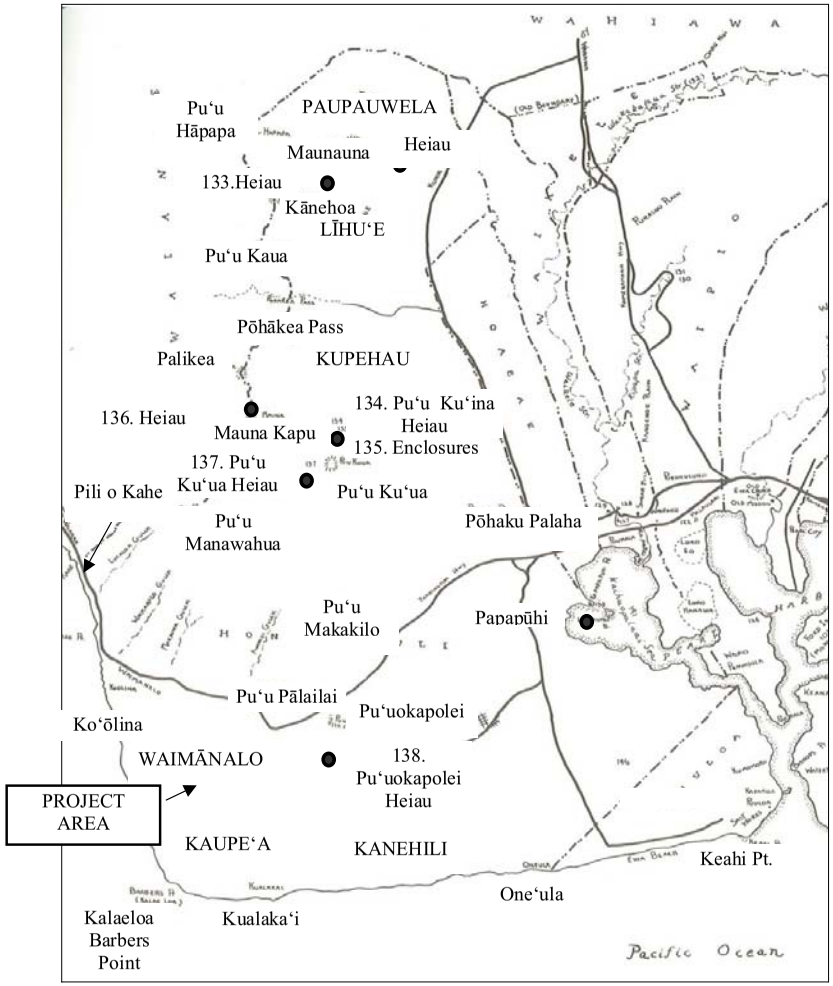

Figure 7. Place Names of Honouliuli (adapted from Sterling and Summers 1978)

2.2 Legends and Traditional Places in the Upland Hills of Honouliuli

Honouliuli is divided from Wai’anae Ahupua‘a on the west by a ridge with several prominent hills. From north (*mauka*) to south (*makai*) these peaks are: Hāpapa, which means “rock stratum” (Pukui et al. 1974:42) or “shallow soil” (Sterling and Summers 1978:1); Kānehoa (which will be discussed in more detail below); Pu‘ukaua, which means “war hill or fort hill” (Pukui et al. 1974:199); Palikea, which means “white cliff” (Pukui et al. 1974:177); Maunakapu, meaning “sacred mountain”(Pukui et al. 1974:148); and, Pu‘umanawahua, which means “great grief hill or nausea hill” (Pukui et al. 1974:203).

The central section of ‘Ewa is divided by a series of northeast-southwest trending gulches, that intermittently carry rainwater towards the coast. In this area there are several other notable hills; Pu‘umakakilo, which translates as “observing eyes hill” (Pukui et al. 1974:201); Pu‘ukapua‘i, or “footprint hill” (Pukui et al. 1974:199); and, Pu‘upālailai, probably meaning the young *lai* (*Scomberoides* sp.) fish (Pukui et al. 1974:205).

To the south (*makai*) is Kānehoa, which can be translated as “companion of Kāne” (Pukui et al. 1974:84), “Kāne, the divine companion or friend,” or Kāne, the divine fire-maker” (Westervelt 1999:64). This peak was named for a god (Kane-hoa-lani), who was said to be the father of Pele (Emerson 1915:ix) in some versions, and the brother of Pele in others (Westervelt 1999:64). The hill Kānehoa is mentioned in the following hula chant.

Anklet Song	**Mele Ku-pe‘e**
Fragrant the grasses of high Kanehoa.	*Aala kupukupu ka uka o Kane-hoa*
Bind on the anklets, bind!	*E ho-a!*
Bind with finger deft as the wind	*Hoa na lima o ka makani, he Wai- kaloa.*
That cools the air of this bower.	*He Wai-kaloa ka makani anu Lihue.*
Lehua blooms pale at my flower,	*Alina lehua i kau ka opua-*
O sweet heart of mine,	*Ku‘u pua,*
Bud that I’d pluck and wear in my wreath.	*Ku‘u puai‘ini e ku-i a lei.*
If thou wert but a flower!	*Ina ia oe ke l*

[Emerson 1998:49]

A similar chant is found in the Legend of Pamano, which mentions the *kupukupu* (fern), a fragrant flowering shrub.

> The uplands of Kanehoa are scented with kupukupu.
> Bind on, the hands of the Waikoloa wind are binding,
> The Waikoloa wind is the cold wind of Lihue,
> Withering the branches in the uplands of Waiopua,
> My flower I said I would string into garlands. If you have it,
> You would have worn it.
>
> *Aala kupukupu ka uka o Kanehoa la!*
> *Hoa! Hoa na lima o ka makani Waikoloa,*
> *He Waikoloa ka makani anu, o Lihue,*
> *Weli no loha ka uka o Waiopua la,*
> *Kuu pua i i ai e kui e lei, I na ia oe ke lei ia ala*

[Fornander 1919, Vol. V, Part 2:310-311].

2.3 Pōhākea Pass

Pōhākea Pass lies between the peaks of Pu‘u Kaua and Palikea along the Wai’anae Mountain range. Pōhākea Pass, *pōhākea* meaning “white stone” (Pukui et al. 1974:185).

2.3.1 Hi‘iaka at the summit of Pōhākea Pass (Pele and Hi‘iaka)

Pōhākea Pass was one of the resting places of Pele’s sister, Hi‘iaka, as she was returning from Kaua‘i with Pele’s lover Lohiau (Fornander 1918 Vol. V, Part 1:188 note 6). Hi‘iaka elected to travel overland, while her companions traveled by canoe. A considerable number of *mele* (songs) and *pule* (prayers) are ascribed to Hi‘iaka as she stood at the summit of Pōhākea (*Aluna au a Pōhākea*, *Kū au, nānā ia Puna* . . .) (Emerson 1915:162-168). From this vantage point Hi‘iaka could see through her powers of vision that her beloved *lehua* groves and friend Hōpoe at Puna, Hawai‘i Island had been blasted by Pele. She could also see that in her canoe, off the coast of Wai‘anae, Lohiau was seducing her traveling companion Wahine‘ōma‘o.

2.3.2 Keahumoa, Residence of Māui’s Grandfather

In the Legend of *Māui*’s Flying Expedition (Thrum 1923:252-259) *Māui*-kupua looked toward Pōhākea Pass and saw his wife, Kumulama, being carried away by chief Peapeamakawalu. After failing to recover her, *Māui* returned and told his problems to his mother, Hina. Hina instructed her son to go to Keahumoa and visit his grandfather, Kuolokele, who lived there in a large hut. The hump-backed Kuolokele returned home with a load of potato leaves, and *Māui* cured him by striking him in the back with a stone (which Kuolokele threw to Waipahū, where it remains). Kuolokele had *Māui* gather *kī* leaves, *‘ie‘ie* vines and bird feathers, from which the old man fabricated a “bird-ship” (*moku-manu*), which *Māui* used to defeat Peapeamakawalu and recover his wife. They returned to Kuolokele’s house, where they feasted, and *Māui* ate Peapeamakawalu’s eyeballs.

2.3.3 The Frightened Populace of Honouliuli

In the Legend of Palila (Fornander 1918, Vol. V, Part 1:136-153), the *kupua*, or demigod hero, of Kaua‘i landed at Ka‘ena Point with his fabulous war club (*lā‘au pālau*), which required eighty men to carry, and crossed into Honouliuli through Pōhākea Pass. He traveled by throwing his supernatural war club and hanging on to one end. The first throw was to Ka‘ena Point, Oahu.

> After leaving Kaena he came to Kalena, then on to Pohakea, then to Maunauna, then to Kanehoa, then to the plain of Keahumoa and looking toward Ewa. At this place he stood and looked at the dust as it ascended into the sky caused by the people who had gathered there; he then pushed his war club toward Honouliuli.
>
> *Haalele keia ia Kaena, hele mai la a Kalena, a Pohakea, maunauna, kanehoa, a ke kula o Keahumoa, nana ia Ewa. Ku keia I laila nana I ke ku a ka ea o ka lepo I na kanaka, e pahu aku ana keia I ka laau palau aia nei I kai o Honouliuli. . . .*
>
> [Fornander 1918, Vol. V, Part I:142-143]

He descended to the plain of Keahumoa:

At this place he stood and looked at the dust as it ascended to the sky caused by the people who had gathered there; he then pushed his war club toward Honouliuli. When the people heard something roar like an earthquake they were afraid and they all ran to Waikele . . .

Kū kēia i laila nānā i ke kū ka ea o ka lepo i nā kānaka, e pahu aku ana kēia i ka lā‘au pālau aia nei i kai o Honouliuli, kū ka ea o ka lepo o ka honua, me he ōla‘i la, maka‘u nā kānaka holo a hiki i Waikele.

[Fornander 1918, Vol. V, Part I:142-143]

2.3.4 Kahalaopuna at Pōhākea Pass

One of the most popular legends of O‘ahu is that of Kahalaopuna (or Kaha), a young woman of Mānoa who was slandered by others and then killed by her betrothed, Kauhi, a chief from Ko‘olau. While the numerous accounts (Day 1906:1-11, Fornander 1918 Vol. V, Part 1:188-193, Kalākaua 1888:511-522, Nakuina 1904:41-45, Patton 1932:41-49, Skinner 1971:220-223, Thrum 1907:118-132, Westervelt 1987 127-137, Westervelt 1998:84-93) vary in details, they typically have Kahalaopuna slain and then revived repeatedly with the aid of a protective owl. Kauhi forced her to hike west from Mānoa through the uplands until they got to Pōhākea Pass through the southern Wai‘anae Range in north Honouliuli. At Pōhākea Pass, Kauhi beat her with a stick until she was dead (*Ia hahau ana a Kauhi i ka lā‘au, make loa o Kahalaopuna*). Her spirit (‘*uhane*) flew up into a *lehua* tree and chanted for someone to go notify her parents:

E hai aku oukou ua make o Kahalaopuna;	And tell them that Kahalaopuna is dead
Aia la i ka uka o Pohakea,	For she lies in the uplands of Pohakea
I ke kumu lehua la o lalo iho.	Beneath the lehua tree.

[Fornander 1918, Vol. V, part 1:192

Upon hearing the news, her parents fetched Kahalaopuna back to Mānoa, and she was restored.

2.4 Legends and Traditional Places in Upland Honouliuli

2.4.1 Paupauwela and Līhu‘e

Paupauwela, also spelled Popouwela (derivation unknown), is the name of the land area in the extreme *mauka* section of Honouliuli *Ahupua‘a*. The land area of Līhu‘e is just *makai* of this land, and extends into the *ahupua‘a* of Waipi‘o (adjacent to the eastern border of Honouliuli). Both place names are mentioned in a chant recorded by Abraham Fornander, which was composed as a *mele* for the O‘ahu king, Kūali‘i, as he was preparing to battle Kuiaia, the chief of Wai‘anae:

Where? Where is the battle field	*Ihea, ihea la ke kahua,*
Where the warrior is to fight?	*Paio ai o ke koa-a?*
On the field of Kalena,	*I kai i kahua i Kalena,*
At Manini, at Hanini,	*I Manini, i Hanini*
Where was poured the water of the god	*I ninia i ka wai akua,*
By your work at Malamanui;	*I ko hana i Malamanui*

On the heights of Kapapa, at Paupauwela,	*Ka luna o Kapapa, i Paupauwela,*
Where they lean and rest;	*I ka hilinai i ke kalele,*
At the hala trees of indolent Halahalanui,	*Ka hala o Halahalanui maauea,*
At the ohia grove of Pule-e	*E kula ohia ke Pule-e,*
The god of Lono, of Makalii	*Ke ‘kua o Lono o Makalii*
Thr fragrant branch of the Ukulonoku,	*Ka lala aalao Ukulonoku,*
Mayhap from Kona, from Lihue,	*No Kona paha, no Lihue.*
For the day at Maunauna	*No ka la i Maunauna,*
For the water at Paupauwela.	*No ka wai i Paupauwela.*

. . . [Fornander 1917, Vol. IV, Part 2:384-386].

Red is the water of Paupauwela,	*Ula ka wai i Paupauwela,*
From the slain at Malamani,	*Ke kilau o Malamani,*
The slain on the ridge at Kapapa.	*Ka moo kilau I Kapapa.*

The derivation of the place name Līhu‘e (meaning “cold chill”) is illustrated in the following poem; all other places names mentioned in this poem are in Waipi‘o:

The icy wind of Lihue plied its spurs,
Pulling up the bridle of Haleauau,
Speeding headlong over Kalena
And running over the plain of Kanoenoe
[*Ka Loea Kālai‘āina*, July 22, 1899, translated in Sterling and Summers 1978:21].

This explains the meaning of a Hawaiian saying “*Hao na kēpā o Līhu‘e i ke anu*. The spurs of Līhu‘e dig in with cold” [Pukui 1983:#479].

The icy winds of Honouliuli are also noted in a *mele* for the high king Kūali‘i. In this *mele*, the cold winds of Kumomoku and Leleiwe, near Pu‘uloa in Honouliuli are compared unfavorably to the god Kū.

Not like these are thou, Ku	*Aole i like Ku.*
[Nor] the rain that brings the land breeze,	*Ia ua hoohali kehau,*
Like a vessel of water poured out.	*Mehe ipu wai ninia la,*
Nor to the mountain breeze of Kumomoku,	*Na hau o Kumomoku;*
[The] land breeze coming round to Leleiwi.	*Kekee na hau o Leleiwi,*
Truly, have you not known?	*Oi ole ka oe i ike*
The mountain breezes, that double up your back,	*I ka hau kuapuu.*
[That make you] sit crooked and cramped at Kaimohala,	*Kekee noho kee, o Kaimohala,*
The Kanehili at Kaupea?	*O Kanehili i Kaupea-la*
Not like these are thou, Ku.	*Aole i like Ku.*

[Fornander 1917, Vol. IV, Part II:390-391]

In the Legend of Halemano (Fornander 1919, Vol. V, Part II:252), the romantic O‘ahu anti-hero chanted a love song with a reference to the winds of Līhu‘e:

Search is made to the top of Ka‘ala,	*Huli a‘e la Ka‘ala kau i luna,*
The lower end of Pōka‘ī is plainly seen.	*Waiho wale kai o Pōka‘ī,*

Love looks in from Honouliuli,	*Nānā wale ke aloha i Honouliuli,*
The dew comes creeping, it is like the wind of Līhu‘e...	*Kokolo kēhau he makani no Līhu‘e.*

The wind of Līhu‘e and others in the region are also named by Moses K. Nakuina, as follows:

Moa‘e-kū is of ‘Ewaloa
Kēhau is of Waiopua
Waikōloa is of Līhu‘e
Kona is of Pu‘uokapolei
Maunuunu is of Pu‘uloa
[Nakuina 1992:43]

The *ali‘i* (chiefly class) were closely associated with Līhu‘e, which had habitation areas and playing grounds set aside for their sports. ‘Ewa

> Lolale was the father and Keleanohoapiapi the mother of Ka-lo-kaholi-a-Lale. He was born in the land of Lihue and there he was reared into manhood. He excelled in good looks and greatly resembled his mother.
>
> In the olden days the favorite occupation of Lihue chiefs was spear throwing and the best instructors hailed from this locality [*Ka Nūpepa Kū‘oko‘a*, Aug. 26, 1865, translation in Sterling and Summers 1978:23].

Līhu‘e was also the home of a famous cannibal king-man, Kaupe, who overthrew the ruling chiefs to become the paramount power between Nu‘uanu and the sea. He had a home and a *heiau* in Līhu‘e. Kaupe was a *kapua*, a supernatural being who could take the form of a man or a dog; this type of dog man was known as an ‘*ōlohe*. Although he left the O‘ahu *ali‘i* alone, he killed many commoners in the area, and eventually sailed to the island of Hawai‘i on a raid, where he captured a chief’s son; he planned to sacrifice this boy at his *heiau* in Līhu‘e. The father came to O‘ahu, and with the help of the priests of the Hawaiian hero, Kahanaiakeakua, was able to free his son, escape back to Hawai‘i, and eventually kill the dog-man, Kaupe (Westervelt 1963:90-96).

2.4.2 Hill of Maunauna

The hill Maunauna lies between the lands Paupauwela and Līhu‘e. one translation of Maunauna is “mountain sent [on errands]. Two servant *mo‘o* who lived here had no keepers to supply their needs” (Sterling and summers 1:178a. in Pukui *et al* 1974:149). It was at Maunauna, according to one tradition, that the forces of the chiefs Kūali‘i and Kuiaia of Wai‘anae met to do battle, but was averted when a *mele* honoring the god Kū was chanted (see previous section). (Fornander 1917, Vol IV, Part 2:348). In the Legend of Ke-ao-melemele, a woman named Paliuli traveled in this area.

> In a very short time she [Paliuli] walked over the plain of Ewa; Ewa that is known as the land of the silent fish [pearl oysters] . . . She went on to the plain of Punalu‘u and turned to gaze at Maunauna point and the plain of Lihue [Manu 1885, translation in Sterling and Summers 1978:21].

Certain place names in the uplands, including Maunauna, are also mentioned in the story of Lo-lae’s Lament. The place of Lolale’s residence is given in King Kalākaua’s version of this story. According to him (Kalākaua 1990:232): “There lived there at that time in Lihue, in the district of ‘Ewa, on the island of Oahu, a chief named Lo-lale, son of Kalona-iki, and brother of Piliwale, the *alii-nui*, or nominal sovereign, of the island, whose court was established at Waialua.”

> In this story, Lolale was a chief of O‘ahu who asked his friend Kalamakua to find him a bride (Kalākaua 1990:228-246; Skinner 1971:217-219). Kalamakua traveled to Maui and chose Kelea, the chief’s sister, and returned with her to O‘ahu; during this time the two grew close. Kelea lived with Lolale for a while, but he was a silent type that was often away from home playing sports and walking in the woodlands. Longing for Kalamakua, Kelea decided to leave her husband, Lolale voiced no “spoken bitterness;” however, after she left, he sang this lament:
>
> Farewell, my partner of the lowland plains,
> On the waters of Pohakeo, above Kanehoa,
> On the dark mountain spur of Mauna-una!
> O, Lihue, she is gone!
> Sniff the sweet scent of the grass,
> The sweet scent of the wild vines
> That are twisted by Waikoloa,
> By the winds of Waiopua,
> My flower!
> As if a mote were in my eye.
> The pupil of my eye is troubled.
> Dimness covers my eyes. Woe is me!
> [Kalākaua 1990:244-245].

2.4.3 Pu‘uku‘ua

Makai of the land of Līhu‘e was the land of Kupehau, which was itself *mauka* of Pu‘uku‘ua. Divine sanction was also given to social stratification and the designation of a land for *kauwā* (outcastes, pariahs), a low, slave caste of Hawai‘i, in the vicinity of Pu‘uku‘ua:

> . . . If you are above Puuloa, you wil see Pu‘u-o-Kapolei, a small hill. Lying below and back of that hill is the government road going to Waianae. Above that is also a small hill and back of that, is a big hill and above it is a large hollow. That is Pu‘u-Kuua where the very dirty ones lived [*Ka Loea Kālai‘āina* July 15, 1899, translation in Sterling and Summers 1978:32].

The creation of the *kauwā* class is told in a tradition of the gods Kāne and Kanaloa:

> *A penei na‘e i kauwā loa [sic. “loa‘a”] ai. Aia a mana‘o ke Ali‘i Nui (Mō‘ī) e ‘au‘au kai i Waikīkī. Eia ka nīnau a ke Ali‘i Nui i ke ali‘i ma lalo iho ona, “Pehea āu mau wahi lepo kanu o Pu‘u Ku‘ua? ‘A‘ole paha he mau wahi pōhuli?” Eia ka*

pane a ke ali‘i ma lalo iho ona, “He Pōhuli nō. ‘O ke kauoha ia akula nō ia e ki‘i. ‘Oiai ko kāne me ka wahine e nanea ana me nā keiki, a hiki ‘ana ke ki‘i i mau keiki. ‘O ke kū a‘ela nō ia o ka makuakāne a lawe ‘ana i kāna mau keiki a hiki i Waikīkī. Aia ho‘i a hiki i ka wā a ke Ali‘i e hele ai i ka ‘au‘au kai, a laila, hoouna ‘ia mai ke kahu e ki‘i mai i ua keiki a lawe aku ia ma kahi pāpa‘u o ke kai, ma kahi a ke Ali‘i nui e hele kū ‘ana, a laila kau nā lima o ka Mō‘ī i luna o kahi keiki a me kahi keiki, ma nā ‘ā‘ī o nā keiki a pa‘a ai. ‘O ka hua ‘ōlelo ma ka waha o ke Ali‘i nui e ‘ōlelo ai, “‘A‘ole pau ku‘u loa! ‘A‘ole pau ku‘u loa!” ‘Oiai ‘o ia e ‘au ana me ka pa‘a nō o nā lima i nā keiki a hiki i ka umauma ke kai o ke ali‘i. Ua lana a‘ela nā keiki i luna o ka ‘ilikai, aia ke alo i lalo. Eia ho‘i ka ‘ōlelo a ka makuakāne ma kula aku nei, “Moe mālie i ke kai o ko Haku,” a pēlā aku.

‘O ke kai o Waikīkī ke kai i ‘ōlelo ‘ia he kai lumaluma‘i kanaka o ka lua, aia i Kualoa [*Ka Loea Kālai‘āina*, July 8, 1899].

Translation:

The chiefs of old, who lived at that time, were of divine descent. The two gods [Kāne and Kanaloa] looked down on the hollow [vicinity of Pu‘u Ku‘ua] and saw how thickly populated it was. The mode of living here was so that chiefs and commoners mixed freely and they were so like the lowest of people (*kauwā*). That is what these gods said and that was the time when the term *kauwā* was first used, and was used for many years afterwards. . . . This was how they were made to be *kauwā*. When the ruling chief wished to go to Waikīkī for sea bathing he asked the chief just below him in rank, “How are my planting places at Pu‘u Ku‘ua, have they not produced young suckers?” The chief next to him answered, “There are some suckers,” and sent someone for them. When the men, women and children least expected it, the messenger came to get some of the children. The father stood up and took his sons to Waikīkī. Then, when the ruling chief went sea bathing, he sent an attendant to get the boys and take them to a shallow place where the ruling chief would come. Then the ruler placed a hand on each of the boys, holding them by the necks. The words he uttered were, “My height has not been reached! My height has not been reached!” He advanced and held onto the boys until the sea was up to his chest. The boys floated on the water face down. The father on shore called out, “Lie still in the sea of your Lord,” and so on.

The Sea of Waikīkī is said to have been used to kill men in and the other place is Kualoa. The inhabitants of Pu‘u-Kuua were so mixed, like taro beside an imu [translation in Sterling and Summers 1978:32-33].

A Hawaiian saying concerning ‘Ewa suggests that this drowning also took place in this *ahupua‘a*.

‘Ewa of the drowning sea	*‘Ewa kai lumaluma‘i*

An epithet applied to ‘Ewa, where kauwā were drowned prior to offering their bodies in sacrifice [Pukui 1983:#385].

On Hi‘iaka’s journey as she leaves ‘Ewa and descends to the coast, she sees some women stringing *lei* and offered a chant, naming several place names in the area:

Rising in the presence of the cliff of Pu‘uku‘ua	*Ke ku no i ke alo o pali o Pu‘uku‘ua*
The land is indeed a chief	*He ali‘i nona‘e ka ‘āina*
Man is indeed a slave	*He kauwā no na‘e kanaka*
I am indeed a slave to *aloha* – love	*I kauwā no na‘e wau i ke aloha*

[*Ka hōkū o Hawai‘i* February 22, 1927, translation in Maly 1997:17]

The great fisherman, Nihookeki, was born in Keauhou, Kona, but traveled to O‘ahu and lived in Wai‘anae and became a great chief. Fornander (1917, Vol. IV, Part 3:488) places his home at Pu‘uku‘ua, in Pu‘uokapolei in Wai‘anae, possibly during one of the times that both Wai‘anae and ‘Ewa were ruled by one chief.

O Keauhou, i Kona, Hawaii, ka aina hanau o Nihooleki, a malaila mai ka hele ana *a noho i Kuukuua, i Puuokapolei ma Waianae, no laila ka wahine.*

Keauhou in Kona, Hawaii, was the birthplace of Nihooleki and it was from this place that he moved to Kuukuua, in Puuokapolei at Waianae, where he took unto himself a wife [Fornander 1917, Vol. IV, Part 3:488-489].

Keahaikiaholeha, the paramount chief of Wai‘anae, owned a famous mother-of-pearl fishhook, called Pahuhu, which he used to catch many *aku* (bonito, *Katsuwonus pelamis*). He later sailed to Waimea, Kaua‘i, where his wife had been born, and there also became the ruling chief of Kaua‘i. When Keahaikiaholeha died, his body was brought back to Kuukuua and placed in a *pu‘āo* (*A make o Kaehaikiaholeha, hoihoi ia mai a Kuukuua, i Waianae, waiho ia kona kino kupapau; i loko o ka hale, puoa . . .*). A *pu‘āo* is an open, small, temporary cone-shaped structure, of poles; in this case, this *pu‘āo* was used as his tomb. The parents of the chief worshiped the spirit (‘*uhane*) of their son, until it became strong enough to go about in the form of a live person. The spirit took the name of Nihooleki, traveled to Kaua‘i, and married his wife, although she was unaware that this was the spirit of her dead husband. Nihooleki used his magic fishhook to catch canoes full of *aku* until it became the wonder of the islands. The piles of fish that he caught and gave away came to the ears of Kamapua‘a, who was then living at Waiohuli, sick with dropsy.

Nihooleki told his wife that if a man with dropsy came to the door, to ask him in because he was a friend. But when Kamapua‘a arrived, the wife would not let him in since he was so dirty. Kamapua‘a had to wait in the pig pen for the return of his friend. Nihooleki was angry about the treatment of his friend when he returned and left the island with Kamapua‘a.

Lohe aku la na ‘lii, a me na kaikoeke, o ke ‘lii no keia, alualu mai la lakou, luu laua nei i ke kai, a ea ana i Kuukuua, ma Waianae. . . .

A kokoke laua i ka hale o na mauka a me ke kaikuahine, a e ku ana hoi ka puoa hale o ke kino kupapau ona. “. . . A o ke kaikuahine o kaua, o kau wahine no ia, no ka mea, he wahine maikai, ua nui no ke kino.”

O Kaehaikiaholeha, oia o Nihooleki, komo aku la ia i kona puoa kupapau a nalo iho la, oia ka pau o kona kaao ana.

> He [Nihooleki] and his friend [Kamapua‘a] then dove into the sea and swam under water until they came up at Kuukuua, at Waianae. . .. As they drew near to the house where the parents and sister of Nihooleki were living and near to the tomb where his dead body was laid, Nihooleki then turned to his friend. “ . . . Take our sister and make her your wife as she is fair to look upon and is also of proper age.” . . . Keahaikiaholeha, who was Nihooleki, entered the tomb and disappeared. Thus ends the story [Fornander 1917, Vol. IV, Part 3:496].

This legend suggests associations with Pu‘uku‘ua to Pu‘uokapolei, worship of the dead, and wandering souls, all of which are prominent themes associated with Pu‘uokapolei, as seen in the next section. It also ties the pig god Kamapua‘a to Pu‘uokapolei in ‘Ewa.

2.5 Pu‘uokapolei and the Plains of Kaupe‘a

Pu‘uokapolei is a prominent hill at the *mauka* edge of the coastal ‘Ewa Plains and was the primary landmark for travelers on the trail that ran from Pearl Harbor west to Wai‘anae (‘Ī‘ī 1959:27, 29; Nakuina 1992:54; E.M. Nakuina 1904, in Sterling and Summers 1978:34).

2.5.1 Pu‘uokapolei, Astronomical Marker and Heiau

Pu‘u means hill and Kapolei means “beloved Kapo,” a reference to the sister of the Hawaiian volcano goddess, Pele Samuel Kamakau (1976:14) says that the Hawaiians used Pu‘uokapolei as an astronomical marker to designate the seasons. Samuel Kamakau (1870 *Mo‘olelo Hawai‘i* Vol. I, Chap. 2, p. 23) relates:

> . . . the people of O‘ahu reckoned from the time when the sun set over Pu‘uokapolei until it set in the hollow of Mahinaona and called this period Kau [summer], and when it moved south again from Pu‘uokapolei and it grew cold and the time came when young sprouts started, the season was called from their germination (‘*ōilo*) the season of Ho‘oilo [winter, rainy, season].

A *heiau* was once on Pu‘uokapolei, but had been destroyed by McAllister’s (1933:108) survey of the island in the early 1930s. The hill was used as a point of solar reference or as an observation place for such observations (Fornander 1919, Vol. VI, Part 2:292). Pu‘uokapolei may have been regarded as the gate of the setting sun, just as the eastern gate of Kumukahi in Puna is regarded as the rising sun; both places are associated with the Hawaiian goddess Kapo (Emerson 1915:41). This somewhat contradicts some Hawaiian cosmologies, in which Kū was the god of the rising sun, and Hina, the mother of Kamapua‘a was associated with the setting sun. Fornander (Fornander 1919, Vol. VI, Part 2:292) states that Pu‘uokapolei may have been a jumping off place (also connected with the setting sun) and associated with the wandering souls who roamed the plains of Kaupe‘a and Kānehili, *makai* of the hill.

2.5.2 Pu‘uokapolei and the Plains of Kaupe‘a and Kānehili

Hi‘iaka sang this bitter chant addressed to Lohiau and Wahine-oma‘o, which uses the association of the Plains of Kaupe‘a as a place for the wandering of lost souls:

> *Ku‘u aikana i ke awa lau o Pu‘uloa,*
> *Mai ke kula o Pe‘e-kaua, ke noho oe,*
> *E noho kaua e kui, e lei i ka pua o ke kauno‘a,*

> *I ka pua o ke akuli-kuli, o ka wili-wili;*
> *O ka iho‘na o Kau-pe‘e i Kane-hili,*
> *Ua hili au; akahi no ka hili o ka la pomaika‘i;*
> *E Lohiau ipo, e Wahine-oma‘o,*
> *Hoe ‘a mai ka wa‘a i a‘e aku au.*
>
> We meet at Ewa’s leaf-shaped lagoon, friends;
> Let us sit, if you will on this lea
> And bedeck us with wreaths of Kauno‘a,
> Of akuli-kuli and wili-wili,
> My soul went astray in this solitude;
> It lost the track for once, in spite of luck,
> As I came down the road to Kau-pe‘a.
> No nightmare dream was that which tricked my soul.
> This way, dear friends; turn the canoe this way;
> Paddle hither and let me embark
> [Emerson 1915:162-163].

Several other Honouliuli places are mentioned in this chant, including Pe‘e-kaua, which may be a variation of Kau-pe‘e or Kaupe‘a, and the plains of Kānehili, the last of which again refers to wandering, as the word *hili* means “to go astray” (Emerson 1915:162). In the chant, Hi‘iaka is moving downhill from Kaupe‘a, probably the plains adjacent to Pu‘uokapolei, toward the coast, the plain of Kānehili.

2.5.3 The plains of Kaupe‘a and Pu‘uokapolei and the Realm of Homeless Souls

There are several places on the ‘Ewa coastal plain that are associated with *ao kuewa*, the realm of the homeless souls. Samuel Kamakau (1991b:47-49) explains the Hawaiian beliefs in the afterlife:

> . . . There were three realms (*ao*) for the spirits of the dead. . . There were, first, the realm of the homeless souls, the *ao kuewa*; second, the realm of the ancestral spirits, the *ao ‘aumakua*; and third, the ream of Milu, *ke ao o Milu* . . .
>
> The *ao kuewa*, the realm of homeless souls, was also called the *ao ‘auwana*, the realm of wandering souls. When a man who had no rightful place in the ‘*aumakua* realm (*kanaka kuleana ‘ole*) died, his soul would wander about and stray amongst the underbrush on the plain of Kama‘oma‘o on Maui, or in the *wiliwili* grove of Kaupe‘a on Oahu. If his soul came to Leilono [in Halawa, ‘Ewa near Red Hill], there he would find the breadfruit tree of Leiwalo, *ka‘ulu o Leiwalo*. If it was not found by an ‘*aumakua* soul who knew it (*i ma‘a mau iaia*), or one who would help
>
> it, the soul would leap upon the decayed branch of the breadfruit tree and fall down into endless night, *the pō pau ‘olo o Milu*. Or, a soul that had no rightful place in the ‘*aumakua* realm, or who had no relative or friend (*makamaka*) there who would watch out for it and welcome it, would slip over the flat lands like a

> wind, until it came to a leaping place of souls, a *leina a ka ‘uhane*. . . [Kamakau 1991b:47].

> On the plain of Kaupe‘a beside Pu‘uloa [Pearl Harbor], wandering souls could go to catch moths (*pulelehua*) and spiders (*nanana*). However, wandering souls could not go far in the places mentioned earlier before they would be found catching spiders by ‘aumakua souls, and be helped to escape. . . . [Kamakau 1991b:49].

The breadfruit tree Leilono was said to have been located on the ‘Ewa-Kona border, above Āliamanu. In another section of his account of the dead, Kamakau calls the plain of wandering souls the “plain at Pu‘uokapolei.”

> There are many who have died and have returned to say that they had no claim to an ‘aumakua [realm] (*kuleana‘ole*). These are the souls, it is said, who only wander upon the plain of Kama‘oma‘o on Maui or on the plain at Pu‘uokapolei on Oahu. Spiders and moths are their food [Kamakau 1991b:29].

This association of Pu‘uokapolei and Kānehili with wandering souls is also illustrated in a lament on the death of Kahahana, the paramount chief of O‘ahu, who was killed by his father, Kahekili, after Kahahana became treacherous and killed the high priest Kaopulupulu.

Go carefully lest you fall dead in the sun,	*E newa ai o hea make i ka la,*
The god that dwells on Kapolei hill.	*Akua noho la i Puuokapolei.*
The sun is wailing on account of the women of Kamao,	*E hanehane mai ana ka la i na wahine o Kamao,*
A hiding god, blossoming ohai of the banks,	*Akua pee, pua ohai o ke kaha,*
Contented among the stones-	*I walea wale i ke a-*
Among the breadfruit planted by Kahai.	*I ka ulu kanu a Kahai.*
Thou wast spoken of by the oo-	*Haina oe e ka oo-*
By the bird of Kanehili.	*E ka manu o Kanehili.*

[Fornander 1919, Vol. VI, Part 2:297]

Fornander provides some notes on this lament. The god dwelling at Kapolei is the god Kahahana, stating that this is where his soul has gone. Kamao is one of the names of the door to the underworld. This lament draws an association with wandering souls and the place where the first breadfruit tree was planted by Kahai at Pu‘uloa (Fornander 1919, Vol. VI, Part 2:304).

Pukui (1983:180) offers this Hawaiian saying, which places the wandering souls in a *wilwili* grove at Kaupe‘a.

The wiliwili grove of Kaupe‘a	*Ka wiliwili of Kaupe‘a.*

In ‘Ewa, O‘ahu. Said to be where homeless ghosts wander among the trees.
[Pukui 1983:#1666].

Beckwith (1940:154) has stressed that “the worst fate that could befall a soul was to be abandoned by its ‘*aumakua* and left to stray, a wandering spirit (*kuewa*) in some barren and desolate place.” These wandering spirits were often malicious, so the places that they wandered were avoided.

2.5.4 The Plain of Pukaua

The Hawaiian language newspaper *Ka Loea Kālai‘āina*, (January 13, 1900) relates that near Pu‘uokapolei, on the plain of Pukaua, on the *mauka* side of the road, there was a large rock. This legend suggests that the plain around Pu‘uokapolei was called Pukaua. The legend is as follows:

> If a traveler should go by the government road to Waianae, after leaving the village of gold, Honouliuli, he will first come to the plain of Puu-ainako and when that is passed, Ke-one-ae. Then there is a straight climb up to Puu-o-Kapolei and there look seaward from the government road to a small hill, That is Puu-Kapolei. . . . You go down some small inclines, then to a plain. This plain is Pukaua and on the mauka side of the road, you will see a large rock standing on the plain. . . . There were two supernatural old women or rather peculiar women with strange powers and Puukaua belonged to them. While they were down fishing at Kualaka‘i [near Barbers Point] in the evening, they caught these things, *‘a‘ama* crabs, *pipipi* shellfish, and whatever they could get with their hands. As they were returning to the plain from the shore and thinking of getting home while it was yet dark, they failed for they met a one-eyed person [bad omen]. It became light as they came near to the plain, so that passing people were distinguishable. They were still below the road and became frightened lest they be seen by men. They began to run - running, leaping, falling, sprawling, rising up and running on, without a thought of the *‘a‘ama* crabs and seaweeds that dropped on the way, so long as they would reach the upper side of the road. They did not go far for by then it was broad daylight. One woman said to the other, “Let us hide lest people see us,” and so they hid. Their bodies turned into stone and that is one of the famous things on this plain to this day, the stone body. This is the end of these strange women. When one visits the plain, it will do no harm to glance on the upper side of the road and see them standing on the plain [*Ka Loea Kālai‘āina*, January 13, 1900, translation in Sterling and Summers 1978:39].

In another version of this story, the two women met Hi‘iaka as she journeyed toward the ‘Ewa coast. The women were *mo‘o* (supernatural beings) and were afraid that Hi‘iaka would kill them, so they changed into their lizard form. One of the lizards hid in a little space on a stone beside the coastal trail, and the other hid nearby (*Ka Hōkū o Hawai‘i*, February 15, 1927, translated in Maly 1997:19). From that time on the stone was known as *pe‘e-kāua*, meaning “we two hidden.” Hi‘iaka greeted the two women but did not harm them, and passed on.

When she reached Pu‘uokapolei, she also greeted two old women who lived at a ‘*ohai* grove on the hill. These women were named Pu‘uokapolei and Nāwaineokama‘oma‘o (*Ka Hōkū o Hawai‘i*, February 22, 1927, translated in Maly 1997:19). As she continued her travels, she looked to the ocean and saw the canoe carrying Lohi‘au.

My man on the many harbored sea of Pu‘uloa	*Ku‘u kāne i ke awa lau o Pu‘uloa*
As seen from the plain of Pe‘ekāua	*Mai ke kula o Pe‘ekāua ke noho*
Let us dwell upon the ‘ōhai covered shore	*E noho kāua i ke kaha o ka ‘ōhai*
Where the noni blossoms are twisted together	*I ka wiliwili i ka pua o ka lau noni*

Descending along Kānehili	*O ka ihona i Kānehili la*
I am winding along	*Ua hili ho‘i au-e*

[*Ka Hōkū o Hawai‘i*, February 22, 1927, translated in Maly 1997:20].

2.5.5 Pu‘uokapolei and Kamapua‘a

Pu‘uokapolei’s was the home of Kamapua‘a’s grandmother, Kamaunuaniho, who was one of the three migrants from Kahiki that were ancestors to the people of O‘ahu (Fornander 1919, Vol. V, Part 2:318; Kahiolo 1978:81, 107). Kamapua‘a, the Hawaiian pig god once lived in Kaluanui on the windward side, but escaped to ‘Ewa when he was pursued by the chief Olopana.

> Kamapua‘a subsequently conquered most of the island of O‘ahu, and, installing his grandmother [Kamaunuaniho] as queen, took her to Pu‘uokapolei, the lesser of the two hillocks forming the southeastern spur of the Wai‘anae Mountain Range, and made her establish her court there. This was to compel the people who were to pay tribute to bring all the necessities of life from a distance, to show his absolute power over all [Nakuina 1904:50-51].

Emma Nakuina goes on to note: “A very short time ago [prior to 1904] the foundations of Kamaunuaniho’s house could still be seen at Pu‘uokapolei.” Another account (*Ka Loea Kālai‘āina* January 13, 1900, from Sterling and Summers 1978:34) speaks of Kekeleaiku, the older brother of Kamapua‘a, who also lived on Pu‘uokapolei.

2.5.6 The Strife at Honouliuli; Kūali‘i unites Hawai‘i *nei* (*Mo‘olelo o Kūali‘i*)

The celebrated chief, Kūali‘i, is said to have led an army of twelve thousand (‘*ekolu mano*) against the chiefs of Ko‘olauloa with an army of twelve hundred (‘*ekolu lau*) upon the plains of Keahumoa (Fornander 1917 Vol. IV, Part 2:364-401). Perhaps because the odds were so skewed the battle was called off and the *ali‘i* of Ko‘olau ceded (*ha‘awi a‘e*) the districts of Ko‘olauloa, Ko‘olaupoko, Waialua and Wai‘anae to Kūali‘i. When the *ali‘i* of Kaua‘i heard of this victory at Honouliuli they gave Kaua‘i to Kūali‘i as well and thus he became possessed of all the islands (*a lilo a‘e la nā moku a pau ia Kūali‘i mai Hawai‘i a Ni‘ihau*). The strife at Honouliuli was the occasion of the recitation of a song for Kūali‘i by a certain Kapa‘ahulani (*Ka Pule Ana a Kapa‘ahulani*). This *mele* compares the king to certain places and objects in the islands, in this instance to the first breadfruit planted by Kahai at Pu‘uloa, and a pig and a woman on Pu‘u Kapolei, possibly a reference to Kamapua‘a and his grandmother.

Not like these art thou, Ku.	*Aole I like Ku.*
Not like the pig	*Aole I like i ka puaa,*
Discerning the progeny of the god;	*I ka weke lao a ke akua,*
[Or] The breadfruit planted by Kahai.	*Ka ulu kanu a Kahai;*
Truly, have you not known	*Oi ole ka oe i ike,*
The woman with the dyed garment,	*Ka wahine pau mao*
On the top of Puuokapolei?	*I ka luna o Puuokapolei-la?*

[Fornander 1917, Vol. IV, Part 2:392-393].

A later section of this *mele* also refers to Pu‘uokapolei and makes mention of the famous blue poi of Honouliuli.

O Kawelo! Say, Kawelo!	*O Kawelo-e, e Kawelo-e,*

Kawelokiki, the sharp-ponted hill,	O Kaweloiki puu oioi,
Hill of Kapolei.	*Puu of Kapolei-e-*
Blue is the poi which appeases [the hunger] of Honouliuli.	*Uliuli ka poi e piha nei-o Honouliuli;*

[Fornander 1917, Vol. IV, Part 2:400-401].

2.6 Coastal Honouliuli

The coastal area of Honouliuli is a triangular area that stretches from Pili o Kahe on the northwestern corner that marks the boundary with the Wai‘anae District to Kalaeloa (now Barbers Point) on the southwestern corner, to Keahi Point on the southeastern corner at the mouth of Pearl Harbor. There were likely Hawaiian settlements at Ko‘ōlina on the west side, at Kualaka‘i on the south, at the royal residence in Pu‘uloa near the mouth of the harbor, and at Honouliuli town at the upper end of West Loch, surrounding Kapapapūhi Point, north of the current study area.

Kalaeloa literally means “the long point” (Pukui et al. 1974:72), but Raphaelson (1925) has a different translation. He says the name of the point is Kalaiekao, meaning “sky rocket cape,” because it was on this point that signal fires were set to signal canoes to go out to meet European boats during the early historic period. Kalaeloa Point was the home of Uhu makaikai, a *kupua* (supernatural being) who could take the form of a man or a giant parrotfish (*uhu).* He is mentioned in several legends concerning the hero Kawelo and with Kawelo’s struggles with the ruling chief of Kaua‘i, Aikanaka.

> This friend was Kauahoa also an alii of Wailua (Kauai). Their king, Aikanaka, in the time of Kākuhihewa of Oahu and Lonoikamakahiki of Hawaii. Aikanaka got offended with Kawelo and sent him to live at Waikiki. Cause. The king at a surf bathing told Kawelo to get a calabash of water for him to wash off with, but on Kawelo’s failing to do it, he took a calabash of soft poi and threw it over Kawelo and sent him off as already stated. At Waikiki, Kawelo studied the art of fighting to be revenged on Aikanaka. A *kupua*, Uhu makaikai, a fish was his teacher. Makuakeke was his helper in the canoe. The fish lived at Pōhaku o Kawai near Kalailoa (Kalaeloa), Oahu (Barbers Point) . . . . [Hawaiian Ethnological Notes, Bishop Museum Vol. II:114, translation in Sterling and Summers 1978:41].

One historical account of particular interest refers to an *ali‘i* residing in Ko‘ōlina, within Waimānalo (meaning “brackish water”).

> Ko‘ōlina is in Waimānalo near the boundary of ‘Ewa and Wai‘anae. This was a vacationing place for chief Kākuhihewa and the priest Napuaikamao was the caretaker of the place. Remember reader, this Ko‘ōlina is not situated in the Waimānalo on the Ko‘olau side of the island but the Waimānalo in ‘Ewa. It is a lovely and delightful place and the chief, Kākuhihewa loved this home of his [*Ke Au Hou* July 13, 1910, from Sterling and Summers 1978:41].

Between Pili o Kahe and Kalaeloa there is Kahe Point, which was formerly marked by two drainage ditches called Keone‘ō‘io and Limaloa, which may explain the name Kahe, which means “flow” (Pukui et al. 1974:64). Keone*‘ō‘io* means “the *‘ō‘io* sand; this area once had large schools of *‘ō‘io* (bonefish; Albulidae), a fish usually found on sandy-bottom areas (Clark

1977:77). Kalaeloa, meaning “the long point,” got its present name Barbers Point from Captain Henry Barber of the brig *Arthur*, who ran his ship aground on October 31, 1796 on a shoal west of the entrance to Pearl Harbor. Hawaiians, under the command of Kamehameha I, salvaged the cannon from the ship and used them to man a new fort on Lāhainā, Maui (Clark 1977:75-76).

Kualaka‘i is the name of the beach area on the south ocean coast of Honouliuli. Clark (1977:74) says it is named for a type of sea cucumber that squirts a purple fluid when squeezed, but, the book *Hawaiian Place Names* (Pukui et al. 1974:119) identifies the sea creature as ‘tethys,” a member of the invertebrate family Aplysiidae, commonly called sea hares. In the legend of Hi‘iaka, there was a spring located at Kualaka‘i named Hoaka-lei (*lei* reflection) where Hi‘iaka picked *lehua* flowers to make a *lei* and saw her reflection in the water (*Ka Hōkū o Hawai‘i*, February 22, 1927, translated in Maly 1997:20).

Keahi Point, at the entrance to Pearl Harbor, has already been noted as the surf spot for the chiefess Pāpio who was killed by the queen shark of Peark Harbor, Ka‘ahupāhau. It was also known as a good fishing spot for the *‘ō‘io* (bonefish, *Albula vulpes*). The *‘ō‘io* from Keahi were famed for their fragrance, like that of the *līpo‘a* (*Dictyopteris* spp.) seaweed (Pukui 1943:56).

In pre-Contact times, Pu‘uloa was an *‘ili* of Honouliuli, but sometime after 1868, it was designated as a separate *ahupua‘a* (Maly 1997:9). Pu‘uloa was a royal habitation area, and according to one tradition, was the first place that “human beings” landed on O‘ahu (Beckwith 1940:343). Within Pu‘uloa (meaning “long hill”) on the seashore side was a beach area called One‘ula, which means “red sand,” possibly named for a large drainage ditch which carried red dirt from the inlands to the seashore (Clark 1977:73).

2.6.1 The Strife of Nāmakaokapāo‘o and Puali‘i (*Ka‘ao no Nāmakaokapāo‘o*)

In the Legend of Nāmakaokapāo‘o (Fornander 1919, Vol. V, Part 2:274-277), the brave boy, Nāmakaokapāo‘o, and his mother, Pokai, appear to have been living near the coast but were quite destitute (*‘ilihune loa*). His mother met Puali‘i when he came from Līhu‘e to fish at Honouliuli, the two married, and the new family went to live on the plains of Keahumoa (*ke kula o Keahumoa*). Puali‘i kept sweet potato patches (*māla uala*) and fished for *ulua*. Following a dispute over sweet potatoes, Nāmakaokapāo‘o defeated his step-father, Puali‘i and:

> Nāmakaokapāo‘o picked up Puali‘i’s head and threw it towards Waipouli, a cave situated on the beach at Honouliuli (a distance of about five miles).
>
> *Lālau aku la o Nāmakaokapāo‘o i ke po‘o o Puali‘i a kiola aku la i kai o Waipouli, he ana ma kahakai o Honouliuli, o kona loa, ‘elima mile ka loa* [Fornander 1919, Vol. V, Part 2:276-277].

2.6.2 Coastal Village of Kualaka‘i

In the Legend of the Children, is a tale that foretold the later breaking of the eating *kapu* by the *ali‘i*. A young brother and sister always fished at Kualaka‘i, a beach area on the southern coast of Honouliuli. One day they laid out their nets, but all they caught was one *palani* (surgeonfish), a fish that was *kapu* (tabu) for men; only women could eat it.

> . . . They fished again and again until the afternoon and nothing was caught. The children were weary and went home without fish. When they came as far as

> Pu‘u-o-Kapolei where the blossoms of the ma‘o looked golden in the sunlight, the sister sat
>
> ...down to make ma‘o leis for themselves. When the leis were made they went across the breadth of Kaupe‘a to Waipio [*Ka Loea Kālai‘āina*, July 22, 1899:15; translation in Sterling and Summers 1978:7].

They stopped at the stream of Ka‘aimalu on the way to their home, and the sister convinced her brother to share the fish between the two, thus breaking the *kapu*. “Because these children ate fish secretly, the spot is called Ka‘ai-malu (Secret eating) to this day” (Sterling and Summers 1978:7). This legend also shows the relation of several landmarks on the coastal plain, as the children travel from the coast at Kualaka‘i, across the plain of Kaupe‘a to Waipi‘o, passing next to Pu‘uokapolei.

2.6.3 Pu‘uloa and the Breadfruit

Pu‘uloa was noted as one of the first places to have breadfruit. It was brought to the islands by Kaha‘i, son of Ho‘okamali‘i and grandson of Moikehā, who brought the plant from Upolu (central Polyneisa) to Hawai‘i and planted it at Pu‘uloa (Beckwith 1940:97).

Two other versions can be found in Fornander. In the first, the location of the first planting is in Pu‘uloa, but the story does not mention Kaha‘i (Fornander 1919, Vol. V, Part 3:678):

> At Puuloa, Oahu. Its breadfruit plant came from Kanehunaamoku [a mythical land supposed to have been hidden by the god Kāne], brought by two men at Puuloa who were out fishing and were blown off by a heavy wind and rainstorm and landed at the uninhabited land, save gods only. Therefore by them it was introduced at Puuloa and planted in a large excavation where it grew and bore fruit, which they ate.
>
> *Ma Puuloa i Oahu. Ko laila ulu no Kanehunamoku mai, na kekahi mau kanaka o Puuloa i hele i ka lawaia a pūhia e ka ino nui, makani a me ka ua, a pae i keia aina kanaka ole, he akua wale no; nolaila mai ka laua lawe ana mai i keia ulu a hiki i Puuloa, kanu a ulu i kekahi lua niu a hua, ai keia mau kanaka.*
>
> [Fornander 1919, Vol. V, Part 3:678-679].

A second version associates the breadfruit tree in ‘Ewa to the chief Namaka-o-ka-paoo, the Hawaiian born son of Ka-ulu-o-kaha‘i, which means “Breadfruit of Kaha‘i.” Kauluokaha‘i had left O‘ahu to return to his ancestral lands of Kahiki (Hawaiian ancestral land). Once Namakaokapa‘o had conquered the island of O‘ahu, he wanted to travel to Hawai‘i in secret to spy on the land.

> . . . He [Namakaokapaoo] then went and got a small gourd wherein to place his garments which his father had left him. This gourd was deposited at Kualakai, where a breadfuit tree is standing to this day. This is the breadfruit impersonation of his father, Kahaiulu. When the real person went home the breadfruit tree remained, being in the supernatural state.

> *. . .Alaila, kii aku la ia he wahi hokeo waiho kapa nona, na kona makuakane i waiho nona. O kahi i waiho ai ua wahi hokeo la, makai o Kualakai, oia kela ulu e ku nei a hiki i keia la ma Kualakai. Oia ke kino ulu o kona makuakane o Kahaiulu. Hoi ke kino maoli, koe ke kino ulu, ma ke ano akua keia kino* [Fornander 1919, Vol. V, Part 2:279-280].

Section 3 Historical Background

3.1 Pre-Contact and Early Post-Contact Period

By ca. A.D. 1320, ‘Ewa, along with Kona, and Ko‘olaupoko were the dominant polities, ruled by the sons of a chief named Māweke (Cordy 2002:21). ‘Ewa at this time included the traditional districts of ‘Ewa, Wai‘anae, and Waialua (Fornander 1880:48). Around A.D. 1400, the entire island was ruled by King La‘akona; chiefs within his line, the Māweke-Kumuhonua line, reigned until about A.D. 1520-1540, with their major royal center in Līhu‘e, in ‘Ewa. (Cordy 2002:24). Haka was the last chief of the Māweke-Kumuhonua line; he was slain by his men at the fortress of Waewae near Līhu‘e (Kamakau 1991a:54-54; Fornander 1880:88). Power shifted between the chiefs of different districts from the 1500s until the early 1700s, when Kūali‘i achieved control of all of O‘ahu by defeating the Kona chiefs, then the ‘Ewa chiefs, and then expanding his control on windward Kaua‘i. Peleiholani, the heir of Kūali‘i, gained control of O‘ahu ca. 1740, and later conquered parts of Moloka‘i. He was ruler of O‘ahu until his death in ca. 1778, when Kahahana, of the ‘Ewa line of chiefs was selected as the ruler of O‘ahu (Cordy 2002:24-41).

After Kamehameha’s O‘ahu victory, he gave the *ahupua‘a* of Honouliuli to Kalanimōkū as part of the *panalā‘au*, or conquered lands, with the right to pass the land on to his heirs rather than having it revert to Kamehameha (Kame‘eleihiwa 1992:58, 112). Kalanimōkū subsequently gave the *ahupua‘a* to his sister, Wahinepi‘o.

John Papa ‘Ī‘ī describes a network of Leeward O‘ahu trails (figure 8), which in historic times encircled and crossed the Wai‘anae Range, allowing passage from Lualualei to Honouliuli by three different trails (‘Ī‘ī 1959:96-98). The coastal trail skirted Pearl Harbor, passing by Pu‘uokapolei; this would have been the nearest of three Honouliuli trails to the current project area. Following ‘Ī‘ī’s description, a portion of this trail network would have passed close to the existing Farrington Highway, near the north border of the project area, as seen in an 1825 map (Figure 9) map of the south coast of O‘ahu by Charles Malden of the British ship the *Blonde*.

The trail is described by ‘Ī‘ī as:

The trail went down to the stream and up again, then went above the taro patches of Waiau, up to a *makai* field, to Waimano, to Manana, and to Waiawa; then to the stream of Kukehi and up to two other *makai* fields, Pueohulunui and Haupuu. At Pueohulunui was the place where a trail branched off to go Waialua and down to Honouliuli and on to Waianae. As mentioned before, there were three trails to Waianae, one by way of Pu‘u o Kapolei, another by way of Pohakea, and the third by way of Kolekole [‘Ī‘ī 1959:97].

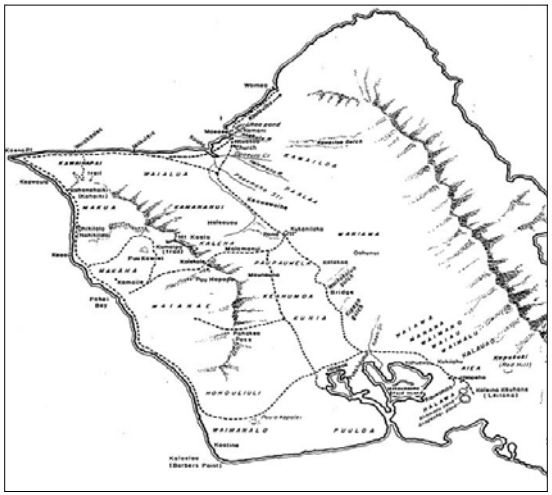

Figure 8. Trails of Leeward Oahu. Map by Paul Rockwood. (‘Ī‘ī 1959:96)

Early historical accounts of the general region typically refer to the more populated areas of the ‘Ewa district, where missions and schools were established and subsistence resources were perceived to be greater. However, the presence of archaeological sites along the barren coral plains and coast of southwest Honouliuli Ahupua‘a, indicate that prehistoric and early historic populations also adapted to less inviting areas, despite the environmental hardships.

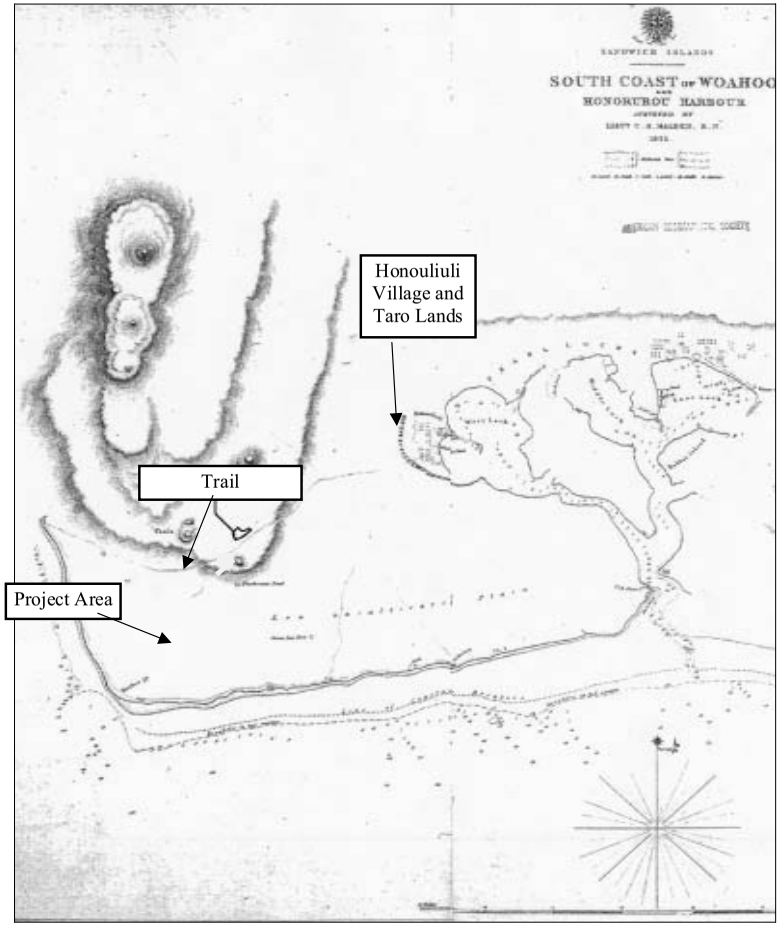

Figure 9. Portion of 1825 Map of the South Coast of Woahoo (O‘ahu) and Honolulu by Lieut. C.R. Malden from the British ship the *Blonde*

3.2 Observations of Early Explorers and Foreign Residents

Captain Vancouver sailed by Kalaeloa (Barbers Point) in 1792, and recorded his impression of the small coastal village of Kualaka‘i and the arid Honouliuli coast.

> The point is low flat land, with a reef round it. . . Not far from the S.W. point is a small grove of shabby cocoa-nut trees, and along these shores are a few struggling fishermen’s huts [Vancouver 1798, Vol. I:167].
>
> . . .from the commencement of the high land to the westward of Opooroah [Pu‘uloa], was composed of one very barren rocky waster, nearly destitute of verdure, cultivation of inhabitants, with little variation all the way to the west point of the island . . . [Vancouver 1798, Vol. II:217].
>
> . . .This tract of land was of some extent but did not seem to be populous, nor to possess any great degree of fertility; although we were told that at a little distance from the sea, the soil is rich, and all necessaries of life are abundantly produced . . . [Vancouver 1798, Vol. III:361-363].

Archibald Campbell, an English seamen who was given some land in Waimano Ahupua‘a by King Kamehameha in 1809, described his land around Pearl Harbor:

> In the month of November the king was pleased to grant me about sixty acres of land, situated upon the Wymummee [traditional Hawaiian name for Pearl River], or Pearl-water, an inlet of the sea about twelve miles to the west of Hanaroora [Honolulu]. . . .We passed by footpaths, winding through an extensive and fertile plain, the whole of which is in the highest state of cultivation. Every stream was carefully embanked, to supply water for the taro beds. Where there was not water, the land was under crops of yams and sweet potatoes [Campbell 1967:103-104].
>
> Pearl and mother of-pearl shells are found here in considerable quantity. Since the king has learned of their value, he has kept the fishing to himself, and employs divers for the purpose [Campbell 1967:114-115].

Subsequent to western contact in the area, the landscape of the ‘Ewa plains and Wai‘anae slopes was adversely affected by the removal of the sandalwood forest, and the introduction of domesticated animals and new vegetation species. Domesticated animals, including goats, sheep and cattle, were brought to the Hawaiian Islands by Vancouver in the early 1790s, and allowed to graze freely about the land for some time after. It is unclear when the domesticated animals were brought to O‘ahu; however, L.A. Henke reports the existence of a longhorn cattle ranch in Wai‘anae by at least 1840 (Frierson 1972:10). During this same time, perhaps as early as 1790, exotic vegetation species were introduced to the area. These typically included vegetation best suited to a terrain disturbed by the logging of sandalwood forest and eroded by animal grazing. Within the current project area, the majority of the vegetation is comprised of introduced species, mainly grasses.

At contact, the most populous *ahupua‘a* on the island was Honouliuli, with the majority of the population centered on Pearl Harbor. In 1832, a missionary census of Honouliuli recorded the

population as 1,026. Within four years the population was down to 870 (Schmitt 1973:19, 22). In 1835, there were eight to ten deaths for every birth (Kelly 1991:157-158). Between 1848 and 1853, there was a series of epidemics of measles, influenza, and whooping cough that often wiped out whole villages. In 1853, the population of ‘Ewa and Wai‘anae combined was 2,451 people. In 1872, it was 1,671 (Schmitt 1968:71). The inland area of ‘Ewa was probably abandoned by the mid-nineteenth due to population decline and consolidation of the remaining people in the town of Honouliuli (at Papapūhi Point, north of the project area). A detailed discussion of the historic population counts in the ‘Ewa District has been presented by Charvet-Pond and Davis (1992).

The first mission station in ‘Ewa was established in 1834 at Kalua‘aha near Pearl Harbor. Charles Wilkes, of the U.S. Exploring Expedition visited the missionary enclave at Honouliuli town in 1840.

> At Ewa, Mr. Bishop has a large congregation. The village comprises about fifty houses, and the country around is dotted with them. . . . The natives have made some advance in the arts of civilized life; there is a sugar-mill which, in the season, makes two hundred pounds of sugar a day. . . . In 1840, the church contained nine hundred members, seven hundred and sixty of whom belonged to Ewa, the remainder to Waianae; but the Catholics have now established themselves at both these places, and it is understood are drawing off many from their attendance on Mr. Bishop’s church [Wilkes 1970:80-81].

The earliest detailed map of the area (Alexander 1873) shows no habitation closer than the western edge of West Loch in the vicinity of Pāpapūhi Point. A Monsarrat survey map of 1878 documents substantial settlement at the “Honouliuli Taro Land” in the Pāpa*pūhi* Point area, and it seems clear that in early historic time’s that this was the focus of the population of Honouliuli. The amenities of the area - including fishponds, taro *lo‘i*, abundant shellfish, and saltpans - would have focused population there in pre-Contact times as well.

3.3 Mid-Nineteenth Century and the Māhele

The Organic Acts of 1845 and 1846 initiated the process of the *māhele* - the division of Hawaiian lands, which introduced private property into Hawaiian society. In 1848 the crown and the *ali‘i* (chiefly class) received their land titles. The common people received their *kuleana* (individual parcels) in 1850.

During the *Māhele* of 1848, 72 individual land claims in the *ahupua‘a* of Honouliuli were registered and awarded by King Kamehameha III (Tuggle and Tomonari-Tuggle 1997:34).

Maly (1997:52) compiled a list of all of the fishponds listed for Honouliuli (including Pu‘uloa) mentioned in the Land Commission Award texts. Nine fishpond names were mentioned: Kapāākule, ‘Oko‘ookilepe, Pāmoku (also called Kapāmuku), Laulaunui, Kaihuopal‘ai, Kalokoloa, Loko‘eli, Ka‘aimanō, and Nihola; it is possible that some ponds had more than one name. Maly (1997, Table 3, pp. 38-42) also provides a table recording information on each award, including awardees, ‘*ili*, and land use of the awarded ‘*āpana* (lot). A summary of the information on houses, agricultural fields, and boundary landmarks noted for each ‘*ili* is given below (Table 1).

Table 1. Summary of land use and boundary landmarks recorded in Honouliuli LCA awards

‘Ili	Land Use and Boundary Landmarks
Hiwalalo	kou trees
Ka‘aumakua	houselots, *kalo* (taro) patches; *kula* (pasture/dryland agriculture), two fishponds called Mokumeha; landmarks - *kula ālialia* (salt plains), land division wall, Pānāhāhā *loko* (fishpond), Kalahu fishpond, Naholowaa pond, Honouliuli Stream (called stream of Makai‘i), or *‘aka‘akai* (bulrush growth) of Kamo‘okahi
Kaihuopala‘ai	*mo‘i* (arable land in a long strip); on lot bounded by *‘auwai* (irrigation ditch) called Panaenui
Ka‘ilikahi	houselot and *kalo* patches; landmarks – highway, Kauhipuna cliff, *lapalapa* (*panax*) thickets,meeting house
Kamilomilo	houselot and *kalo* patches
Kamoku	fenced *mo‘o kalo*, *lo‘i* (irrigated fields) *kalo*, houselot; landmarks – Kauhipuna pali
Kamo‘okahi	bulrushes
Kapāpahi	houslets, *kalo* patches; bounded by ponds of Healani
Kapapapūhi	houselots, vineyard, *kula*, pond, trails, hog pens, and salt beds; a church and cemetery are shown on Figure 8 but not mentioned in testimony; therefore it was probably built in the post-Māhele period
Ka‘ula‘ula	*mo‘o* next to Kaulaula (cliff) with a houselot and a wall
Loloulu	*kalo* patches, 1/3 of a fishpond (in land of Kahakuli‘ili‘i), hala grove, pig pens, breadfuit, bulrushes
Maka‘u	houselot and *kalo* patches
Maui	kalo patches, *kula*, houselots, bounded by *pā‘āina a ke Aupini* (land division wall of the government)
Mokumeha	2 fishponds, salt beds (western one called Kohumakahou)
Niuke‘e	*kalo* patches, *kula*, potato field, houselots; landmarks - *loko kalo* (taro/ fishpond) of Nihola, Loko‘eli pond, Kehewanakawalu pond, Kalokoiki pond, *pali* of Kihewamakawela; Ka‘akau pali; Ka‘akau community, meeting house, prison plot, cattle fences
Polapola	*kalo* patches; houselots, school house, prison plot; some bounded by *pā‘āina a ke Aupini,* or high road from the sea, or Catholic Chapel yard
Pō‘ohilo	*kula*, *kalo* patches, *loko kalo*, houselots; landmarks - *pā‘āina,* Ka‘aimanō fishpond, *kula* of Kahakai, *loko kalo* of Kalokoloa, Aimea Pond, Waianu pond, Kahui pond, Ka‘aimano fishpond, *pupulu* cave (wet cave?), prison plot, Makaakua pali, Puehuehu Stream, Puehuehu road
Pua‘alu‘u	*lo‘i*, houselot
Pu‘uloa	houslots; boundaries include the sea, a *kula* called Waioipu, and the plain of Kaluanohu

In 1855 the Land Commission awarded all of the unclaimed lands in Honouliuli, 43,250 acres, to Miriam Ke‘ahikuni Kekau‘ōnohi (Royal Patent #6971 in 1877; Parcel #1069 in the Land Court office), a granddaughter of Kamehameha I, and the heir of Kalanimōkū, who had been given the land by Kamehameha after the conquest of O‘ahu (Indices of Awards 1929; Kame‘eleihiwa 1992). Kekau‘ōnohi was also awarded the *ahupua‘a* of Pu‘uloa, but she sold this land in 1849 to a man named Isaac Montgomery, a British lawyer.

> Kekau‘ōnohi was one of Liholiho's (Kamehameha II's) wives, and after his death, she lived with her half-brother, Luanu‘u Kahalai‘a, who was governor of Kaua‘i (Hammatt and Shideler 1990:19-20:20). Subsequently, Kekau‘ōnohi ran away with Queen Ka‘ahumanu’s stepson, Keli‘iahonui, and then became the wife of Chief Levi Ha‘alelea. Upon her death on June 2, 1851, all her property was passed on to her husband and his heirs. A lawsuit (Civil Court Case No. 348) was brought by Ha‘alelea in 1858, to reclaim the fishing rights of the Pu‘uloa fisheries from Isaac Montgomery, and the court ruled in Ha‘alaea’s favor. In 1863, the owners of the *kuleana* lands deeded their lands back to Ha‘alelea to pay off debts owed to him (Frierson 1972:12). In 1864, Ha‘alealea died, and his second wife, Anadelia Amoe, transferred ownership of the land to her sister’s husband, John Coney (Yoklavich et al 1995:16).

3.4 Early Ranching in on the ‘Ewa Plain

John Coney rented the land to James Dowsett and John Meek in 1871, which used the land for cattle grazing. In 1877, the land, except for the ‘*ili* of Pu‘uloa, was sold to James Campbell. He drove off 32,237 head of stock belonging to Dowsett and Meek and to James Robinson and constructed a fence around the outer boundary of his property (Bordner and Silva 1983:C-12). He let the land rest for one year and then began to restock the ranch, so that he had a head of 5,500 head after a few years (Dillingham 1885, cited in Frierson 1972:14)

In 1880-81, the Honouliuli ranch was described as:

> . . . Acreage, 43,250, all in pasture, but possessing fertile soils suitable for agriculture; affords grazing for such valuable stock. The length of this estate is noless than 18 miles. It extends to within less than a mile of the sea coast, to the westward of the Pearl River inlet. . . . There are valuable fisheries attached to this estate . . . . [Bowser 1880:489].
>
> From Mr. Campbell’s veranda, looking eastward, you have one of the most splendid sights imaginable. Below the house there are two lochs, or lagoons, covered with water fowl, and celebrated for their plentiful supply of fish, chiefly mullet. . . . Besides Mr. Campbell’s residence, which is pleasantly situated and surrounded with ornamental and shade trees, there are at Honouliuli two churches and a school house, with a little village of native huts [Bowser 1880:495].

Most of Campbell's lands in Honouliuli were used exclusively for cattle ranching. At that time, one planter remarked “the country was so dry and full of bottomless cracks and fissures that water would all be lost and irrigation impracticable” (Ewa Plantation Co. 1923:6-7). In 1879, Campbell brought in a well-driller from California to search the ‘Ewa plains for water, and

the well, drilled to a depth of 240 feet near Campbell's home in 'Ewa, resulted in ". . . a sheet of pure water flowing like a dome of glass from all sides of the well casing" (The Legacy of James Campbell n.d., cited in Pagliaro 1987:3). Following this discovery, plantation developers and ranchers drilled numerous wells in search of the valuable resource.

3.5 History of the Ewa Sugar Plantation

In 1886, Campbell and B. F. Dillingham put together the "Great Land Colonization Scheme," which was an attempt to sell Honouliuli land to homesteaders (Thurm 1886:74). This homestead idea failed, but with the water problem solved by the drilling of artesian wells, Dillingham decided that the area could be used instead for large-scale cultivation (Pagliaro 1987:4).

In 1889, Campbell leased his property to Benjamin Dillingham, who subsequently formed the Oahu Railway & Land Co. (O.R. & L) in 1890. During the last decade of the nineteenth century, the railroad would reach from Honolulu to Pearl City in 1890, to Wai'anae in 1895, to Waialua Plantation in 1898, and to Kahuku in 1899 (Kuykendall 1967:100). This railroad line eventually ran across the center of the 'Ewa Plain at the lower boundary of the sugar fields. An 1895 tourist guide noted development of the West Loch of Pearl Harbor in association with the railway:

> COAL TRAFFIC. – Another outcome of the Oahu railway enterprise is the erection of a coal depot, on the west side of the harbor, where cargoes of coal are rapidly discharged by an apparatus known as the Boston coal elevator, which had been doing good work in unloading and loading ships during the past two or three years. The coal is stored in sheds erected for it, and can be put on board vessels in the same way, whenever required for coaling steamships or for shipment to other ports [Whitney 1895:39-40]. To attract business to his new railroad system, Dillingham subleased all land below 200 ft elevation to William Castle, who in turn sublet the area to the newly-formed Ewa Plantation Company (Frierson 1972:15). Dillingham's Honouliuli lands above the 200 ft elevation, those suitable for sugar cane cultivation, were sublet to the Oahu Sugar Company. Throughout this time, and into modern times, cattle ranching continued in the area, and Honouliuli Ranch - established by Dillingham was - the "fattening" area for the other ranches (Frierson 1972:15)

Ewa Plantation Company (Figure 10) was incorporated in 1890 for sugar cane cultivation. The first crop, 2,849 tons of sugar, was harvested in 1892 at the Ewa Plantation. 'Ewa was the first all-artesian plantation, and it gave an impressive demonstration of the part artesian wells were to play in the later history of the Hawaiian sugar industry (Kuykendall 1967:69). As a means to generate soil deposition on the coral plain and increase arable land in the lowlands, the Ewa Plantation Company installed ditches running from the lower slopes of the mountain range to the lowlands. When the rainy season began, they plowed ground perpendicular to the slope so that soil would be carried down the drainage ditches into the lower coral plain. After a few years, about 373 acres of coral wasteland were reclaimed in this manner (Immisch 1964). By the 1920s, Ewa Plantation was generating large profits and was the "richest sugar plantation in the world" (*Paradise of the Pacific,* Dec. 1902:19-22, cited in Kelly 1985:171).

During the twentieth century, the Ewa Plantation would continue to grow and, by the 1930s, would encompass much of the eastern half of Honouliuli Ahupua'a. This growth impelled the creation of plantation villages to house the growing immigrant labor force working the fields. In the decade of the 1890s, the plantation built 72 houses, cottages or dwellings; in the first decade of this century, 536; in the second decade, 132; in the 1920s, 285; in the 1930s, 168; and in the 1940s, only 35. Censuses of the Ewa Plantation population record 4,967 persons in 1928, 4,477 in 1929, and 4,100 in 1932. After the outbreak of World War II, which siphoned off much of the plantation's manpower, along with the changeover to almost complete reliance on mechanical harvesting in 1938, there was little need for the large multi-racial (Japanese, Chinese, Okinawan, Korean, Portuguese, Spanish, Hawaiian, Filipino, European) labor force that had characterized most of the early history of the plantation.

Just north of Ewa Plantation was the equally sprawling O'ahu Sugar Company which "covered some 20 square miles . . . ranging in elevation from 10 feet at the Waipi'o Peninsula . . . to 700 feet at the Waiahole Ditch" (Condé and Best 1973:313). The Oahu Sugar Company was incorporated in 1897. Prior to commercial sugar cultivation, the lands occupied by the Oahu Sugar Company were described as being "of near desert proportion until water was supplied from drilled artesian wells and the Waiahole Water project" (Condé and Best 1973:313). The Oahu Sugar Company took control of the Ewa Plantation lands in 1970 and continued operations until 1995, when they decided to shut down sugar cane production in the combined plantation area (Dorrance and Morgan 2000:45, 50).

During the subsequent decades of the twentieth century, sugar cane operations in 'Ewa phased out and, more recently, former cane lands have been rezoned for residential development. Structures in the area of the former plantation villages have fallen into disrepair or have been demolished. However, portions of the area - including Varona Village, Tenney Village, and Renton Village - have been designated the 'Ewa Villages Historic District (State site 50-80-12-9786), which has been nominated for National Historic Landmark status. Additionally, the still-extant O.R. &L. rail line through Honouliuli has been placed on the National Register of Historic Places (Site 50-80-12-9714).

Section 4 Review of Past Archaeological/Paleontological Studies

4.1.1 Overview of Archaeological Studies in Western Honouliuli

An overview of archaeological studies in the west half of Honouliuli Ahupua‘a is presented in Table 2 and Figure 11. A discussion of archaeological findings germane to the present project area follows.

Table 2. Archaeological and Related Studies in Western Honouliuli Ahupua‘a

Reference	Nature of Study	General Location of Study
Thrum 1907	*Heiau* study	Hawaiian Islands
McAllister 1933	All island survey	O‘ahu Island
Kikuchi 1959	Site letter report	Barbers Point
Lewis 1970	Reconnaissance survey	Barbers Point (harbor area)
Frierson 1972	Study of land use & vegetation change	Honouliuli
Barrera 1975	Reconnaissance survey	Barbers Point (harbor area)
Clark and Connolly 1975	Reconnaissance survey	Barbers Point (harbor area)
Oshima 1975	Reconnaissance survey	Barbers Point
Sinoto 1976	Cultural resources survey	Barbers Point (harbor area)
Bordner 1977	Reconnaissance survey	Kalo‘i Gulch
Davis 1978	Scholarly paper	Barbers Point (harbor area)
Davis and Griffin 1978	Archaeological Survey	Barbers Point (harbor area)
Hawai‘i Marine Research Inc. 1978	Geoarchaeological reconnaissance	Barbers Point (harbor area)
Kirch 1978	Land snail study	Barbers Point (harbor area)
Sinoto 1978	Archaeological & Paleontological salvage	Barbers Point (harbor area)
Barrera 1979	Archaeological Survey	West Beach
Clark 1979	Reconnaissance survey	Barbers Point (harbor area)
Cleghorn 1979	Reconnaissance survey	Barbers Point
Davis 1979a	Emergency excavations	Barbers Point (harbor area)
Davis 1979b	Emergency excavations	Barbers Point (harbor area)
Davis 1979c	Emergency excavations	Barbers Point (harbor area)
Komori and Dye 1979	Archaeological testing	West Beach
Sinoto 1979	Cultural resources survey	Barbers Point (harbor area)
Davis 1980	Research design	Barbers Point
Kirch and Christensen 1980	Land snail study	Barbers Point (harbor area)
Christensen and Kirch 1981	Land snail study	Barbers Point (harbor area)
Hammatt and Folk 1981	Archaeological and Paleontological Investigation	Barbers Point (harbor area)
Davis 1982	Academic paper	Barbers Point
McCoy et al. 1982	Proposal for investigations	Barbers Point (harbor area)
Neller 1982	Scholarly study	Barbers Point

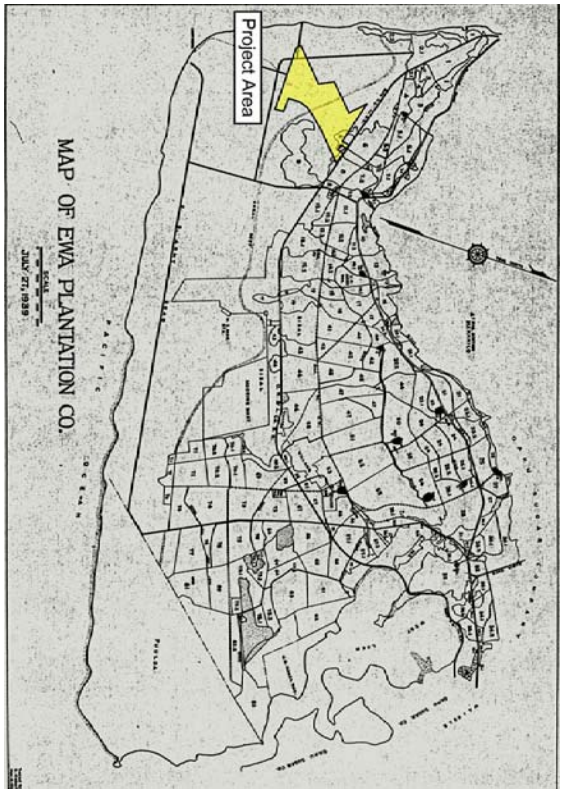

Figure 10. 1939 map of Ewa Plantation Co., with current project area outlined in yellow (figure from Condé and Best 1973)

Reference	Nature of Study	General Location of Study
Ahlo and Homon 1983	Reconnaissance survey	Barbers Point (harbor area)
Barrera 1984	Archaeological Status Report	West Beach
Bordner and Silva 1983	Reconnaissance survey	Waimānalo Gulch
Ahlo and Homon 1984	Test excavations	Barbers Point (harbor area)
Hammatt 1984	Reconnaissance survey	Kahe Point
Haun and Kelly 1984	Research resign	Naval Air Station
Tuggle 1984	Survey report	Naval Air Station
Neller 1985	Review and evaluation	West Beach
Barrera 1986	Archaeological Investigations	West Beach
Davis and Haun 1986	Intensive survey and test excavations	West Beach
Davis et al. 1986 a and b	Research design	West Beach
Haun 1986a	Reconnaissance survey	Kapolei Town
Haun 1986b	Reconnaissance survey	Kapolei Town
Davis and Haun 1987	Intensive survey & test excavations	West Beach
Rosendahl 1987a	Reconnaissance survey	Kapolei Town
Rosendahl 1987b	Survey report	Kapolei Town
Welch 1987	Reconnaissance survey	Naval Air Station
Bath 1989a	Petroglyph study	Waimānalo Gulch
Bath 1989b	Burial documentation	Kahe
Burgett and Rosendahl 1989	Subsurface archaeological testing	North of O.R.&L.
Hammatt and Shideler 1989a	Archaeological assessment	Barbers Point (harbor area)
Hammatt and Shideler 1989b	Reconnaissance survey	Kahe
Carlson and Rosendahl 1990	Inventory survey	Kaomi Loop Subdivision
Cleghorn and Davis 1990	Archaeological and paleontological investigation	Barbers Point (harbor area)
Davis 1990b	Archaeological and paleontological investigation	Barbers Point (HECO area)
Davis 1990a	Archaeological and paleontological study (Ph.D. dissertation)	Barbers Point (harbor area)
Rosendahl 1990	Letter report	Kapolei Town
Kennedy 1991	Subsurface testing	Pu'uokapolei
Hammatt et al. 1991	Inventory survey	Makaiwa Hills
Hammatt and Shideler 1991	Archaeological assessment	Barbers Point (harbor area)
Haun et al. 1991	Survey report	Naval Air Station
Burgett and Rosendahl 1992	Inventory survey	Barbers Point (harbor area)
Hammatt and Folk 1992	Subsurface testing	Barbers Point (harbor area)
Glidden et al. 1993	Data recovery excavations	Paradise Cove
Jones 1993	Fossil coral reefs study (Ph.D. dissertation)	Hawaiian Islands

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Reference	Nature of Study	General Location of Study
Landrum 1993	Reconnaissance and subsurface testing	Naval Air Station
Miller 1993	Data recovery	Barbers Point (harbor area)
Hammatt and Shideler 1994	Archaeological assessment	Barbers Point (harbor area)
Hammatt et al. 1994	Inventory survey	Barbers Point (harbor area)
Davis 1993	Archaeological and paleontological investigation	Barbers Point (harbor area)
Erkelens 1992	Archaeological survey	Naval Air Station
Hammatt and Shideler 1995	Data recovery plan	Barbers Point (harbor area)
Jourdane 1995	Burial documentation	Paradise Cove
O'Hare et al. 1996	Intensive survey and testing	Naval Air Station
Wulzen and Rosendahl 1996	Subsurface testing & data recovery	Naval Air Station
Athens et al. 1997	Cultural resource inventory, paleoenvironmental investigation	'Ewa Plain:Naval Air Station
Tuggle 1997a	Cultural resource inventory	Naval Air Station
Tuggle 1997b	Synthesis	'Ewa Plain
Tuggle and Tomonari 1997a	Cultural resource inventory survey	Naval Air Station
Wickler and Tuggle 1997	Cultural resource inventory, Inventory Survey	Naval Air Station
McDermott et al. 2000	Data recovery	Barbers Point (harbor area)
Cordy and Hammatt 2003	Archaeological assessment	Barbers Point, North of O.R.&L.
O'Hare et al. 2004	Documentation of Plantation Infrastructure	North of O.R.&L.
Terry et al. 2004	Archaeological Inventory Survey of Two Sinkholes	North of O.R.&L.
Hoffman et al. 2005	Archaeological Inventory Survey	South of O.R.&L.

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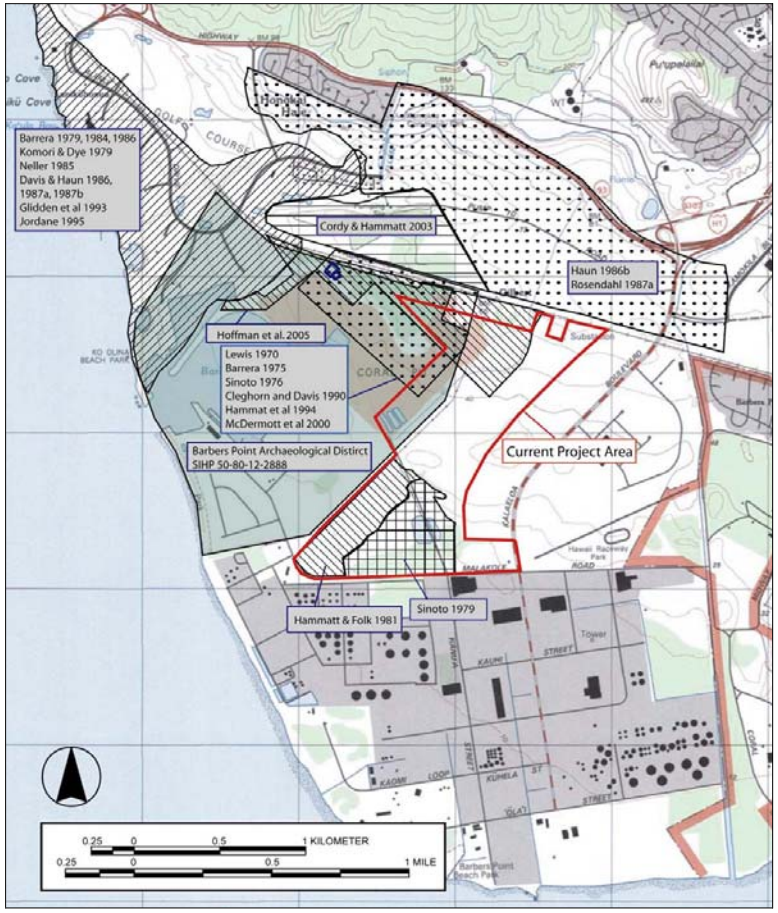

Figure 11. 2002 'Ewa USGS 7.5-minute topographic quadrangle, showing general areas of archaeological study near the project area

The first effort to record archaeological sites in Honouliuli was by Thrum (1907:46), who references "a *heiau* on Kapolei hill, 'Ewa - size and class unknown. Its walls thrown down for fencing." This *heiau*, Pu'u Kapolei, is east of the present study area.

In his 1930 surface survey of the island of O'ahu, archaeologist J. Gilbert McAllister recorded the specific locations of important archaeological and cultural sites, and the general locations of some sites of lesser importance. McAllister (1933:107-108) recorded seven specific sites at Honouliuli (numbered 133-139) and these became the first seven sites in the Bishop Museum's Site Numbering System (OA-B6-1 through OA-B6-7). The nearest of these specific sites to the present project area is McAllister Site 138, including the Pu'u Kapolei Heiau and an adjacent rock shelter. McAllister (1933:109), however designated his site 146 to include archaeological features covering a large but poorly defined area along the coast. His impressions of site 146 are recorded as follows:

> 'Ewa coral plains, throughout which are remains of many sites. The great extent of old stone walls, particularly near the Pu'uloa Salt Works belongs to the ranching period of about 75 years ago [c. 1850s]. It is probable that the Hawaiians formerly used the holes and pits in the coral. Frequently the soil on the floor of larger pits was used for cultivation, and even today one comes upon bananas and Hawaiian sugar cane still growing in them. They afford shelter and protection, but I doubt if previous to the time of Cook there was ever a large population here.

These archaeological sites of the 'Ewa coral plains would be the subject of some 40 or so archaeological reports in the 1970s and 1980s.

From the period between McAllister's 1930 study and the flurry of work that began in 1969, there are only a few sporadic pieces of poorly documented research. "In 1933, Dr. Kenneth P. Emory examined a well-preserved house site and a possible *heiau* in the western part of the coral plain; these sites were later destroyed by sugar-cane planting" (Sinoto 1976:1). In 1959, William Kikuchi removed a number of burials from a burial cave site (Bishop Museum Site OA-B6-10) at the Standard Oil Refinery, which was subsequently destroyed (Barrera 1975:1). Kikuchi recovered 12-16 incomplete primary and/or secondary burials cached in a sinkhole or crevice exposed during construction activities near the big bend in Malakole Road, south of the present project area (Kikuchi 1959; Davis 1990:146, 147). In 1960, Yoshi Sinoto and Elspeth Sterling made note of a house site (Bishop Museum Site OA-B6-8). "In 1962, Lloyd Soehren recorded another secondary human burial in a sinkhole at the Barbers Point Naval Air Station" (Davis 1990a:147). In 1966 (per Sinoto 1960), Lloyd Soehren "carried out salvage excavations at BPBM Site # 50-OA-B6-13 (a possible fishing shrine.)" The site was reported as destroyed by construction (Barrera 1975:1) but Davis (1990a:148) relocated the shrine and performed additional excavations in 1982. In 1969, artifacts were recovered by Roger Green from a beach midden site (B6-14), south of the barge harbor.

This resulted in a number of visits by Dr. Sinoto and student volunteers in late 1969 and early 1970. A University of Hawaii graduate student, Ernest Lewis did a preliminary survey and test excavations for a graduate seminar in Polynesian Archaeology and donated his report to the Bishop Museum. Lewis was the first to document sites within the present project area.

As Barrera (1975:3) points out there are "a number of discrepancies and inconsistencies" in Lewis' report. "For example, some sites mentioned in the [Lewis] text are not indicated on any

of his maps, and some sites shown on his maps are not discussed in the report" (Barrera 1975:3). However, taken for what it professes to be: "a preliminary report of a preliminary survey" (Lewis 1970:3), the survey is useful. Lewis provides a good summary of historical accounts (pages 4-18) and early maps of the region and a summary of significant aspects of the geography and geology of the study area. Lewis also provided an extensive bibliography suggesting directions for further historical research.

Lewis conducted a surface survey that located some 22 archaeological sites of the types that are typical for the Kalaeloa region, including various types of enclosures and mounds, as well as walls, made of the locally available stacked limestone cobbles and boulders. Lewis' site map indicates that four of these sites existed within the current project area (Lewis 1970: Fig. 21). Three were interpreted as house sites B6-15, 16, and 17. They were located in the southeastern corner of the project area. The fourth site (B6-36) is comprised two stone walls 30 m apart that extended in an east-west direction for 400 m.

In 1975, William Barrera of the Bishop Museum, under contract with the U.S. Army Corps of Engineers (USACE), conducted an archaeological reconnaissance survey for the proposed Barbers Point Harbor. Barrera recorded twelve previously unidentified sites, of which two are believed to be located within the current project area. The first is a 15 m long wall (T-10). The second is an additional wall section of the west of site B6-36.

The USACE continued the archaeological research in 1976 by requesting another survey (Sinoto 1976) of the cultural remains in the area previously surveyed in 1970 (Lewis) and 1975 (Barrera). Sinoto designated four survey areas (A, B, C, and D) but only a small portion of Area D lies within the current project area. Sinoto's work included mapping of 68 new archaeological sites and more complete mapping of 30 previously recorded sites. In the course of this research, two excavations were conducted in the large, presently fenced, sinkhole site 9545, located west of the current project area. This large sinkhole yielded archaeological remains and a radiocarbon date from a hearth feature, as well as bones of extinct bird species.

Aki Sinoto considered his 1976 work a reconnaissance survey and recommended an inventory level survey with location and plan mapping in addition to test excavation and mapping of any areas in which sites may remain extant.

An important aspect of this first research (1976) by Sinoto was the identification of the presence of numerous avifaunal skeletal remains within limestone sinkholes, which led to the contacting of Storrs Olson, Associate Curator of Birds at the Smithsonian Institution. After a field inspection of sites in the vicinity of the project area and a brief review of the recovered material he knew that many extinct endemic species, new species, and even new genera were present. Olson stated that:

> The various limestone sinks...contain probably the most extensive fossil avifauna in Hawaii with many new species endemic to the island. Such fossils have not and probably cannot be found anywhere else on the island. Furthermore, the nature of preservation is such as to insure that virtually complete skeletons can probably be assembled for most species. Thus, there is much highly significant and totally new biological and paleontological information that can be obtained at the Barbers Point site.
>
> Destruction of any of the potential fossil sinks would result in the loss of many specimens, some possibly unique, since one sinkhole might contain species absent

> in another. Also, the fauna of one sinkhole might not be coetaneous with that of another, the age of a deposit being determined by when a sinkhole first formed. Therefore, an investigation of the fauna of different sinks might show changes in species composition and changes in morphology within a species through time. Finally, it would also be desirable to retain some sinks intact as fossil "banks" should some new technique or different information be desired in the future. The fossil deposits at Barbers Point are a unique and irreplaceable resource. (Olson in Sinoto, 1976:74)

In 1980, Storrs Olson extended the test pit of Aki Sinoto in the large sinkhole site # 9545 and conducted extensive excavation of this area in 1981 (Olson, 1982:27).

In 1977, Aki Sinoto (1978) undertook salvage archaeological and paleontological excavations in the proposed barge harbor area (in Areas A and E). These investigations were just west and south (outside) of the proposed Barbers Point Harbor Expansion Area.

Sinoto's work for the Corps of Engineers (1978) included preliminary sampling and analytical studies of avifaunal remains and terrestrial gastropods (land snails) and a geological study of the emerged coral reef based on the excavation of one sinkhole.

In late 1977 and early 1978 archaeological survey was conducted by the Archaeological Research Center of Hawaii in the deep draft port facility area. This research (Davis and Griffin, 1978) identified one site (numbered -2716) including 44 archaeological features lying in or near the south portion of the present project area. No excavation was accomplished until Davis' emergency excavations of 1979 (Davis 1979a, 1979b).

In 1977, Barbers Point Archaeological District was assigned Site # 50-80-12-2888 and listed on the National Register of Historic Places, based on the SHPD's Hawai'i/National Register web site (http://www.hawaii.gov/dlnr/hpd/hpgreeting.htm). A portion of this district overlaps with the current project area (Figure 11).

To complete the archaeological survey of the entire area to be affected by the harbor and support facilities, the USACE contracted for survey of the areas designated as Optional Area 1 and Study Area 1a (Davis, 1978) and Area 1b (Sinoto 1979) located in the southern portion of the present study area. Those surveys by Davis and Sinoto located numerous archaeological sites, as well as sinks of late Pleistocene to early Holocene age that are of considerable paleontological interest.

Sinoto's (1979) work shows that, although sinks containing remains of extinct species are dispersed throughout his study area, only 3 out of 19 sinks tested (or 16%) contained extinct species. However, this amounts to a considerable number of sinks as Sinoto estimated the total number of testable sinks in the 1979 study area as between 1,100 and 2,500 (Sinoto, 1979:34). The majority of Sinoto's New Disposal Site Area has been utilized for chemical dumps and coral stockpiling. That portion which remains is the site of the proposed Sinkhole Reserve and Park, comprising approximately 7 acres of the southern portion of the current project area.

In 1979, Bertell Davis carried out "emergency excavations" (Davis, 1979; a, b, c,) within the area he had previously designated as Area II, located east of the easternmost corner (the *mauka*, Diamond Head corner) of the present harbor open water. These excavations were carried out in advance of the quarry expansion operation (which preceded the harbor expansion) and it is

believed that all sites in this area were salvaged or lost. This work was conducted to the west of the current project area.

Also in 1979, an archaeological reconnaissance survey of a proposed waterline route down the east side of Kalaeloa Blvd. and then east along the north side of Malakole Rd. "No archaeological sites were found along the proposed waterline route." and it was noted that "this area is either presently in sugar cane cultivation or has been used for this purpose in the past" (Cleghorn, 1979:5).

Hammatt and Folk (1981) undertook archaeological testing and salvage excavations in three adjoining parcels designated Study Areas 1A, 1B and Optional Area. Of 138 archaeological sites, 88 sites were tested and 26 were excavated. Associated paleontological studies show that the limestone solution sinks and surrounding terrain were a major habitat of many fossil birds. Appendix 1 of their report, by Storrs Olson and Helen James, lists over 30 species of extinct fossil birds identified at Barbers Point. A total of ten new archaeological sites were identified. All of these sites were located within the present project area. This work was conducted in the southwest corner of the current study area.

The most voluminous study (Cleghorn and Davis 1990) started in 1982 and concentrated in Stockpile Area III, as well as the marsh area to the east. The project area from this earlier work is partially included by the northwest corner of the current study area. A "final draft" (Davis 1993) report documenting that research and Dr. Bertell Davis' Ph.D. dissertation (1990) were also produced.

Lynn Miller produced a report (1993) on her findings in a 31-acre parcel located just to the southeast of the present Deep Draft Harbor. Her research covers some 20 features at two state sites (2710 and 2711) that included enclosures, sinkhole caves, and a single burial.

The extensive archaeological and paleontological research conducted prior to development of West Beach (Ko'olina) to the west of the current project are is certainly relevant to the work accomplished within the project area. It is the second area of the 'Ewa Plain in which major data recovery was accomplished. Barrera (1979, 1984, 1986) conducted preliminary surveys and Davis (1986) undertook intensive survey and data recovery. Over 600 sinkholes were identified in the area along with around 180 surface sites, many of them similar in function to those at Barbers Point.

In 1985, Haun reported on a survey of the Naval Air Station at Barbers Point (Haun 1985) which lies along the coast to the southeast of the harbor area. In 1991, Hammatt et al. conducted an archaeological inventory survey on a 1,915-acre parcel located 1.5 kms to the north, identifying 34 sites.

Haun's (1986) archaeological reconnaissance survey for the 'Ewa Town Center/Secondary Urban Center study covered an area of approximately 1,400 acres north of the present project area. A study by Burgett and Rosendahl (1989) involved the excavation of seventy-two backhoe test trenches in a 360-acre portion of the Haun study area. There were no significant finds relevant to the current study.

A preliminary reconnaissance survey conducted by Haun (1986a) covered approximately 200 acres on the *mauka* side of Farrington Highway. Only one site was identified, an irrigation ditch that extended from the northwestern edge of his project area to a quarry at the northeastern edge. The ditch was described as "constructed of concrete and stone. Elevated flumes constructed of

timbers and galvanized steel bridge the gulches" (Haun 1986a:3). This site was later designated SIHP 50-80-12-4341.

Haun's (1986b) preliminary reconnaissance survey of a 1,400-acre parcel was conducted on both the *mauka* and *makai* side of Farrington Highway, and surrounded the 200-acre parcel surveyed in earlier in 1986. One previously recorded site was known to have once been in the project area, a portion of the Oahu Railroad and Land Company right-of-way (Site 50-80-12-9714). One portion of Haun's project area *makai* of Farrington Highway is adjacent to the northern boundary of the current study area (Figure 10). Haun's (1986b) project area also extended up the eastern slope of Pu'u Palailai (this is not shown on Figure 10). The additional sites Haun (1986b) identified included an irrigation ditch (a portion of the same site –4341 identified during the 200-acre survey), a military structure, and a rock wall that paralleled the irrigation ditch. This wall was later designated SIHP 50-80-12-4314. The military structure consisted of two features at the summit of Pu'u Palailai: a ferro-concrete structure with a "stair-case-like series of rooms" identified as a WWII military structure, and an associated small, circular dry-laid stone masonry enclosure, also identified as a WWII military structure. The ferro-concrete structure is Fire Station B, built in the 1920s and 1930s but used into WWII, and the masonry structure is a USGS benchmark structure on the summit of Pu'u Palailai.

Between 1989 and 1994 Hammatt and Shideler produced a number of archaeological assessments of the Barbers Point area. An archaeological assessment was conducted of the entire current project area (Hammatt and Shideler 1989). A detailed discussion of the creation of the preserve area that is centrally located along the southern edge of the current project area is included in the report (Hammatt and Shideler 1989:33-36). At the time the authors stated:

> "We agree whole-heartedly with the principle of such a sinkhole park and reserve. The scientific merit of the proposition is very high." (Hammatt and Shideler 1989: 23).
>
> "The authors of this report are of the opinion that there are no other areas of the 'Ewa Plain where sinkholes containing fossil bird bones survive in accessible locations… We favor the use of the 8-acre Malakole area as an educational/scientific reserve." (Hammatt and Shideler 1989: 34).

To the west of the project area, Paradise Cove, Lanikūhonua, and West Beach have been the subject of numerous archaeological studies (Barrera 1979, 1984, 1986; Komori & Dye 1979; Neller 1985; Davis & Haun 1986, 1987; Glidden et al. 1993; and Jourdane 1995).

To the west of the current project area Hammatt et al. (1994) and McDermott et al. (2000) conducted an archaeological inventory survey and a large archaeological data recover project respectively. This work resulted in the creation of two archaeological preserve areas. SIHP site 50-80-12-9633 is a cave that was found to contain human created rock piles and wall, human remains, and part of a wooden canoe (Hammatt et al. 1994:93-94). Because of its function as a burial site, the cave was not excavated and the remains were protected in the state in which they were discovered. Just east of that fenced preserve is another smaller preserve area surrounding SIHP site 50-80-12-9545.

Cordy and Hammatt (2003) made a study of a land parcel north of the current project area, across the O.R.&L. Several sinkholes were noted as of potential archaeological interest. The study also documented the presence of a historic chicken farm as well as other twentieth century

architectural remains, including a Quonset hut. Two follow-up studies of plantation infrastructure (O‘Hare et al. 2004) and two of these sinkholes (Terry et al. 2004) further addressed cultural resources north across the O.R.&L. alignment from the present study area.

Most recently, Hoffman (et al. 2005) identified several archaeological and historic sites as part of an archaeological inventory survey that covered portions of the northwest corner of the current project area. This investigation noted that this northwest portion of the current project area had been greatly affected by past land use; particularly the limestone quarry operation; however, there were still remnant archaeological features preserved within the less disturbed *kiawe* thicket portions of the project area. The types of features documented included sinkholes and stacked limestone wall segments and enclosures.

Section 5 Community Contact Process

Throughout the course of this study, an effort was made to contact and consult with Hawaiian cultural organizations, government agencies, and individuals who might have knowledge of and/or concerns about traditional cultural practices specifically related to the project area. CSH made this effort by letter, e-mail, telephone, and in personal contact. In the majority of cases, a letter along with a TMK map and a USGS topographical map of the project area were mailed with the following text:

> In collaboration with Environmental Communications, Inc., Cultural Surveys Hawai‘i (CSH) is conducting a Cultural Impact Assessment for the proposed West Kalaeloa Industrial Area ‘Ewa District, Honouliuli Ahupua‘a, O‘ahu Island (TMK [(1) 9-1-14: 027, 034, 035 & 9-1-15: 001) A map of the project area is enclosed for your reference.
>
> The purpose of this assessment is to identify any traditional cultural practices associated with the project area, past or present, pursuant to Hawaii revised Statutes 343. We are seeking your *kōkua* and guidance regarding the following aspects of our study:
>
> General history and present and past land use of the study area;
>
> Knowledge of cultural sites that may be impacted by the project, for example historic sites, archaeological sites, and burials;
>
> Knowledge of traditional gathering practices in the study area, both past and on-going;
>
> Cultural associations with the study area through legends, traditional use or otherwise;
>
> Referrals of *kūpuna* or anyone else who might be willing to share their general cultural knowledge of the study area; and,
>
> Any other cultural concerns the community might have related to cultural practices in the ‘Honouliuli area.
>
> The focus of this study is to document the potential impacts to cultural practices or resources of the proposed project area. If you wish to voice any cultural concerns or provide input on any of the above, please contact Kēhaulani Souza of Cultural Surveys Hawai‘i at (808) 262-9972. Ms. Souza may also be contacted by e-mail at ksouza@culturalsurveys.com.

The individuals, organizations, and agencies attempted to be contacted and the results of any consultations are presented in the table below.

Table 3. Community Contact List

Name	Affiliation	Comments
Aila, William	Hawaii Community Development Authority (HCDA)	Mr. Aila is aware of many sinkholes in the ‘Ewa coral plains including the project area. He strongly recommends that the sinkhole preserve is protected and not disturbed in anyway.
Amaral, Annelle	‘Ahahui Siwila Hawaii O Kapolei Hawaiian Civic Club	See Appendix A for letter sent by ‘Ahahui Siwila Hawaii O Kapolei Hawaiian Civic Club
Cope, Aggie	Hale O Na‘auao Society	No cultural Concerns
Eaton, Arline	*Kūpuna* at Iroquois Elementary School	See Traditional Cultural Practices below for response
Johnson, Rubellite Kawena	Professor at University of Hawaii	Mrs. Johnson mentioned her father Ernest Kinney and uncle Richard would fish along the coast of Honouliuli on to Wai‘anae. They would gather *nehu* from Pu‘uloa for bait before it was restricted. She suggested Aunty Arline Eaton as another contact.
Kane, Shad	Makakilo, Kapolei, Honokai Hale Neighborhood Board Member and ‘Ahahui Siwila Hawaii O Kapolei Hawaiian Civic Club member	See Appendix A
Makaiwi, Martha	Makakilo, Kapolei, Honokai Hale Neighborhood Board No. 34	Made referral: Maeda Timson and Shad Kane
McKeaque, Kawika	O‘ahu Island Burial Council	See Traditional Cultural Practices below for response
McKinzie, Edith	Kawananakoa Foundation	No response left message a number of times
Nāmu‘o, Clyde	Administrator at Office of Hawaiian Affairs	Made referral: Shad Kane and Nettie Tiffany. OHA stated: The ‘Ewa plain has historically been known to contain sinkholes in which human skeletal and avi-faunal remains have been encountered. These sinkholes can continue to exist in areas that have been graded or heavily cultivated for agricultural use. See Appendix B for letter.
Tiffany, Nettie	Kahu of Lanikūhonua and member O‘ahu Island Burial Council	See Traditional Cultural Practices below for response
Timson, Maeda	Makakilo, Kapolei, Honokai Hale Neighborhood Board No. 34 and President of Ua au O Kapolei	Made referrals: Nettie Tiffany and Shad Kane

Section 6 Traditional Cultural Practices

The project area is situated on the extensive ‘Ewa limestone plain, which was, according to Honouliuli settlement predictions, probably never permanently inhabited. It did have temporary habitations for resource gatherers and fisherman traveling to the coast. A relatively barren and waterless area, it nonetheless might have been occasionally traversed, as the project area is situated between the greater populated and watered uplands and marine resource rich coast and near shore waters. The limestone plain would have been used for bird catching, seasonal planting in limestone sinks. In general the project area lies in a region that would have been less than bountiful, and therefore sparsely utilized, even in ancient times.

Discussions of specific aspects of traditional Hawaiian culture during interviews and talk story sessions are incorporated through this section as they may relate to the project area. The interviewees are represented by first and last initials with CSH denoting the Cultural Surveys Hawai‘i interviewer. Some of these interviews were conducted previously but the interviewees all agreed to allow the reuse of their interviews for this project.

6.1 Limestone Sink Features

Limestone sink features are valuable because of a build-up of natural and cultural deposits over time which may inform on past environmental conditions. It is also a known fact that burials in sinks and limestone features were a fairly common Hawaiian mortuary practice. Mrs. Nettie Tiffany mentioned that she is aware of many burials in sinkholes near and around the project area therefore there is a possibility of encountering burials in remaining sink features. William Aila is also concerned about the traditional burial practices in the limestone sink features in the project area.

During a field inspection in November 1989 of the project area numerous limestone sink formations were documented (Hammatt and. Shideler 1989). Based on this research a sinkhole preserve encompassing approximately seven acres is situated on the southern edge of the project boundary (O’Leary and Hammatt 2006). Documentation regarding the creation of the sinkhole preserve is difficult to find, it appears that the preserve was created in the early 1990s through the efforts of Dr. Alan Ziegler, a noted Hawai‘i Zoologist with a long history of research in the Barbers Point area.

Through consultation between Dr. Ziegler, the property owner, Campbell Estate, and apparently the State Senate, and the City and County of Honolulu, the sinkhole preserve was established (Haliday 2005; Ziegler 1990a and b). At the time of the present field inspection report (McDermott *et al* 2006) was prepared, the status and permanence of the sinkhole preserve could not be determined. A chain link fence bounded the sinkhole preserve area in which 40+ sinkholes remain. The sinkhole features vary greatly in size and shape with many over three meters deep and most are irregular in shape. Some of the sinkhole features within the project area have been partially or completely filled by past bulldozing activity. Other sinkhole features have apparently been the focus of controlled stratigraphic excavation in the relatively recent past, as denoted by the back dirt piles adjacent to the sinkhole features. These features have potential to contain both paleontological avian and land snail deposits as well as cultural deposits related to traditional Native Hawaiian land-use and burials.

Based on above information, it is possible that the proposed project will impact the sinkhole features and other historic properties, cultural, and/or paleontological deposits which may be contained within the sink features themselves.

6.2 Gathering for Plant Resources

Given the environmental constraints within this portion of the Honouliuli *ahupua‘a*, it is likely that the major traditional cultural practice associated with the present project area would have been the gathering of native plant resources. Barbara Frierson (1973) compiled a list of native plant species present in Honouliuli before 1790. Additionally plant use data based on I. Abbott (1992) was added to the table. Table 4 list Honouliuli lowland plants and uses with columns for common/Hawaiian name, scientific name and use.

Table 4. Native Plants in Honouliuli

Common/Hawaiian Name	Scientific Name	Use
Hala, pandanus	Pandanus odoratissimus	Weaving
Hau, hibiscus	Hibiscus tiliaceus	Cordage
Milo	Thespesia paradisiaca	Wood used for bowls
Neneleau, Sumac	Rhus sandwicensis Rhus chinensis	Unknown
‘Ilima	Sida cordifolia S. fallax	Leis, medicine
Kou	Cordia subcordata	Bowls
Makaloa, sedge	Cyperus laevigatus	Mats (Abbott)
Pili grass	Heteropogon contortus	Thatch
Kakonakona, grass	Panicum torridum	Unknown
Honohonowai	Commelina nudiflora	Unknown
Ma‘o, cotton	Gossypium tomentosum Abutilon incanum	Flowers used as dye for kapa (Abbott)
‘Ūlei	Osteomeles anthyllidifolia	Branches used for fishing nets (Abbott)
‘Uhaloa	Waltheria americana	Medicine (Abbott)
Koali‘ai	Ipomoea cairica	Cordage (Abbott)
Pā‘ū o Hiiaka	Jacquemontia sandwicensis	Unknown
Ko‘oko‘olau	Bidens sp.	Use as tea (Abbott)

Common/Hawaiian Name	Scientific Name	Use
‘Ulu, breadfruit	Artocarpus incisus	Food
Taro	Colocasia esculenta	Food
Niu, coconut	Cocos nucifera	Food, liquid

The accessibility of Honouliuli lands, including the present project area, to the Hawaiians for gathering or other cultural purposes would be radically curtailed during the second half of the nineteenth century. As noted above in this evaluation, by the 1870s, herds of cattle grazing across the ‘Ewa Plain likely 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 project area. Cane cultivation – and the sense that the project area was private property – restricted access inside the project area to employees of Ewa Plantation.

Mrs. Nettie Tiffany noted that she and her brother were taken down to the ‘Ewa Coral Plains around the project areas for medical attention. She specially commented:

> When we were young children, my brother and I were taken there by our mother. There were still people living there during the 1950s. The people there were Hawaiian and had the powers of healing and they were very black people. Both my brother and I were healed by those people. I do not remember any kind of gathering only that my mother brought things to exchange with the people of Honouliuli. I remember being shown some cultural sites further south of Malakole Street. My mother did tell me that most of this area was the dry plain and later cultivated for sugar cane. I know my mother knew the medicines and what grew close to the beach of Kalaeloa, like the morning glory, and what they gathered from the mountains.
>
> My main concern is that when the project has been started those involved should be very careful when bulldozing, it should be monitored. I also feel that they should take soil samples of that area. The soils used to cultivate sweet potato in the ancient times were also the same soil used in burials and are very rich in nutrients. The soil was taken from various sinkholes in the *āina.* Just be very careful.

6.3 Historic Properties

The Cultural Resource Literature Review and Field Inspection for the proposed 345-Acre Kapolei Harborside Center (O'Leary and Hammatt 2006) investigation identified the following cultural resources/historic properties within or near the project area. These sites likely, or potentially, will be affected by the proposed project:

1) State Inventory of Historic Properties (SIHP) # 50-80-12-6679, historic plantation-era drainage channel, a portion of which has already been determined Hawai‘i Register-eligible under Criterion D.
2) Numerous sinkhole features within the project area's archaeological/paleontological preserve area, likely National/Hawai‘i Registers eligible under Criterion D, and, because of the potential for human burials, Criterion E (Hawai‘i Register only)
3) Stacked stone prehistoric or early historic enclosures and mounds, perhaps previously recorded, likely eligible to the National/Hawai‘i Registers under Criterion D.
4) SIHP # 50-80-12-2888, the Barber's Point Harbor Archaeological District, listed on the National Register.

The O. R. & L. right-of-way, SIHP # 50-80-12-9714, immediately adjacent to the project area, currently listed on the National Register under Criteria A, B, and C.

6.4 Trails

Trails served to connect the various settlements throughout the District of ‘Ewa. Based on nineteenth and twentieth century maps the primary transportation routes *mauka/makai* correlated closely to the existing major roadways. John Papa ‘I‘ī describes a network of Leeward O‘ahu trails that in later historic times encircled and crossed the Wai‘anae Range, allowing passage from West Loch to the Honouliuli lowlands, past Pu`uokapolei and Waimānalo Gulch to the Wai‘anae coast and onward, circumscribing the shoreline of O‘ahu (‘Ī‘ī 1959:96-98). Following ‘I‘ī's description, a portion of this trail network would have passed close to the presently existing Farrington Highway.

It seems clear that a major east/west artery from ‘Ewa and Kona O‘ahu to Wai‘anae ran just upslope (northern side) of Pu`uokapolei roughly along the Farrington Highway alignment (see figure 8). To our knowledge, no clear remnant of this east/west trail or associated site has been identified. It seems likely that there would have been a spur trail off of this major artery descending down to the sea near Kalaeloa approximating modern Kalaeloa Blvd. but again no remnants of this possible spur trail or associated sites have ever been identified. No trail has been identified within the project area.

6.5 Pa‘akai (Salt Making)

Pa‘akai (salt) was one of the condiments used by Hawaiians for curing fish and other foods. Out of all Polynesia, Hawaiians were the only group of people to produce salt from the sea by properly constructing salt pans. These salt pans were noticed and described by Reverend William Ellis:

> We saw a number of their pans, in the disposition of which they display great ingenuity. They have generally one large pond near the sea, into which the water

> flows by a channel cut through the rocks, or is carried thither by natives in large calabashes. After remaining there some time, it is conducted into a number of smaller pans, about six to eight inches in depth, which are made with great care, and frequently lined with large evergreen leaves, in order to prevent absorption. Along the narrow banks or partitions between the different pans, we saw a number of large evergreen leaves placed. They were tied up at each end, so as to resemble a shallow dish, and filled with sea water, in which the crystals of salt were abundant [Ellis 1839 in Buck 1964:71].

Salt making was intensively undertaken in coastal Honouliuli, as documented on old maps. Aunty Arline Eaton also mentioned that they never had to worry about not having enough salt growing up as a child:

> AE: during that period of time they had salt works in the area (looking at the 1927 map). . . . yeah that's what it was, and there's that flume. We used to ride on this thing. . .you go right under here . . . but they don't have the salt works anymore, sad yeah? Yeah that had the salt pans, all the way down to Kualaka‘i, all the way to Kalaeloa, the whole thing. From Pu‘uloa, which is Pearl Harbor, working all the way around pass Keone‘ula, all the way down past where Kualaka‘i is. That's almost the ending, though they maybe had one or two close to Kalaeloa. Because a lot of the boats came in there. I think, like how they have, [on the map]. That's true, exactly what you have over there. See it has Ewa Plantation, but there was water all in this area. The salt pans are really, actually, no more pan, but its coral, and you can see. But they called it that ["salt pans"]. But now that's all made out of the reef, the coral, all in that area.
>
> CSH: *So your family would gather salt?*
>
> AE: Oh, yeah. We never worried about salt, because right there. And had the ‘*alaea* [type of ocherous earth, mixed with the salt] down at Keone‘ula, we go pick that up too. Because the water comes all in here it [the map] doesn't show you that. But water used to come all in that area. I tell people, this whole area here had water before we even had the *paniolo* here. Yeah that had those things (salt pans), all the way down to Kualaka‘i, all the way to Kalaeloa, the whole thing. From Pu‘uloa, which is Pearl Harbor, working all the way around pass Keoneula, all the way down past where Ku‘alaka‘i is. That's almost the ending though they maybe had one or two close to Kalaeloa. Because a lot of the boats came in there.

One of the first enterprises in Honouliuli in the post-Contact period was the making of salt. Soon after Kekau‘ōnohi sold the land of Pu‘uloa to Isaac Montgomery in 1849, the king (Kamehameha III) and Montgomery entered into a partnership to run the salt works in Pu‘uloa. Kamakau (1961:409) reported "The king and Isaac of Pu‘uloa are getting rich by running the salt water into patches and trading salt with other islands." The salt was also sent to Russian settlements in the Pacific Northwest, where it was used to pack salmon (*Hawaiian Gazette,* January 29, 1897). An 1853 newspaper article (*Polynesian,* August 20, 1853) on the "Puuloa Salt Works" says that this was the only place "where large quantities of salt were manufactured." Kelly (1991:160) says that there was another salt works at Kualaka‘i (Nimitz Beach) south of project area, but does not give a reference for this claim.

The project area is just back from the coast therefore the environment is not conducive to the “old” style of salt making.

6.6 Marine Resources

The sea is a rich resource and the Hawaiian people were traditionally expert fishermen. Fish, shellfish, and other invertebrates of all types supplied the Hawaiian diet with a rich source of protein. Myths and legends support the abundant marine life in Honouliuli documented in the legend above of Pukaua “While they were down fishing at Kualaka‘i in the evening, they caught these things, *‘a‘ama* crabs, *pipipi* shellfish, and whatever they could get with their hands.” This area was also noted for the abundance of *moi*. Below is another story that gives evidence of fishing south of the project area at Kualaka‘i: In the Legend of the Children, is a tale that foretold the later breaking of the eating *kapu* by the *ali‘i*. A young brother and sister always fished at Kualaka‘i. One day they laid out their nets, but all they caught was one *palani* (surgeonfish), a fish that was *kapu* (tabu) for men; only women could eat it.

> . . . They fished again and again until the afternoon and nothing was caught. The children were weary and went home without fish. When they came as far as Pu‘u-o-Kapolei where the blossoms of the ma‘o looked golden in the sunlight, the sister sat down to make ma‘o leis for themselves. When the leis were made they went across the breadth of Kaupe‘a to Waipio [*Ka Loea Kālai‘āina*, July 22, 1899:15; translation in Sterling and Summers 1978:7].

They stopped at the stream of Ka‘aimalu on the way to their home, and the sister convinced her brother to share the fish between the two, thus breaking the *kapu*. “Because these children ate fish secretly, the spot is called Ka‘ai-malu (Secret eating) to this day” (Sterling and Summers 1978:7). This legend also shows the relation of several landmarks on the coastal plain, as the children travel from the coast at Kualaka‘i, across the plain of Kaupe‘a to Pu‘uokapolei and on to Waipi‘o.

Limu was very important in the Hawaiian diet and is defined by Pukui & Elbert (1971) “A general name for all kinds of plants living under water, both fresh and salt, also algae growing in any damp place in the air, as on the ground, on rocks and other plants.” Honouliuli was well known for its abundance of edible limu people from all over the island would come to gather limu along the coastal beaches such as Kalaeloa and Kualaka‘i which is south of the project area. Aunty Arline spoke of the different types of *limu* in the Honouliuli area:

> AE: This whole area was known as the house of the *limu*. You can imagine the smell, but we never bothered. And now no more *limu*. Had plenty . . . and now no more. Well you know, there was a heavy influx of immigrants coming in. First they look at it, oh this is plenty, lets pick em (*limu)* all up, and they’d go and sell em. They’d never think about just pick their part, no they’d take the whole thing. So when they’d go, they’d pick up everything. Oh no, had in the lochs, in Hō‘ae‘ae, had to have *limu* over here, all the way out. You know, maybe not as much as you see out there, but they did have *limu* in there because you had the fish. As long as you have the fish inside there, gotta have the *limu* inside there. That’s why I said the *limu* is very important. That’s why we were teaching the

> children. Had *līpo’a*, plentiful, but not as much as you would find in Pu‘uloa, because of the changing of the ocean and the tide.
>
> You need to have lots of running water back and forth, like waves coming in, going out. That’s how that *limu* is strong and fresh. But we also had it in here too, all into this area. Mostly, the kind of *limu* you would find in here is ‘*ele‘ele*. They had, cause of the water, there was a lot of fresh water that went in there. You would find it close up into an area where there is a lot of running water. That’s how we knew there had fresh water coming out, can’t live without fresh water, all of it needs it.

The project area is back from the coast therefore the marine resources will not be affected.

6.7 *Wahi Pana* (Storied Places)

The concept of *wahi pana* (a place with a story or legend attached to it) is very important in the Hawaiian culture because it is a connection to the past and, therefore, the ancestors. From the name of a place one can know intimate details about the people who lived there, the environment, cultural practices, and historical events that took place. In Hawaiian culture, if a particular spot is given a name, it is because an event occurred there that has meaning for the people of that time. Because Hawaiian culture was based on oral traditions, place names and their stories were an important way of remembering these traditions and ensuring these stories would be passed on to future generations. In Hawaiian thinking, the fact that a place has a name deems it important. Often, spiritual power or *mana* is attached to a place, which increases its importance. On the subject of *wahi pana*, Edward Kanahele writes:

> As a native Hawaiian, a place tells me who I am and who my extended family is. A place gives me my history, the history of my clan, and the history of my people. I am able to look at a place and tie in human events that affect me and my loved ones. A place gives me a feeling of stability and of belonging to my family, those living and dead. A place gives me a sense of well-being and of acceptance of all who have experienced that place [Kanahele, in James 1995:6].

Below Kawika McKeaque gives light and goes even deeper into what is the meaning of *wahi pana* and how the Hawaiian culture is strongly rooted to the ancestors and the *‘āina.* Mr. McKeaque feels that these connections need to be considered and incorporated into the project design:

> 1) Spiritual transcendence imbued into physical landscape- there is a fine line of existence and being within the worlds of the ethereal and "reality" within the entire Honouliuli ahupua'a. This fine line between two worlds of knowing, perceiving, and attaining life essence creates a cultural/spiritual foundation for this area to provide the means for moments of revelation through various sensories. These ho'ike reveal themselves through 'ike papalua, secondary sight/knowledge, hihi'o, akaku, and ho'ike na ka po.
>
> Even the name of the ahupua'a is suggestive of the deep well of knowledge and understanding that comes from the time of Po. Some of the supporting elements to this line of thought of extrasensory "enlightenment" to delve into different plains of being and existence include:

a) Kapo'ulakina'u- (Kapo of the red streaked with dark) the female akua that provides inspiration and insight only through one's dreams- her presence demarked by the ula rays of the setting sun, which also belongs to Hina/Papa/Haumea;

b) the area of Kaupe'a- the plains of the ao auana, where unsettled souls wander and dwell

c) Hoakalei- area near White Plains Beach- where it it said that Hi'iaka receives vision of the death of Hopoe and the burning groves of lehua on Hawai'i island

d) Pu'uomakakilo- any term with kilo- indicative of being able to read ho'ailona, second sighters, if you will

e) Mo'olelo of Kamapua'a- foretells or gives Kamaunaaniho the ho'ailona that will reveal his death at Pu'uokapolei- the smelling burning bristles-

2) Sensory exploits of the female persona- you look at the natural landscape and you begin to understand some of the place names are related to physical, emotional, and spiritual cycles that are a natural part of a wahine's passage through and during childbirth. There's multiple loaded kaona in these place names but there is commonality again in sensory experiences that sustain the cyclic nature between life and death, ignorance and enlightenment, po to ao-

a) Pu'umanawahua- discomfort of the stomach, nausea; to suffer great grief; also jealousy

b) Pu'ukapua'i- to cause to flow, to bubble, gurgle; to vomit; to appear, as a color; variation on the work kapua'i also means to tread

c) Pu'umo'opuna- grandchild; offspring; relative or descendant two generations later

d) Puuku'ua- to release; let go; discharge

e) Pu'upoulihale- again the reference to uli- any dark color, richness of vegetation, of seed banks; also female akua of certain sorcery; short for 'ouli- study of omens; also the name for the developmental stage of a fetus, as the body begins to form. Pouli can mean darkness, sometimes ignorance (modern mental ascription to the night but a more traditional line of thinking could be that of Po, of knowledge beyond the sensory experiences of ao, of being awake, in the light; the knowledge that stems from such a time of antiquity.

f) Akupu- to sprout; germinate; supernatural

g) Awanui gulch- could reference the "large passage", indicative of birthing passage or "outburst" (alluding to Papahanaumoku/Haumea's birth of the island- geologically one of the main outvents of Wai'anae volcanic eruption);

h) Pohakea- where Pele receives the cloud omens; where Kauhi kills Kahalaopuna who is resuscitated by her pueo 'aumakua. I've been taught that

name ascribed is Poha a Kea- the bursting forth (as thunder) of Kea (or Wakea)- presence of all the childbearing qualities and emotions; the ability of a woman to bring life into the world; of Papa to give birth to the islands, Wakea's presence must be the balance. However, some traditions cite that Papa and Lua mated to birth O'ahu in Papa's jealousy of Wakea and Ho'ohokukalani's relationship. In Pele and Hi'iaka epic, Hi'iaka undergoes a long period of visions and mo'olelo/oli are iterated (so much so Emerson's says there's too much going on that he purposefully does not include it in his account).

i) Palehua- I disagree with Pukui; I don't believe it's only meaning is the lehua enclosure; I see two other words prominent- pale and hua, the idea that this place is where the hua is protected or perhaps in another meaning one is protected by hua, by jealousy

j) Palikea- the cliff of Kea (Wakea)- he is detached from the processes of the childbearing activities that are evident with the form of these pu'u- this distinguished "setting aside" of place for Kea further support that the mountainscape down to Pu'uokapolei is female, is lifebearing, is transcending between this life and others yet to be or that have passed before.

k) Palailai- I disagree with Pukui; I don't believe it's the "young of the lai fish"- my hale is on the northeast corner of its kahua- I believe it's to "experience or be in a state of being calm and clear"- again sensory; having clear vision or thought as something is born in thought through experience

l) Mauna Kapu- I know some say this is regards to Kakuhihewa's kapu. Could be- my mana'o is that this point clearly defines what is Wakea and what is Papa, my mana'o only...Papa giving birth- woman giving birth-probably the strongest period where Haumea thrives and is more "powerful" or omniscient than Wakea- kapu had to be established to protect both male/female sources of identity.

m) Makaiwa- I think it's a shortened version of-Maka a aiwa, as in the face (essence) of complete mystery, incomprehensible (as in caught in a wake between two worlds- again transitional, balancing between two worlds).

Understanding the meanings of these traditional place names is important to the consciousness of the Hawaiian people and the culture, it gives light to what was going on in this area in regards to the spiritual and physical nature of the whole ahupua‘a.

Section 7 CONCLUSION AND RECOMMENDATIONS

7.1 Conclusion

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

The project area lies just back from the coast, on the extensive ‘Ewa limestone plain, which was, based on Honouliuli settlement patterns and archaeological investigations of the *ahupua‘a*, probably never permanently inhabited. It could have, however, provided temporary habitation for gatherers and fisherman traveling to the coast. A relatively barren and waterless area, it nonetheless might have been occasionally traversed, as the project area is situated between the relatively well-watered uplands and *makai* resources. Based on ethnographic accounts and past archaeological investigations in the project area and its vicinity, limestone sink holes on the ‘Ewa Plain were used for agriculture and burial interment, with the largest shelters used for temporary shelter. With the spread of Western land use in the 19th century, the project area was used for ranching first, then intensive commercial agriculture. In general the project area lies in a region that would have been less than bountiful, and therefore sparsely utilized, even in pre-contact times.

Hawaiian organizations, government agencies, community members, and cultural and lineal descendants with ties to Honouliuli were contacted to: (1) identify potentially knowledgeable individuals with cultural expertise and knowledge of the project area and its surroundings, and (2) identify cultural concerns and potential impacts within the project area. An effort was made to locate informants with ties to Honouliuli 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, Rubellite Johnson, and Nettie Tiffany and other *kūpuna* and community members such as Kawika McKeaque and Shad Kane were interviewed for this assessment. They mentioned that in the past there was traditional gathering of native plants, *limu* and salt along with fish such as *pāpio*, and *moi*, near the project area. The people contacted were not aware of any on-going cultural practices, archaeological sites, or trails within the project area. However, OHA, Nettie Tiffany and William Aila mentioned that the ‘Ewa plains is a well known place of sinkhole burials. Most of the people contacted mentioned that the project area was heavily altered by plantation and ranching activities. However, OHA noted “Furthermore, the nature of documented interments in the ‘Ewa area (stone pits, sinkholes, crypts, etc.) could lead to the survival of these sites despite intensive agricultural activities on the surface”.

Based on what was gathered from the consultation process and the evidence of LCA’s and lack of resources, the vast majority of the project area was utilized less intensively during traditional times. Additionally the years of sugar cane cultivation and ranching left no reason for access. Most of the resources such as salt farming and gathering of marine resources were on the coastal fringe outside of the project area.

7.2 Recommendations

It should be noted that significant cultural resources/historic properties will likely be affected by the proposed industrial development despite the extensive past disturbance within the project area. As a precautionary measure, personnel involved in future development should be informed of the possibility of inadvertent cultural finds, and should be made aware of the appropriate notification measures to follow. We also recommend that through out the duration of this project that you continue to consult with the community especially those mentioned in this report. We also feel that the project should incorporate the traditional place names of the surrounding area into the proposed development to sustain a connection to the past. Additionally, it was recommended in the Cultural Resource Literature Review and Field Inspection for this project (O’Leary and Hammatt 2006) that project proponents consult with the State Historic Preservation Division/Department of Land and Natural Resources (SHPD/DLNR) and develop an appropriate scope of work for an archaeological inventory survey

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Appendix A Ahahui Siwila Hawaii O Kapolei Letter

March 30, 2006

Kehaulani Souza

Cultural Surveys Hawaii, Inc.

P.O. Box 1114

Kailua, Hawaii 96734

Dear Ms. Souza:

The Ahahui Siwila Hawaii O Kapolei (Ahahui) is one of fifty component organizations throughout the State of Hawaii and seven states on the continent, linked under the Association of Hawaiian Civic Clubs. The first civic club was founded in 1918 and, since then, the movement to preserve and protect all aspects of the native culture has continued to develop and expand.

Our Ahahui was established and chartered in Kapolei in 1993 and, among others, we have concentrated our efforts on the identification, preservation and restoration of historic sites in the ahupua`a of Honouliuli. This area includes, but is not limited to, the Ewa Plains, Kalaeloa, Ko Olina, Kapolei, Makakilo, Honokai Hale, Makaiwa, Waimanalo, Ka Lo`i and Palehua.

General history and present and past land use of the project area

The area identified as the "West Kalaeloa Industrial Area Project Honouliuli Ahupua`a, Ewa District, O`ahu Island" is identified as former sugar lands and previously open grazing lands for cattle. Prior to that it was a traditional cultural landscape identified by Vancouver as a sea of gold referring to the abundance of native Ilima. Due to the destruction of the cultural landscape by agriculture it is difficult to determine the actual Ili boundaries. It is perhaps safe to say that 2 ancient geographical areas came together in this approximate area. They were Kaupe`a and Pukaua.

Knowledge of cultural sites which may be impacted by future development of the project area – for example, historic sites, archaeological sites, and burials.

Much of the cultural landscape has been destroyed by agriculture. Native wild plants can still be found throughout the area and especially in areas of dissection along the coral plains.

Knowledge of traditional gathering practices in the project area – both past and ongoing.

It is not known what kind of traditional gathering practices may have occurred in the project area although there is no question that it did occur. It is not known whether traditional gathering practices are presently ongoing within the project area.

Cultural associations of the project area, such as legends and traditional uses.

The project area lies in an area between 2 notable ancient places historically known as Kualaka`iand Pukaua. From the following story it appears that the project area may have been a place where the Po`e Kahiko may have passed through in support that an ancient trail may have once existed. Following is that story:

> "……That is Pu`uokapolei. It is this hill that hides Ewa from view. When you go to that side of Waimanalo, you see no more of the sight back here. You go down some small inclines, then to a plain. This plain is Pukaua and on the mauka side of the road, you will see a large rock standing on the plain. This stone has a legend that made this plain noted. This is a noted legend of this plain. There were two supernatural old women or rather peculiar women with strange powers and Pukaua belonged to them. While they were down fishing at Kualaka`i in the evening, they caught these things, aama crabs, pipipi shell fish and whatever they could get with their hands. As they were returning to the plain from the shore and thinking of getting home while it was yet dark, they failed for they met a one-eyed person. It became light as they came near to the plain, so that passing people were distinguishable. They were still below the road and became frightened lest they be seen by men. They began to run, running, leaping, falling sprawling, rising up and running on, without a thought of the aama crabs and seaweeds that dropped on the way. So long as they would reach the upper side of the road. They did not go far for by then it was broad daylight. One woman said to the other, "Let us hide lest people see us," and so they hid. Their bodies turned into stone and that is one of the famous things on this plain to this day, the stone body. This is the end of these strange women. When one visits the plain, it will do no harm to glance on the upper side of the road and see them standing on the plain."
>
> ….this article appeared in the January 13, 1900 Ka Loea Kalaaina newspaper under the article of Na Wahi Pana O Ewa.

Referrals of Kupuna or elders who might be willing to share their cultural knowledge of the project area and the surrounding ahupua`a lands.

There are none living today that have first hand cultural knowledge of the project area prior to sugar.

Any other cultural concerns the community might have related to Hawaiian cultural practices within or in the vicinity of the project area.

There are none that I am aware of.

We appreciate the opportunity to comment whenever possible. Please feel free to contact me at_____.

Mahalo nui loa,

Annelle Amaral, President

Ahahui Siwila Hawaii O Kapolei

Appendix B The Office of Hawaiian Affairs Letter

PHONE (808) 594-1888 FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

HRD06/2270

March 7, 2006

Kēhaulani Souza
Cultural Surveys Hawaii, Inc.
P.O. Box 1114
Kailua, HI 96734

RE: Cultural Impact Assessment for the West Kalaeloa Industrial Area Project, 'Ewa, O'ahu, TMK: 9-1-14: 33 por. 35 and 9-1-15: 20.

Dear Kēhaulani,

The Office of Hawaiian Affairs (OHA) is in receipt of your February 9, 2006 request for comment on the above listed proposed project. OHA offers the following comments:

The 'Ewa plain has historically been known to contain sinkholes in which human skeletal and avi-faunal remains have been encountered. These sinkholes can continue to exist in areas that have been graded or heavily cultivated for agricultural uses.

According to records at the Bishop Museum pertaining to inventories conducted for compliance with the Native American Graves Protection and Repatriation Act of 1990, burial sites in Honouliuli and in 'Ewa in general have been documented in the past including:

> *In 1938, human remains representing six individuals from Honouliuli, 'Ewa, O'ahu were collected by Kenneth P. Emory and William A. Lessa and acquired by the Bishop Museum. Museum documentation indicates these remains were in a shallow crypt burial one mile from the coast;*
>
> *In 1933, human remains representing three individuals from stone pits at 'Ewa, O'ahu were collected by J.W. Barrington and Edwin H. Bryan;*
>
> *In 1942, human remains representing two individuals from Kualakai, 'Ewa Beach, O'ahu were donated to the Bishop Museum;*
>
> *In 1959, human remains representing seven individuals from 'Ewa, O'ahu were donated to the Bishop Museum by the Anthropology Club of the University of Hawaii (from Standard Oil Refinery land);*

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March 7, 2006

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>
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>
> *In 1959, human remains representing seven individuals from 'Ewa, O'ahu were donated to the Bishop Museum by the Anthropology Club of the University of Hawaii (from Standard Oil Refinery land);*

> *In 1980, human remains representing nine individuals from Honouliuli, O'ahu were collected and donated to the Bishop Museum by Albert, Borthwick and Folk. Donor information indicates these human remains were recovered from coral sinkholes.*

In the last decade, unmarked burial sites have been found in the area of St. Francis West, West Loch Estates, Old Fort Weaver Road, Kalaeloa, One'ula Beach, Campbell Estate, Ko'Olina and other areas in the vicinity of this project.

The depth of grading activities and the likelihood of adversely impacting any sub-surface cultural sites or deposits is contingent upon understanding the original surface grade as it may have existed prior to agricultural activities such as sugarcane.

Native Hawaiian burial sites have been found just on and under the surface to depths of eight or nine feet depending upon the nature of the terrain. Furthermore, the nature of documented interments in the 'Ewa area (stone pits, sinkholes, crypts, etc.) could lead to the survival of these sites despite intensive agricultural activities on the surface.

As for the future consultation process, OHA recommends contacting two individuals in particular: Shad Kane and Nettie Tiffany. Both individuals have served as cultural resources on past projects and would likely aid in the community consultation process.

OHA asks that, In accordance with Section 6E-46.6, Hawaii Revised Statutes and Chapter 13-300, Hawaii Administrative Rules, if any significant cultural deposits or human skeletal remains are encountered, work shall stop in the immediate vicinity and the State Historic Preservation Division (SHPD/DLNR) shall be contacted.

Thank you for the opportunity to comment. If you have further questions or concerns, please contact Jesse Yorck, Native Rights Policy Advocate, at (808) 594-0239 or jessey@oha.org.

'O wau iho nō,

Clyde W. Nāmu'o
Administrator

Appendix G
Archaeological Inventory Survey

Archaeological Inventory Survey for the Proposed 345-Acre Kapolei Harborside Center, Honouliuli Ahupuaʻa, ʻEwa District, Oʻahu Island

TMK: [1] 9-1-14:027, 034, 035, & 9-1-15:001

by

Matt McDermott, M.A.

Owen L. O'Leary, M.A.

Todd Tulchin, B.S.

and

David W. Shideler, M.A.

Prepared for

Group 70 International, Inc.

Prepared by

Cultural Surveys Hawaiʻi, Inc.

Kailua, Hawaiʻi

(CSH Job Code: HONO 69)

July 2006

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Management Summary

Reference	Archaeological Inventory Survey for the Proposed 345-Acre Kapolei Harborside Center, Honouliuli Ahupuaʻa, ʻEwa District, Oʻahu Island (McDermott et al. 2006)
Date	July 2006
Project Number	Cultural Surveys Hawaiʻi Inc. (CSH) Job Code: HONO 69
Permit Number	The fieldwork for this investigation was carried out under archaeological permit numbers 0508 and 0605, issued by the Hawaiʻi State Historic Preservation Division/Department of Land and Natural Resources (SHPD/DLNR), per Hawaiʻi Administrative Rules (HAR) Chapter 13-282.
Project Agencies	SHPD
Project Funding and Land Jurisdiction	Private, Kapolei Property Development, LLC
Project Location	TMK: [1] 9-1-014: 027, 034, 035, & 9-1-015: 001 in Kalaeloa (Barber's Point), Honouliuli Ahupuaʻa, ʻEwa District, Island of Oʻahu. This area is depicted on the 1998 ʻEwa USGS 7.5-minute topographic quadrangle. Generally, the project area lies south of the Oahu Railway and Land Company (O. R. & L.) railroad right-of-way, north of Malakole Road, west of Kalaeloa Boulevard, and east of the Kalaeloa Harbor.
Project Acreage	Approximately 345 acres
Project Description and Related Ground Disturbance	The project area is proposed predominantly for industrial development. Minimally, this development would include grading, foundation work, street and utility installation, and landscaping.
Area of Potential Effect (APE) and Survey Area Acreage	For this inventory survey investigation, the project's APE is defined as the entire approximately 345-acre project area. This includes a proposed intersection of the O. R. & L. Railroad with the proposed Hanua Street, along the northern boundary of the project area. The survey area included the entire project APE, however, 100 percent pedestrian inspection was limited to approximately 20 acres, the only portions of the project area that had not been heavily modified by extensive prior ground disturbance related to commercial agricultural, quarrying, green waste processing, and materials stockpiling. The approximately 325 acres of the project area that were not subjected to 100 percent pedestrian inspection were subjected to less intensive pedestrian and vehicular inspection to confirm the extensive prior ground disturbance and resulting unlikelihood of surviving historic properties within these areas.
Project Historic Preservation Regulatory Context	As a privately funded project on privately owned land, the proposed industrial development is subject to Hawaiʻi state environmental and historic preservation review legislation [Hawaiʻi Revised Statutes (HRS) Chapter 343 and HRS Chapter 6E-42/HAR Chapter 13-284, respectively].
Document Purpose	This investigation was designed to fulfill Hawaiʻi state requirements for an archaeological inventory survey per HAR Chapter 13-276 and Chapter 13-284.

	A companion cultural impact assessment (CIA) study (Souza and Hammatt *in prep.*), prepared to support the project's Hawai‘i state environmental review, per the guidelines of the Hawai‘i State Department of Health's Office of Environmental Quality Control "*Guidelines for Assessing Cultural Impacts*", further evaluates the project's potential impacts to cultural resources. Both documents will support the project's historic preservation consultation effort.
Fieldwork Effort	Matt McDermott, M.A., and Hallett H. Hammatt, Ph.D. conducted initial field inspections of the project area on November 21 and December 7, 2005. Intensive pedestrian survey of relatively undisturbed lands and documentation of historic properties within the project area was completed by Todd Tulchin, B.S. and Bradley Garrett, M.A. on June 19-20, 2006. Fieldwork for the archaeological inventory survey required a total of five person-days to complete.
Number of Historic Properties Identified	Six historic properties were identified within the project's APE. Three historic properties (SIHP # 50-80-12-6679 drainage channel, SIHP # 50-80-12-2888 Barber's Point Harbor Archaeological District, and SIHP # 50-80-12-9714 O. R. & L. right-of-way) were previously identified. Three historic properties (CSH 1, 2, and 3) were newly recorded as part of the current inventory survey investigation.
Historic Properties Recommended Eligible to the Hawai‘i Register of Historic Places (Hawai‘i Register)	1) State Inventory of Historic Properties (SIHP) # 50-80-12-6679, historic plantation-era drainage channel, previously determined Hawai‘i Register-eligible under Criterion D. 2) SIHP # 50-80-12-2888, the Barber's Point Harbor Archaeological District, listed on the National Register. 3) CSH 1, pre-contact stacked stone enclosure, recommended Hawai‘i Register-eligible under Criterion D. 4) CSH 2, pre-contact stacked stone enclosures and mounds, recommended Hawai‘i Register-eligible under Criterion D. 5) CSH 3, numerous sinkhole features within the project area's approximately 6-acre archaeological/paleontological preserve area, recommended Hawai‘i Register eligible under Criterion D, and because of the potential for human burials, Criterion E. 6) SIHP # 50-80-12-9714, the O. R. & L. right-of-way, immediately adjacent to the project area, will be intersected by the project's proposed construction of Hanua Street, currently listed on the National Register of Historic Places (National Register) under Criteria A, B, and C.
Historic Properties Recommended Ineligible to the Hawai‘i Register	None
Project Effect and Mitigation Recommendations	Based on the results of this investigation, the project will affect historic properties currently listed on the National Register as well as historic properties recommended eligible to the Hawai‘i Register. Accordingly, a project-specific effect recommendation of "effect, with agreed upon mitigation commitments" is warranted under HAR Chapter 13-284-7. The following mitigation

	recommendations are proposed to alleviate the project's affect to significant historic properties. SIHP # 50-80-12-6679, historic plantation-era drainage channel: The proposed project will most likely completely remove this feature. No further cultural resource management work is recommended to mitigate this impact, however, because sufficient information regarding this feature has been collected by this investigation and a past investigation of the same feature outside the current project area (Hoffman et al. 2005). CSH 1 and CSH 2 stacked stone prehistoric or early historic enclosures: These features are within or immediately adjacent to a proposed park and passive preservation is recommended. CSH 3 the numerous sinkhole features within the project area's archaeological/ paleontological preserve area: Project proponents intend to avoid this portion of the project area. No impact to the sinkholes is anticipated as a result of the proposed project. For the current project, the preserve area will continue under passive preservation. SIHP # 50-80-12-2888, the Barber's Point Harbor Archaeological District: the portions of the archaeological preserve within the current project area appear to have already been completely disturbed by historic and modern land use. It is likely that the previously documented surface archaeological features within this portion of the project area have been completely removed. Accordingly, the proposed project is not regarded as having an impact on SIHP # 50-80-12-2888. SIHP # 50-80-12-9714, the O. R. & L. right-of-way, located immediately adjacent to the project area: the Kapolei Harborside Center project master plan indicates a northern extension of Hanua Street will cross the O. R. & L. right-of-way. This crossing will likely involve modification of the railroad bed and right away, including modifications to the track and the installation of vehicular traffic crossing signals and/or gates. Similar past road crossings of the O. R. and L. in the vicinity of the current project area have required the development of appropriate mitigation measures among SHPD, the State of Hawaii Department of Transportation (understood as the land owner of the right-of-way), and the Hawaiian Railway Society. It is recommended that appropriate treatment of this National Register-listed historic property include, to the extent possible, preservation in place of existing track and railway ties and installation of necessary crossing features (signals and/or gates) that are in keeping with the railway's historic appearance. It is recommended that a cultural resource mitigation plan be prepared for the project. This should include a preservation plan for CSH 1 through 3 detailing the short and long term preservation measures that will safe-guard these historic properties during project construction and subsequent use of the project area. It should also include the mitigation measures for the proposed intersection of the O. R. and L. right-of-way and Hanua Street.

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Section 1 Introduction

1.1 Project Background

At the request of Group 70 International, Inc., Cultural Surveys Hawai‘i, Inc. (CSH) completed this archaeological inventory survey investigation for the proposed 345-acre Kapolei Harborside Center. The irregularly-shaped project area is located in the Kapolei area of Honouliuli Ahupua‘a, ‘Ewa District, in the southwest corner of the Island of O‘ahu. Generally the project area is located south of the Oahu Land and Railway Company (O.R. & L.) railway alignment, north of Malakole Road, west of Kalaeloa Boulevard, and east of the Barber’s Point Harbor (TMK: [1] 9-1-014: 027, 034, 035, & 9-1-015: 001). This area is depicted on the 1998 ‘Ewa USGS 7.5-minute topographic quadrangle and additional location maps (Figures 1-4).

The approximately 345-acre project area is proposed predominantly for industrial development. Minimally, this development would include grading, foundation excavations, street and utility installation, and landscaping. As a privately funded project on privately owned land, the proposed industrial development is subject to Hawai‘i state environmental and historic preservation review legislation [Hawai‘i Revised Statutes (HRS) Chapter 343 and HRS Chapter 6E-42/ Hawai‘i Administrative Rules (HAR) Chapter 13-284, respectively]. The archaeological inventory survey investigation was designed to fulfill State requirements for an archaeological inventory survey per HAR Chapter 13-276 and Chapter 13-284. CSH completed the fieldwork component of the archaeological inventory survey under SHPD permit Nos. 0508 and 0605, per Hawai‘i Administrative Rules (HAR) Chapter 13-13-282.

For this inventory survey investigation, the project’s area of potential effect (APE) is defined as the entire approximately 345-acre project area. This includes a proposed intersection of the O. R. & L. Railroad with the proposed Hanua Street, along the northern boundary of the project area (refer to Figure 4). The survey area included the entire project APE, however, 100 percent pedestrian inspection was limited to approximately 20 acres, the only portions of the project area that had not been heavily modified by extensive prior ground disturbance related to commercial agricultural, quarrying, green waste processing, and materials stockpiling. The approximately 20 acres that was subjected to 100 percent pedestrian inspection include the geographic areas 1, 9, and 10, as shown on Figure 12 and 13, below. The remaining approximately 325 acres of the project area that were not subjected to 100 percent pedestrian inspection were subjected to less intensive pedestrian and vehicular inspection to confirm the extensive prior ground disturbance and resulting unlikelihood of surviving historic properties within these areas. This past disturbance is clearly visible on project area aerial photographs (refer to Figure 3 and Figure 6, below). This past disturbance is more thoroughly described in Sections 1.3 and 3.1 of this report.

Under Hawai‘i state historic preservation legislation, archaeological inventory surveys are designed to identify, document, and provide significance and mitigation recommendations for historic properties. Under this legislation, historic properties are defined as any “building, structure, object, district, area, or site, including *heiau* and underwater site, which is over fifty years old.” A project’s effect and potential mitigation measures are evaluated based on the

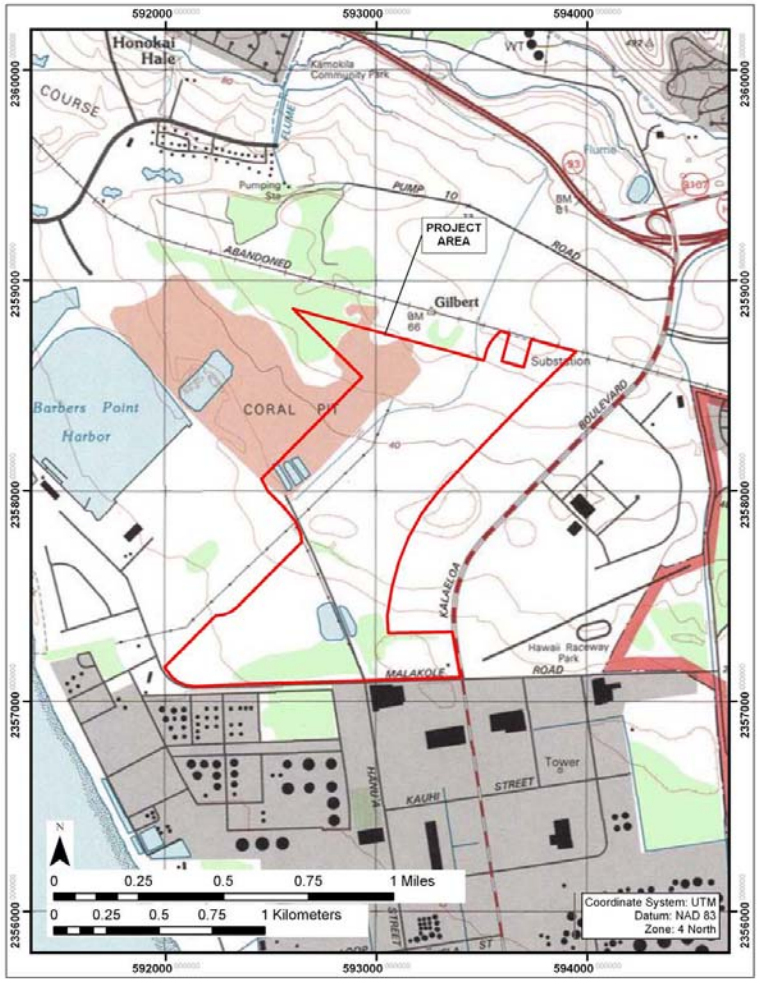

Figure 1. USGS 7.5-minute series topographic map, 'Ewa quadrangle (1998), showing the location of the project area.

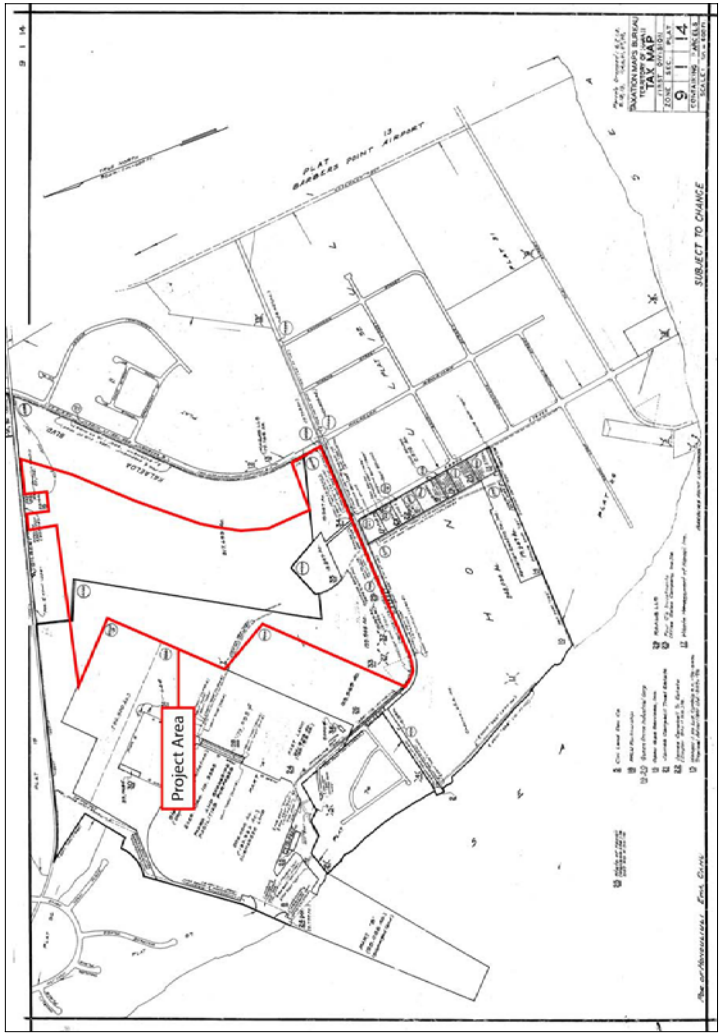

Figure 2. TMK 9-1-14 showing the location of the project area.

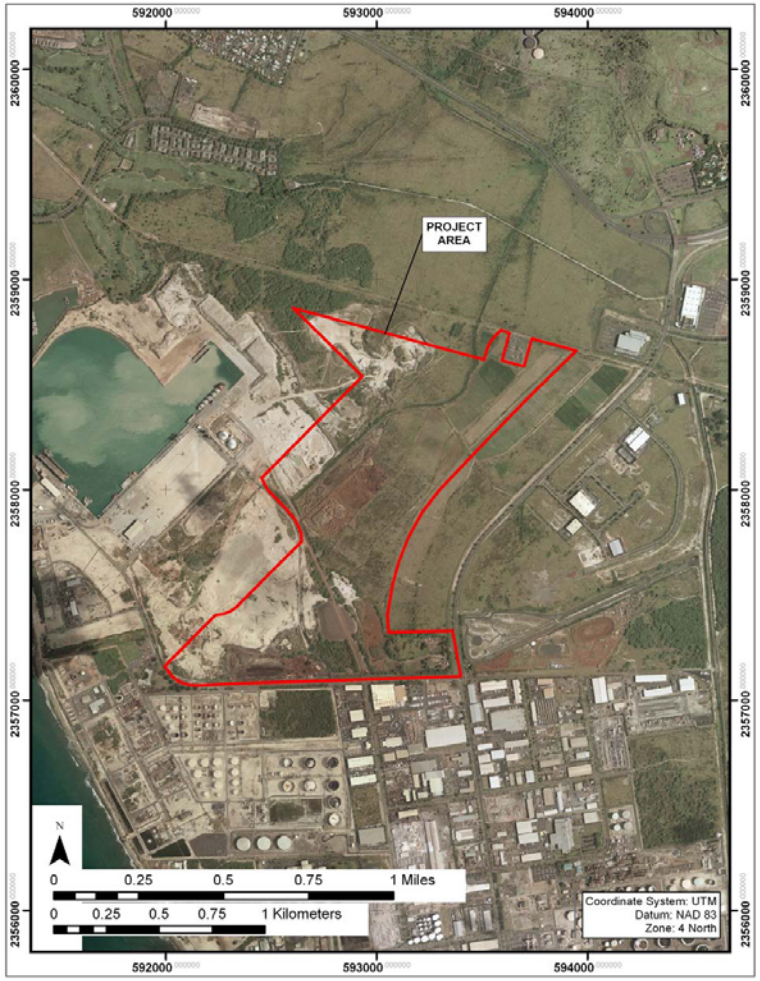

Figure 3. Aerial photograph, showing the location of the project area (source: USGS Orthoimagery 2005).

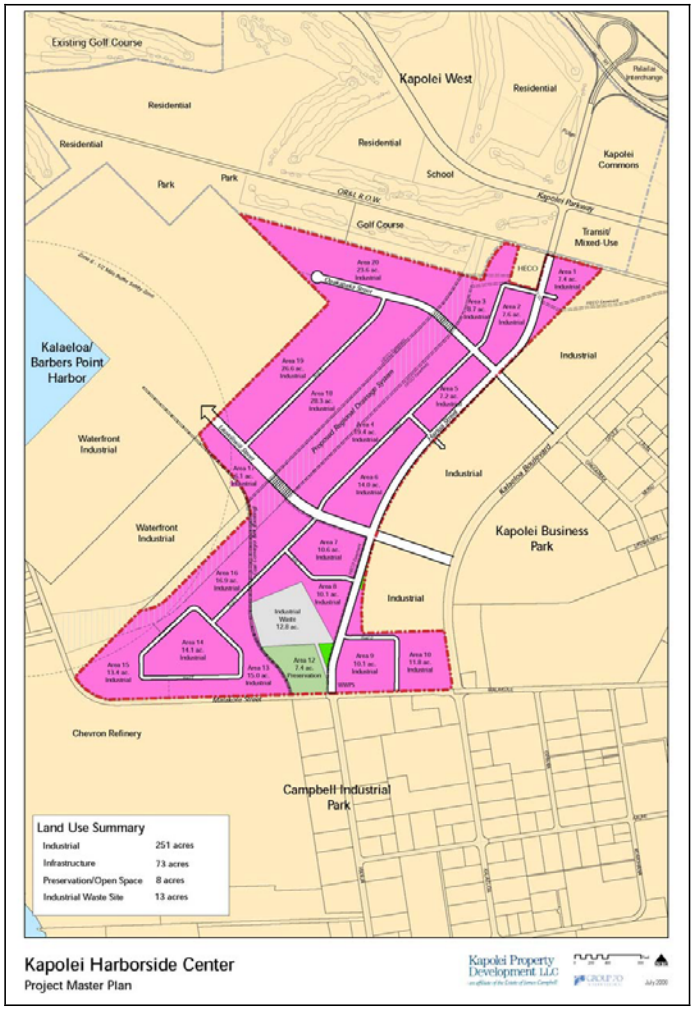

Figure 4. Kapolei Harborside Center project master plan.

project’s potential impact to “significant” historic properties (those historic properties determined eligible, based on established significance criteria, for inclusion in the Hawai‘i Register of Historic Places [Hawai‘i Register]). Determinations of eligibility to the Hawai‘i Register result when a state agency official’s historic property “significance assessment” is approved by the State Historic Preservation Division (SHPD), or when SHPD itself makes an eligibility determination for an historic property (HAR Chapter 13-284).

The archaeological inventory survey report includes a project-specific effect recommendation and mitigation recommendations for the project area’s historic properties that are recommended eligible to the Hawai‘i Register. This document is intended to support project-related historic preservation consultation among state agencies and interested Native Hawaiian and community groups.

A companion cultural impact assessment (CIA) study (Souza and Hammatt 2006), prepared to support the project’s Hawai‘i state environmental review (HRS Chapter 343), per the Hawai‘i State Department of Health’s Office of Environmental Quality Control “*Guidelines for Assessing Cultural Impacts*”, further evaluates the project’s potential impacts to historic properties. Both documents will support the project’s historic preservation consultation effort.

1.2 Scope of Work

The scope of work for this archaeological inventory survey was a little different given the extraordinary extent of previous archaeological study on these lands and the prior obliteration of almost all of the previously documented historic properties by land modifications going back several decades. Following an initial field inspection of current conditions within the project area, it was determined that intensive (100 percent) pedestrian survey within the project area was only necessary within lands observed to be relatively undisturbed. The locations of these areas are described in Section 3: Results of Fieldwork.

The archaeological inventory survey and this report document all extant historic properties within the subject parcel. The following scope of work satisfies State and County requirements for an archaeological inventory survey [per HAR 13-13-276]: The scope of work included:

1. A ground survey of the entire project area for the purpose of site inventory. All sites were located, described, and mapped with evaluation of function, interrelationships, and significance. Documentation included photographs and scale drawings. All sites are to be assigned State Inventory of Historic Properties (SIHP) numbers.
2. Limited subsurface testing was conducted to determine if subsurface deposits were located in archaeological sites of the project area and, if so, to evaluate their significance.
3. Research on historic and archaeological background, including search of historic maps, written records, and Land Commission Award documents. This research focused on the specific area with general background on the *ahupua‘a* and district and emphasizes settlement patterns.
4. Preparation of this inventory survey report including the following:
    a. A topographic map of the survey area showing all archaeological sites and site areas;

    b. Description of all archaeological sites with selected photographs, scale drawings, and discussions of function;
    c. Historical and archaeological background sections summarizing prehistoric and historic land use as they relate to the archaeological features;
    d. A summary of site categories and their significance in an archaeological and historic context;
    e. Recommendations based on all information generated specifying what steps should be taken to mitigate the impact of development on archaeological resources - such as data recovery (excavation) and preservation of specific areas. These recommendations will be developed in consultation with the client and the State Historic Preservation Division.

This scope of work also includes full coordination with the State Historic Preservation Division (SHPD), and County relating to archaeological matters. This coordination takes place after consent of the owner or representatives.

1.3 Environmental Setting

1.3.1 Natural Environment

The project area is located on the ‘Ewa plain, south of the Wai‘anae Mountain Range in the southwest corner of O‘ahu. The terrain is limestone and alluvial deposits, overlying flows of the Wai‘anae volcanic series (Macdonald et al. 1983:423). The project area is generally quite level varying between 10 feet at the southern (*makai*) end of the project area and 70 feet elevation above sea level at the project area’s northern (*mauka*) end.

Lying in the lee of the Wai‘anae mountain range, the project area is one of the driest areas of O‘ahu with most of the area averaging about 18 inches of rainfall annually (Juvik and Juvik 1998:56). In pre-contact Hawai‘i the project area would have been mostly lowland dry shrub and grassland, but this area has been extensively disturbed and transformed by human activity with a variety of exotic grasses, weeds, and shrubs now dominating. These grasses and shrubs, along with pockets of *kiawe* forest, and a few scattered banyan trees are characteristic of the vegetation of the project area.

Based on USGS soil survey data, the project area is largely covered with thin clay soils including a moderately shallow ‘Ewa silty clay loam (EmA and EmB), and Mamala stony silty clay loam (MnC) overlying coral (limestone) outcrop (CR) (Foote et al. 1972) (Figure 5). The surface of the Pleistocene limestone outcrop, where not covered by alluvium or stockpiled material, has characteristic dissolution “pit caves” (Mylroie and Carew 1995), which are nearly universally, but erroneously, referred to as “sink holes” (Halliday 2005). These pit caves, or sinkholes, vary widely in areal extent and depth, with some of the more modest features comparable in volume to five-gallon buckets, while some of the larger features, although usually irregularly shaped, are several meters wide and several meters deep. The clay and silty clay loam deposits that overly the sinkhole-pocked Pleistocene limestone outcrop are likely of historic deposition, resulting from a combination of increased erosion from introduced grazing animals and deliberately induced erosion to augment the portions of the ‘Ewa Plain that were suitable for

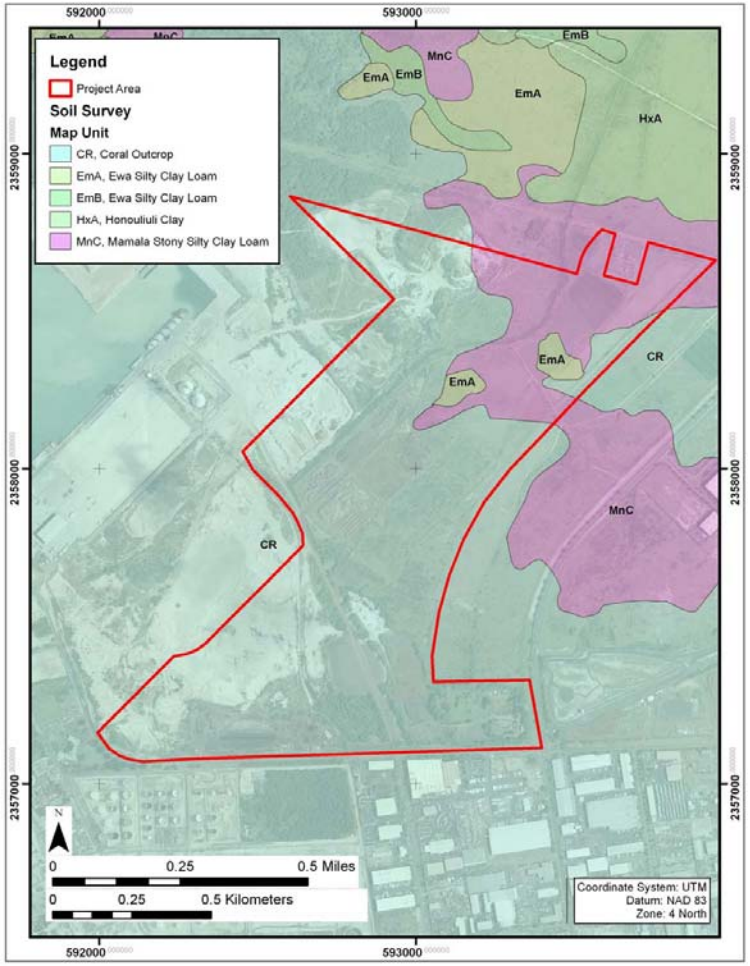

Figure 5. Aerial photograph (source: USGS Orthoimagery 2005) with overlay of USDA Soil Survey (Foote et al. 1972), showing the soil types within the project area.

intensive agriculture. In traditional Hawaiian times, the areas of exposed coral outcrop were undoubtedly more extensive.

1.3.2 Built Environment

The current project area has been drastically altered by historic and modern land use, including intensive sugar cane cultivation, large-scale limestone quarrying operations, quarry material stockpiling, a commercial plant nursery, and green waste processing. Figure 6 is a circa 1980s aerial photograph of the project area showing these areas of past disturbance. The in-use sugar cane fields are visible in the central and northeastern portions of the project area. As mentioned above, in the late 19th and early 20th centuries, arable land in Honouliuli was expanded through a program of sediment relocation from the higher, volcanic, soil-rich slopes of the Wai'anae Range down onto the soil-poor Pleistocene limestone plains of the Kalaeloa area. This was accomplished through plowing and scarification of the terrigenous slopes to increase sediment erosion and transport during heavy rains down onto the adjacent limestone plain. The agricultural lands in the project area likely resulted, at least partially, from this arable land expansion program.

In Figure 6, the extensive quarrying and quarry-stockpiling activity are visible as the white areas along the project area's western side. These quarrying operations are also clearly visible in Figure 3. The extent of this quarrying is greater than it may initially appear as haole koa and other vegetation have covered some quarried material stockpile areas over the decades.

The only portions of the current project area that have not been greatly altered by past land use are the approximately 6-acre archaeological/paleontological preserve of limestone sinkholes, located along the project area's southern boundary, and the northwestern tip of the project area. Both these areas have been moderately affected by *kiawe*-wood cutting activity and minor bulldozing in the past, but they still have the characteristic limestone land surface and *kiawe* thicket vegetation. The preserve area is enclosed within a chain-link fence, and contains scores of limestone sinkholes.

1.4 Methods

1.4.1 Document Review

Background research included a review of previous archaeological studies on file at SHPD/DLNR and a review of documents and maps at the Cultural Surveys Hawai'i library. Individuals knowledgeable about the project area's history and significance regarding traditional cultural practices are being consulted in conjunction with the companion cultural impact assessment for the project (Souza and Hammatt 2006 *in prep*.).

1.4.2 Field Methods

Matt McDermott, M. A., and Hallett H. Hammatt, Ph.D., conducted initial field inspections of the project area on November 21 and December 7, 2005. Intensive pedestrian survey of relatively undisturbed lands and documentation of historic properties within the project area

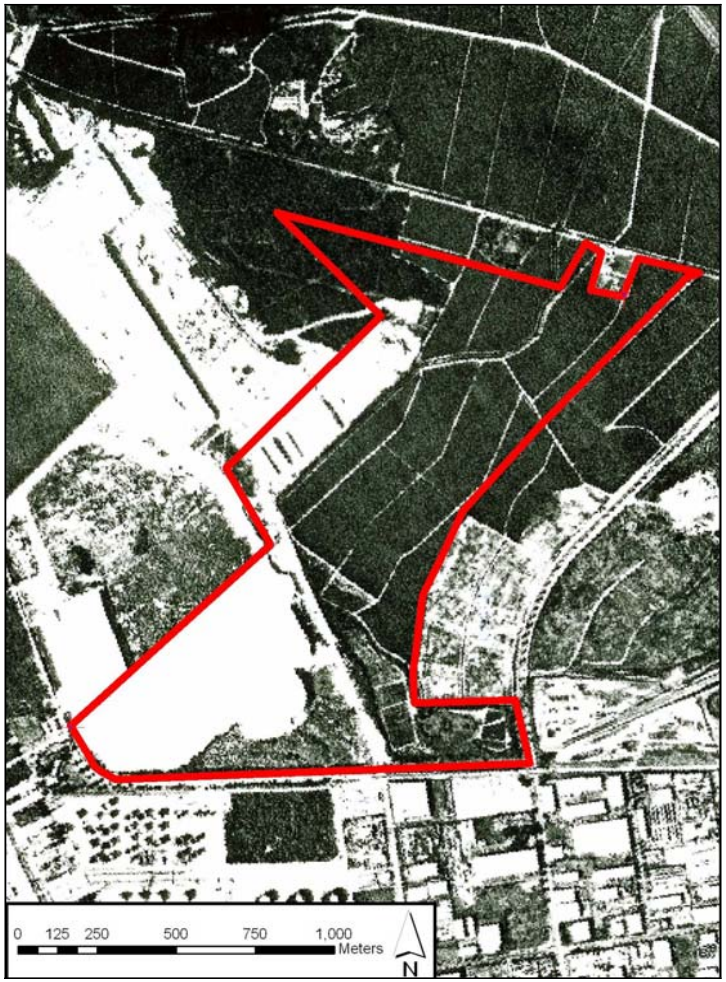

Figure 6. 1980s aerial photograph showing extensive land modification within the project area by historic and modern land use.

was completed by Todd Tulchin, B.S. and Bradley Garrett, M.A. on June 19-20, 2006. Fieldwork for the archaeological inventory survey required a total of five person-days to complete.

The initial field inspection of the project area was accomplished on foot and by vehicle. Inspection coverage was not 100 percent owing to the large stockpile areas, but was sufficient to characterize the extent of prior land use disturbance within different parts of the project area. It was also sufficient to determine the likelihood of previously recorded cultural resources surviving this extensive disturbance.

Lands determined to be relatively undisturbed by the initial filed inspection were subsequently subjected to a 100% coverage pedestrian inspection. The intensive pedestrian inspection was accomplished through systematic sweeps. The interval between the archaeologists was generally 5-10 m. All historic properties encountered were recorded and documented with a written field description, site maps, photographs, and each site was located using Trimble Pro XR GPS survey technology (accuracy +/- 0.5 m). The general locations of sinkhole features within the approximately 6-acre sinkhole preserve area were recorded with a handheld, 12-channel, WAAS-enabled, Garmin GPSMAP 76S unit, which has a usual horizontal accuracy of three to six meters.

Subsurface testing consisted of the partial excavation, by hand, of selected surface archaeological features located during the pedestrian survey. The purpose of the subsurface testing was to aid in determining the function of located surface sites, as well as to possibly obtain datable materials for later radiocarbon dating. All excavated material was sifted through a 1/8 in. wire mesh screen to separate out the soil matrix, then all cultural material was collected for analysis in the lab. Each test excavation was documented with a scale section profile, photographs, and sediment descriptions. Sediment descriptions included characterizations of Munsell color designations, compactness, texture, structure, inclusions, cultural material present, and boundary distinctness and topography.

1.4.3 Laboratory Methods

Laboratory analyses of material recovered from limited subsurface testing within the project area included:

1) Identification of invertebrate midden. Common marine shells were identified and analyzed at the Cultural Surveys Hawai‘i laboratory in Kailua, Hawai‘i.
2) Identification of vertebrate faunal material. All vertebrate faunal material was identified and analyzed at the Cultural Surveys Hawai‘i laboratory in Kailua, Hawai‘i.
3) Identification and cataloguing of traditional Hawaiian artifacts. Any artifacts collected in situ at the project area or contained within sediment samples were measured, weighed and classified by material type and artifact type. The analysis then focused on distinguishing the possible function of the artifact.

1.4.4 Discussion of Cultural Resource Significance

In Hawai‘i cultural recourse management, historic property significance is generally evaluated and expressed as eligibility for listing on the Hawai‘i Register of Historic Places (Hawai‘i Register). To be considered eligible for listing on the Hawai‘i Register, an historic property must possess integrity of location, design, setting, materials, workmanship, feeling, and

association, and meet one or more of the following broad cultural/historic significance criteria: “A” reflects major trends or events in the history of the state or nation; “B” is associated with the lives of persons significant in our past; “C” is an excellent example of a site type/work of a master; “D” has yielded or may be likely to yield information important to prehistory or history; and, “E” has traditional cultural significance to an ethnic group; includes religious structures and/or burials. For this report, historic property integrity and significance were considered based on the guidance provided in National Register Bulletin # 15, “How to Apply the National Register Criteria for Evaluation.”

1.5 Community Consultation

Individuals knowledgeable about the project area’s history were consulted in conjunction with the companion Cultural Impact Assessment for the project area (Souza and Hammatt *in prep.*).

Section 2 Background Research

2.1 Traditional and Historical Background

2.1.1 Mythological and Traditional Accounts and Early Historic Period

Various legends and early historical accounts indicate that the *ahupua‘a* of Honouliuli (Figure 7) was once heavily populated by pre-contact Hawaiians. This substantial settlement is attributable for the most part to the plentiful marine and estuarine resources available at the coast, as well as lowlands fronting the west loch of Pearl Harbor (Kaihuopala‘ai) suitable for wetland taro cultivation. In addition, forest resources along the slopes of the Wai‘anae Range, as suggested by E.S. and E.G. Handy, probably acted as a viable subsistence alternative during times of famine and/or low rainfall.

> The length or depth of the valleys and the gradual slope of the ridges made the inhabited lowlands much more distant from the *‘wao*, or upland jungle, than was the case on the windward coast. Yet the *‘wao* here was more extensive, giving greater opportunity to forage for wild foods during famine time [Handy and Handy 1972:469-470].

John Papa ‘Ī‘ī describes a network of Leeward O‘ahu trails that in later historic times encircled and crossed the Wai‘anae Range, allowing passage from West Loch to the Honouliuli lowlands, past Pu‘u Kapolei and Waimānalo Gulch to the Wai‘anae coast and onward, circumscribing the shoreline of O‘ahu (‘Ī‘ī 1959:96-98). Following ‘Ī‘ī's description, a portion of this trail network would have passed close to the present Farrington Highway alignment.

The Hawaiian *ali‘i* were also attracted to this region. One historical account of particular interest refers to an *ali‘i* residing in Ko‘olina, a kilometer and a half to the northwest of the project area:

> Ko‘olina is in Waimānalo near the boundary of ‘Ewa and Wai‘anae. This was a vacationing place for chief Kākuhihewa and the priest Napuaikamao was the caretaker of the place. Remember reader, this Ko‘olina is not situated in the Waimānalo on the Ko‘olau side of the island but the Waimānalo in ‘Ewa. It is a lovely and delightful place and the chief, Kākuhihewa loved this home of his [*Ke Au Hou* July 13, 1910 in Sterling and Summers 1978:41].

Other early historical accounts of the general region typically refer to the more populated eastern portion of the ‘Ewa district, where missions and schools were established and subsistence resources were perceived to be greater. However, the presence of archaeological sites along the barren coral plains and coast of southwest Honouliuli Ahupua‘a indicate that pre-contact and early post-contact populations also adapted to less inviting areas, despite the environmental hardships.

Barber’s Point is named after Captain Henry Barber, whose ship ran aground on October 31, 1796. Subsequent to western contact in the area, the landscape of the ‘Ewa plains and Wai‘anae slopes was adversely affected by the over-harvesting of the sandalwood forest, and particularly by the introduction of domesticated animals and exotic plant species. Domesticated animals

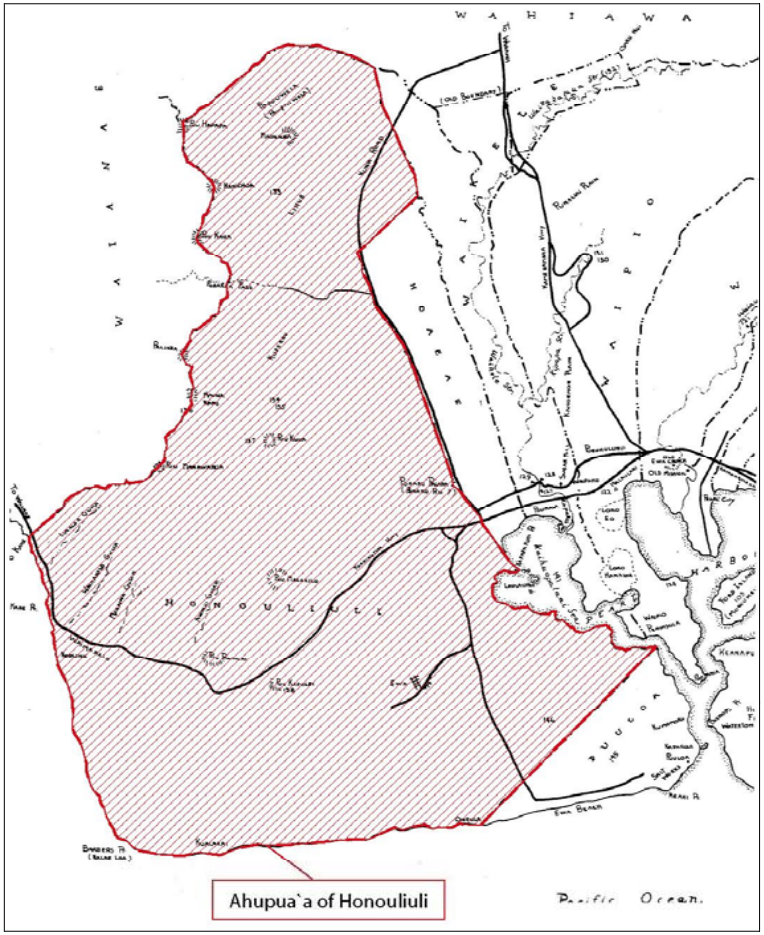

Figure 7. Map showing location of Honouliuli Ahupua‘a in west O‘ahu (adapted from Sterling and Summers 1978)

including goats, sheep and cattle were brought to the Hawaiian Islands by Capt. George Vancouver in the early 1790s, and were allowed to graze freely about the land for some time after. L.A. Henke reports the existence of a longhorn cattle ranch in Wai‘anae by circa 1840 (in Frierson 1972:10).

During this same time, perhaps as early as 1790, exotic plant species were introduced to and flourished in the area. The following dates of specific vegetation introduced to Hawai‘i are given by R. Smith and outlined by Frierson (1972:10-11):

1) “early”, c. 1790: Prickly pear cactus (*Opuntia tuna)*; *Haole koa* (*Leucaena glauca)*; Guava (*Psidium guajava)*

2) 1835-1840: Burmuda [sic] grass (*Cynodon dactylon);* Wire grass (*Eleusine indica)*

3) 1858: Lantana (*Lantana camara)*

The *kiawe* tree was also introduced during this period, either in 1828 or 1837 [Frierson 1972:11].

2.1.2 Mid- to late-1800s

Following the Māhele of 1848, 99 individual land claims in the *ahupua‘a* of Honouliuli were registered and awarded by King Kamehameha III. The present study area appears to have been included in the largest award (Royal Patent 6071, LCA 11216, *‘Āpana* 8) granted in Honouliuli Ahupua‘a to Miriam Ke‘ahi-Kuni Kekau‘ōnohi on January 1848 (Native Register). Kekau‘ōnohi acquired a deed to all unclaimed land within the *ahupua‘a*, totaling 43,250 acres.

Kekau‘ōnohi was one of Liholiho’s (Kamehameha II’s) wives, and after his death, she lived with her half-brother, Luanu‘u Kahala‘i‘a, who was governor of Kaua‘i. Subsequently, Kekau‘ōnohi ran away with Queen Ka‘ahumanu’s stepson, Keli‘i-ahonui, and then became the wife of Chief Levi Ha‘alelea. Upon her death on June 2, 1851, all her property was passed on to her husband and his heirs. When Levi Ha‘alelea died, the property went to his surviving wife, who in turn leased it to James Dowsett and John Meek in 1871 for stock running and grazing.

In 1877, James Campbell purchased most of Honouliuli Ahupua‘a -including the current project area- for a total of $95,000. He then drove off 32,347 head of cattle belonging to Dowsett, Meek and James Robinson and constructed a fence around the outer boundary of his property (Bordner and Silva 1983:C-12). By 1881, the Campbell property of Honouliuli prospered as a cattle ranch with “abundant pasturage of various kinds” (Briggs in Haun and Kelly 1984:45).

In 1889, Campbell leased his property to Benjamin Dillingham, who subsequently formed the O‘ahu Railway and Land Company (O.R. & L.) as the result of a franchise granted by King Kalākaua in 1886. In 1889, Dillingham opened the first nine miles of narrow gauge track on the King’s birthday. To attract business to his new railroad system, Dillingham subleased all land below 200 feet to William Castle who in turn sublet the area to the Ewa Plantation Company for sugar cane cultivation (Frierson 1972:15).

Ewa Plantation Co. grew quickly and continued in full operation up into modern times. As a means to generate soil deposition on the coral plain and increase arable land in the lowlands, the Ewa Plantation Co. installed ditches running from the lower slopes of the mountain range to the

lowlands and then plowed the slopes vertically just before the rainy season to induce erosion (Frierson 1972:17).

2.1.3 1900s

Twentieth century land use in the vicinity of the project area included transportation along the former O.R. & L. alignment. Passenger totals on the O.R. & L. line increased throughout the first half of the twentieth century. In 1908, a total of 446,318 people rode on the line. This total rose to approximately 1,200,000 by 1922 and 1943 saw an all time high of 2,642,516 passengers. Throughout WWII, the rail way served a critical function in moving both personnel and equipment.

The development of a better road system and more cars on the island began to cut into passenger totals on the O.R. & L. According to the National Register of Historic Places Inventory forms on file at SHPD/DLNR, on December 12, 1947, all operations outside of Honolulu were ceased. In 1950, the U.S. Navy purchased the track and right-of-way from Pearl Harbor to the Naval Ammunition Depot (NAD) access road in Nānākuli for $1.00 in the name of “National Defense”. The NAD maintained this 25.5-mile stretch of track until the early 1950s when a 6.5-mile stretch from Pearl Harbor to Waipahu was ceded to the state of Hawai‘i. A further 6 miles was reverted to the state in 1954 after a heavy flood. The final 13-mile stretch was in use until 1968, when it too was ceded to the state in 1980.

The 1922 Fire Control Map (Figure 8) shows a road and architectural features in the area of the Gilbert Station understood as the site of a very small Gilbert Camp associated with the railway and ‘Ewa Plantation. These features also appear, though less extensive, in the 1928 U.S. Geological Survey map (Figure 9). A 1943 war department map (Figure 10) shows the same features and indicates that only a small part of the northeast portion of the project area (light shading) may have been under cultivation at that time. None of these three maps shows any further development within the area of present concern.

Cultural Surveys Hawai‘i Job Code: HONO 69 Background Research

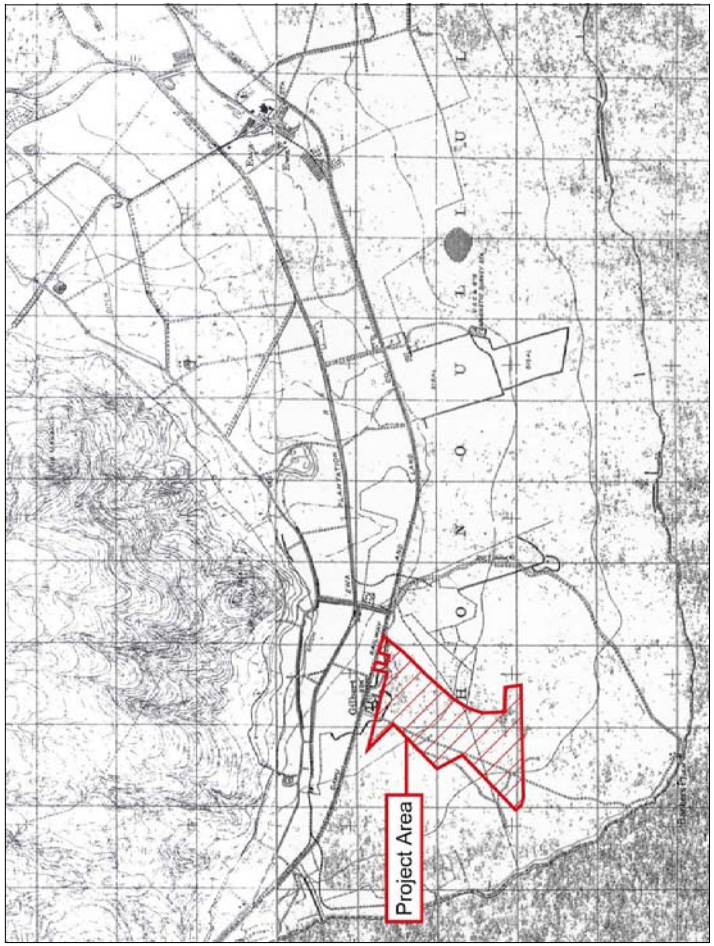

Figure 8. 1922 fire control map showing the location of the project area.

Archaeological Inventory Survey for the Kapolei Harborside Center Page 17
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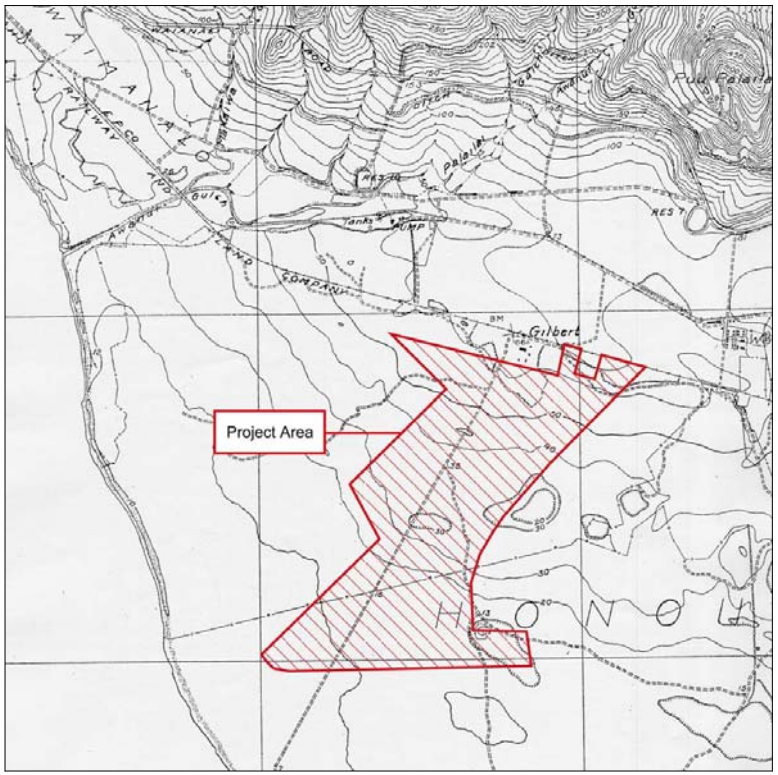


Figure 9. 1928 USGS Topographic Map, 'Ewa Quadrangle, showing the location of the project area.

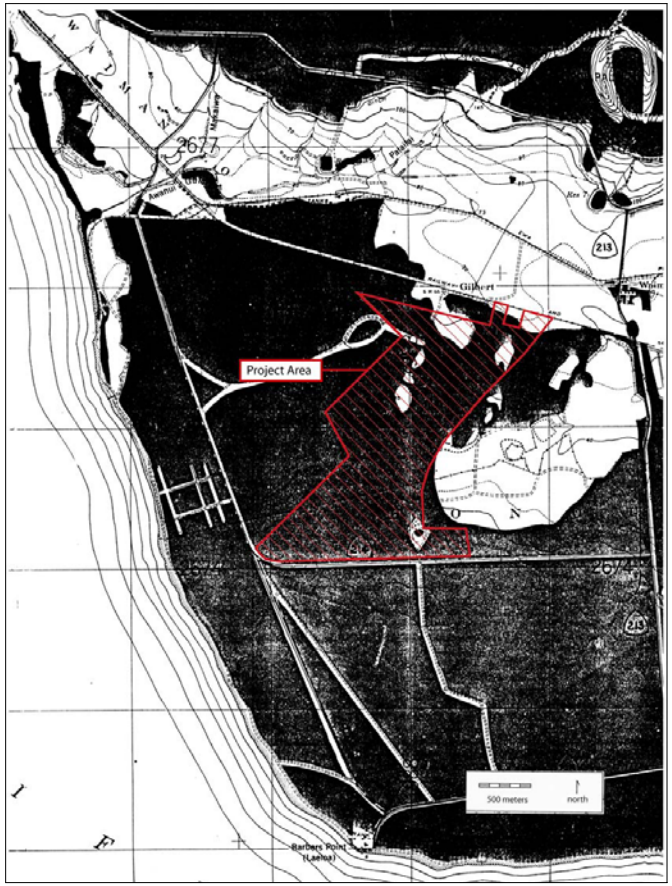


Figure 10. 1943 War Department map showing the location of the project area.

2.2 Review of Past Archaeological / Paleontological Studies

2.2.1 Overview of Archaeological Studies in Western Honouliuli

An overview of archaeological studies in the west half of Honouliuli Ahupua‘a is presented in Table 1 and Figure 11. A discussion of archaeological findings germane to the present project area follows.

Table 1. Archaeological and Related Studies in Western Honouliuli Ahupua‘a

Reference	Nature of Study	General Location of Study
Thrum 1907	*Heiau* study	Hawaiian Islands
McAllister 1933	All island survey	O‘ahu Island
Kikuchi 1959	Site letter report	Barbers Point
Lewis 1970	Reconnaissance survey	Barbers Point (harbor area)
Frierson 1972	Study of land use & vegetation change	Honouliuli
Barrera 1975	Reconnaissance survey	Barbers Point (harbor area)
Clark and Connolly 1975	Reconnaissance survey	Barbers Point (harbor area)
Oshima 1975	Reconnaissance survey	Barbers Point
Sinoto 1976	Cultural resources survey	Barbers Point (harbor area)
Bordner 1977	Reconnaissance survey	Kalo‘i Gulch
Davis 1978	Scholarly paper	Barbers Point (harbor area)
Davis and Griffin 1978	Archaeological Survey	Barbers Point (harbor area)
Hawai‘i Marine Research Inc. 1978	Geoarchaeological reconnaissance	Barbers Point (harbor area)
Kirch 1978	Land snail study	Barbers Point (harbor area)
Sinoto 1978	Archaeological & Paleontological salvage	Barbers Point (harbor area)
Barrera 1979	Archaeological Survey	West Beach
Clark 1979	Reconnaissance survey	Barbers Point (harbor area)
Cleghorn 1979	Reconnaissance survey	Barbers Point
Davis 1979a	Emergency excavations	Barbers Point (harbor area)
Davis 1979b	Emergency excavations	Barbers Point (harbor area)
Davis 1979c	Emergency excavations	Barbers Point (harbor area)
Komori and Dye 1979	Archaeological testing	West Beach
Sinoto 1979	Cultural resources survey	Barbers Point (harbor area)
Davis 1980	Research design	Barbers Point
Kirch and Christensen 1980	Land snail study	Barbers Point (harbor area)
Christensen and Kirch 1981	Land snail study	Barbers Point (harbor area)
Hammatt and Folk 1981	Archaeological and Paleontological Investigation	Barbers Point (harbor area)
Davis 1982	Academic paper	Barbers Point
McCoy et al. 1982	Proposal for investigations	Barbers Point (harbor area)

Reference	Nature of Study	General Location of Study
Neller 1982	Scholarly study	Barbers Point
Olson 1982	Fossil avifauna study	Barbers Point
Ahlo and Homon 1983	Reconnaissance survey	Barbers Point (harbor area)
Bordner and Silva 1983	Reconnaissance survey	Waimānalo Gulch
Ahlo and Homon 1984	Test excavations	Barbers Point (harbor area)
Barrera 1984	Archaeological Status Report	West Beach
Hammatt 1984	Reconnaissance survey	Kahe Point
Haun and Kelly 1984	Research resign	Naval Air Station
Tuggle 1984	Survey report	Naval Air Station
Neller 1985	Review and evaluation	West Beach
Barrera 1986	Archaeological Investigations	West Beach
Davis and Haun 1986	Intensive survey and test excavations	West Beach
Davis et al. 1986 a and b	Research design	West Beach
Haun 1986a	Reconnaissance survey	Kapolei Town
Haun 1986b	Reconnaissance survey	Kapolei Town
Davis and Haun 1987 a and b	Intensive survey & test excavations	West Beach
Rosendahl 1987a	Reconnaissance survey	Kapolei Town
Rosendahl 1987b	Survey report	Kapolei Town
Welch 1987	Reconnaissance survey	Naval Air Station
Bath 1989a	Petroglyph study	Waimānalo Gulch
Bath 1989b	Burial documentation	Kahe
Burgett and Rosendahl 1989	Subsurface archaeological testing	North of O.R.&L.
Hammatt and Shideler 1989a	Archaeological assessment	Barbers Point (harbor area)
Hammatt and Shideler 1989b	Reconnaissance survey	Kahe
Sinoto 1989	Letter report	Barbers Point
Carlson and Rosendahl 1990	Inventory survey	Kaomi Loop Subdivision
Cleghorn and Davis 1990	Archaeological and paleontological investigation	Barbers Point (harbor area)
Davis 1990b	Archaeological and paleontological investigation	Barbers Point (HECO area)
Davis 1990a	Archaeological and paleontological study (Ph.D. dissertation)	Barbers Point (harbor area)
Rosendahl 1990	Letter report	Kapolei Town
Kennedy 1991	Subsurface testing	Pu‘u o Kapolei
Folk 1991	Archaeological reconnaissance	Drainage channel
Hammatt et al. 1991	Inventory survey	Makaīwa Hills
Hammatt and Shideler 1991	Archaeological assessment	Barbers Point (harbor area)
Haun et al. 1991	Survey report	Naval Air Station

Reference	Nature of Study	General Location of Study
Burgett and Rosendahl 1992	Inventory survey	Barbers Point (harbor area)
Hammatt and Folk 1992	Subsurface testing	Barbers Point (drainage beach berm)
Glidden et al. 1993	Data recovery excavations	Paradise Cove
Jones 1993	Fossil coral reefs study (Ph.D. dissertation)	Hawaiian Islands
Landrum 1993	Reconnaissance and subsurface testing	Naval Air Station
Miller 1993	Data recovery	Barbers Point (harbor area)
Hammatt and Shideler 1994	Archaeological assessment	Barbers Point (harbor area)
Hammatt et al. 1994	Inventory survey	Barbers Point (harbor area)
Davis 1993	Archaeological and paleontological investigation	Barbers Point (harbor area)
Erkelens 1992	Archaeological survey	Naval Air Station
Hammatt and Shideler 1995	Data recovery plan	Barbers Point (harbor area)
Jourdane 1995	Burial documentation	Paradise Cove
O'Hare et al. 1996	Intensive survey and testing	Naval Air Station
Athens et al. 1997	Cultural resource inventory, paleoenvironmental investigation	'Ewa Plain:Naval Air Station
Tuggle 1997a	Cultural resource inventory	Naval Air Station
Tuggle 1997b	Synthesis	'Ewa Plain
Tuggle and Tomonari-Tuggle 1997	Cultural resource inventory survey	Naval Air Station
Wickler and Tuggle 1997	Cultural resource inventory, Inventory Survey	Naval Air Station
Wulzen and Rosendahl 1997	Subsurface testing & data recovery	Naval Air Station
McDermott et al. 2000	Data recovery	Barbers Point (harbor area)
Cordy and Hammatt 2003	Archaeological assessment	Barbers Point, North of O.R.&L.
O'Hare et al. 2004	Documentation of Plantation Infrastructure	North of O.R.&L.
Terry et al. 2004	Archaeological Inventory Survey of Two Sinkholes	North of O.R.&L.
Hoffman et al. 2005	Archaeological Inventory Survey	South of O.R.&L.

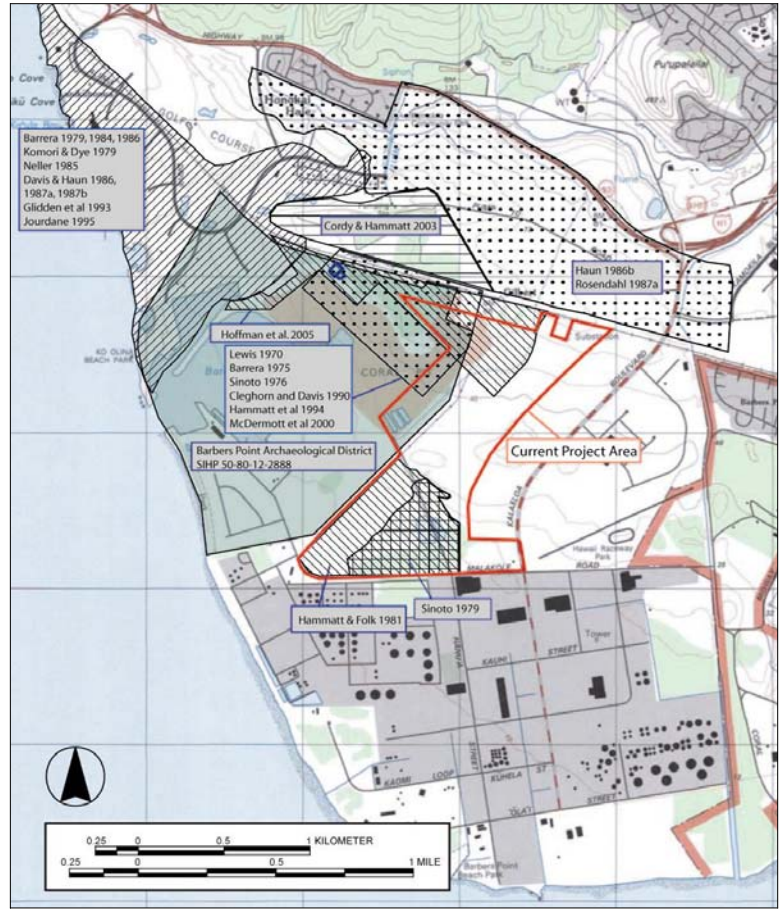


Figure 11. USGS 7.5-minute series topographic map, 'Ewa quadrangle (1998), showing general areas of archaeological study in the vicinity of the project area

The first effort to record archaeological sites in Honouliuli was by Thrum (1907:46), who references "a *heiau* on Kapolei hill, 'Ewa - size and class unknown. Its walls thrown down for fencing." The former *heiau* was on Pu'u Kapolei, 3 kilometers northeast of the present study area.

In his 1930 surface survey of the island of O'ahu, archaeologist J. Gilbert McAllister recorded the specific locations of important archaeological and cultural sites, and the general locations of some sites of lesser importance. McAllister (1933:107-108) recorded seven specific sites at Honouliuli (numbered 133-139) and these became the first seven sites in the Bishop Museum's Site Numbering System (OA-B6-1 through OA-B6-7). The nearest of these specific sites to the present project area is McAllister Site 138, including the Pu'u Kapolei *heiau* and an adjacent rock shelter. McAllister (1933:109), however designated his Site 146 to include archaeological features covering a large but poorly defined area along the coast. His impressions of Site 146 are recorded as follows:

> 'Ewa coral plains, throughout which are remains of many sites. The great extent of old stone walls, particularly near the Pu'uloa Salt Works belongs to the ranching period of about 75 years ago [c. 1850s]. It is probable that the Hawaiians formerly used the holes and pits in the coral. Frequently the soil on the floor of larger pits was used for cultivation, and even today one comes upon bananas and Hawaiian sugar cane still growing in them. They afford shelter and protection, but I doubt if previous to the time of Cook there was ever a large population here.

These archaeological sites of the 'Ewa coral plains would be the subject of some 40 or so archaeological reports in the 1970s and 1980s.

From the period between McAllister's 1930 study and the flurry of work that began in 1969, there are only a few sporadic pieces of poorly documented research. "In 1933, Dr. Kenneth P. Emory examined a well-preserved house site and a possible *heiau* in the western part of the coral plain; these sites were later destroyed by sugar-cane planting" (Sinoto 1976:1). In 1959, William Kikuchi removed a number of burials from a burial cave site (Bishop Museum Site OA-B6-10) at the Standard Oil Refinery, which was subsequently destroyed (Barrera 1975:1). Kikuchi recovered 12-16 incomplete primary and/or secondary burials cached in a sinkhole or crevice exposed during construction activities near the big bend in Malakole Road at the southwest corner of the present project area (Kikuchi 1959; Davis 1990:146, 147). In 1960, Yoshi Sinoto and Elspeth Sterling made note of a house site (Bishop Museum Site OA-B6-8). "In 1962, Lloyd Soehren recorded another secondary human burial in a sinkhole at the Barber's Point Naval Air Station" (Davis 1990a:147). In 1966 (per Sinoto 1960), Lloyd Soehren "carried out salvage excavations at BPBM Site # 50-OA-B6-13 (a possible fishing shrine.)" The site was reported as destroyed by construction (Barrera 1975:1) but Davis (1990a:148) relocated the shrine and performed additional excavations in 1982. In 1969, artifacts were recovered by Roger Green from a beach midden site (B6-14), south of the barge harbor.

These reports of a number of sites resulted in a number of visits by Dr. Sinoto and student volunteers in late 1969 and early 1970. A University of Hawaii graduate student, Ernest Lewis did a preliminary survey and test excavations for a graduate seminar in Polynesian Archaeology and donated his report to the Bishop Museum. Lewis was the first to document sites within the present project area.

As Barrera (1975:3) points out there are "a number of discrepancies and inconsistencies" in Lewis' report. "For example, some sites mentioned in the [Lewis] text are not indicated on any of his maps, and some sites shown on his maps are not discussed in the report" (Barrera 1975:3). However, taken for what it professes to be: "a preliminary report of a preliminary survey" (Lewis 1970:3), the survey is useful. Lewis provides a good summary of historical accounts (pages 4-18) and early maps of the region and a summary of significant aspects of the geography and geology of the study area. Lewis also provided an extensive bibliography suggesting directions for further historical research.

Lewis conducted a surface survey that located some 22 archaeological sites of the types that are typical for the Kalaeloa region, including various types of enclosures and mounds, as well as walls, made of the locally available stacked limestone cobbles and boulders. Lewis' site map indicates that four of these sites existed within the current project area (Lewis 1970: Fig. 21). Three that would have been in the southeast corner of the present project lands by a former pond were interpreted as house sites (Bishop Museum site #s B6-15, 16, and 17). The fourth (Bishop Museum site # B6-36) was comprised of two stonewalls 30 m apart that extended in an east-west direction for 400 m near the northwest corner of the present project lands.

In 1975, William Barrera of the Bishop Museum, under contract with the U.S. Army Corps of Engineers (USACE), conducted an archaeological reconnaissance survey for the proposed Barber's Point Harbor. Barrera located 24 sites of which two are believed to have been located within the current project area: a 15 m long wall (T-10). and another wall section (not designated) described as to the west of the site B6-36 parallel walls. Both of these walls appear to have been in the northwest corner of the present project lands.

The USACE continued the archaeological research in 1976 by requesting another survey (Sinoto 1976) of the cultural remains in the area previously surveyed in 1970 (Lewis) and 1975 (Barrera). Sinoto designated four survey areas (A, B, C, and D) but only a small portion of Area D lies within the current project area. Sinoto's work included mapping of 68 new archaeological sites and more complete mapping of 30 previously recorded sites. In the course of this research, two excavations were conducted in the large, presently fenced, sinkhole Site 9545, located west of the current project area. This large sinkhole yielded archaeological remains and a radiocarbon date from a hearth feature, as well as bones of extinct bird species. Aki Sinoto considered his 1976 work a reconnaissance survey and recommended an inventory level survey with location and plan mapping in addition to test excavation and mapping of any areas in which sites may remain extant.

An important aspect of this first research (1976) by Sinoto was the identification of the presence of numerous avifaunal skeletal remains within limestone sinkholes, which led to the contacting of Storrs Olson, Associate Curator of Birds at the Smithsonian Institution. After a field inspection of sites in the vicinity of the project area and a brief review of the recovered material he knew that many extinct endemic species, new species, and even new genera were present. Olson stated that:

> The various limestone sinks...contain probably the most extensive fossil avifauna in Hawaii with many new species endemic to the island. Such fossils have not and probably cannot be found anywhere else on the island. Furthermore, the nature of preservation is such as to insure that virtually complete skeletons can probably be assembled for most species. Thus, there is much highly significant and totally new

> biological and paleontological information that can be obtained at the Barbers Point site.
>
> Destruction of any of the potential fossil sinks would result in the loss of many specimens, some possibly unique, since one sinkhole might contain species absent in another. Also, the fauna of one sinkhole might not be coetaneous with that of another, the age of a deposit being determined by when a sinkhole first formed. Therefore, an investigation of the fauna of different sinks might show changes in species composition and changes in morphology within a species through time. Finally, it would also be desirable to retain some sinks intact as fossil "banks" should some new technique or different information be desired in the future. The fossil deposits at Barbers Point are a unique and irreplaceable resource. (Olson in Sinoto, 1976:74)

In 1980, Storrs Olson extended the test pit of Aki Sinoto in the large sinkhole site # 9545 and conducted extensive excavation of this area in 1981 (Olson, 1982:27).

In 1977, Aki Sinoto (1978) undertook salvage archaeological and paleontological excavations in the proposed barge harbor area (in Areas A and E). These investigations were just west and south (outside) of the proposed Barber's Point Harbor Expansion Area. Sinoto's work for the Corps of Engineers (1978) included preliminary sampling and analytical studies of avifaunal remains and terrestrial gastropods (land snails) and a geological study of the emerged coral reef based on the excavation of one sinkhole.

In late 1977 and early 1978, archaeological survey was conducted by the Archaeological Research Center of Hawaii in the deep draft port facility area. This research (Davis and Griffin, 1978) included within its Survey Zone 1 a number of sites within or just to the west of the southwest portion of the present project lands. As is often the case with the early Barber’s Point studies ascertaining the true location of sites is remarkably problematic.

In 1977, Barber’s Point Archaeological District was assigned Site # 50-80-12-2888 and listed on the National Register of Historic Places, based on the SHPD’s Hawai‘i/National Register web site (http://www.hawaii.gov/dlnr/hpd/hpgreeting.htm). A portion of this district overlaps with the current project area (see Figure 11).

To complete the archaeological survey of the entire area to be affected by the harbor and support facilities, the USACE contracted for survey of the areas designated as Optional Area 1 and Study Area 1a (Davis, 1978) and Area 1b (Sinoto 1978) located in the southwest portion of the present study area. Those surveys by Davis and Sinoto located numerous archaeological sites, as well as sinks of late Pleistocene to early Holocene age that are of considerable paleontological interest.

Sinoto's (1979) work shows that, although sinks containing remains of extinct species are dispersed throughout his study area, only 3 out of 19 sinks tested (or 16%) contained extinct species. However, this amounts to a considerable number of sinks as Sinoto estimated the total number of testable sinks in the 1979 study area as between 1,100 and 2,500 (Sinoto, 1979:34). The majority of Sinoto's New Disposal Site Area has been utilized for chemical dumps and coral stockpiling. That portion which remains is the site of the proposed Sinkhole Reserve and Park, comprising approximately 6 acres of the southern portion of the current project area.

In 1979, Bertell Davis carried out "emergency excavations" (Davis, 1979; a, b, c,) within the area he had previously designated as Area II, located east of the easternmost corner (the *mauka*, Diamond Head corner) of the present harbor open water. These excavations were carried out in advance of the quarry expansion operation (which preceded the harbor expansion) and it is believed that all sites in this area were salvaged or lost. This work was conducted a kilometer to the west of the current project area.

Also in 1979, an archaeological reconnaissance survey of a proposed waterline route down the east side of Kalaeloa Blvd. and then east along the north side of Malakole Road. "No archaeological sites were found along the proposed waterline route." and it was noted that "this area is either presently in sugar cane cultivation or has been used for this purpose in the past" (Cleghorn 1979:5).

Hammatt and Folk (1981) undertook archaeological testing and salvage excavations in three adjoining parcels designated Study Areas 1A, 1B and Optional Area. Of 138 archaeological sites, 88 sites were tested and 26 were excavated. Associated paleontological studies show that the limestone solution sinks and surrounding terrain were a major habitat of many fossil birds. Appendix 1 of their report, by Storrs Olson and Helen James, lists over 30 species of extinct fossil birds identified at Barber's Point. A total of ten new archaeological sites were identified. All of these Hammatt and Folk sites were located within the southwest corner of the current study area.

The most voluminous study (Cleghorn and Davis 1990) started in 1982 and concentrated in the area just northeast of the main bend of Malakole Road. Many of these sites were within the southwest and south central portion of the present project lands and many were outside just to the northwest.. A "final draft" (Davis 1993) report documents that research as does Dr. Bertell Davis’ Ph.D. dissertation (1990).

Lynn Miller (1993) produced a report on her findings in a 31-acre parcel located just to the southeast of the present Deep Draft Harbor. Her research covers some 20 features at two state sites (2710 and 2711) that included enclosures, sinkhole caves, and a single burial.

The extensive archaeological and paleontological research conducted prior to development of West Beach (Ko‘olina) to the west of the current project area is certainly relevant to the work accomplished within the project area. It is the second area of the ‘Ewa Plain in which major data recovery was accomplished. Barrera (1979, 1984, 1986) conducted preliminary surveys and Davis (1986) undertook intensive survey and data recovery. Over 600 sinkholes were identified in the area along with around 180 surface sites, many of them similar in function to those at Barber's Point.

In 1985, Haun reported on a survey of the Naval Air Station at Barber's Point (Haun 1985) which lies along the coast to the southeast of the present project lands.

In 1991, Hammatt et al. conducted an archaeological inventory survey on a 1,915-acre Makaīwa Hills project area located 1.5 km to the north, *mauka* of Farrington Highway, identifying 34 sites.

Haun’s (1986) archaeological reconnaissance survey for the ‘Ewa Town Center/Secondary Urban Center study covered an area of approximately 1,400 acres north of the present project

area. A study by Burgett and Rosendahl (1989) involved the excavation of seventy-two backhoe test trenches in a 360-acre portion of the Haun study area. There were no significant finds.

A preliminary reconnaissance survey conducted by Haun (1986a) covered approximately 200 acres on the *mauka* side of Farrington Highway. Only one site was identified, an irrigation ditch that extended from the northwestern edge of his project area to a quarry at the northeastern edge. The ditch was described as "constructed of concrete and stone. Elevated flumes constructed of timbers and galvanized steel bridge the gulches" (Haun 1986a:3). This site was later designated SIHP 50-80-12-4341.

Haun's (1986b) preliminary reconnaissance survey of a 1,400-acre parcel was conducted on both the *mauka* and *makai* side of Farrington Highway, and surrounded the 200-acre parcel surveyed in earlier in 1986. One previously recorded site was known to have once been in the project area, a portion of the Oahu Railroad and Land Company right-of-way (Site 50-80-12-9714). One portion of Haun's project area *makai* of Farrington Highway is adjacent on the *mauka* side of the OR&L right-of-way to the northeast corner of the current study area (Figure 10). Haun's (1986b) project area also extended up the eastern slope of Pu'u Pālailai (this is not shown on Figure 10). The additional sites Haun (1986b) identified included an irrigation ditch (a portion of the same site –4341 identified during the 200-acre survey), a military structure, and a rock wall that paralleled the irrigation ditch.

Between 1989 and 1994 Hammatt and Shideler produced a number of archaeological assessments of the Barber's Point area. An archaeological assessment was conducted of the entire current project area (Hammatt and Shideler 1989). A detailed discussion of the creation of the preserve area that is centrally located along the southern edge of the current project area is included in the report (Hammatt and Shideler 1989:33-36). At the time the authors stated:

> We agree whole-heartedly with the principle of such a sinkhole park and reserve. The scientific merit of the proposition is very high. (Hammatt and Shideler 1989: 23).
>
> The authors of this report are of the opinion that there are no other areas of the 'Ewa Plain where sinkholes containing fossil bird bones survive in accessible locations… We favor the use of the 8-acre Malakole area as an educational/ scientific reserve. (Hammatt and Shideler 1989: 34).

To the west of the project area, Paradise Cove, Lanikūhonua, and West Beach have been the subject of numerous archaeological studies (Barrera 1979, 1984, 1986; Komori & Dye 1979; Neller 1985; Davis & Haun 1986, 1987; Glidden et al. 1993; and Jourdane 1995).

To the west of the current project area Hammatt et al. (1994) and McDermott et al. (2000) conducted an archaeological inventory survey and a large archaeological data recovery project respectively. This work resulted in the creation of two archaeological preserve areas. SIHP site 50-80-12-9633 is a cave that was found to contain human remains and part of a wooden canoe (Hammatt et al. 1994:93-94). Because of its function as a burial site, the cave was not excavated and the remains were protected in the state in which they were discovered. Just east of that fenced preserve is another smaller preserve area surrounding the very large sinkhole SIHP site 50-80-12-9545.

Cordy and Hammatt (2003) made a study of a land parcel north of the current project area, across the O.R.&L. Several sinkholes were noted as of potential archaeological interest. The study also documented the presence of a historic chicken farm as well as other twentieth century architectural remains, including a Quonset hut. Two follow-up studies of plantation infrastructure (O'Hare et al. 2004) and two of these sinkholes (Terry et al. 2004) further addressed cultural resources north across the O.R.&L. alignment from the present study area.

Most recently, Hoffman (et al. 2005) identified several archaeological and historic sites as part of an archaeological inventory survey that covered portions of the northwest corner of the current project area. This investigation noted that this northwest portion of the current project area had been greatly affected by past land use; particularly the limestone quarry operation; however, there were still remnant archaeological features preserved within the less disturbed *kiawe* thickets. The types of features documented included sinkholes and stacked limestone wall segments and enclosures.

2.3 Background Summary and Predictive Model

The one general observation regarding the archaeology of the 'Ewa Plain is that there was more pre-contact utilization of the area than might be expected given its present day uninviting ambiance and "marginal ecology" (Sinoto 1976:71). Within the current project area, however, back from the coast and seaward of the forested inlands, pre-contact land use was likely less intensive.

Prior to extensive historic and modern land alteration, this area of Honouliuli would be expected to yield the remnants of traditional Hawaiian temporary habitations used during forays for marine resources and/or evidence of opportunistic seasonal agriculture. Based on ethnographic accounts and past archaeological investigations in the project area and its vicinity, limestone sinkholes on the 'Ewa Plain were used for agriculture and burial interment, with the largest overhangs used for temporary shelter. With the spread of Western land use in the 19th century, the project area was used for ranching first, then intensive commercial agriculture. Intensive agriculture would have destroyed or buried portions of the project area's traditional Hawaiian archaeological record, including surface features and sinkholes. Archaeological documentation in the 1970s (particularly Sinoto 1979 and Hammatt & Folk 1981) confirmed that traditional Native Hawaiian archaeological remains survived agricultural land use in portions of the project area. It also recognized the sinkholes as a storehouse of data on more than a score of previously unknown, extinct, bird species.

The most recent land use within the project area, subsequent to the 1970s, includes limestone quarrying, materials stockpiling and green waste processing. These activities have expanded into and largely removed or covered over the portions of the project area where Native Hawaiian archaeological remains and sinkholes were previously documented.

Section 3 Results of Fieldwork

The document review focused on synthesizing the abundant background historical and archaeological information that already exists for the project area and its vicinity. This synthesis revealed that large portions of the project area had been previously inspected as part of previous archaeological investigations in the last 35 years (particularly Sinoto 1979 and Hammatt & Folk 1981, Cleghorn and Davis 1990 and Davis 1993). There is a very substantial record of survey, site mapping and excavation within the project area as part of these investigations. The portions of the project area that had not been previously inspected for historic properties were previously used for commercial sugar cane cultivation, and have been thought to have little likelihood for significant archaeological deposits.

This section outlines the results of the fieldwork portion of the archaeological inventory survey undertaken by CSH personnel. Prior to fieldwork, background research identified where earlier cultural resource management investigations had identified historic properties within the project area. Background research also compiled available land use information to determine where modern land alteration had been extensive. Based on this information, the portions of the project area that had been previously surveyed for historic properties were inspected to determine how likely it was that the previously documented historic properties within these areas had survived modern and current disturbances, including on-going land use practices. The portions of the project area that had not been previously inspected for historic properties, because they had been under commercial sugarcane cultivation, were also inspected to determine if historic properties are present. As noted above, pedestrian field inspection of the ground surface was limited by stockpiling activities; however, all portions of the project area were inspected.

As noted in the report introduction, the approximately 20 acres that was subjected to 100 percent pedestrian inspection include the geographic areas 1, 9, and 10, as shown on Figure 12 and 13, below. The remaining approximately 325 acres of the project area that were not subjected to 100 percent pedestrian inspection were subjected to less intensive pedestrian and vehicular inspection to confirm the extensive prior ground disturbance and resulting unlikelihood of surviving historic properties within these areas.

3.1 Survey Findings

Because of the complexities of land-use history, field survey findings are best discussed by geographic area (Figure 12 and 13) In these figures, the project area has been divided into ten geographic areas based predominantly on past and current land use. Inventory survey findings are discussed below by these ten geographic areas.

3.1.1 Area 1—Sinkhole Preserve

The sinkhole preserve encompasses approximately six acres along the southern edge of the project boundary (refer to Figure 4, 12 and 13). Although documentation regarding the creation of the sinkhole preserve is difficult to find, it appears the sinkhole preserve was created in the early 1990s through the efforts of Dr. Alan Ziegler, a noted Hawai‘i Zoologist with a long history of research in the Barber’s Point area.

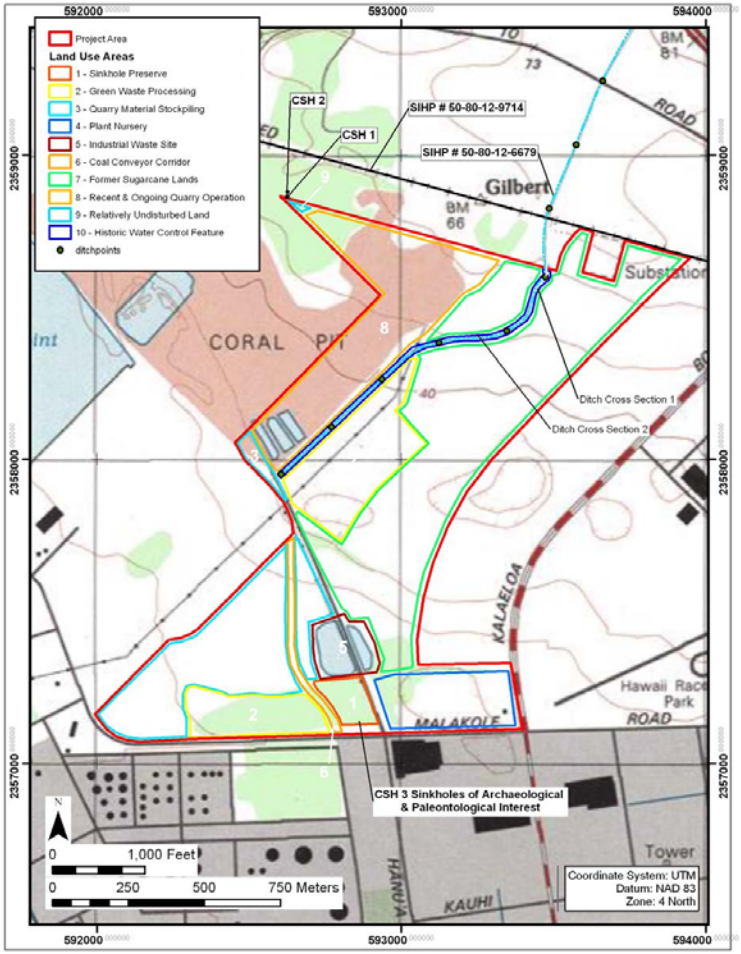


Figure 12. Portion of the 2002 ‘Ewa USGS 7.5-minute topographic quadrangle showing the ten geographic areas of the project area discussed in the text and the locations of the cultural resources observed in the project area

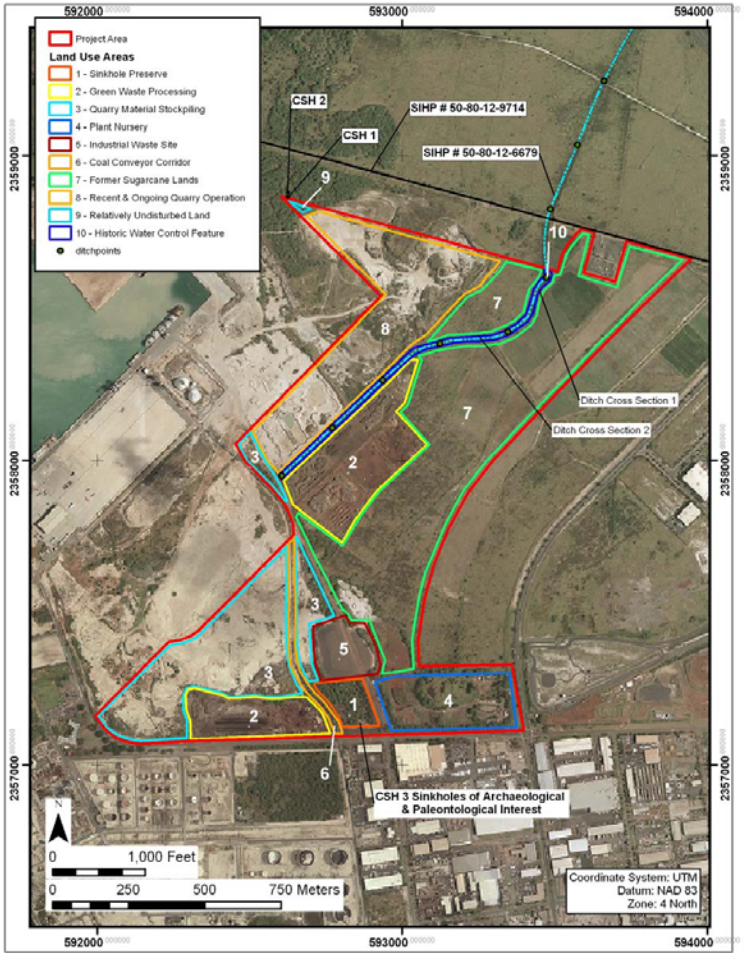


Figure 13. Aerial photograph showing the ten geographic areas of the project area discussed in the text and the locations of the cultural resources observed in the project area (source: USGS Orthoimagery 2005)

Through consultation between Dr. Ziegler, the property owner, Campbell Estate, and apparently the State Senate, and the City and County of Honolulu, the sink area preserve was established (Haliday 2005; Ziegler 1990a and 1990b). At the time that this report was prepared, the status and permanence of the sinkhole preserve could not be determined. During the inventory survey fieldwork, a chain link fence bounded the sinkhole preserve area ensuring protection against accidental damage. As part of the inventory survey, CSH personnel recorded the locations of 40+ sinkholes within the preserve (Figure 14). For the current investigation, the numerous sink hole features that comprise the sink hole preserve area were grouped together and designated temporary site number CSH 3.

Figure 15 and 16 show typical sinkholes within the sinkhole preserve. These sinkhole features vary greatly in size and shape. Many are over three meters deep and most are irregular in shape. Some of the sinkhole features have been partially or completely filled in by past bulldozing activity. Other sinkhole features have apparently been the focus of controlled stratigraphic excavation in the relatively recent past, as indicated by the adjacent back dirt piles. These features have potential to contain the remains of more than a score of extinct endemic bird species both known and presently un-described. They may also contain cultural deposits related to traditional Native Hawaiian land-use. The latter could include human burial interment.

The present Kapolei Harborside Center project proposal intends to completely avoid development within this portion of the project area. Consequently, no further archaeological work, such as site mapping or excavations, were undertaken as part of the current inventory survey investigation. Should any future development plans consider impacts within this fenced preserve then further archaeological documentation and mitigation would be indicated.

3.1.2 Area 2—Green Waste Processing

Two sections of the project lands are included under Area 2 (see Figure 12 and 13). One of these portions is located along the southwest edge of the project area and the other is located in the west central portion of the project lands. These two portions are primarily used for green waste processing and are covered in large mounds of plant material and wood chips (Figure 17). These large mounds, varying between 3 and 5 meters high, are frequently moved by heavy equipment. New material is added as the final processed material is removed for use as mulch.

Inspection of the ground surface between the piles revealed that the area beneath the piles has been bulldozed, thus destroying any surface historic properties. There still is the possibility, however, that sinkholes could be located under the piles of green waste. If present, these sinkhole features would have undoubtedly been filled by past grubbing and grading of these portions of the project area. No historic properties were identified within the Area 2 portions of the project area.

3.1.3 Area 3—Quarry Material Stockpiling

Much of the south side of the project lands (see Figure 12, 13 & 18 as well as Figure 6), are covered in stockpiled limestone from quarrying operations in Area 8 (described below). The overall effect of this stock piling can be seen in Figure 13, where the landscape has been completely covered by bleached piles of limestone material. The older stockpile areas have *koa haole* vegetation growing on the piles. The mounds of stockpiled limestone vary greatly in size; some mounds are massive, measuring over ten meters in height and covering several acres.

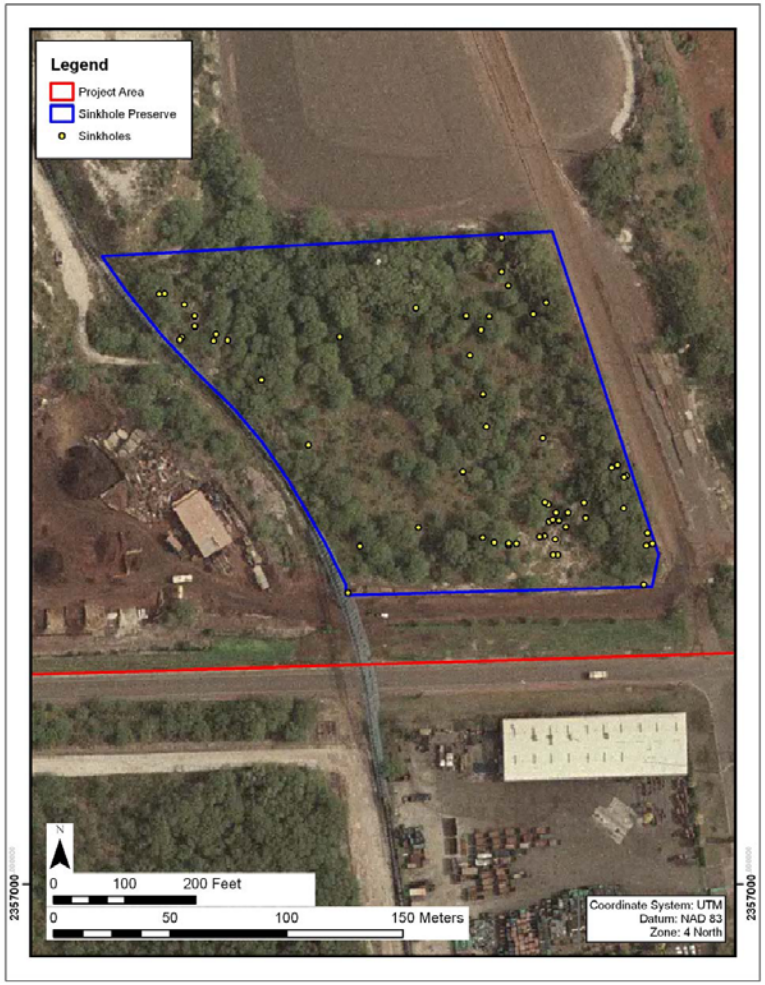


Figure 14. Aerial photograph, showing sinkhole locations within the approximately 6-acre sinkhole preserve (source: USGS Orthoimagery 2005).

Figure 15. Photograph of typical limestone sinkhole located within the 6-acre archaeological/ paleontological sinkhole preserve (Area 1) along the south edge of the project lands

Figure 16. Photograph of another typical limestone sinkhole located within the 6-acre archaeological/paleontological sinkhole preserve (Area 1) along the south edge of the project lands (note the chain link fence surrounding the preserve area)

Figure 17. View of the green waste processing operation (the brown mounds) in the central portion of the project (Area 2); view to west

Figure 18. View of the quarry stockpile (Area 3) with the conveyor line to the left. The low mounds in the background are stockpiled quarry material covered with vegetation; view to south

Inspection of the area did not reveal any exposures of the pre-limestone stockpiling landsurface. Undoubtedly, past stockpiling activity has destroyed the fairly abundant surface archaeological features that were once extent in this portion of the project area (see the previous archaeology summary, above). There still is the possibility, however, that sinkholes could be located under the stockpiled limestone. If present, these sinkhole features have undoubtedly been filled by past stockpiling activity within this portion of the project area. No historic properties were identified within the Area 3 portions of the project area.

3.1.4 Plant Nursery

A commercial plant nursery designated here as Area 4 is located in the southeast corner of the project lands (see Figure 12 and 13). This portion of the project area is currently being used as a plant nursery, with dirt roads, equipment storage, and plant growing areas (Figure 19). Like much of the project area, this portion has been previously bulldozed, thus eliminating any surface historic properties. It is likely that any sink holes within the Area 4 have been filled through prior earth moving activity.. No historic properties were identified within the Area 4 portion of the project lands.

3.1.5 Area 5—Industrial Waste Site

The industrial waste site is located within the south central portion of the project lands (see Figure 12 and 13). The site consists of mounded earth capped with asphalt pavement, covering approximately 12-acres (see Figures 12, 13, & 20). Area 5 has undergone substantial prior disturbance and no historic properties are present.

3.1.6 Area 6—Coal Conveyor Corridor

The coal conveyor corridor enters the project lands from Malakole Street, on the south central edge, continues up along the west side of the sinkhole preserve area and the industrial waste site, and cuts through the quarry material stock pile areas. The coal conveyor then exits the central western edge of the project area and continues west to the Kalaeloa Harbor facilities (see Figures 12 and 13). Within the project area, the coal conveyor measures approximately 700 m in length. The coal conveyor consists of a conveyor belt and two parallel PVC pipes that are vertically supported above the ground by a metal frame. A chain link fence protects the conveyor belt on each side (Figure 20). The conveyor was apparently built on areas that were originally bulldozed and cleared for the stockpiling of quarry materials. No historic properties were identified within the Area 6 portion of the project area.

3.1.7 Area 7—Former Sugarcane Lands

Nearly the entire east half of the project lands (designated as Area 7) were formerly under sugarcane cultivation. (see Figure 12 & 13 as well as Figure 6). Sugarcane was grown here for decades and most recently, corn was planted in parts of the area (Figure 21). Large stands of *koa haole* (*Leucaena leucocephal*) and other opportunistic invasive grasses and shrubs have sprung up in the sections of this portion of the project area that have been neglected the longest (Figure 22). Two sections of the northwest corner of this portion of the project area are bounded by the O.R. & L Railroad (SIHP # 50-80-12-9714).

Figure 19. View of the plant nursery operation in the southeast corner of the project lands (Area 4); view to east

Figure 20. View of the industrial waste site (Area 5, background) with the coal conveyor corridor (Area 6) in the foreground; view to east

Figure 21. View of former sugarcane lands (Area 7) in the central north portion of the project lands showing the remnants of a recent corn crop; view to southeast

Figure 22. View of the now fallow, former sugar cane fields (Area 7) in the northern portion of the project lands, the HECO substation is on the left; view to northeast

As discussed above, Dillingham began construction of the O.R. & L. in 1889. The section of the O.R.& L. adjacent to the northwest corner of the present project lands (Figure 23) is listed on the National Register ofHistoric Places, under criteria A, B & C. The tracks are in place today and are still used by the Hawaiian Railway Society train tours. According to the file on record at the SHPD/DLNR, the O. R. & L. Right-of-Way consists of 25.5 miles of raised roadbed 40 feet wide running from Hālawa Stream at Pearl Harbor on the easternmost end, to the intersection of Farrington Highway and Auyong Homestead Road in Nānākuli at the northwestern-most point. The railroad is a narrow gauge (36 inches inside dimension).

The intensive land use in this area, including decades of agricultural plowing and grading, would have destroyed any surface traditional Native Hawaiian historic properties that may have been present. In addition, layers of alluvium likely bury any sinkholes that may be present. No historic properties were identified within the Area 7 portion of the project area.

3.1.8 Area 8—Recent and Ongoing Quarry Operation

The northwestern portion of the project lands principally consists of the ongoing quarrying of limestone for various construction projects throughout O‘ahu (see Figure 12 & 13). Large sections of this portion of the project are have been excavated over ten meters below the natural ground level (Figure 24 & 25). The effect of the quarrying can be seen in Figure 13.

The excavation and extensive use of heavy earth-moving machinery in this area has completely destroyed any cultural resources that may have been present in the past. Sinkholes that may once have been present in the area are likely all destroyed. No historic properties were identified within the Area 8 portion of the project area.

3.1.9 Area 9—Relatively Undisturbed Land

Area 9 makes up the northwestern corner of the project area (see Figure 12, 13 & 26). This portion of the project area has not undergone the same level of bulldozing or agricultural disturbance as the rest of the project area (with the exception of the Area 1 sinkhole preserve.) A 100% coverage pedestrian inspection of Area 9 was made to identify any historic properties within this relatively undisturbed portion of the project area.

There is evidence of limited bulldozing and *kiawe* wood cutting activity within Area 9. At the time of the initial field inspection, the area had fairly recently been burned, the underbrush had been completely removed, and the larger tree trunks were scorched. Largely as a result of this drastically reduced underbrush, two small limestone enclosure features (given temporary site designations as CSH 1 and 2), along with some crude mounds and alignments, were discovered (see Figure 12 & 13).

These two enclosures and the more ephemeral mound and alignment features around them appear to be typical examples of the types of surface traditional Hawaiian archaeological features that have been documented at Barber’s Point in the past. These features do not appear to have been previously identified, although this portion of the project area was previously surveyed (Hoffman et al. 2005.) Heavy undergrowth may have obscured these features that were revealed by the recent burning. Detailed descriptions of the identified historic properties are provided in Section 3.2 (Site Descriptions) of this study.

Figure 23. View of the O. R. and L. Railroad line (SIHP # 50-80-12-9714) that extends along the northwest corner of the project lands; view to southeast

Figure 24. View of the ongoing limestone quarry operation (Area 8) in the northwest portion of the project area; view to west

Figure 25. View of on-going quarrying activities (Area 8), Barbers Point Harbor in the background; view to west

Figure 26. View of relatively undisturbed land (Area 9) in the northwest corner of the project lands, view to northeast

3.1.10 Area 10—Historic Water Control Feature

Area 10 designates a historic plantation-era drainage channel, which extends through the northern and central portions of the project area (see Figure 12 & 13). The drainage channel enters the project lands from the north, crosses through the former sugarcane lands, then runs between the active quarry and green waste processing areas ending at the middle of the east side of the project lands where it had apparently been bulldozed during the construction of the road or the adjacent coal conveyor corridor (Figure 27). Koa haole, exotic grasses, and other invasive plants have grown up inside and outside of the drainage channel.

The historic plantation-era drainage channel has been documented in a previous archaeological study (Hoffman et al. 2005) and assigned SIHP # 50-80-12-6679. The historic property was determined to be eligible for the Hawaii Register of Historic Places under criterion D. A detailed description of the SIHP # 50-80-12-6679 historic plantation-era drainage channel is provided in Section 3.2: Site Descriptions below.

3.2 Site Descriptions

3.2.1 SIHP # 50-80-12-6679

SITE TYPE: Drainage Channel
FUNCTION: Flood Control
FEATURES: 1
DIMENSIONS: Approx 1200 m long by 20 m wide
CONDITION: Good
AGE: Historic
TAX MAP KEY: [1] 9-1-014:027, 9-1-015:001

SIHP # 50-80-12-6679 consists of a historic plantation-era drainage channel, located in the northern and central portions of the project area (see Figure 12 & 13). The drainage channel was previously identified north of the current project area (Hoffman et al. 2005) and assigned SIHP # 50-80-12-6679. The following description was provided:

> Site 50-80-12-6679 consists of a single drainage canal. The drainage canal runs through the eastern portion of the project area, this being only a small portion of the entire canal. The drainage canal was observed to be mechanically excavated, with the excavated material mounded approximately 3 m above the ground surface along each edge of the canal. The interior of the canal measured approximately 7.5-9.0 m wide and 4.5-6.0 m deep. The canal was generally earth-lined and exhibited significant erosion of the sidewalls.
>
> The canal was observed to have sidewalls reinforced with a cemented basalt boulder lining. The lining extended approximately 2 m above the base of the canal. The base of the canal, throughout its observed length, appeared to be earth-lined, though heavy sedimentation may have covered any evidence of improvements.
>
> Site 50-80-12-6679 appears to serve the function of channeling storm water from gulches upslope, as to prevent flooding of the lowland plantation fields. The

Figure 27. View of the bulldozed terminus of SIHP # 50-80-12-6679, historic plantation-era drainage channel at intersection with the main access road, central west edge of project lands; view to northeast

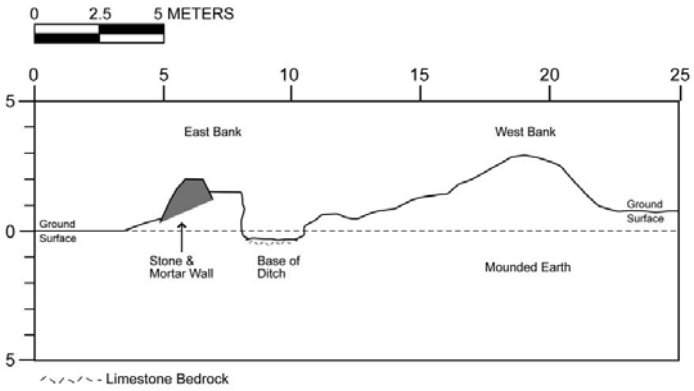


Figure 28. Cross-section 1 of northern portion of SIHP # 50-80-12-6679 drainage channel (see Figures 12 & 13 for location of cross-section)

> canal may also be related to efforts by the Ewa Plantation to induce erosion and sedimentation of the lowlands. Site-50-80-12-6679 is in good condition and appears to continue to function as a flood control measure. (Hoffman et al. 2005:45)

As the SIHP # 50-80-12-6679 drainage channel enters the northern end of the current project area, the western edge of the channel consists of mounded earth, and the eastern edge consists of a combination of mounded earth and a stone and mortar retaining wall (Figure 28). At the location of Cross Section 1 (see Figure 12 & 13), the drainage channel measures approximately 20 m wide, with an interior width of approximately 7 m and depth of approximately 3 m. The retaining wall running along the eastern berm of the drainage channel is trapezoidal shaped, with a wide base and narrower top (Figure 29 & 30). The wall measured 60 cm wide at the top and a maximum height of 1.6 m above the exterior ground surface. The base of the wall is flush with the exterior ground level. The western berm of the drainage channel measured approximately 2.5 m in height above the exterior ground surface and approximately 8.5 m wide. The base and western bank of the drainage channel are earth lined, with the pronounced water flow channel at the base consisting of exposed limestone bedrock. Significant erosion of the sidewalls was observed.

At the central portion of the SIHP # 50-80-12-6679 drainage channel, the western edge of the channel consists of mounded earth, and the eastern edge consists of a combination of mounded earth and a dry masonry retaining wall (Figure 31). At the location of Cross Section 2 (see Figure 12 & 13), the drainage channel measures approximately 20 m wide, with an interior width of approximately 7 m and depth of approximately 2.5 m. The eastern bank measures 6.8 m wide and 2.2 m in height above the exterior ground surface. The dry masonry retaining wall along the interior of the eastern berm of the drainage channel is constructed of stacked limestone boulders and cobbles, 5-7 courses high, with a maximum of 0.9-1.3 m high facing observed (Figure 32). The western berm of the drainage channel measured approximately 2.0 m in height above the exterior ground surface and approximately 7.5 m wide. The base and western bank of the drainage channel are earth lined, with the pronounced water flow channel at the base consisting of exposed limestone bedrock. Significant erosion of the sidewalls was observed.

At the southern portion of the SIHP # 50-80-12-6679 drainage channel, in the vicinity of the Area 2 green waste processing area, the eastern and western banks of the channel consist of mounded earth (Figure 33). The embankments measure a maximum of 2.4 m above the base of the channel, and 0.9-1.1 m above the exterior ground surface. The elevation of the embankments above both the exterior ground surface and the base of the channel decreases with distance *makai*. The overall width of the drainage channel and mass of the embankments also decreases with distance *makai*. The base and banks of the drainage channel are earth lined, with the pronounced water flow channel at the base consisting of both exposed limestone bedrock and soil (Figure 34). The SIHP # 50-80-12-6679 drainage channel terminates at the intersection with the project area's access road, where it had apparently been bulldozed during the construction of the road or the adjacent coal conveyor corridor (see Figure 27).

Figure 29. View of stone and mortar wall along east bank of SIHP 50-80-12-6679 drainage channel; view from exterior of channel to north

Figure 30. View of stone and mortar wall along east bank of SIHP 50-80-12-6679 drainage canal; view from interior of channel to southeast

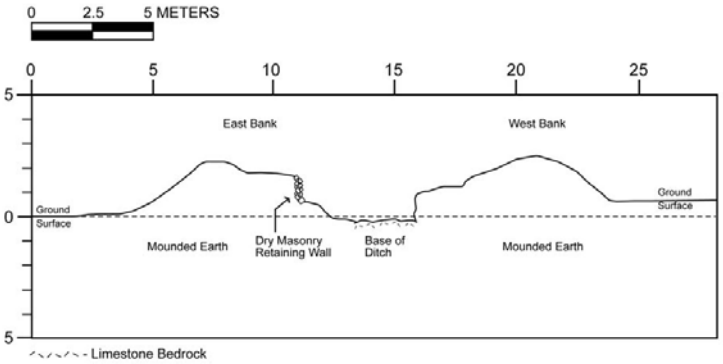


Figure 31. Cross-section 2 of central portion of SIHP # 50-80-12-6679, historic plantation-era drainage channel (see Figures 12 & 13 for location of cross-section)

Figure 32. View of the dry masonry, limestone lining of the interior of the eastern berm of SIHP # 50-80-12-6679, historic plantation-era drainage channel; view to south.

Figure 33. View of the eastern berm of SIHP # 50-80-12-6679, historic plantation-era drainage channel; view to west

Figure 34. View of the interior of SIHP # 50-80-12-6679, historic plantation-era drainage channel, view to northeast.

3.2.2 Temp Site # CSH 1

SITE TYPE: Enclosure
FUNCTION: Habitation
FEATURES: 1
DIMENSIONS: 4.2 m NE/SW x 3.8 m NW/SE
CONDITION: Good
AGE: Prehistoric
TAX MAP KEY: [1] 9-1-014:027

CSH 1 consists of a single, stacked stone enclosure located near the northwest corner of the project area (see Figure 12 and 13). The enclosure is situated on a level coral plain, with a thin soil layer overlying limestone bedrock. Exposed limestone outcrops are abundant in the immediate vicinity of the feature.

The CSH 1 enclosure is rectangular in shape, measuring 4.2 m NE/SW by 3.8 m NW/SE, with a maximum height of 0.8 m (Figure 35 and Figure 36). A constructed entrance to the enclosure is located in the central portion of the western wall, and consists of an approximately 0.8 m wide break in the wall. The perimeter walls of the enclosure are constructed of loosely stacked limestone boulders and cobbles, 3-5 courses high. The stacked stones average 10-15 cm in diameter, with larger stones along the edges and base of the walls, and smaller interior stones. The walls have a maximum thickness of 1.4 m and are generally faced on both the interior and exterior sides, with considerable collapse observed along the west and south interior faces and the east exterior face. The northern wall of the enclosure is the best preserved of the feature construction. The interior facing of the enclosure walls includes large, flat limestone slabs situated in an upright orientation, generally 1 course high, with stacked stones behind. The interior of the enclosure measures 2.5 m NE/SW by 1.5 m NW/SE and consists of a level soil floor, generally cleared of surface stones. No surface cultural material was observed within or in the immediate vicinity of the enclosure. A 50 cm by 50 cm test unit (Test Unit 1) was excavated within the interior of the enclosure (see Section 3.3 Test Excavations Findings). No cultural material was observed through the excavation of Test Unit 1.

The southeastern portion of the CSH 1 enclosure is constructed adjacent to an unusually large and conspicuous limestone boulder, measuring approximately 2 m in diameter and 0.75 m in height. At its eastern end, the boulder overhangs, creating an open crevice measuring 1.0 m deep, 1.2 m wide, and 0.5 m high. The interior surface of the overhang consisted of sloping soil with scattered limestone cobbles and pebbles No surface cultural material was observed within the overhang. A 50 cm by 50 cm test unit (Test Unit 2) was excavated within the interior of the overhang (see Section 3.3 Test Excavations Findings). No cultural material was observed through the excavation of Test Unit 2.

CSH 1 enclosure is interpreted to function as a traditional Hawaiian habitation site. The enclosure was likely utilized as a temporary shelter associated with the procurement of nearby marine resources. The enclosure dates to the pre-contact or possibly early historic period, based on construction-type and lack of historic artifacts in the vicinity. The area immediately west and southwest of the CSH 1 enclosure was observed to have been disturbed by bulldozing, with possible disturbance to the western edge of the enclosure. Despite the limited disturbance to the feature, CSH 1 is in good condition with essentially intact walls.

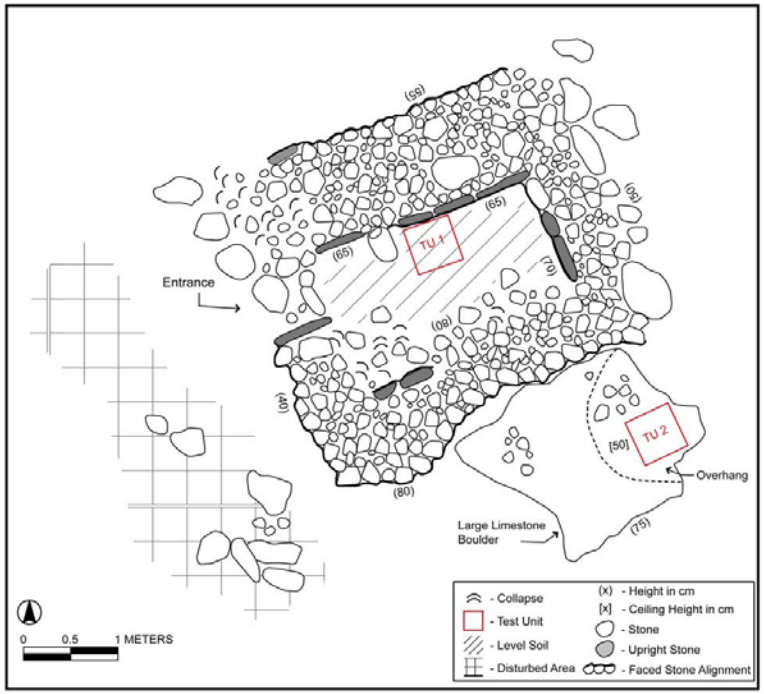


Figure 35. Plan view diagram of CSH 1 enclosure

Figure 36. View of CSH 1, remnant stacked limestone boulder rectangular enclosure located near the northwestern tip of the project area; view to northeast

3.2.3 Temp Site # CSH 2

SITE TYPE: C-Shaped Enclosure
FUNCTION: Habitation
FEATURES: 1
DIMENSIONS: 3.2 m N/S x 4.2 m E/W
CONDITION: Good
AGE: Prehistoric
TAX MAP KEY: [1] 9-1-014:027

CSH 2 consists of a single, stacked stone C-shaped enclosure located near the northwest corner of the project area (see Figure 12 and 13). The enclosure is situated on a level coral plain, with a thin soil layer overlying limestone bedrock. Exposed limestone outcrops are abundant in the immediate vicinity of the feature.

The CSH 2 C-shaped enclosure measures 3.2 m N/S by 4.2 m E/W, with a maximum height of 0.5 m (Figure 37 and Figure 38). The perimeter wall of the enclosure is constructed of loosely stacked limestone boulders and cobbles, 2-3 courses high. The walls are predominantly collapsed, with limited facing observed along portions of the interior wall edge. The constructed entrance to the C-shape is on the southern portion of the enclosure and consists of a 0.8 m wide break in the perimeter wall. The entrance area is also paved with limestone pebbles and cobbles. The interior of the enclosure measures approximately 2 m in diameter and consists of a level soil floor, generally cleared of surface stones. No surface cultural material was observed within or in the immediate vicinity of the enclosure. A 1.0 m by 50 cm test unit (Test Unit 1) was excavated within the entrance area of the CSH 2 C-shaped enclosure (see Section 3.3 Test Excavations Findings). The test excavation revealed the presence of marine vertebrate and invertebrate midden and a small amount of avian midden. The composition of the invertebrate midden indicates a pattern of inter-tidal harvesting at a rocky shore environment with significant wave wash. Such environments are common in the immediate area of Barber's Point. The midden collection represents typical traditional Hawaiian foodstuffs. In addition to the midden, four limestone flakes were recovered from the test excavation, possibly indicative of limited limestone tool manufacture at the site.

CSH 2 C-shaped enclosure is interpreted to function as a traditional Hawaiian habitation site. The enclosure was likely utilized as a temporary shelter associated with the procurement of nearby marine resources. The enclosure dates to the pre-contact or possibly early historic period, based on construction-type, presence of traditional Hawaiian cultural material, and lack of historic artifacts in the vicinity. The CSH 2 C-shaped enclosure is in fair condition, with much of the wall construction suffering from collapse.

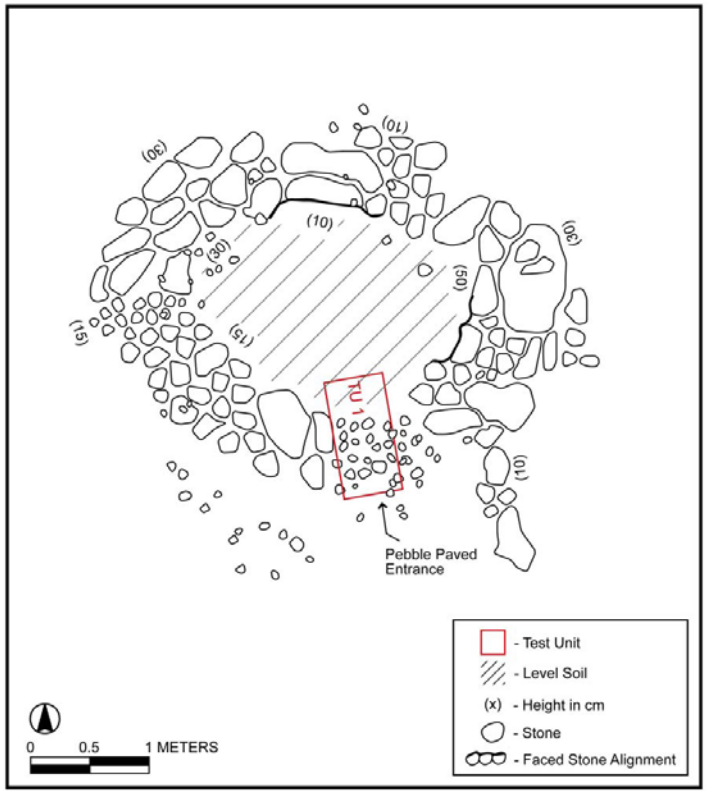


Figure 37. Plan view diagram of CSH 2 C-shaped enclosure

Figure 38. View of a remnant stacked limestone boulder C-shape enclosure located near the northwestern tip of the project area; view to west

3.2.4 Temp Site # CSH 3

SITE TYPE: Numerous sink hole features of archaeological and paleoenvironmental interest
FUNCTION: Various
FEATURES: 40+
AREA: c. 6 acres
CONDITION: Good
AGE: Prehistoric
TAX MAP KEY: [1] 9-1-014:027

Refer to Section 3.1.1, above, and Figures 12, 13, 14, 15, and 16 regarding CSH 3. The component features of CSH 3 are to be preserved by the current project within the sinkhole preserve area.

3.3 Test Excavations Findings

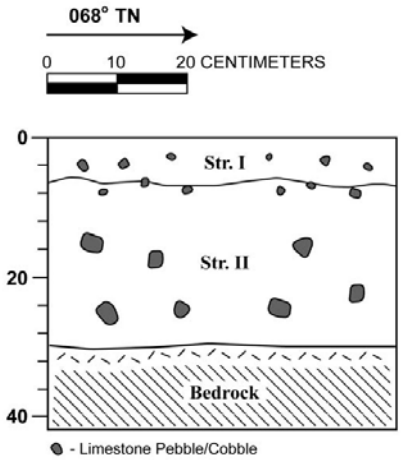
3.3.1 CSH 1: Test Unit 1

A 50 cm by 50 cm test unit was excavated within the interior of the CSH 1 enclosure to better determine the age and function of the feature (see Figure 35). The test excavation was located adjacent to the central portion of the northern interior wall face as this was the best constructed and least disturbed portion of the enclosure. This area was thought to have the highest likelihood of containing intact cultural material.

The surface of the test excavation was level soil with scattered limestone cobbles and pebbles (Figure 39). A total of two sediment strata were observed through the excavation of Test Unit 1 (Figure 40). Stratum I consisted of ash, leaf litter and humus accumulated within the interior surface of the enclosure. The ash deposit was the result of recent, as well as past, brush fires that are common in the area. Stratum II consisted of a brownish yellow silt sediment, consisting of sterile saprolite developed from the decomposition of the underlying limestone bedrock. The test excavation terminated at limestone bedrock, approximately 30 cm below the existing ground surface. No cultural material of any kind was observed through the excavation of Test Unit 1. Detailed sediment descriptions are as follows:

Strata	Depth (cmbd)	Description
Stratum I	0-5	Ash, leaf litter, and humus accumulated on ground surface; no cultural material observed; Lower Boundary (LB) is abrupt, smooth.
Stratum II	5-BOE	10YR 6/8 brownish yellow silt; weak, fine granular structure; dry, loose consistency; non-plastic; no cementation; terrestrial origin; contains abundant roots and decomposing limestone cobbles and pebbles; no cultural material observed; LB is at limestone bedrock.

Figure 39. CSH 1 Test Unit 1, pre-excavation (above) and post-excavation (below) photographs; views to northwest



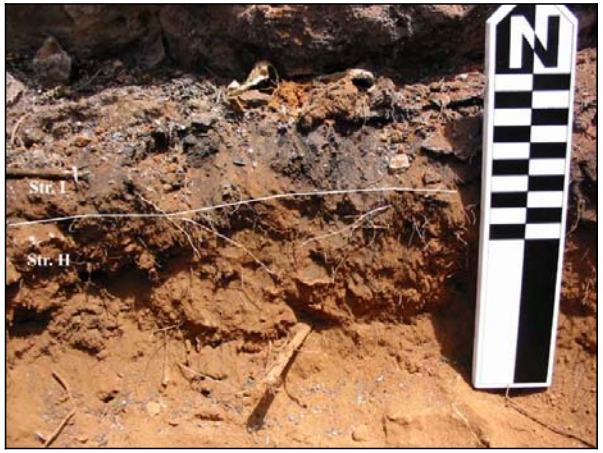


Figure 40. Stratigraphic profile (above) and photograph (below) of north wall of CSH 1 Test Unit 1.

3.3.2 CSH 1: Test Unit 2

A 50 cm by 50 cm test unit was excavated within the interior of a small overhang created by a large limestone boulder located 1 m south of the southeast corner of the CSH 1 enclosure (see Figure 35). With the construction of the CSH 1 enclosure adjacent to a conspicuous and unusually large limestone boulder, it was thought that the overhang area under the boulder may have functioned as a possible storage area or cupboard. The test excavation was made to prospect for possible intact cultural material related to the CSH 1 enclosure.

The surface of the test excavation was sloping soil with scattered limestone cobbles and pebbles (Figure 41). A total of two sediment strata were observed through the excavation of Test Unit 2 (Figure 40). Stratum I consisted of ash, leaf litter and humus accumulated within the interior surface of the overhang. The ash deposit was the result of recent, as well as past, brush fires that are common in the area. Stratum II consisted of a brownish yellow silt sediment, consisting of sterile saprolite developed from the decomposition of the underlying limestone bedrock. The test excavation terminated at limestone bedrock, approximately 40 cm below the existing ground surface. No cultural material of any kind was observed through the excavation of Test Unit 2. Detailed sediment descriptions are as follows:

Strata	Depth (cmbd)	Description
Stratum I	0-8	Ash, leaf litter, and humus accumulated on ground surface; no cultural material observed; Lower Boundary (LB) is abrupt, smooth.
Stratum II	8-BOE	10YR 6/8 brownish yellow silt; weak, fine granular structure; dry, loose consistency; non-plastic; no cementation; terrestrial origin; contains abundant roots and decomposing limestone cobbles and pebbles; no cultural material observed; LB is at limestone bedrock.

Figure 41. CSH 1 Test Unit 2, pre-excavation (above) and post-excavation (below) photographs, views to southwest

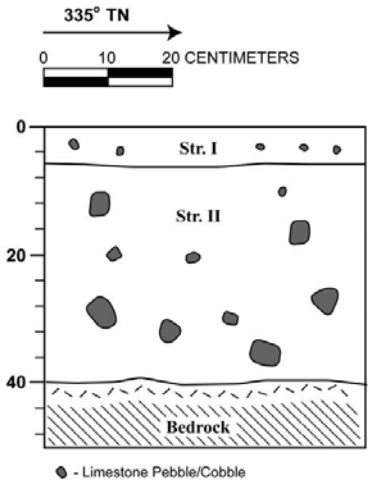


Figure 42. Stratigraphic profile (above) and photograph (below) of west wall of CSH 1 Test Unit 2.

3.3.3 CSH 2: Test Unit 1

A 1 m by 50 cm test unit was excavated within the CSH 2 C-shaped enclosure to better determine the age and function of the feature (see Figure 37). The test excavation was placed at the constructed entrance area of the enclosure, with roughly half of the excavation within the enclosure and half outside of the enclosure. Excavation within this well-constructed and minimally disturbed portion of the enclosure was thought to have the highest likelihood of containing intact cultural material.

The surface of the test excavation was a combination of level soil and level limestone cobble paving (Figure 43). The excavation of Test Unit 1 revealed a roughly 1-2 course limestone cobble and pebble pavement serving as the entrance to the CSH 2 C-shaped enclosure. Underlying the paving were limestone cobbles and small boulders that extended down into the sterile subsoil overlying limestone bedrock.

A total of three sediment strata were observed through the excavation of Test Unit 1 (Figure 44). Stratum I consisted of ash, leaf litter and humus accumulated within the interior surface of the enclosure. The ash deposit was the result of recent, as well as past, brush fires that are common in the area. Stratum II consisted of a very dark grayish brown silt loam. A total of 79.7 grams of marine shell midden, 13.1 grams of unidentified fish bone and 0.4 grams of unidentified bird bone were recovered from the portion of Stratum II that was excavated in the interior portion of the CSH 2 C-shaped enclosure (Figure 44). Four limestone flakes, weighing a total of 13.1 g, were also recovered from Stratum II. Stratum III consisted of a yellowish brown silt sediment, consisting of sterile saprolite developed from the decomposition of the underlying limestone bedrock. The test excavation terminated at limestone bedrock and clearly sterile sediments, approximately 25 cm below the existing ground surface. Detailed sediment descriptions are as follows:

Strata	Depth (cmbd)	Description
Stratum I	0-4	Ash, leaf litter, and humus accumulated on ground surface; no cultural material observed; Lower Boundary (LB) is abrupt, smooth.
Stratum II	4-16	10YR 3/2 very dark grayish brown silt loam; weak, fine granular structure; dry, loose consistency; non-plastic; no cementation; terrestrial origin; contains abundant marine vertebrate and marine invertebrate midden and limestone flakes; LB is abrupt, smooth
Stratum III	16-BOE	10YR 5/4 yellowish brown silt; structureless; dry, loose consistency; non-plastic; no cementation; terrestrial origin; contains abundant roots and decomposing limestone cobbles and pebbles; no cultural material observed; LB is at limestone bedrock.

Figure 43. CSH 2 Test Unit 1, pre-excavation (above) and post-excavation (below) photographs; views to NNW

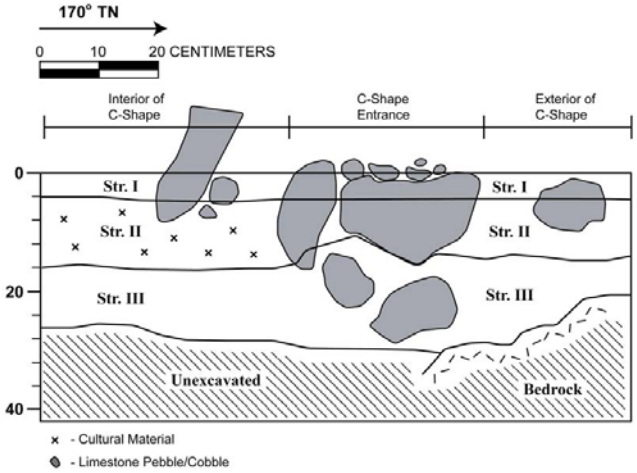


Figure 44. Stratigraphic profile (above) and photograph (below) of north wall of CSH 2 Test Unit 1.

Section 4 Results of Laboratory Analyses

Cultural material was only encountered in the 1.0 m by 0.5 m Test Unit 1 excavation at Site CSH 2. A total of 79.7 grams of marine shell midden, 13.1 grams of unidentified fish bone and 0.4 grams of unidentified bird bone were recovered from this excavation unit (Table 2). The composition of the invertebrate midden indicates a pattern of inter-tidal harvesting at a rocky shore environment with significant wave wash. Such environments are common in the immediate area of Barber's Point. In addition to the midden, four limestone flakes, weighing a total of 13.1 g, were recovered from the test excavation (Table 3), possibly indicative of limited limestone tool manufacture at the site.

Table 2. Catalog of Marine and Terrestrial Midden Recovered from CSH 2, Test Unit 1.

	Weight (g)	
Depth (cmbs)/Stratum	**4-16/II**	**TOTAL**
Class *Gastropoda*		
Conus sp.	9.3	9.3
Cypraea sp.	6.2	6.2
Littorina sp.	0.4	0.4
Nerita sp.	4.8	4.8
Unidentified/Other	1.3	1.3
Class *Pelecypoda (Bivalvia)*		
Brachidontes crebristriatus	31.4	31.4
Trapezium oblongum	21.3	21.3
TOTAL MOLLUSCA	**74.7**	**74.7**
Crustacean	0.7	0.7
Echinoderm	4.3	4.3
TOTAL INVERTEBRATE MIDDEN	**79.7**	**79.7**
Class *Osteichthyes*		
Unidentified Fish	13.1	13.1
TOTAL CHORDATA	**13.1**	**13.1**
TOTAL MARINE MIDDEN	**92.8**	**92.8**
Class *Aves*		
Unidentified Bird	0.4	0.4
TOTAL AVES	**0.4**	**0.4**
TOTAL TERRESTRIAL MIDDEN	**0.4**	**0.4**
TOTAL MIDDEN	**93.2**	**93.2**

Table 3. Catalog of Indigenous Artifacts Recovered from CSH 2, Test Unit 1.

Acc. #	Stratum	Depth (cmbd)	Pieces	Weight (g)	Material Type	Comments
1	II	4-16	4	13.1	Limestone	Limestone Flakes

Section 5 Summary and Interpretation

Cultural Surveys Hawai‘i’s senior staff has a long history of association with the project lands including in particular the work documented in Hammatt and Folk (1982). Based on previous archaeological work (particularly Sinoto 1979, Hammatt and Folk 1982, Cleghorn and Davis 1990 and Davis 1993) this was once a surprisingly rich natural and cultural landscape. most of this landscape was lost to commercial agriculture and mining prior to documentation and most of what was documented has long since been lost. What remains is summarized in Table 4 and is discussed below.

5.1 SIHP 50-80-12-2888, the Barber’s Point Harbor Archaeological District

SIHP # 50-80-12-2888, the Barber’s Point Harbor Archaeological District was declared eligible for the National Register of Historic Places in 6/10/77 and then following boundary revision was again found eligible for the National Register on 12/28/79, The portions of the archaeological preserve within the current project area (see Figure 11) appear to have already been completely disturbed by historic and modern land use. It is likely that the previously documented surface archaeological features within this portion of the project area have been completely removed. Accordingly, the proposed project is not regarded as having an impact on SIHP # 50-80-12-2888.

5.2 SIHP 50-80-12-6679 Flood Control Drainage Channel

The previously described (Hoffman et al. 2005) SIHP # 50-80-12-6679 flood control drainage channel was described in greater detail with cross sectional drawings, photographs and descriptions. This is suggested to be sufficient and appropriate documentation for this site that appears to us to have no particular aesthetic merit or historic import.

5.3 SIHP 50-80-12--9714 O.R. & L. Right-of-Way

The portion of the O.R. & L. Right-of-Way (SIHP 50-80-12-9714) that lies adjacent to the northeast corner of the project area was placed on the National Register of historic Places on 12/1/1975. Any plans to cross or breach this rail line need to be addressed with the State Historic Preservation Division, 2) the State Department of Transportation & 3) the Hawaiian Railway Society to determine appropriate mitigation.

5.4 CSH 1 and CSH 2 Stacked Stone Enclosures

The only traditional Hawaiian surface sites observed in the project lands are the two stacked stone enclosures at the northwest tip of the project area. Both are regarded as pre-contact temporary habitation features. The results of subsurface testing indicate that modest quantities of midden and artifacts are present. Many such sites have been described from the surrounding lands but few remain.

Table 4. Historic Properties within the Study Aea

SIHP # (50-80-12)	Site Type	Age	Posited Function	Work Accomplished	Significance	Recommendation
-2888	Barber’s Point Harbor Archaeological District	Primarily pre-contact	Primarily temporary habitation	Inspected the portion of the District within the current project area	Determined Eligible for the National Register D	A small portion of the District lies within the present project area—lacking historic properties—No Further Work
-6679	Drainage Channel	Historic	Flood Control	L, M, P, D	D	No Further Work
-9714	O.R. & L. Right-of-Way	Historic	Transportation	D	Determined Eligible to the National Register A, B, C	Consultation with 1) the SHPD 2) State DOT & 3) the Hawaiian Railway Society
CSH 1	Stacked-Stone Enclosure	Pre-contact	Habitation	L, M, P, D, T	D	Preservation within park
CSH 2	Stacked-Stone Enclosure	Pre-contact	Habitation	L, M, P, D, T	D	Preservation within park
CSH 3 Sinkhole Preserve	archaeological/ paleontological resources	Pre-contact	cultural remains could include habitation deposits and/or burials	L,M,P,D	D (E because of possibility of burials)	Continued passive preservation*

L=Located with a GPS, M. = Mapped, P = Photographed, D=Described, T=Tested

*Prior to any development of this parcel further study in consultation with the state historic preservation division is recommended

5.5 CSH 3 Sinkhole Preserve

It was known going into this study that a particularly important remnant of this archaeological/paleontological landscape is still extant within a fenced preserve area (see section 3.1.1 Area 1 – Sink Preserve discussion.) Because there are no plans for development in this area at this time and the area is to continue under passive preservation, the work accomplished within the preserve in the course of the present study was limited. Prominent sinkholes within the preserve were mapped (Figure 14). There is good reason to believe that the sinkholes in this area contain the remains of more than 20 extinct species of birds both new to science and still undescribed. The resources within this preserve are a unique trove of information on Hawai‘i’s past without parallel elsewhere. However, it may be noted from the distribution of sinkholes within the preserve (Figure 14) that they tend to be somewhat clumped particularly on the east side and northwest corner. Preservation of the vast majority of these sinks may be compatible with some limited development of the parcel. Prior to any development in this preserve further archaeological study including both inventory documentation and data recovery mitigation would be warranted.

Section 6 Significance Assessments

Each historic property identified within the project area was evaluated for significance according to the broad criteria established for the Hawai‘i State Register of Historic Places. The five criteria are:

- A Associated with events that have made an important contribution to the broad patterns of our history;
- B Associated with the lives of persons important in our past;
- C Embodies the distinctive characteristics of a type, period, or method of construction, represent the work of a master, or possess high artistic value;
- D Have yielded, or is likely to yield information important for research on prehistory or history;
- E Have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property, or due to associations with traditional beliefs, events or oral history accounts – these associations being important to the group’s history and cultural identity.

CSH 1 consists of a single, stacked stone enclosure located near the northwest corner of the project area. The enclosure is interpreted to be a prehistoric, traditional Hawaiian habitation site. The enclosure was likely utilized as a temporary shelter associated with the procurement of nearby marine resources. The enclosure is in good condition and maintains integrity of location, design, materials, and workmanship. Due to the extensive land modification in the vicinity, the enclosure does not have integrity of setting, feeling, or association. CSH 1 is recommended eligible to the Hawai‘i Register of Historic Places under Criterion D.

CSH 2 consists of a single, stacked stone C-shaped enclosure located near the northwest corner of the project area. The C-shaped enclosure is interpreted to be a prehistoric, traditional Hawaiian habitation site. The enclosure was likely utilized as a temporary shelter associated with the procurement of nearby marine resources. The C-shaped enclosure is in fair condition and maintains integrity of location, design, and materials. Due to the extensive land modification in the vicinity, and the primarily collapsed condition of the C-shaped enclosure. CSH 2 does not have integrity of setting, workmanship, feeling, or association. CSH 2 is recommended eligible to the Hawai‘i Register of Historic Places under Criterion D.

CSH 3, the component, 40+ sinkhole features that comprise the project area’s sinkhole preserve, is recommended eligible to the Hawai‘i Register of Historic Places under Criterion D, for its archaeological and paleoenvironmental information potential. Additionally, because of the potential for traditional Native Hawaiian burial deposits, the preserve area may be eligible under Criterion E, for its traditional cultural significance to Native Hawaiians. The component sinkhole features are generally in good condition and maintain integrity of location and materials. As largely natural features, integrity of workmanship is not relevant. Due to the extensive land modification in the vicinity, the sinkholes do not have integrity of setting, feeling, or association.

SIHP 50-80-12-9714, the O.R. & L. Railroad right-of-way, and SIHP 50-80-12-2888, the Barber's Point Harbor Archaeological District are currently listed or have been determined eligible to the National Register of Historic Places, under Criteria A, B, and C, and Criterion D, respectively. As such, generally they are considered eligible to the Hawai‘i Register of Historic Places.

A portion of SIHP 50-80-12-6679, the historic drainage channel has already been determined eligible to the Hawai‘i Register of Historic Places under Criterion D (Hoffman et al. 2005). The portion within the current project area is likewise recommended Hawai‘i Register-eligible under Criterion D.

Section 7 Project Effect and Mitigation Recommendations

7.1 Project Effect Recommendations

The following project effect discussion and cultural resource management recommendations are intended to facilitate project planning and support the project's required historic preservation consultation. This discussion is based on the results of this archaeological inventory survey investigation, the results of the companion CIA investigation (Souza and Hammatt *in prep.*), and CSH's communication with agents for the project proponents regarding the project's potential impacts to the historic properties described in the Results of Fieldwork section, above.

This investigation identified the following historic properties within or near the project area. These features likely, or potentially, will be affected by the proposed project:

1. State Inventory of Historic Properties (SIHP) # 50-80-12-6679, historic plantation-era drainage channel, a portion of which has already been determined Hawai‘i Register-eligible under Criterion D. The alignment of this feature through the project area is shown on Figure 12. The proposed project will most likely completely remove this historic feature.
2. CSH 3 numerous sinkhole features within the project area's archaeological/paleontological preserve area, recommended Hawai‘i Register eligible under Criterion D, and, because of the potential for human burials, Criterion E. There has been some past archaeological and/or paleontological investigation of these sinkhole features (Sinoto 1978; Hammatt and Folk 1981) but direct correlation of specific sinkholes to those previously reported on was not attempted as part of this study. Project proponents intend to avoid this portion of the project area. No impact to the sinkholes is anticipated as a result of the proposed project.
3. CSH 1 and CSH 2 stacked stone prehistoric or early historic enclosures, recommended eligible to the Hawai‘i Register under Criterion D. These features lie very close, if not within proposed park land (Figure 4). The effect of the project on these sites is unclear at this time.
4. SIHP # 50-80-12-2888, the Barber's Point Harbor Archaeological District, listed on the National Register. The boundaries of this archaeological district area shown in Figure 11 in relation to the project area's boundaries. The portions of the archaeological preserve within the current project area appear to have already been completely disturbed by historic and modern land use. It is likely that the previously documented surface archaeological features within this portion of the project area have been completely removed. Accordingly, the proposed project is not regarded as having an impact on SIHP # 50-80-12-2888.
5. The O. R. & L. right-of-way, SIHP # 50-80-12-9714, is immediately adjacent to the project area (refer to Figure 12), and is currently listed on the National Register under

Criteria A, B, and C. The Kapolei Harborside Center project master plan (see Figure 4) indicates a northern extension of Hanua St. will cross the O. R. & L. right-of-way.

7.2 Mitigation Recommendations

The extensive past cultural resource management investigations of the project area and its vicinity have documented the area's rich historic properties; however, historic and modern intensive agriculture, modern quarrying and materials stockpiling, and modern green waste processing have greatly disturbed the vast majority of the 345-acre project area. These activities have largely removed the historic properties that were once extant. Accordingly, no further cultural resource management work is recommended for these portions of the project area, which include Areas 2, 3, 4, 5, 6, 7 and 8, as described above and shown on Figure 12.

7.2.1 Recommendations for SIHP # 50-80-12-2888, the Archaeological District

No further documentation of the small portion of SIHP # 50-80-12-2888, the archaeological district, that extends into the current project area is recommended because the archaeological features once extent have been removed by modern quarrying operations.

7.2.2 Recommendations for SIHP # 50-80-12-6679 Historic Drainage Channel

The SIHP # 50-80-12-6679 historic plantation-era drainage channel was initially described in an adjacent study area (Hoffman et al. 2005). The present study describes the portion of this canal site that traverses the present project area and provides further documentation in the form of descriptions, photographs and cross-section drawings. No further work is recommended for SIHP# 50-80-12-6679. Sufficient information regarding the location, function, age, and construction methods of the SIHP# 50-80-12-6679 Historic Drainage Channel has been generated by the current study.

7.2.3 Recommendations for SIHP # 50-80-12-9714 O. R. & L. Right-of-Way

Although there are several existing road crossings of the O. R. & L. right-of-way (such as neighboring Kalaeloa Blvd. and Fort Barrette Road), it is nevertheless concluded that the proposed undertaking would have a potentially adverse impact on this National Register listed historic property. The Kapolei Harborside Center project master plan indicates a northern extension of Hanua Street will cross the O. R. & L. right-of-way (Figure 4). This crossing will likely involve modification of the railroad bed and right away, including modifications to the track and the installation of vehicular traffic crossing signals and/or gates. Similar past road crossings of the O. R. and L. in the vicinity of the current project area have required the development of appropriate mitigation measures among SHPD, the State of Hawaii Department of Transportation (understood as the land owner of the right-of-way), and the Hawaiian Railway Society.

It is recommended that appropriate treatment of this National Register-listed historic property include, to the extent possible, preservation in place of existing track and railway ties and installation of necessary crossing features (signals and/or gates) that are in keeping with the railway's historic appearance. It might be appropriate to formally detail the agreed upon mitigation measures in a formal Memorandum of Agreement-type document.

7.2.4 Recommendations for CSH 1 and CSH 2 Prehistoric Stacked-Stone Structures

CSH 1 enclosure and CSH 2 C-shaped enclosure were newly identified by the current inventory survey investigation. Each feature was documented with written descriptions, scale drawings, photographs, and accurately located with GPS survey technology. Limited subsurface testing was also conducted within each feature. These historic properties lie very close, if not within, designated park land (refer to Figure 4). They are characteristic remnants of Kalaeloa's prehistoric land use and potential resources for future archaeological research. These features are recommended for passive preservation (conservation: avoidance and protection) within the proposed park land.

7.2.5 Recommendations for CSH 3 Sinkhole Preserve

As noted above, project proponents intend to avoid all impact to the sinkhole preserve as part of the current project. For the current project, the preserve area will continue under passive preservation (conservation: avoidance and protection).

7.2.6 Mitigation Plan Preparation

It is recommended that a cultural resource mitigation plan be prepared for the project. This should include a preservation plan for CSH 1 through 3 detailing the short and long term preservation measures that will safe-guard these historic properties during project construction and subsequent use of the project area. It should also include the mitigation measures for the proposed intersection of the O. R. and L. right-of-way and Hanua Street

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Appendix A: Historic Property Location Information

Coordinate System: UTM
Datum: NAD 83
Zone: 4 North
Coordinates of Central Points of Each Historic Property

Temp Site #	SIHP #	Easting (m)	Northing (m)
CSH 1		592624.97	2358863.66
CSH 2		592625.88	2358878.11
CSH 3		592796.52	2357193.16
	50-80-12-6679	592604.39	2357949.86
	50-80-12-6679	592769.96	2358106.37
	50-80-12-6679	592935.39	2358263.03
	50-80-12-6679	593122.90	2358383.47
	50-80-12-6679	593345.88	2358421.44

Appendix H
Survey of Botanical, Avian, and Mammalian Resources

A Survey of Botanical, Avian, and Mammalian Resources, Kapolei Harborside Center, ‘Ewa District, O‘ahu, Hawai‘i.

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October 2, 2006,

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Introduction

Kapolei Property Development, LLC, an affiliate of the Estate of James Campbell, is proposing to develop an industrial park on approximately 345-acres of land in Honouliuli, ‘Ewa District, Kapolei, O‘ahu (Figure 1). This report summarizes the findings of the botanical, avian and mammalian surveys that were conducted to determine the potential effects of the proposed development on biological resources present on the site, and within the general project area.

A primary goal of the surveys was to determine if there were any Federal or State of Hawai‘i listed endangered, threatened, proposed, or candidate avian, mammalian or botanical resources on, or in the immediate vicinity of the proposed project site. Federal and State of Hawai‘i listed species status follows species identified in the following referenced documents (DLNR, 1998, Federal Register, 1999, 2005). Fieldwork was conducted on May 4, 2006.

The avian phylogenetic order and nomenclature used in this report follows *The American Ornithologists’ Union Checklist of North American Birds 7th Edition* (American Ornithologists’ Union 1998), and the 42nd through the 46th supplements to *Check-list of North American Birds* (American Ornithologists’ Union 2000; Banks et al. 2002, 2003, 2004, 2005). Mammal scientific names follow *Mammals in Hawaii* (Tomich 1986). Higher native and naturalized plant names follow *Manual of the Flowering Plants of Hawai‘i* (Wagner et al. and Wagner and Herbst, 1990, 1999). Ornamental plant names follow *A Tropical Garden Flora: Plants Cultivated in the Hawaiian Islands and Other Tropical Places* (Staples and Herbst 2005). Place names follow *Place Names of Hawaii* (Pukui et al. 1974).

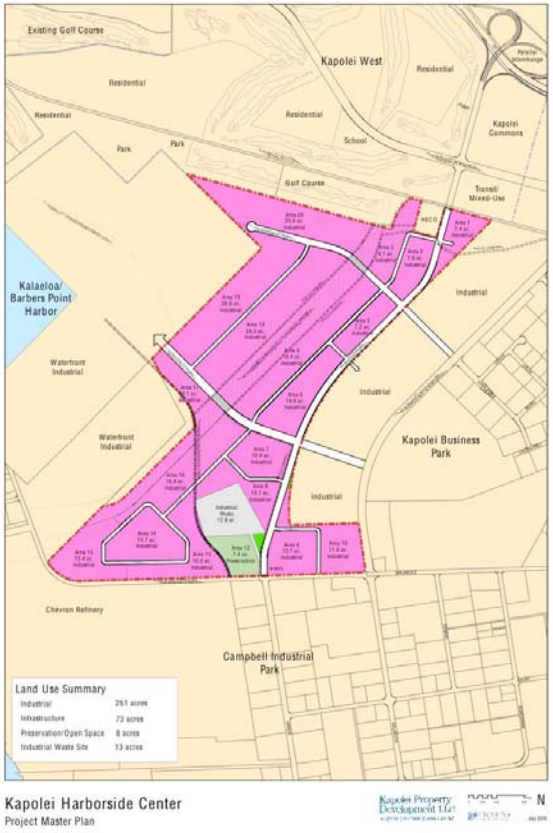
Hawaiian and scientific names are italicized in the text. A glossary of technical terms and acronyms used in the document, which may be unfamiliar to the reader, are included at the end of the narrative text on (Page 19).

General Site Description

The project site, is bounded by vacant, industrially-zoned land, Kalealoa Boulevard and Kapolei Business Park to the east, Malakole Road and Campbell Industrial Park to the south, Kalaeloa/Barbers Point Harbor and supporting industrial areas to the west and the proposed Kapolei West master planned community to the north (Figure 1).

The project site is owned by Kapolei Property Development, LLC, Aina Nui Corporation and the Estate of James Campbell and is proposed for development by Kapolei Property Development, LLC. The project area encompasses several parcels including Tax Map Key (TMK) (1) 9-1-14:33 (por) (137.529-acres), (1) 9-1-14:34 (19.947-acres), (1) 9-1-15:20 (por) (174.198-acres), and (1) 9-1-14:35 (12.845-acres).

Figure I Kapolei Harborside Center Project Site



The project area currently has several different users operating various operations on-site, although the majority of the parcel is vacant. Existing uses include a nursery, intermittent agricultural use, a greenwaste collection and compost processing operation, fill material stockpiling, and a coal conveyor belt that transports coal from the harbor to power stations located south of the site.

Full-time agricultural uses on the site ended in 1995 after O‘ahu Sugar Company ceased cultivation of approximately 145-acres in sugar cane cultivation. Over 200-acres of the site was previously utilized for coral mining operations for the manufacture of cement and concrete products.

Mammalian Survey Methods

All observations of mammalian species were of an incidental nature. With the exception of the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), or ‘ōpe‘ape‘a as it is known locally, all terrestrial mammals currently found on the Island of O‘ahu are alien species, and most are ubiquitous. The survey of mammals was limited to visual and auditory detection, coupled with visual observation of scat, tracks, and other animal signs. A running tally was kept of all vertebrate species observed and heard within the study area.

Mammalian Survey Results

Three mammalian species were detected while on the site: domestic dog (*Canis f. familiaris*), small Indian mongoose (*Herpestes a. auropunctatus*), and cat (*Felis catus*). We saw one mongoose as well as tracks and sign of dog, mongoose and cats at numerous. locations within the project site. All three of these are introduced species that are considered deleterious to native avian species and Hawaiian ecosystems.

Avian Survey Methods

Fourteen avian count stations were sited at approximately 300-meter intervals along linear transects running from north-to-south through the project area. One six-minute point count was conducted at each station. Field observations were made using Leitz 10 X 42 binoculars to sight birds and by listening for vocalizations. Counts took place between 07:30 a.m. and 10:30 a.m., the peak of daily bird activity. Time not spent conducting station counts was used to search the area for species and habitats not detected during count sessions.

Avian Survey Results

A total of 441 individual birds of 18 different avian species, representing 15 separate families were recorded during station counts. An additional species, Cattle Egret (*Bubulcus ibis*), was recorded as an incidental observation while transiting between count stations (Table 1).

Table 1. Avian Species Detected, Kapolei Harborside Center Site

Common Name	*Scientific Name*	*ST*	*RA*	*NT*
	ANSERIFORMES			
	ANATIDAE - Ducks, Geese & Swans			
	Anserinae - Ducks			
Hawaiian Duck x Mallard hybrid	*Anas wyvilliana x A. platyrhynchos*	**EH**		(A)
	GALLIFORMES			
	PHASIANIDAE - Pheasants & Partridges			
	Phasianinae - Pheasants & Allies			
Gray Francolin	*Francolinus pondicerianus*	A	0.14	
Black Francolin	*Francolinus francolinus*	A	0.43	
	CICONIIFORMES			
	ARDEIDAE - Herons, Bitterns & Allies			
Cattle Egret	*Bubulcus ibis*	A	**I-1**	(B)
Black-crowned Night-Heron	*Nycticorax nycticorax hoactli*	IR	0.07	
	CHARADRIIFORMES			
	CHARADRIIDAE - Lapwings & Plovers			
	Charadriinae - Plovers			
Pacific Golden-Plover	*Pluvialis fulva*	IM	0.64	
	RECURVIROSTRIDAE - Stilts & Avocets			
Black-necked Stilt	*Himantopus mexicanus knudseni*	**ER**	0.57	
	SCOLOPACIDAE - Sandpipers, Phalaropes & Allies			
	Scolopacinae - Sandpipers & Allies			
Ruddy Turnstone	*Arenaria interpres*	IM	0.57	
	COLUMBIFORMES			
	COLUMBIDAE - Pigeons & Doves			
Spotted Dove	*Streptopelia chinensis*	A	5.14	
Zebra Dove	*Geopelia striata*	A	3.00	
	PASSERIFORMES			
	PYCNONOTIDAE - Bulbuls			
Red-vented Bulbul	*Pycnonotus cafer*	A	3.86	
	ZOSTEROPIDAE - White-Eyes			
Japanese White-eye	*Zosterops japonicus*	A	1.93	
	MIMIDAE - Mockingbirds & Thrushes			
Northern Mockingbird	*Mimus polyglottos*	A	0.64	

Common Name	Scientific Name	ST	RA	NT
	STURNIDAE - Starlings			
Common Myna	*Acridotheres tristis*	A	3.93	
	EMBERIZIDAE - Emberizids			
Red-crested Cardinal	*Paroaria coronata*	A	0.50	
	CARDINALIDAE - Cardinals Saltators & Allies			
Northern Cardinal	*Cardinalis cardinalis*	A	0.64	
	FRINGILLIDAE - Fringilline And Cardueline Finches & Allies			
	Carduelinae - Carduline Finches			
House Finch	*Carpodacus mexicanus*	A	1.79	
	PASSERIDAE - Old World Sparrows			
House Sparrow	*Passer domesticus*	A	0.43	(B)
	ESTRILDIDAE - Estrildid Finches			
	Estrildinae - Estrildine Finches			
Common Waxbill	*Estrilda astrild*	A	6.43	
Red Avadavat	*Amandava amandava*	A	0.23	
Chestnut Munia	*Lonchura atricapilla*	A	0.50	

KEY TO TABLE 1

ST Status
EH Endangered Endemic Hybrid Species
ER Endangered Resident Species
IM Indigenous Migrant – a native migratory species that winters in Hawai'i but breeds elsewhere
IR Indigenous Resident Species
A Alien – introduced to the Hawaiian Islands by humans
RA Relative Abundance – Number of birds detected divided by the number of count stations (14)
I - Incidental observation, followed by the number of individuals recorded
NT Note, see below for explanation of notes (A) and (B)
(A) Not recorded during this survey, but recorded during the 2005 survey (David and Guinther 2005)
(B) Recorded on this survey but not on during the 2005 survey (David and Guinther 2005)

Four of the species recorded, Black-crowned Night-Heron (*Nycticorax nycticorax hoactli),* Pacific Golden-Plover (*Pluvialis fulva*), Black-necked Stilt (*Himantopus mexicanus knudseni*), and Ruddy Turnstone (*Arenaria interpres*) are native to the Hawaiian islands. The Black-necked Stilt is a resident endangered endemic sub-species. The Black-crowned Night-Heron is an indigenous resident species, and the Pacific Golden-Plover and Ruddy Turnstone are both indigenous migratory waterbird species. The remaining 15 species detected during the course of this survey are considered to be alien to the Hawaiian Islands (Table 1).

Avian diversity was relatively low, though densities of several species were relatively high. Three species: Common Waxbill (*Estrilda astrild*), Common Myna (*Acridotheres*

tristis), and Red-vented Bulbul (*Pycnonotus cafer*), accounted for slightly more than 45% of the total number of individual birds recorded. Common Waxbills were the most frequently recorded species, accounting for slightly more than 20% of the total number of individual birds recorded during station counts. We recorded an average of 32 birds per station count.

Botanical Survey Methods

A pedestrian botanical survey was conducted on May 4, 2006 noting the occurrence and relative abundance of all species of plants observed. Wandering transects were used to cover the area in combination with a previous survey undertaken in August 2005 (David & Guinther, 2005) to yield reasonably complete coverage of all of the property proposed for the Kapolei Harborside Development. As the survey progressed, 19 waypoints (intermittent position locations) were entered into a hand-held GPS unit (Garmin *etrex* "Vista"®). These 19 points were later downloaded into a computer mapping program (TOPO!®) and a map produced showing the general route of the survey (Figure 2; waypoints shown as blue diamonds with red centers). Because only waypoints of the botanists were recorded, the actual ground covered during the biological surveys was more extensive, in addition to the fact that the actual route was more convoluted than shown. A dashed blue line shows the approximate route taken by the botanist in August 2005 covering more of the interior of the project area. Only the southeast corner of the Kapolei Harborside Development area was not surveyed. This parcel is occupied by a nursery, a survey of which would provide minimal value in understanding impacts on natural vegetation of the project site.

This survey was conducted following a relatively wet period on O'ahu. Consequently, most of the plants encountered (including annuals) were growing well and were in flower, making positive field identifications relatively easy.

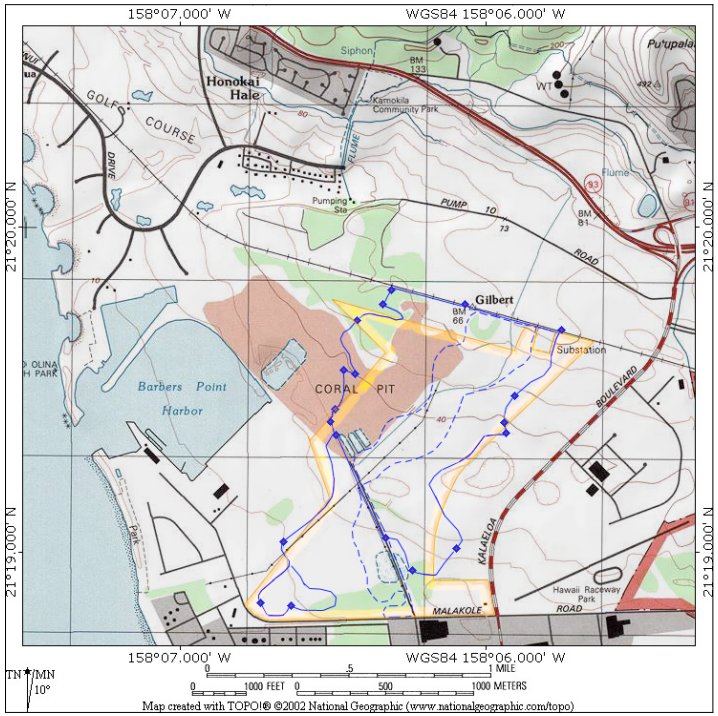
Botanical Survey Results

The project area is characterized by several distinct vegetation areas: 1) quarry and dredged material tailings, 2) former agriculture lands now abandoned, and 3) *kiawe* (*Prosopis pallida*) and buffelgrass (*Cenchrus ciliaris*) lowland forest and savannah.

Quarry and dredged spoil areas are characterized by extensive bare calcareous soil and sediment deposits, with isolated pockets of vegetation and pioneer species growing in less recently disturbed parts. This environment type covers nearly all of the western half of the project area. Numerous weedy species occur here, and there is evidence of ephemeral flooding and ponding, creating special habitats that support many plants (such as California grass, *Urochloa mutica*, and sprangletop, *Leptochloa uninervia*) that otherwise would not occur in this area. Despite the origin of the sediment being material accumulated from the dredging of Barbers Point Deep Draft Harbor, ephemeral pools no longer show evidence of salt encrustations upon drying out. Conspicuous plants

characteristic of the wasteland environment are tree tobacco (*Nicotiana glauca*) and Russian thistle or tumbleweed (*Salsola tragus*).

Figure 2. Kapolei Harborside Center Site Survey Routes



Map of Barbers Point Harbor and vicinity showing approximate project boundary (outlined in orange) and survey routes in blue: solid line = May 2006 with GPS points plotted; dashed line = August 2005 from memory.

Former agriculture lands were once in sugar cane (Char & Associates, 1989), and evidence of subsequent truck crops (melons, corn) is still present, but the fields occupying the eastern half of the project area from the railroad right-of-way south for about 2/3 of the project site length appear to have been abandoned for over a year. This area is characterized by numerous ruderal weeds that spread over the fields after agricultural operations ceased.

The remainder of the area, being mostly the northwestern corner and land between the former agriculture fields and the Milo Nursery in the southeast corner, is occupied by an open to closed *kiawe* forest with a dense undergrowth of buffelgrass. In some areas, koa haole (*Leucaena leucocephala*) is prominent as scrub growth. The kiawe forest at the north end has suffered fires in recent years, and many of the trees are burned and pushed over.

A plant checklist (Table 2) was compiled from the observations, with entries arranged alphabetically under family names. Included in the list are scientific name, common name, and status (whether native or not-native) of each species.

In addition to identifying the plants present within the study site, qualitative estimates of plant abundance were made. These are coded in the table as explained in the Legend to Table 2 and apply to observations made during the present survey. However, the table lists all species recorded in the present survey as well as those listed in two previous surveys: David & Guinther (2005; for area surveyed as shown in Figure 2) and Char & Associates (1989), providing a more complete list of plant species likely to be found in the project area. The Char & Associates (1989) survey covered a larger area than that delineated for the Kapolei Harborside Development, the east boundary extended further east to and a little beyond the map border in Figure 2. Species unique to this additional area and not found in the project area could not be eliminated from the Char list, but this fact does not alter any conclusions presented in this report.

Table 2. Flora Listing, Kapolei Harborside Center Site

Species listed by family	Common name	Status	Abundance	Notes
FLOWERING PLANTS				
DICOTYLEDONES				
ACANTHACEAE				
Asystasia gangetica (L.) T. Anderson	Chinese violet	Nat.	U	
AIZOACEAE				
Sesuvium portulacastrum (L.) L.	*`akulikuli*	**Ind.**	U1	
Trianthema portulacastrum L.	---	Nat.	--	(1)
AMARANTHACEAE				
Achyranthes aspera L.	---	Nat.	--	(1,2)
Alternanthera pungens Kunth	khaki weed	Nat.	O2	
Alternanthera sessilis (L.) DC	sessile joyweed	Nat.	--	(2)
Amaranthus spinosus L.	spiny amaranth	Nat.	O	
Amaranthus virdis L.	slender amaranth	Nat.	R	
ANACARDIACEAE				
Mangifera indica L.	mango	Nat.	--	(2,3)
Schinus terebinthefolius Raddi	Christmasberry	Nat.	U	
APIACEAE				
Ciclospermum leptophylum (Pers.) Sprague	fir-leaved celery	Nat.	--	(2)
ASTERACEAE (COMPOSITAE)				
Ageratum conyzoides L.	*maile honohono*	Nat.	--	(2)
Bidens pilosa L.	*ki*	Nat.	--	(1)
Conyza bonariensis (L.) Cronq.	hairy horseweed	Nat.	--	(1,2)
Conyza canadensis (L.) Cronq.	horseweed	Nat.	--	(2)
Crasocephalum crepidioides (Benth.) S. Moore	---	Nat.	--	(2)
Dyssodia tenuiloba (Candolle) Robinson	Dahlberg daisy	Nat.	R	
Eclipta prostrata (L.) L.	false daisy	Nat.	--	(2)
Emilia fosbergii Nicolson	*pualele*	Nat.	--	(1,2)
Flaveria trinerva (Spreng.) C. Mohr	---	Nat.	U	
Lactuca serriola L.	prickly lettuce	Nat.	U	
Pluchia carolinensis (Jacq.) G. Don	sourbush	Nat.	C3	
Pluchia x *fosbergii* Cooperr. & Galang	---	Nat.	U	
Pluchea indica (L.) Less.	Indian fleabane	Nat.	O	
Sonchus oleraceus L.	sow thistle	Nat.	C	
Tridax procumbens L.	coat buttons	Nat.	R	
Verbesina enceliodes (Cav.) Benth. & Hook.	golden crown-beard	Nat.	A3	
Xanthium strumarium L.	*kikiana,* cockleburr	Nat.	O	

Table 2 (continued).

Species listed by family	Common name	Status	Abundance	Notes
BORAGINACEAE				
Heliotropum currasavicum L.	seaside heliotrope	**Ind.**	U	
Heliotropum procumbens Mill.	---	Nat.	C	
CAPPARACEAE				
Cleome gynandra L.	wild spider flower	Nat.	--	(1,2)
CARICACEAE				
Carica papaya L.	papaya	Nat.	R	(3)
CARYOPHYLLACEAE				
Spergularia marina (L.) Griseb.	saltmarsh sand spurry	Nat.	R1	
CHENOPODIACEAE				
Atriplex semibaccata R. Br.	Australian saltbush	Nat.	--	(1,2)
Atriplex suberecta Verd.	---	Nat.	A	
Chenopodium murale L.	*`aheahea*	Nat.	O3	
Salsola tragus L.	tumbleweed	Nat.	O2	
CONVOLVULACEAE				
Convolvulus arvense L.	field bindweed	Nat.	--	(1)
Ipomoea indica (J. Burm.) Merr.	*koali'awa*	**Ind.**	R	
Ipomoea obscura (L.) Ker-Gawl.	---	Nat.	U2	
Ipomoea triloba L.	little bell	Nat.	U2	
Jacquemontia ovalifolia (Choisy) H. Hallier	*pa'u-o-Hi'iaka*	**Ind.**	--	(2)
Merremia aegyptia (L.) Urb.	hairy merremia	Nat.	U	
CUCURBITACEAE				
Coccinia grandis (L.) Voigt	scarlet-fruited gourd	Nat.	--	(2)
Cucumis dipsaceus Ehrenb. Ex. Spach	teasel gourd	Nat.	R	
Momordica charantia L.	balsam pear	Nat.	--	(1,2)
Sicyos pachycarpus Hook & Arnott.	*kupala*	**End.**	O	
EUPHORBIACEAE				
Chamaesyce hirta (L.) Millsp.	garden spurge	Nat.	U	
Chamaesyce hypercifolia (L.) Millsp.	graceful spurge	Nat.	U2	
Chamaesyce hyssopifolia (L.) Small	---	Nat.	--	(1)
Chamaesyce prostrata (Aiton) Small	prostrate spurge	Nat.	--	(1,2)
Euphorbia cyathophora J.A. Murray	Mexican fire plant	Nat.	--	(2)
Euphorbia graminea Jacq.	---	Nat.	--	(2)
Euphorbia heterophylla L.	*kaliko*	Nat.	R	
Ricinus communis L.	castor bean	Nat.	U2	
FABACEAE				
Acacia farnesiana (L.) Willd.	*klu*	Nat.	R	
Chamaecrista nictitans (L.) Moench	partridge pea	Nat.	--	(2)

Table 2 (continued).

Species listed by family	Common name	Status	Abundance	Notes
Crotalaria incana L.	fuzzy rattlepod	Nat.	U	
Desmanthus virgatus (L.) Willd.	virgate mimosa	Nat.	O	
Leucaena leucocephala (Lam.) deWit	*koa haole*	Nat.	AA	
Erythrina cf. *crista-galli* L.	coral tree	Orn.	R	(3)
Indigofera spicata Forssk.	creeping indigo	Nat.	--	(1)
Macroptilium atropurporeum (DC) Urb.	---	Nat.	R3	
Macroptilium lathyroides (L.) Urb.	cow pea	Nat.	--	(1,2)
Pithecelobium dulce (Roxb.) Benth.	*`opiuma*	Nat.	--	(1,2)
Prosopis pallida (Humb. & Bonpl. ex Willd.) Kunth	*kiawe*	Nat.	C	
Senna occidentalis (L.) Link	coffee senna	Nat.	U2	
LAMIACEAE				
Leonotis nepetifolia (L.) R. Br.	lion's ear	Nat.	C	
LAURACEAE				
Cassytha filiformis L.	*kauna'oa*	**Ind.**	--	(2)
MALVACEAE				
Abutilon grandifolium (Willd.) Sweet	hairy abutilon	Nat.	U	
Malva parviflora L.	cheese weed	Nat.	--	(2)
Malvastrum coromandelianum (L.) Garcke	false mallow	Nat.	O	
Sida ciliaris L.	---	Nat.	U	
Sida fallax Walp.	*`ilima*	**Ind.**	O2	
Sida rhombifolia L.	Cuba jute	Nat.	--	(1,2)
Sida spinosa L.	prickly sida	Nat.	O	
MELIACEAE				
Melia azedarach L.	Chinaberry	Nat.	--	(2)
MENISPERMACEAE				
Cocculus trilobus (Thunb.) DC	*huehue*	**Ind.**	--	(1)
MORACEAE				
Ficus microcarpa L. f.	Chinese banyan	Nat.	--	(2)
MORINGACEAE				
Moringa oleifera Lam.	horseradish tree	Orn.	O	(3)
MYOPORACEAE				
Myoporum sandwicense A. Gray	*naio*	**Ind.**	--	(2)
NYCTAGINACEAE				
Boerhavia coccinea Mill.	false *alena*	Nat.	U1	
PASSIFLORACEAE				
Passiflora foetida L.	running pop	Nat.	U	
PLANTAGINACEAE				
Plantago major L.	common plantain	Nat.	--	(2)
POLYGONACEAE				
Antigonon leptopus Hook. & Arnott	Mexican creeper	Nat.	R2	

Table 2 (continued).

Species listed by family	Common name	Status	Abundance	Notes
Coccoloba uvifera (L.) L.	sea grape	Orn.	--	(2)
PORTULACACEAE				
Portulaca oleracea L.	pigweed	Nat.	--	(1,2)
SOLANACEAE				
Capsicum annuum L.	chili pepper	Nat.	--	(2)
Datura strumonium L.	Jimson weed	Nat.	U	
Nicandra physalodes (L.) Gaertn.	apple of Peru	Nat.	U	
Nicotiana glauca R.C. Graham	tree tobacco	Nat.	C	
Nicotiana tabacum L.	tobacco	Nat.	R1	(4)
Physalis angulata L.	---	Nat.	--	(2)
Solanum americanum Mill.	*popolo*	**Ind.**	U2	
Solanum lycopersicum var. *cerasiforme* (Dunal) Spooner, G Anderson, & Jansen	cherry tomato	Nat.	U2	
Solanum seaforthianum Andr.	---	Nat.	--	(2)
STERCULIACEAE				
Waltheria indica L.	*`uhaloa*	**Ind.**	O	
VERBENACEAE				
Lantana camara L.	lantana	Nat.	--	(2)
Verbena litoralis Kunth	*owi*	Nat.	--	(2)
ZYGOPHYLLACEAE				
Tribulus terrestris L.	puncture vine	Nat.	--	(1)
MONOCOTYLEDONES				
AGAVACEAE				
Cordyline fruticosa L.	*ti*	**Pol.**	--	(1,3)
ARACACEAE				
Cocos nucifera L.	coconut	**Pol.**	R	(3)
COMMELINACEAE				
Commelina benghalensis L.	hairy *honohono*	Nat.	--	(2)
Commelina diffusas N.L. Burm.	*honohono*	Nat.	--	(2)
CYPERACEAE				
Cyperus rotundus L.	nut grass	Nat.	R3	
MUSACEAE				
Musa X *paradisiaca* L.	banana	**Pol.**	R	(2)
POACEAE				
Cenchrus ciliaris L.	buffelgrass	Nat.	AA	
Cenchrus echinatus L.	sandbur	Nat.	R3	
Chloris barbata (L.) Sw.	swollen fingergrass	Nat.	AA	

Table 2 (continued).

Species listed by family	Common name	Status	Abundance	Notes
Cynodon dactylon (L.) Pers.	Bermuda grass	Nat.	--	(2)
Digitaria insularis (L.) Mez ex Ekman	sourgrass	Nat.	R	
Eleusine indica (L.) Gaertn.	beach wiregrass	Nat.	U	
Eragrostis tenella (L.) P. Beauv. ex Roem. & Schult.	lovegrass	Nat.	O3	
Leptochloa uninervia (K Presl.) Hitchc. & Chase	sprangletop	Nat.	U3	
Melinus repens (Willd.) Zizka	Natal redtop	Nat.	O	
Panicum maximum Jacq.	Guinea grass	Nat.	C	
Saccharum officinarum L.	sugar cane	**Pol.**	--	(2,3)
Setaria verticillata (L.) P. Beauv.	bristly foxtail	Nat.	O3	
Sporobolus cf. *diander* (Retz.) P. Beauv.	Indian dropseed	Nat.	O3	
Urochloa mutica (Forssk.) T.Q. Nguyen	para grass	Nat.	R2	
indet. grass	large with hairy culms	Nat.	R	

Legend to Table 2

STATUS = distributional status for the Hawaiian Islands:

- **end.** = endemic; native to Hawaii and found naturally nowhere else.
- **ind.** = indigenous; native to Hawaii, but not unique to the Hawaiian Islands.
- nat. = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation.
- orn. = exotic, ornamental or cultivated; plant not naturalized (not well-established outside of cultivation).
- **pol.** = Polynesian introduction before 1778.

ABUNDANCE = occurrence ratings for plants by area:

- R – Rare — seen in only one or perhaps two locations.
- U - Uncommon- — seen at most in several locations
- O - Occasional — seen with some regularity
- C - Common — observed numerous times during the survey
- A - Abundant — found in large numbers; may be locally dominant.
- AA - Very abundant — abundant and dominant; defining vegetation type.

Numbers following an occurrence rating indicate clusters within the survey area. The ratings above provide an estimate of the likelihood of encountering a species within the specified survey area; numbers modify this where abundance, where encountered, tends to be greater than the occurrence rating:

- 1 – several plants present
- 2 - many plants present
- 3 – locally abundant

NOTES:

- (1) — Previously identified from project area in David & Guinther (2005)
- (2) — Previously identified from project area in Char & Associates (1989)
- (3) — Probably cultivated in this area
- (4) — No fruit or flowers

Discussion

Mammalian Resources

A one-time survey can not provide a total picture of the wildlife utilizing any given area. Certain species will not be detected for one reason or another. Seasonal variations in populations coupled with seasonal usage and availability of resources will cause different usage patterns throughout a year or, in fact, over a number of years. Coupling the results of a one-time survey with the results of previous surveys conducted in similar habitat

within the general project area, greatly enhances the understanding of the faunal makeup of site.

The findings of the mammalian survey are consistent with the findings of at least two other survey conducted on portions of the proposed project site (Bruner 1989, Guinther and David 2005) and with several others faunal surveys conducted on lands in the general vicinity of the subject property in the recent past (David, 2000, 2001, 2004, 2005a, 2005b, 2006, David and Guinther 2005, 2006).

Although no rodents were detected during the course of this survey, it is likely that roof rats (*Rattus r. rattus*), Norway rats (*Rattus norvegicus*), European house mice (*Mus domesticus*) and possibly Polynesian rats (*Rattus exulans hawaiiensis*) use resources within the general project area. All of these introduced rodents are deleterious to remaining native ecosystems and the native floral and faunal species that are dependant on them for their survival.

Avian Resources

The findings of the avian survey are consistent with the findings of at least two other survey conducted on portions of the proposed project site (Bruner 1989, Guinther and David 2005) and with several others faunal surveys conducted on lands in the general vicinity of the subject property in the recent past (David, 2000, 2001, 2004, 2005a, 2005b, 2006, David and Guinther 2005, 2006).

As previously mentioned we recorded four native avian species, including Black-necked Stilt, which is listed as endangered under both Federal and State of Hawai‘i endangered species statutes. We recorded a total of four Black-necked Stilts, three birds were first seen to flush off of a small, water filled depression within the coral mining operation quarry. As we walked southwest towards the Chevron tank farm two of the birds followed us, often circling and calling vociferously. These two birds followed us all the way to Malakole Road, a distance of some 1000-meters from where they were initially seen. The aggressive behavior exhibited by the stilts could have represented defense of a nest, eggs, or chicks, conversely the behavior could simply have been a reaction to our presence, stilts are extremely vocal birds and easily flush when disturbed. We conducted an extensive search of the three mining scrapes present on the site in an effort to detect any active stilt nests. None were found, nor were any chicks or sub-adult birds, or nests found during Bruner's July (1989) survey, or our August 2005 survey of the same area (David and Guinther 2005). The bulk of stilts nest between February and Mid-August, thus if active nesting was going on the site it is probable that we would have detected that activity during the 1989, 2005 or the 2006 surveys of the site. Stilt are extremely opportunistic, and rapidly explore any ephemeral standing water, they have been seen along the harbor, within the green waste dump, and are regularly seen, and nest within the Chevron tank farm located to the southwest of the site.

Of the three other native avian species recorded, one (the Black-crowned Night-Heron) is an indigenous resident species commonly encountered foraging or roosting at wetland features such as man-made canals, stream, ponds, lakes and just about any area that holds water for a reasonable amount of time. The other two native species recorded, Pacific Golden-Plover and Ruddy Turnstone, are common indigenous migratory shorebirds that nest in the high Arctic in the late spring and summer, returning to Hawai‘i and the tropical Pacific Islands during fall and winter months. The remaining 15 species detected during the course of this survey are considered to be alien to the Hawaiian Islands.

During the course of this survey we did not see one listed species Hawaiian Duck (*Anas wyvilliana*) that were seen on the most recent previous survey of portions of the subject property. Additionally, we recorded two species on this survey, Cattle Egret, and House Sparrow (*Passer domesticus*), which were not record during the 2005 survey (Table 1), (David and Guinther 2005).

From an avian perspective there is nothing unique about the habitat present on the subject property, and none of the habitat present on the site is important habitat for any listed avian or mammalian species currently known from the Island of O‘ahu.

Botanical Resources

A one-time survey can not provide a total picture of the botanical makeup of any given area. Certain species will not be detected for one reason or another. Seasonal variations in populations coupled with seasonal usage and availability of resources will cause different usage patterns throughout a year or, in fact, over a number of years. We surveyed the site in May 2006, it followed on a wet period and we recorded most of the annual species that one would expect from the site. If another survey was conducted between November and January, typically the wetter months, additional species, would be recorded, thought the majority of these would likely be weedy alien species. This site has been surveyed for botanical resources by Char in August (1989), David and Guinther August (2005), and by this survey which was conducted in May (2006).

No ferns or fern allies were observed during the plant survey. The dry climate and reasonably well-drained calcareous soils are not conducive to supporting most fern species found in Hawai‘i. The flora of the project area is comprised of flowering plants and overwhelmingly dominated by alien plant species. A total of 121 species of plants are listed in Table 2. Of these, 73 were recorded during the survey on May 4, and another 48 species, while not observed in May, were previously recorded from the site by either David and Guinther (2005; 19 species) or from the same general area by Char & Associates (1989; 40 species), (Table 2).

Sixteen of the species recorded were known to occur in the Hawaiian Islands before the arrival of James Cook in 1778. Four of these are considered to be introductions made by the earlier Polynesian settlers, leaving 12 species (10%) as plants native to the Hawaiian Islands. Of these 12, only one is an endemic, and the remaining 10 are indigenous

species. The one endemic species recorded, *kūpala* (*Sicyos pachycarpus*), is a vine that is a seasonal annual and fairly common in leeward coastal areas. The indigenous native species recorded are also common lowland plants found in the dry leeward and coastal sites throughout the Pacific Islands. If we consider the abundance estimates for these native species, all but *kūpala* and *‘ilima* (*Sida fallax*) are rare or uncommon within the survey area. Both of the latter were mostly observed in the Kiawe/Buffelgrass association, comprising only about 10% of the project area. Thus, in terms of biomass as well as number of species, native plants are a mostly minor component of the vegetation.

Conclusions

Faunal Resources

The presence of endangered Black-necked Stilts on the property will likely require that the project consult with the USFWS under the endangered species act of 1973, as amended to determine if the proposed action will result in a deleterious impact to this listed species.

It is not expected that the modification of the habitat currently found on the site or the construction of the proposed industrial park will have a negative impact on any avian or mammalian species currently listed as endangered, threatened, or that are currently proposed for listing under either federal or State of Hawai‘i endangered species statutes (Federal Register, 1999, 2005).

Botanical Resources

The results of the botanical survey indicate there are no special concerns or legal constraints related to botanical resources in the project area. Although the ‘Ewa Plain is known to harbor several rare and, in some cases, federally listed species of Hawaiian native plants (see Char and Balakrishnan, 1979), these species are not present in the highly disturbed quarry and dredged spoil disposal areas around Barbers Point Deep Draft Harbor and former agriculture lands further inland that comprise the Kapolei Harborside Center project. No plant 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 from the project site (Federal Register, 1999, 2005).

Glossary

Alien - Introduced to Hawai‘i by humans
Crepuscular – Twilight hours
Domesticated – Feral species, not considered established in the wild on the Island of O‘ahu
Endangered – Listed and protected under the ESA as an endangered species
Endemic – Native and unique to the Hawaiian Islands
Incidental observation – A species not counted during station counts, but seen within the. project area.
Indigenous – Native to the Hawaiian Islands, but also found elsewhere naturally
Nocturnal – Night-time, after dark
Ruderal – Disturbed, rocky, rubbishy areas, such as old agricultural fields and rock piles
Threatened - Listed and protected under the ESA as a threatened species

DLNR – Hawaii State Department of Land & Natural resources
TMK – Tax Map Key

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Appendix I
Air Quality Assessment

AIR QUALITY STUDY

FOR THE PROPOSED

KAPOLEI HARBORSIDE CENTER PROJECT

KAPOLEI, OAHU, HAWAII

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6 Estimated Worst-Case 8-Hour Carbon Monoxide Concentrations Along Roadways Near Kapolei Harborside Center Project

1.0 SUMMARY

Kapolei Property Development LLC is proposing to develop the Kapolei Harborside Center Project at Kapolei, Oahu. The proposed project will consist for light industrial, warehousing and service business types on approximately 250 acres of land adjacent to Campbell Industrial Park at Barbers Point. Development of the project is expected to be completed and fully occupied by 2018. This study examines the potential short- and long-term air quality impacts that could occur as a result of construction and use of the proposed facilities and suggests mitigative measures to reduce any potential air quality impacts where possible and appropriate. Potential impacts on the project from nearby industrial sources are also examined.

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. Hawaii air quality standards are comparable to the national standards except those for nitrogen dioxide and carbon monoxide which are more stringent than the national standards.

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 Kapolei 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 circulations may

develop. Wind speeds typically vary between about 5 and 15 miles per hour providing relatively good ventilation much of the time. Temperatures in the leeward Oahu area are generally very moderate with average daily temperatures ranging from about 65°F to 84°F. The extreme minimum temperature recorded at the nearby (former) Ewa Plantation is 47°F, while the extreme maximum temperature is 93°F. This area of Oahu 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.

The present air quality of the project area appears to be reasonably good based on nearby air quality monitoring data. Air quality data from the nearest monitoring stations operated by the Hawaii Department of Health suggest that all national air quality standards are currently being met, although occasional exceedances of the more stringent state standards for carbon monoxide may occur near congested roadway intersections.

If the proposed project is given the necessary approvals to proceed, it may be inevitable that some short- and/or long-term impacts on air quality will occur either directly or indirectly as a consequence of project construction and use. Short-term impacts from fugitive dust will likely occur during the project construction phase. To a lesser extent, exhaust emissions from stationary and mobile construction equipment, from the disruption of traffic, and from workers' vehicles may also affect air quality during the period of construction. State air pollution control regulations require that there be no visible fugitive dust emissions at the property line. Hence, an effective dust control plan must be

implemented to ensure compliance with state regulations. Fugitive dust emissions can be controlled to a large extent by watering of active work areas, using wind screens, keeping adjacent paved roads clean, and by covering of open-bodied trucks. Other dust control measures could include limiting the area that can be disturbed at any given time and/or mulching or chemically stabilizing inactive areas that have been worked. Paving and landscaping of project areas early in the construction schedule will also reduce dust emissions. Monitoring dust at the project boundary during the period of construction could be considered as a means to evaluate the effectiveness of the project dust control program. Exhaust emissions can be mitigated by moving construction equipment and workers to and from the project site during off-peak traffic hours.

After construction, motor vehicles coming to and from the proposed development will result in a long-term increase in air pollution emissions in the project area. To assess the impact of emissions from these vehicles, an air quality modeling study was undertaken to estimate current ambient concentrations of carbon monoxide at intersections in the project vicinity and to predict future levels both with and without the proposed project. During worst-case conditions, model results indicated that present 1-hour and 8-hour carbon monoxide concentrations are within both the state and the national ambient air quality standards. In the year 2018 without the project, carbon monoxide concentrations were predicted to increase at the intersection of Kapolei Parkway and Kalaeloa Boulevard but remain largely unchanged at other locations in the project area. With the project in the year 2018, carbon monoxide concentrations were estimated to remain nearly unchanged at the intersection of Kapolei Parkway and Kalaeloa Boulevard compared to the without-project case, while

concentrations at other locations studied would increase. Even with those increases, worst-case concentrations should remain within both national and state standards through the year 2018 with or without the project. Implementing mitigation measures for traffic-related air quality impacts is probably unnecessary and unwarranted.

In evaluating the proposed project, it may be appropriate to consider not only impacts created by the project but also potential impacts on the project from nearby industrial sources. Due to the close proximity of industries located at Campbell Industrial Park, occasional impacts on the project from emissions emanating from these facilities may occur in conjunction with coincidental occurrences of industry malfunctions and southerly winds, both of which are relatively infrequent events. Increased scrutiny by the Department of Health, an air quality task force mandated by the state legislature, and the modernization by some industrial park tenants should help to mitigate future impacts on the proposed project.

2.0 INTRODUCTION

Kapolei Property Development LLC is proposing to develop the Kapolei Harborside Center Project on approximately 250 acres of vacant lands near the City of Kapolei on the island of Oahu (see Figure 1 for project location). The project site is located on the Waianae (west) side of Kalaeloa Boulevard, and it is bordered by the planned Kapolei West golf course on the mauka side, by undeveloped lands to the east, by Campbell Industrial Park on the makai side, and by the harbor and related industrial lands to the west. The development will include light industrial, warehousing

and service type businesses and associated infrastructure. Construction of the project is expected to commence during 2008, and full development and occupancy is planned by 2018.

The purpose of this study is to describe existing air quality in the project 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 facilities as planned. Potential impacts on the project from nearby air pollution sources are also discussed. Measures to mitigate impacts either by the project or on the project are suggested where possible and appropriate.

3.0 AMBIENT AIR QUALITY STANDARDS

Ambient concentrations of air pollution are regulated by both national and state ambient air quality standards (AAQS). National AAQS are specified in Section 40, Part 50 of the Code of Federal Regulations (CFR), while State of Hawaii AAQS are defined in Chapter 11-59 of the Hawaii Administrative Rules. Table 1 summarizes both the national and the state AAQS that are specified in the cited documents. As indicated in the table, national and state AAQS have been established for particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone and lead. The state has also set a standard for hydrogen sulfide. National AAQS are stated in terms of both primary and secondary standards for most of the regulated air pollutants. National primary standards are designed to protect the public health with an "adequate margin of safety". National secondary standards, on the other hand, define levels of air quality necessary to protect the public welfare from "any known or anticipated adverse effects

of a pollutant". Secondary public welfare impacts may include such effects as decreased visibility, diminished comfort levels, or other potential injury to the natural or man-made environment, e.g., soiling of materials, damage to vegetation or other economic damage. In contrast to the national AAQS, Hawaii State AAQS are given in terms of a single standard that is designed "to protect public health and welfare and to prevent the significant deterioration of air quality".

Each of the regulated air pollutants has the potential to create or exacerbate some form of adverse health effect or to produce environmental degradation when present in sufficiently high concentration for prolonged periods of time. The AAQS specify a maximum allowable concentration for a given air pollutant for one or more averaging times to prevent harmful effects. Averaging times vary from one hour to one year depending on the pollutant and type of exposure necessary to cause adverse effects. In the case of the short-term (i.e., 1- to 24-hour) AAQS, both national and state standards allow a specified number of exceedances each year.

The Hawaii AAQS are in some cases considerably more stringent than the comparable national AAQS. In particular, the Hawaii 1-hour AAQS for carbon monoxide is four times more stringent than the comparable national limit. The U.S. Environmental Protection Agency (EPA) is currently working on a plan to phase out the national 1-hour ozone standard in favor of the new (and more stringent) 8-hour standard.

The Hawaii AAQS for sulfur dioxide were relaxed in 1986 to make the state standards essentially the same as the national limits. In 1993, the state also revised its particulate standards to follow those set by the federal government. During 1997, the federal government again revised its standards for particulate, but the new standards were challenged in federal court. A Supreme Court ruling was issued during February 2001, and as a result, the new standards for particulate were implemented during 2005. To date, the Hawaii Department of Health has not updated the state particulate standards. In September 2001, the state vacated the state 1-hour standard for ozone and an 8-hour standard was adopted.

4.0 REGIONAL AND LOCAL CLIMATOLOGY

Regional and local climatology significantly affects the air quality of a given location. Wind, temperature, atmospheric turbulence, mixing height and rainfall all influence air quality. Although the climate of Hawaii is relatively moderate throughout most of the state, significant differences in these parameters may occur from one location to another. Most differences in regional and local climates within the state are caused by the mountainous topography.

Hawaii lies well within the belt of northeasterly trade winds generated by the semi-permanent Pacific high pressure cell to the north and east. On the island of Oahu, the Koolau and Waianae Mountain Ranges are oriented almost perpendicular to the trade winds, which accounts for much of the variation in the local climatology of the island. The site of the proposed project is located on the broad Ewa Plain leeward of the Koolau Mountains.

Wind frequency data for Honolulu International Airport (HIA), which is located about 10 miles to the east of the project site, are given in Table 2. These data can be expected to be reasonably representative of the project area. Wind frequency for HIA show that the annual prevailing wind direction for this area of Oahu is east northeast. On an annual basis, 34.7 percent of the time the wind is from this direction, and more than 70 percent of the time the wind is in the northeast quadrant. Winds from the south are infrequent occurring only a few days during the year and mostly in winter in association with kona storms. Wind speeds average about 10 knots (12 mph) and mostly vary between about 5 and 15 knots (6 and 17 mph).

Air pollution emissions from motor vehicles, the formation of photochemical smog and smoke plume rise all depend in part on air temperature. Colder temperatures tend to result in higher emissions of contaminants from automobiles but lower concentrations of photochemical smog and ground-level concentrations of air pollution from elevated plumes. In Hawaii, the annual and daily variation of temperature depend to a large degree on elevation above sea level, distance inland and exposure to the trade winds. Average temperatures at locations near sea level generally are warmer than those at higher elevations. Areas exposed to the trade winds tend to have the least temperature variation, while inland and leeward areas often have the most. The project's near coastal, leeward location results in a relatively moderate temperature profile compared to other locations around Oahu and the state. Based on more than 50 years of data collected at the former nearby Ewa Plantation, average annual daily minimum and maximum temperatures in the project area

are 65°F and 84°F, respectively [1]. The extreme minimum temperature on record is 47°F, and the extreme maximum is 93°F.

Small scale, random motions in the atmosphere (turbulence) cause air pollutants to be dispersed as a function of distance or time from the point of emission. Turbulence is caused by both mechanical and thermal forces in the atmosphere. It is oftentimes measured and described in terms of Pasquill-Gifford stability class. Stability class 1 is the most turbulent and class 6 the least. Thus, air pollution dissipates the best during stability class 1 conditions and the worst when stability class 6 prevails. In the Kapolei area, stability class 5 or 6 is generally the highest stability class that occurs, developing during clear, calm nighttime or early morning hours when temperature inversions form due to radiational cooling. Stability classes 1 through 4 occur during the daytime, depending mainly on the amount of cloud cover and incoming solar radiation and the onset and extent of the sea breeze.

Mixing height is defined as the height above the surface through which relatively vigorous vertical mixing occurs. Low mixing heights can result in high ground-level air pollution concentrations because contaminants emitted from or near the surface can become trapped within the mixing layer. In Hawaii, minimum mixing heights tend to be high because of mechanical mixing caused by the trade winds and because of the temperature moderating effect of the surrounding ocean. Low mixing heights may sometimes occur, however, at inland locations and even at times along coastal areas early in the morning following a clear, cool, windless night. Coastal areas also may experience low mixing levels during sea breeze conditions when cooler ocean air rushes in over warmer

land. Mixing heights in Hawaii typically are above 3000 feet (1000 meters).

Rainfall can have a beneficial affect on the air quality of an area in that it helps to suppress fugitive dust emissions, and it also may "washout" gaseous contaminants that are water soluble. Rainfall in Hawaii is highly variable depending on elevation and on location with respect to the trade wind. The Ewa Plain is one of the driest areas on Oahu due to its leeward and near sea level location. Average annual rainfall amounts to about 21 inches but may vary from about 10 inches during a dry year to more than 40 inches during a wet year [1]. Most of the rainfall usually occurs during the winter months. Monthly rainfall may vary from as little as a trace to as much as 15 inches or more.

5.0 PRESENT AIR QUALITY

Present air quality in the project area is mostly affected by air pollutants from motor vehicles, industrial sources, agricultural operations and to a lesser extent by natural sources. Table 3 presents an air pollutant emission summary for the island of Oahu for calendar year 1993. The emission rates shown in the table pertain to manmade emissions only, i.e., emissions from natural sources are not included. As suggested in the table, much of the particulate emissions on Oahu 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 Oahu, emissions of particulate and nitrogen oxides may have increased during the past ten years, while emissions of sulfur oxides, carbon monoxide and hydrocarbons probably have declined.

The H-1 Freeway, which passes through the project area to the north, 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 over portions the project site by the prevailing winds.

Several sources of industrial air pollution are located in the Campbell Industrial Park, which is located adjacent to the project site on the south at Barbers Point. Industries currently operating there include the Chevron and BHP refineries, H-Power, Kalaeloa Partners, Applied Energy Services, Hawaiian Cement and others. Hawaiian Electric Company's Kahe Generating Station is located a few miles to the northwest at Kahe Point. These industries emit large amounts of sulfur dioxide, nitrogen oxides, particulate matter, carbon monoxide and other air pollutants. Prevailing winds from the east or northeast will carry these emissions away from the site most of the time.

Until recently, air pollution in the project area originating from agricultural sources could mainly be attributed to sugar cane operations near the project site. Emissions from both the mill and the canefield operations in the area have now been

eliminated with the closure of the Oahu Sugar Company and much of the former sugarcane lands are currently being used as pastureland or for diversified agriculture. Long-range uses for the land have not yet been determined.

Natural sources of air pollution emissions that also could affect the project area but cannot be quantified very accurately include the ocean (sea spray), plants (aero-allergens), wind-blown dust, and perhaps distant volcanoes on the island of Hawaii.

The State Department of Health operates a network of air quality monitoring stations at various locations on Oahu. Each station, however, typically does not monitor the full complement of air quality parameters. Table 4 shows annual summaries of air quality measurements that were made nearest to the project area for several of the regulated air pollutants for the period 2000 through 2004. These are the most recent data that are currently available.

During the 2000-2004 period, sulfur dioxide was monitored by the State Department of Health at an air quality station located at Kapolei. Concentrations monitored were consistently low compared to the standards. Annual second-highest 3-hour concentrations (which are most relevant to the air quality standards) ranged from 12 to 19 $\mu g/m^3$, while the annual second-highest 24-hour concentrations ranged from 5 to 9 $\mu g/m^3$. Annual average concentrations were only about 1 to 2 $\mu g/m^3$. There were no exceedances of the state/national 3-hour or 24-hour AAQS for sulfur dioxide during the 5-year period.

Particulate matter less than 10 microns in diameter (PM-10) is also measured at the Kapolei monitoring station. Annual second-highest 24-hour PM-10 concentrations ranged from 29 to 129 $\mu g/m^3$ between 2000 and 2004. Average annual concentrations ranged from 13 to 19 $\mu g/m^3$. All values reported were within the state and national AAQS.

Carbon monoxide measurements were also made at the Kapolei monitoring station. The annual second-highest 1-hour concentrations ranged from 1.6 to 2.0 mg/m^3. The annual second-highest 8-hour concentrations ranged from 0.8 to 1.8 mg/m^3. No exceedances of the state or national 1-hour or 8-hour AAQS were reported.

Nitrogen dioxide is also monitored by the Department of Health at the Kapolei monitoring station. Annual average concentrations of this pollutant ranged from 8 to 9 $\mu g/m^3$, safely inside the state and national AAQS.

The nearest available ozone measurements were obtained at Sand Island (about 12 miles east of the project area). The second-highest 8-hour concentrations for the period 2002 through 2004 ranged between 77 and 108 $\mu g/m^3$, which is well inside the state and federal standards. The 8-hour standard for ozone did not exist prior to 2002. Prior to 2002, the now obsolete state 1-hour standard was typically exceeded several times each year.

Although not shown in the table, the nearest and most recent measurements of ambient lead concentrations that have been reported were made at the downtown Honolulu monitoring station between 1996 and 1997. Average quarterly concentrations were near or below the detection limit, and no exceedances of the state AAQS were recorded. Monitoring for this parameter was discontinued during 1997.

Based on the data and discussion presented above, it appears likely that the State of Hawaii AAQS for sulfur dioxide, nitrogen dioxide, particulate matter, ozone and lead are currently being met at the project site. While carbon monoxide measurements at the Kapolei monitoring station suggest that concentrations are within the state and national standards, local "hot spots" may exist near traffic-congested intersections. The potential for this within the project area is examined later in this report.

6.0 SHORT-TERM IMPACTS OF PROJECT

Short-term direct and indirect impacts on air quality could potentially occur due to project construction. For a project of this nature, there are two potential types of air pollution emissions that could directly result in short-term air quality impacts during project construction: (1) fugitive dust from vehicle movement and soil excavation; and (2) exhaust emissions from on-site construction equipment. Indirectly, there also could be short-term impacts from slow-moving construction equipment traveling to and from the project site, from a temporary increase in local traffic caused by commuting construction workers, and from the disruption of normal traffic flow caused by lane closures of adjacent roadways.

Fugitive dust emissions may arise from the grading and dirt-moving activities associated with site clearing and preparation work. The emission rate for fugitive dust emissions from construction activities is difficult to estimate accurately. This is because of its elusive nature of emission and because the potential for its generation varies greatly depending upon the type of soil at the construction site, the amount and type of dirt-disturbing activity taking place, the moisture content of exposed soil in work areas, and the wind speed. The EPA [2] has provided a rough estimate for uncontrolled fugitive dust emissions from construction activity of 1.2 tons per acre per month under conditions of "medium" activity, moderate soil silt content (30%), and precipitation/evaporation (P/E) index of 50. Uncontrolled fugitive dust emissions at the project site would likely be somewhere near that level, depending on the amount of rainfall that occurs. In any case, State of Hawaii Air Pollution Control Regulations [3] prohibit visible emissions of fugitive dust from construction activities at the property line. Thus, an effective dust control plan for the project construction phase is essential.

Adequate fugitive dust control can usually be accomplished by the establishment of a frequent watering program to keep bare-dirt surfaces in construction areas from becoming significant sources of dust. In dust-prone or dust-sensitive areas, other control measures such as limiting the area that can be disturbed at any given time, applying chemical soil stabilizers, mulching and/or using wind screens may be necessary. Control regulations further stipulate that open-bodied trucks be covered at all times when in motion if they are transporting materials that could be blown away. Haul trucks tracking dirt onto paved streets from unpaved

areas is often a significant source of dust in construction areas. Some means to alleviate this problem, such as road cleaning or tire washing, may be appropriate. Paving of parking areas and/or establishment of landscaping as early in the construction schedule as possible can also lower the potential for fugitive dust emissions. Monitoring dust at the project property line could be considered to quantify and document the effectiveness of dust control measures.

On-site mobile and stationary construction equipment also will emit air pollutants from engine exhausts. The largest of this equipment is usually diesel-powered. Nitrogen oxides emissions from diesel engines can be relatively high compared to gasoline-powered equipment, but the standard for nitrogen dioxide is set on an annual basis and is not likely to be violated by short-term construction equipment emissions. Carbon monoxide emissions from diesel engines, on the other hand, are low and should be relatively insignificant compared to vehicular emissions on nearby roadways.

Project construction activities will also likely obstruct the normal flow of traffic at times to such an extent that overall vehicular emissions in the project area will temporarily increase. The only means to alleviate this problem will be to attempt to keep roadways open during peak traffic hours and to move heavy construction equipment and workers to and from construction areas during periods of low traffic volume. Thus, most potential short-term air quality impacts from project construction can be mitigated.

7.0 LONG-TERM IMPACTS OF PROJECT

After construction is completed, use of the proposed facilities will result in increased motor vehicle traffic in the project area, potentially causing long-term impacts on ambient air quality. Motor vehicles with gasoline-powered engines are significant sources of carbon monoxide. They also emit nitrogen oxides and other contaminates.

Federal air pollution control regulations require that new motor vehicles be equipped with emission control devices that reduce emissions significantly compared to a few years ago. In 1990, the President signed into law the Clean Air Act Amendments. This legislation requires further emission reductions, which have been phased in since 1994. More recently, additional restrictions were signed into law during the Clinton administration, which will begin to take effect during the next decade. The added restrictions on emissions from new motor vehicles will lower average emissions each year as more and more older vehicles leave the state's roadways. It is estimated that carbon monoxide emissions, for example, will go down by an average of about 30 to 40 percent per vehicle during the next 10 years due to the replacement of older vehicles with newer models.

To evaluate the potential long-term indirect ambient air quality impact of increased roadway traffic associated with a project such as this, computerized emission and atmospheric dispersion models can be used to estimate ambient carbon monoxide concentrations along roadways leading to and from the project. Carbon monoxide is selected for modeling because it is both the most stable and the most abundant of the pollutants generated by motor vehicles. Furthermore, carbon monoxide air pollution is generally considered

to be a microscale problem that can be addressed locally to some extent, whereas nitrogen oxides air pollution most often is a regional issue that cannot be addressed by a single new development.

For this project, three scenarios were selected for the carbon monoxide modeling study: (1) year 2006 with present conditions, (2) year 2018 without the project, and (3) year 2018 with the project. To begin the modeling study of the three scenarios, critical receptor areas in the vicinity of the project were identified for analysis. Generally speaking, roadway intersections are the primary concern because of traffic congestion and because of the increase in vehicular emissions associated with traffic queuing. For this study, several of the key intersections identified in the traffic study were also selected for air quality analysis. These included the following intersections:

- Kapolei Parkway at Kalaeloa Boulevard
- Malakole Street at Kalaeloa Boulevard
- Malakole Street at Hanua Street
- Kapolei Parkway at Hanua Street
- Opakapaka Street at Hanua Street

The traffic impact report for the project [4] describes the projected future traffic conditions and laneage configurations of these intersections in detail. In performing the air quality impact analysis, it was assumed that all recommended traffic mitigation measures would be implemented.

The main objective of the modeling study was to estimate maximum 1-hour average carbon monoxide concentrations for each of the three scenarios studied. To evaluate the significance of the estimated concentrations, a comparison of the predicted values for each scenario can be made. Comparison of the estimated values to the national and state AAQS was also used to provide another measure of significance.

Maximum carbon monoxide concentrations typically coincide with peak traffic periods. The traffic impact assessment report evaluated morning and afternoon peak traffic periods. These same periods were evaluated in the air quality impact assessment.

The EPA computer model MOBILE6 [5] was used to calculate vehicular carbon monoxide emissions for each year studied. One of the key inputs to MOBILE6 is vehicle mix. Unless very detailed information is available, national average values are typically assumed, which is what was used for the present study. Based on national average vehicle mix figures, the present vehicle mix in the project area was estimated to be 40.9% light-duty gasoline-powered automobiles, 46.2% light-duty gasoline-powered trucks and vans, 3.6% heavy-duty gasoline-powered vehicles, 0.2% light-duty diesel-powered vehicles, 8.5% heavy-duty diesel-powered trucks and buses, and 0.6% motorcycles. For the future scenarios studied, the vehicle mix was estimated to change slightly with fewer light-duty gasoline-powered automobiles and more light-duty gasoline-powered trucks and vans.

Ambient temperatures of 59 and 68 degrees F were used for morning and afternoon peak-hour emission computations, respectively.

These are conservative assumptions since morning/afternoon ambient temperatures will generally be warmer than this, and emission estimates given by MOBILE6 generally have an inverse relationship to the ambient temperature.

After computing vehicular carbon monoxide emissions through the use of MOBILE6, these data were then input to an atmospheric dispersion model. EPA air quality modeling guidelines [6] currently recommend that the computer model CAL3QHC [7] be used to assess carbon monoxide concentrations at roadway intersections, or in areas where its use has previously been established, CALINE4 [8] may be used. Until a few years ago, CALINE4 was used extensively in Hawaii to assess air quality impacts at roadway intersections. In December 1997, the California Department of Transportation recommended that the intersection mode of CALINE4 no longer be used because it was thought the model has become outdated. Studies have shown that CALINE4 may tend to over-predict maximum concentrations in some situations. Therefore, CAL3QHC was used for the subject analysis.

CAL3QHC was developed for the U.S. EPA to simulate vehicular movement, vehicle queuing and atmospheric dispersion of vehicular emissions near roadway intersections. It is designed to predict 1-hour average pollutant concentrations near roadway intersections based on input traffic and emission data, roadway/receptor geometry and meteorological conditions.

Although CAL3QHC is intended primarily for use in assessing atmospheric dispersion near signalized roadway intersections, it

can also be used to evaluate unsignalized intersections. This is accomplished by manually estimating queue lengths and then applying the same techniques used by the model for signalized intersections. Currently, one of the study intersections is unsignalized, Malakole Street at Hanua Street. For the future without-project scenario, in accordance with the traffic report, this intersection was assumed to be signalized, but the intersection of Opakapaka Street and Hanua Street was assumed to be unsignalized. For the future with-project scenario, all intersections were assumed to be controlled by traffic signals.

Input peak-hour traffic data were obtained from the traffic study cited previously. This included vehicle approach volumes, saturation capacity estimates, intersection laneage and signal timings (where applicable). All emission factors that were input to CAL3QHC for free-flow traffic on roadways were obtained from MOBILE6 based on assumed free-flow vehicle speeds corresponding to the posted speed limits (25 to 35 mph depending on location).

Model roadways were set up to reflect roadway geometry, physical dimensions and operating characteristics. Concentrations predicted by air quality models generally are not considered valid within the roadway-mixing zone. The roadway-mixing zone is usually taken to include 3 meters on either side of the traveled portion of the roadway and the turbulent area within 10 meters of a cross street. Model receptor sites were thus located at the edges of the mixing zones near all intersections that were studied for all three scenarios. This implies that pedestrian sidewalks either already exist or are assumed to exist in the future. All receptor heights were placed at 1.8 meters above ground to simulate levels within the normal human breathing zone.

Input meteorological conditions for this study were defined to provide "worst-case" results. One of the key meteorological inputs is atmospheric stability category. For these analyses, atmospheric stability category 6 was assumed for the morning cases, while atmospheric stability category 4 was assumed for the afternoon cases. These are the most conservative stability categories that are generally used for estimating worst-case pollutant dispersion within suburban areas for these periods. A surface roughness length of 100 cm and a mixing height of 1000 meters were used in all cases. Worst-case wind conditions were defined as a wind speed of 1 meter per second with a wind direction resulting in the highest predicted concentration. Concentration estimates were calculated at wind directions of every 5 degrees.

Existing background concentrations of carbon monoxide in the project vicinity are believed to be at low levels. Thus, background contributions of carbon monoxide from sources or roadways not directly considered in the analysis were accounted for by adding a background concentration of 1.0 ppm to all predicted concentrations for 2006. Although increased traffic is expected to occur within the project area during the next several years with or without the project, background carbon monoxide concentrations may not change significantly since individual emissions from motor vehicles are forecast to decrease with time. Hence, a background value of 1.0 ppm was assumed to persist for the future scenarios studied.

Predicted Worst-Case 1-Hour Concentrations

Table 5 summarizes the final results of the modeling study in the form of the estimated worst-case 1-hour morning and afternoon ambient carbon monoxide concentrations. These results can be compared directly to the state and the national AAQS. Estimated worst-case carbon monoxide concentrations are presented in the table for three scenarios: year 2006 with existing traffic, year 2018 without the project and year 2018 with the project. The locations of these estimated worst-case 1-hour concentrations all occurred at or very near the indicated intersections.

As indicated in the table, the highest estimated 1-hour concentration within the project vicinity for the present (2006) case was 5.9 mg/m^3. This was projected to occur during the morning peak traffic hour near the intersection of Kapolei Parkway and Kalaeloa Boulevard. Concentrations at other locations and times studied were 4.6 mg/m^3 or lower. All predicted worst-case 1-hour concentrations for the 2006 scenario were within both the national AAQS of 40 mg/m^3 and the state standard of 10 mg/m^3.

In the year 2018 without the proposed project, the highest worst-case 1-hour concentration was again predicted to occur during the morning at the intersection of Kapolei Parkway and Kalaeloa Boulevard. A value of 7.6 mg/m^3 was predicted to occur at this location and time. Peak-hour worst-case values at the other locations and times studied for the 2018 without project scenario ranged between 2.9 and 5.5 mg/m^3. Compared to the existing case, concentrations remained about the same except for an increase at the intersection of Kapolei Parkway and Kalaeloa Boulevard. All

projected worst-case concentrations for this scenario remained within the state and national standards.

In the year 2018 with the proposed project, the predicted highest worst-case 1-hour concentration continued to occur during the morning at the intersection of Kapolei Parkway and Kalaeloa Boulevard with a value of 7.5 mg/m^3, which is slightly lower compared to the without project case. Other concentrations for this scenario ranged between 3.3 and 7.2 mg/m^3. Although the predicted concentrations increased at most of the locations studied compared to the without project scenario, the values remained within the state and federal standards.

Predicted Worst-Case 8-Hour Concentrations

Worst-case 8-hour carbon monoxide concentrations were estimated by multiplying the worst-case 1-hour values by a persistence factor of 0.5. This accounts for two factors: (1) traffic volumes averaged over eight hours are lower than peak 1-hour values, and (2) meteorological conditions are more variable (and hence more favorable for dispersion) over an 8-hour period than they are for a single hour. Based on monitoring data, 1-hour to 8-hour persistence factors for most locations generally vary from 0.4 to 0.8 with 0.6 being the most typical. One study based on modeling [9] concluded that 1-hour to 8-hour persistence factors could typically be expected to range from 0.4 to 0.5. EPA guidelines [10] recommend using a value of 0.7 unless a locally derived persistence factor is available. Recent monitoring data for locations on Oahu reported by the Department of Health [11] suggest that this factor may range between about 0.2 and 0.6 depending on location and traffic variability. Considering the

location of the project and the traffic pattern for the area, a 1-hour to 8-hour persistence factor of 0.5 will likely yield reasonable estimates of worst-case 8-hour concentrations.

The resulting estimated worst-case 8-hour concentrations are indicated in Table 6. For the 2006 scenario, the estimated worst-case 8-hour carbon monoxide concentrations for the three locations studied ranged from 1.5 mg/m^3 at the Malakole Street/Hanua Street intersection to 3.0 mg/m^3 at the Kapolei Parkway/Kalaeloa Boulevard intersection. The estimated worst-case concentrations for the existing case were within both the state standard of 5 mg/m^3 and the national limit of 10 mg/m^3.

For the year 2018 without project scenario, worst-case concentrations ranged between 1.5 and 3.8 mg/m^3, with the highest concentration occurring at Kapolei Parkway and Kalaeloa Boulevard. All predicted concentrations were within the standards.

For the 2018 with project scenario, worst-case concentrations increased at most locations compared to the without project case, although the location with the highest value, Kapolei Parkway at Kalaeloa Boulevard remained unchanged. The worst-case concentrations ranged from 2.4 to 3.8 mg/m^3. All predicted 8-hour concentrations for this scenario were within both the national and the state AAQS.

Conservativeness of Estimates

The results of this study reflect several assumptions that were made concerning both traffic movement and worst-case meteorological conditions. One such assumption concerning worst-case meteorological conditions is that a wind speed of 1 meter per second with a steady direction for 1 hour will occur. A steady wind of 1 meter per second blowing from a single direction for an hour is extremely unlikely and may occur only once a year or less. With wind speeds of 2 meters per second, for example, computed carbon monoxide concentrations would be only about half the values given above. The 8-hour estimates are also conservative in that it is unlikely that anyone would occupy the assumed receptor sites (within 3 m of the roadways) for a period of 8 hours.

8.0 IMPACTS ON PROJECT FROM CAMPBELL INDUSTRIAL PARK

In addition to assessing the air quality impacts of the project on the surrounding area, the reverse problem of impacts of air pollution sources located in the surrounding area on the residents of the project is also of concern. For this project, the issue of primary concern is the Campbell Industrial Park (CIP) located adjacent to the project site on the south. Several large industrial sources of air pollution are located at CIP including Applied Energy Systems (AES) Generating Station, Kalaeloa Partners Cogeneration Plant, the Chevron and BHP Refineries, H-Power and Hawaiian Cement. During the past few years, several incidents of acute air pollution levels have occurred in areas within and adjacent to CIP. Some of these incidents have been caused by upset conditions at the BHP and Chevron Refineries, while the source or sources of other incidents have never been identified.

As indicated in Section 4, the prevailing winds are in the northeast quadrant, which will carry emissions from CIP away from the project site more than 70 percent of the time. Winds from the south, which could carry emissions toward the site, occur less than about 5 percent of the time. While estimating specific air pollution levels at the project site is beyond the scope of the present study, it is unlikely that concentrations exceed air quality standards during normal operations. Emissions during normal operations are regulated by the Hawaii Department of Health, and industry operators are required to demonstrate compliance with state and national air quality standards. Perhaps the greatest concern is the coincidence of industry malfunctions in conjunction with southerly-wind periods. Even if industry operators are very diligent in operating and maintaining their facilities, occasional malfunctions that result in air pollution incidents in nearby areas are probably unavoidable.

After several incidents over the past few years, the Department of Health has increased scrutiny of industries at CIP. Also, a task force mandated by the state legislature was formed to investigate recent air pollution incidents and to reduce future occurrences. In response to plant malfunctions that have caused the excessive release of air contaminants, several industries have begun modernization programs which are intended to improve operations.

9.0 CONCLUSIONS AND RECOMMENDATIONS

The major potential short-term air quality impact of the project will occur from the emission of fugitive dust during construction. Uncontrolled fugitive dust emissions from construction activities

are estimated to amount to about 1.2 tons per acre per month, depending on rainfall. To control dust, active work areas and any temporary unpaved work roads should be watered at least twice daily on days without rainfall. Use of wind screens and/or limiting the area that is disturbed at any given time will also help to contain fugitive dust emissions. Wind erosion of inactive areas of the site that have been disturbed could be controlled by mulching or by the use of chemical soil stabilizers. Dirt-hauling trucks should be covered when traveling on roadways to prevent windage. A routine road cleaning and/or tire washing program will also help to reduce fugitive dust emissions that may occur as a result of trucks tracking dirt onto paved roadways in the project area. Paving of parking areas and establishment of landscaping early in the construction schedule will also help to control dust. Monitoring dust at the project boundary during the period of construction could be considered as a means to evaluate the effectiveness of the project dust control program and to adjust the program if necessary.

During construction phases, emissions from engine exhausts (primarily consisting of carbon monoxide and nitrogen oxides) will also occur both from on-site construction equipment and from vehicles used by construction workers and from trucks traveling to and from the project. Increased vehicular emissions due to disruption of traffic by construction equipment and/or commuting construction workers can be alleviated by moving equipment and personnel to the site during off-peak traffic hours.

After construction of the proposed project is completed and it is fully occupied, carbon monoxide concentrations in the project area will likely increase due to emissions from project-related

motor vehicle traffic, but worst-case concentrations should remain within both the state and the national ambient air quality standards. Implementing any air quality mitigation measures for long-term traffic-related impacts is probably unnecessary and unwarranted.

Due to the relatively close proximity of industries located at CIP, occasional impacts on the project from emissions emanating from these facilities will probably be unavoidable. Such impacts may occur in conjunction with the coincidental occurrence of industry malfunctions and southerly winds, both of which are relatively infrequent events. Increased scrutiny by the Department of Health, a special task force mandated by the state legislature to assess and monitor emissions in the area, and the upgrade of some of the industries located at CIP, such as Chevron, should help to mitigate future impacts on areas adjacent to CIP.

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Figure 1 - Project Location Map

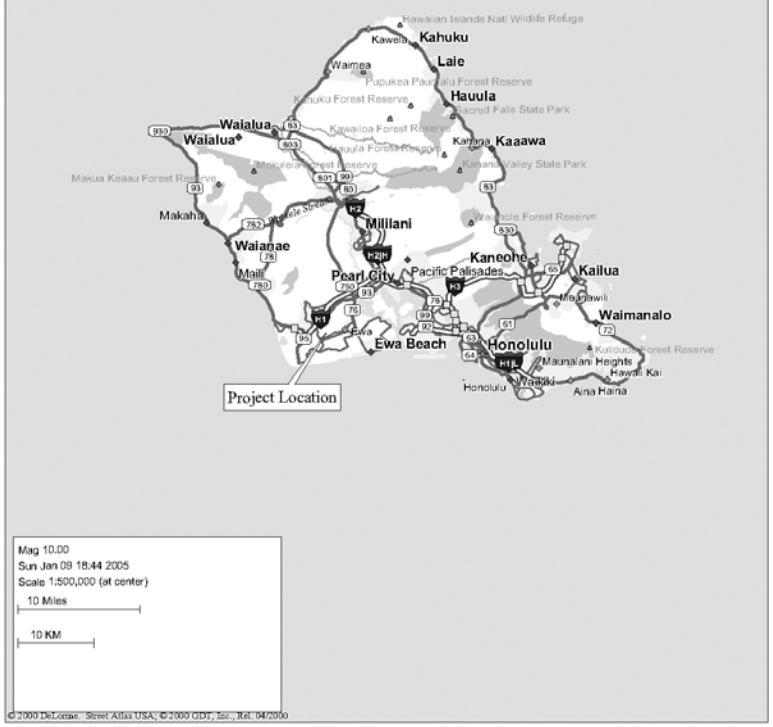

Table 1

SUMMARY OF STATE OF HAWAII AND NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Units	Averaging Time	Maximum Allowable Concentration		
			National Primary	National Secondary	State of Hawaii
Particulate Matter (<10 microns)	$\mu g/m^3$	Annual 24 Hours	50[a] 150[b]	50[a] 150[b]	50 150[c]
Particulate Matter (<2.5 microns)	$\mu g/m^3$	Annual 24 Hours	15[a] 65[d]	15[a] 65[d]	- -
Sulfur Dioxide	$\mu g/m^3$	Annual 24 Hours 3 Hours	80 365[c] -	- - 1300[c]	80 365[c] 1300[c]
Nitrogen Dioxide	$\mu g/m^3$	Annual	100	100	70
Carbon Monoxide	mg/m^3	8 Hours 1 Hour	10[c] 40[c]	- -	5[c] 10[c]
Ozone	$\mu g/m^3$	8 Hours 1 Hour	157[e] 235[f]	157[e] 235[f]	157[e] -
Lead	$\mu g/m^3$	Calendar Quarter	1.5	1.5	1.5
Hydrogen Sulfide	$\mu g/m^3$	1 Hour	-	-	35[c]

[a] Three-year average of annual arithmetic mean.

[b] 99th percentile value averaged over three years.

[c] Not to be exceeded more than once per year.

[d] 98th percentile value averaged over three years.

[e] Three-year average of fourth-highest daily 8-hour maximum.

[f] Standard is attained when the expected number of exceedances is less than or equal to 1.

Table 2

ANNUAL WIND FREQUENCY FOR HONOLULU INTERNATIONAL AIRPORT (%)

Wind Direction	Wind Speed (knots)									Total
	0-3	4-6	7-10	11-16	17-21	22-27	28-33	34-40	>40	
N	0.5	2.5	1.3	0.5	0.0	0.0	0.0	0.0	0.0	4.8
NNE	0.3	1.2	1.6	1.5	0.2	0.0	0.0	0.0	0.0	4.7
NE	0.3	2.1	6.1	11.0	3.2	0.3	0.0	0.0	0.0	23.0
ENE	0.2	2.5	10.9	16.6	4.1	0.3	0.0	0.0	0.0	34.7
E	0.1	1.0	2.5	2.8	0.5	0.0	0.0	0.0	0.0	7.0
ESE	0.0	0.3	0.4	0.3	0.0	0.0	0.0	0.0	0.0	1.1
SE	0.0	0.3	0.8	1.0	0.1	0.0	0.0	0.0	0.0	2.2
SSE	0.1	0.4	1.2	0.7	0.1	0.0	0.0	0.0	0.0	2.4
S	0.1	0.5	1.4	0.6	0.1	0.0	0.0	0.0	0.0	2.7
SSW	0.0	0.3	0.8	0.3	0.0	0.0	0.0	0.0	0.0	1.5
SW	0.0	0.2	0.8	0.4	0.0	0.0	0.0	0.0	0.0	1.5
WSW	0.0	0.3	0.5	0.4	0.0	0.0	0.0	0.0	0.0	1.2
W	0.1	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.1
WNW	0.2	1.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	2.0
NW	0.4	2.3	0.8	0.1	0.0	0.0	0.0	0.0	0.0	3.8
NNW	0.5	2.3	0.8	0.2	0.0	0.0	0.0	0.0	0.0	3.8
Calm	2.5									2.5
Total	5.4	18.3	30.6	36.5	8.5	0.7	0.0	0.0	0.0	100.0

Source: Climatography of the United States No. 90 (1965-1974), Airport Climatological Summary, Honolulu International Airport, Honolulu, Hawaii, U.S. Department of Commerce, National Climatic Center, Asheville, NC, August 1978.

Table 3

AIR POLLUTION EMISSIONS INVENTORY FOR ISLAND OF OAHU, 1993

Air Pollutant	Point Sources (tons/year)	Area Sources (tons/year)	Total (tons/year)
Particulate	25,891	49,374	75,265
Sulfur Oxides	39,230	nil	39,230
Nitrogen Oxides	92,436	31,141	123,577
Carbon Monoxide	28,757	121,802	150,559
Hydrocarbons	4,160	421	4,581

Source: Final Report, "Review, Revise and Update of the Hawaii Emissions Inventory Systems for the State of Hawaii", prepared for Hawaii Department of Health by J.L. Shoemaker & Associates, Inc., 1996

Table 4

ANNUAL SUMMARIES OF AIR QUALITY MEASUREMENTS FOR MONITORING STATIONS NEAREST KAPOLEI HARBORSIDE CENTER PROJECT

Parameter / Location	2000	2001	2002	2003	2004
Sulfur Dioxide / Kapolei					
3-Hour Averaging Period:					
No. of Samples	2505	2511	2420	2461	2504
Highest Concentration ($\mu g/m^3$)	23	24	47	26	17
2nd Highest Concentration ($\mu g/m^3$)	18	15	19	19	12
No. of State AAQS Exceedances	0	0	0	0	0
24-Hour Averaging Period:					
No. of Samples	362	359	344	351	355
Highest Concentration ($\mu g/m^3$)	6	7	9	9	7
2nd Highest Concentration ($\mu g/m^3$)	5	6	7	9	6
No. of State AAQS Exceedances	0	0	0	0	0
Annual Average Concentration ($\mu g/m^3$)	1	2	2	1	1
Particulate (PM-10) / Kapolei					
24-Hour Averaging Period:					
No. of Samples	356	352	351	343	339
Highest Concentration ($\mu g/m^3$)	148	121	55	72	53
2nd Highest Concentration ($\mu g/m^3$)	129	104	35	29	41
No. of State AAQS Exceedances	0	0	0	0	0
Annual Average Concentration ($\mu g/m^3$)	17	19	16	14	13
Carbon Monoxide / Kapolei					
1-Hour Averaging Period:					
No. of Samples	8595	8577	8354	8559	8507
Highest Concentration (mg/m^3)	2.5	2.3	2.2	2.2	2.4
2nd Highest Concentration (mg/m^3)	1.6	1.9	2.0	1.6	1.7
No. of State AAQS Exceedances	0	0	0	0	0
8-Hour Averaging Period:					
No. of Samples	1076	1073	1044	n/a	n/a
Highest Concentration (mg/m^3)	1.0	1.6	1.8	0.8	1.0
2nd Highest Concentration (mg/m^3)	0.8	1.3	1.8	0.8	1.0
No. of State AAQS Exceedances	0	0	0	0	0
Nitrogen Dioxide / Kapolei					
Annual Average Concentration ($\mu g/m^3$)	9	8	9	9	9
Ozone / Sand Island					
8-Hour Averaging Period:					
No. of Samples	-	-	8549	8641	8474
Highest Concentration (mg/m^3)	-	-	89	79	110
2nd Highest Concentration (mg/m^3)	-	-	88	77	108
No. of State AAQS Exceedances	-	-	0	0	0

Source: State of Hawaii Department of Health, "Annual Summaries, Hawaii Air Quality Data, 2000 - 2004"

Table 5

ESTIMATED WORST-CASE 1-HOUR CARBON MONOXIDE CONCENTRATIONS ALONG ROADWAYS NEAR KAPOLEI HARBORSIDE CENTER PROJECT (milligrams per cubic meter)

Roadway Intersection	Year/Scenario					
	2006/Present		2018/Without Project		2018/With Project[a]	
	AM	PM	AM	PM	AM	PM
Kapolei Parkway at Kalaeloa Blvd.	5.9	4.6	7.6	5.5	7.5	5.8
Malakole Street at Kalaeloa Blvd	4.7	3.7	5.1	3.4	6.0	4.4
Malakole Street at Hanua Street	3.0	1.8	3.0[b]	2.3[b]	4.8	3.7
Kapolei Parkway at Hanua Street	-	-	5.2	4.6	7.2	5.4
Opakapaka Street at Hanua Street	-	-	3.2	2.9	5.6	3.3

Hawaii State AAQS: 10
National AAQS: 40

[a]Assumes roadway improvements recommended in traffic study

[b]Assumes traffic signal installed

Table 6

ESTIMATED WORST-CASE 8-HOUR CARBON MONOXIDE CONCENTRATIONS ALONG ROADWAYS NEAR KAPOLEI HARBORSIDE CENTER PROJECT (milligrams per cubic meter)

Roadway Intersection	Year/Scenario		
	2006/Present	2018/Without Project	2018/With Project[a]
Kapolei Parkway at Kalaeloa Blvd.	3.0	3.8	3.8
Malakole Street at Kalaeloa Blvd	2.4	2.6	3.0
Malakole Street at Hanua Street	1.5	1.5[b]	2.4
Kapolei Parkway at Hanua Street	-	2.6	3.6
Opakapaka Street at Hanua Street	-	1.6	2.8

Hawaii State AAQS: 5
National AAQS: 10

[a]Assumes roadway improvements recommended in traffic study

[b]Assumes traffic signal installed

Appendix J
Acoustical Study

D. L. ADAMS ASSOCIATES, LTD.

Consultants in Acoustics and Performing Arts Technologies

Environmental Noise Assessment Report
Kapolei Harborside Center
Kapolei, Oahu, Hawaii

April 2006

DLAA Project No. 06-13

Prepared for:
Group 70 International, Inc.
Honolulu, Hawaii

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APPENDIX

Appendix A Acoustic Terminology

Appendix B Photographs at Project Site

1.0 EXECUTIVE SUMMARY

1.1 The proposed project area includes approximately 345 acres of land in Kapolei, Hawaii and is located between Kalaeloa/Barbers Point Harbor and the existing industrial areas of Campbell Industrial Park and Kapolei Business Park. The land use designation will be changed from agricultural to industrial as the site is proposed to be developed to include industrial lands, preservation, roadways, and support infrastructure. Industrial uses in the project area include light manufacturing, warehousing, and other industrial service businesses. Planned roadway improvements include Hanua Street, Opakapaka Street, and Lauwiliwili Street in addition to the minor roads that are proposed for internal site circulation.

1.2 The sound levels in the project area are dynamic and depend significantly on the vehicular traffic patterns and industrial activities. The hourly L_{eq} noise levels generally range from 48 dBA during the low traffic times to approximately 62 dBA during peak hour traffic at the long term measurement locations. The average calculated day-night level, $L_{dn,}$ at the southern end of the project site was 56 dBA and the average calculated L_{dn} was 58 dBA near the eastern edge of the project site.

1.3 During the project construction, the dominant noise sources will probably be earth moving equipment, such as bulldozers and diesel powered trucks. Noise from construction activities will occur on the project site. Noise from construction activities should be short term and must comply with State of Hawaii Community Noise Control Rules and a construction noise permit issued by the Department of Health.

1.4 The Kapolei Harborside West development will incorporate mechanical equipment that is typical for commercial buildings and industrial lands. Noise from this equipment must meet the State DOH maximum permissible noise limits at the property line. For industrial areas adjacent to other industrial, commercial, and residential areas, the noise limits are 70 dBA during the day and night.

1.5 The traffic noise analysis shows that existing and future noise levels are below the FHWA/DOT maximum noise limit of 72 dBA at the commercial areas adjacent Kalaeloa Boulevard during peak traffic hours. Traffic noise levels within the project site near the proposed Hanua Street is also predicted to be within the maximum noise limit of 72 dBA. Vehicular traffic noise levels are expected to increase by 3 dB or less in the future due to the Kapolei Harborside Center project but will still comply with the FHWA/DOT maximum noise limit.

Vehicular traffic noise from Kapolei Parkway and Hanua Street extensions may exceed the FHWA/DOT maximum permissible noise limit at the planned neighboring residential development, Kapolei West. Although the development does not yet exist, a traffic noise impact is expected in the future. Therefore, design of the residential development should take into account appropriate noise mitigation in order to comply with the FHWA's maximum exterior Leq noise limit of 67 dBA. Mitigation measures include creating a buffer between the

roadway and the buildings, construction of noise barriers (i.e., earth berms, walls, etc.) and air conditioning the impacted residences.

1.6 The Kapolei Harborside Center project site is outside of the 55 L_{dn} noise contour of the Kalaeloa Airport. Therefore, the project will not be impacted by aircraft noise.

2.0 PROJECT DESCRIPTION

The proposed project area includes approximately 345 acres of land in Kapolei, Hawaii and is located between Kalaeloa/Barbers Point Harbor and the existing industrial areas of Campbell Industrial Park and Kapolei Business Park. The project area is currently bounded on the east, west and south by existing industrial areas and on the north by vacant land. The land use designation will be changed from agricultural to industrial as the site is proposed to be developed to include industrial lands, preservation, roadways, and support infrastructure. Industrial uses in the project area include light manufacturing and warehousing, industrial service businesses, and land uses within the current City and County of Honolulu Land Use Ordinance parameters for industrially zoned lands. Roadway improvements planned for the proposed project development include Hanua Street, Opakapaka Street, and Lauwiliwili Street in addition to the minor roads that are proposed for internal site circulation.

The project area currently has several uses operating on-site although the majority of the parcel is vacant. Existing uses include a nursery, intermittent agricultural use, a green waste collection and compost processing operation, fill material stockpiling, and a coal conveyor belt that transports coal from the harbor to HECO power stations to the south of the site.

3.0 NOISE STANDARDS

Various local and federal agencies have established guidelines and standards for assessing environmental noise impacts and set noise limits as a function of land use. A brief description of common acoustic terminology used in these guidelines and standards is presented in Appendix A.

3.1 State of Hawaii, Community Noise Control (DOH)

The State of Hawaii Community Noise Control Rule [Reference 1] defines three classes of zoning districts and specifies corresponding maximum permissible sound levels due to *stationary* noise sources such as air-conditioning units, exhaust systems, generators, compressors, pumps, etc. The Community Noise Control Rule does not address most *moving* sources, such as vehicular traffic noise, air traffic noise, or rail traffic noise. However, the Community Noise Control Rule does regulate noise related to agricultural, construction, and industrial activities, which may not be stationary.

The maximum permissible noise levels are enforced by the State Department of Health (DOH) for any location at or beyond the property line and shall not be exceeded for more than 10% of the time during any 20-minute period. The specified noise limits which apply are a function of the zoning and time of day as shown in Figure 1. With respect to mixed zoning districts, the rule specifies that the primary land use designation shall be used to determine the applicable zoning district class and the maximum permissible sound level. In determining the maximum permissible sound level, the background noise level is taken into account by the DOH.

3.2 U.S. Environmental Protection Agency (EPA)

The U.S. EPA has identified a range of yearly day-night equivalent sound levels, L_{dn}, sufficient to protect public health and welfare from the effects of environmental noise [Reference 2]. The EPA has established a goal to reduce exterior environmental noise to an L_{dn} not exceeding 65 dBA and a future goal to further reduce exterior environmental noise to an L_{dn} not exceeding 55 dBA. Additionally, the EPA states that these goals are not intended as regulations as it has no authority to regulate noise levels, but rather they are intended to be viewed as levels below which the general population will not be at risk from any of the identified effects of noise.

3.3 U.S. Federal Highway Administration (FHWA)

The FHWA defines four land use categories and assigns corresponding maximum hourly equivalent sound levels, $L_{eq(h)}$, for traffic noise exposure [Reference 3], which are listed in Figure 2. For example, Category B, defined as picnic and recreation areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals, has a corresponding maximum exterior L_{eq} of 67dBA and a maximum interior L_{eq} of 52 dBA. These limits are viewed as design goals, and all projects meeting these limits are deemed in conformance with FHWA noise standards.

3.4 Hawaii Department of Transportation (HDOT)

The HDOT has adopted FHWA's design goals for traffic noise exposure in its noise analysis and abatement policy [Reference 5]. According to the policy, a traffic noise impact occurs when the predicted traffic noise levels "approach" or exceed FHWA's design goals or when the predicted traffic noise levels "substantially exceed the existing noise levels." The policy also states that "approach" means at least 1 dB less than FHWA's design goals and "substantially exceed the existing noise levels" means an increase of at least 15 dB.

3.5 Federal Aviation Administration (FAA)

The FAA addresses guidelines for compatible land use that surrounds airports [Reference 6]. Noise contour maps are expressed in terms of yearly day-night average sound levels, L_{dn}, due to aircraft operations. The FAA states that residences outside of the L_{dn} 65 noise contour are compatible without restrictions. Residences between the L_{dn} 65 and 75 contours are only compatible if noise mitigation measures are incorporated into the building structure. Residences inside of the L_{dn} 75 noise contour are generally not compatible. The compatibility of other land uses, such as commercial, manufacturing, public, and recreation, are shown in Table 1.

3.6 Hawaii Department of Transportation (HDOTA), Airports Division

The State of Hawaii, Department of Transportation, Airports Division (HDOTA) has adopted noise restrictions that are similar to, but stricter than, the FAA's noise restrictions [Reference 7]. Like the FAA, HDOTA expresses land use compatibility guidelines based on yearly day-night average sound levels, L_{dn}, due to aircraft operations. In most cases, the HDOTA allows maximum noise limits

that are 5 dB lower than the FAA. For example, the HDOTA states that residences outside of the 60 L_{dn} noise contour are compatible. Residences within the 60 and 70 L_{dn} contours require noise mitigation treatments be incorporated into the construction of the homes. HDOTA also states:

> "Where the community determines that these uses must be allowed, Noise Level Reduction (NLR) measures to achieve interior levels of 45 L_{dn}, or less should be incorporated into building codes and be considered in individual approvals. Normal local construction employing natural ventilation can be expected to provide an average NLR of approximately 9 dB. Total closure, plus air conditioning, may be required to provide additional outdoor to indoor NLR, and will not eliminate outdoor noise problems."

The HDOTA guidelines also specify 60 dBA as the maximum allowable L_{dn} level for school, day care center, and church uses without any mitigation measures. Commercial uses such as retail shops, restaurants, shopping centers, etc. are compatible with L_{dn} levels up to 65 dBA without any mitigation measures. With noise mitigation measures implemented, such commercial uses are allowed in areas exposed to an L_{dn} as high as 75 dBA. The compatibility of other land uses, such as manufacturing, public, and recreation, are shown in Table 2.

In addition to the HDOTA compatibility guidelines, The Hawaii Revised Statutes, Chapter 0508D, Section 15 states a notification is required to the buyer for real estate property that lies,

> "Within the boundaries of the noise exposure area shown on maps prepared by the department of transportation in accordance with Federal Aviation Regulation Part 150-Airport Noise Compatibility Planning (14 Code of Federal Regulations Part 150) for any public airport;"

The FAR Part 150 noise exposure area boundary is defined as the 55 L_{dn} noise contour. Therefore, a notification to the buyer is required for all real estate transactions within the 55 L_{dn} noise contour.

4.0 EXISTING ACOUSTICAL ENVIRONMENT

Two types of noise measurements were conducted to assess the existing acoustical environment in the vicinity of the project location. The first noise measurement type consisted of continuous long-term ambient noise level measurements (Location L1 and L2), as shown in Figure 3. The second type of noise measurement was short-term and included traffic counts (Location S1). The purpose of the short-term noise measurements and corresponding traffic counts were to calibrate a traffic noise prediction model. Both long term and short term measurements were conducted between May 16, 2006 and May 18, 2006.

4.1 Noise Measurement Procedure

<u>Long-Term Noise Measurement Procedure</u>

Continuous, hourly, statistical sound levels were recorded for 55 hours at each location. The measurements were taken using a Larson-Davis Laboratories,

Model 820, Type-1 Sound Level Meter together with a Larson-Davis, Model 2560 Type-1 Microphone. Calibration was checked before and after the measurements with a Larson-Davis Model CAL200 calibrator. Both the sound level meter and the calibrator have been certified by the manufacturer within the recommended calibration period. The microphone was mounted on a tripod, approximately 6 feet above grade. A windscreen covered the microphone during the entire measurement period. The sound level meter was secured in a weather resistant case.

Short-Term Noise Measurement Procedure

An approximate 30-minute equivalent sound level, L_{eq}, was measured. Vehicular traffic counts and traffic mix were documented during the measurement period. The noise measurement was taken using a Larson-Davis Laboratories, Model 824, Type-1 Sound Level Meter together with a Larson-Davis, Model 2541 Type-1 Microphone. Calibration was checked before and after the measurements with a Larson-Davis Model CAL200 calibrator. Both the sound level meter and the calibrator have been certified by the manufacturer within the recommended calibration period. The microphone and sound level meter were mounted on a tripod, approximately 6 feet above grade. A windscreen covered the microphone during the entire measurement period.

4.2 Noise Measurement Locations

Long-Term Noise Measurement Locations

Location L1: Positioned approximately 350 feet west of a dirt road that is an extension of the existing Hanua Road. The area is partially forested (at the 7.4 acre preservation parcel) and partially paved (at the industrial waste parcel). The dirt road is infrequently trafficked by heavy trucks making pick-ups and/or deliveries to the green waste collection station and fill material stockpile area.

Location L2: Positioned 400 feet west of Kalaeloa Boulevard between Opakapaka and Malakole Streets. This location was not within the boundaries of the project site.

Short-Term Noise Measurement Locations

Location S1: Positioned adjacent adjacent to Kalaeloa Boulevard between Opakapaka and Lauwiliwili Streets, approximately 40 feet east of the edge-of-pavement.

4.3 Long-Term Noise Measurement Results

The results from the long-term noise measurements are graphically presented in Figure 4, which shows the measured equivalent sound level, L_{eq}, in A-weighted decibels (dBA) as a function of the measurement date and time.

The sound levels are relatively dynamic and depend significantly on the vehicular traffic patterns and industrial activities in the area for both measurement locations. The hourly L_{eq} noise levels generally range from 48 dBA during the low traffic

times to approximately 62 dBA during peak hour traffic times. The average calculated day-night level, $L_{dn,}$ at the southern end of the project site (location L1) was 56 dBA for the measurement period. The average calculated L_{dn} at location L2 was 58 dBA for the measurement period. Although L2 was not within the boundaries of the project site, the calculated L_{dn} is representative of the parcels bordering the future Hanua Street. The dominant and secondary noise sources for both locations are described below:

The dominant and secondary noise sources are described below:

Dominant: Vehicular traffic on Malakole Hanua Streets was audible at location L1. Vehicular traffic on Kalaeloa Boulevard was audible at location L2

Secondary: Industrial activities, birds, wind.

4.4 Kalaeloa Airport and Honolulu International Airport Noise Contours

The project site is located west of the Kalaeloa Airport. Therefore, the project site was assessed for aircraft noise using airport noise contour maps. The Kalaeloa Master Plan [Reference 8] includes year 2020 projections of airport operations and noise contour maps for airport alternates. Also included in the airport noise contour maps is the affect of the Honolulu International Airport operations [Reference 7]. A complete description of the Kalaeloa Airport alternates can be found in the Kalaeloa Master Plan. The Kapolei Harborside Center project site is outside of the L_{dn} 55 noise contours for both airports based on year 2020 aircraft noise projections.

5.0 POTENTIAL NOISE IMPACTS DUE TO THE PROJECT

5.1 Project Construction Noise

Development of project areas will involve excavation, grading, and other typical construction activities during construction. The various construction phases of the project may generate significant amounts of noise. The actual noise levels produced during construction will be a function of the methods employed during each stage of the construction process. Typical ranges of construction equipment noise are shown in Figure 5. Earthmoving equipment, e.g., bulldozers and diesel-powered trucks, will probably be the loudest equipment used during construction.

5.2 Project Generated Stationary Mechanical Noise and Compliance with State of Hawaii Community Noise Control Rule

The new land development will incorporate stationary and non-stationary mechanical equipment that is typical for commercial buildings and industrial areas. Noise from this equipment must meet the State noise rules, which stipulate maximum permissible noise limits at the property line. For industrial areas adjacent to other industrial, commercial, and residential areas, the noise limits are 70 dBA during the day and night. Mitigation of mechanical noise to meet the State DOH noise rules should be incorporated into the project design.

Intermittent industrial noises may be audible at the adjacent Kapolei West and Koolina residential communites. It is recommended that the industrial lands closest to the proposed golf course, park, and residences be dedicated for light industrial and low noise operations.

5.3 Compliance with FHWA/HDOT Noise Limits

A vehicular traffic noise analysis was completed for the existing conditions, future year 2018 projections without the Kapolei Harborside Center project, and future year 2018 projections with the project using the FHWA Traffic Noise Model Look-up Tables Software Version 2.5 (2004) [Reference 9]. The traffic noise analysis is based on the traffic counts provided by the Traffic Consultant [Reference 10]. Vehicular traffic noise levels were calculated for 4 locations, Locations A, B, C, and D, as shown in Figure 3. The short-term noise measurement and corresponding traffic counts were used to calibrate the software at the noise prediction location along Kalaeloa Boulevard (Location A). Only future noise level predictions were made for Locations B and C because the corresponding roadways do not yet exist. The results of the traffic noise analysis for the existing and future year projections are described below and summarized in Table 3.

5.3.1 Vehicular Traffic Noise Impacts on the Surrounding Community

Noise Prediction Location A

For the commercial areas adjacent Kalaeloa Boulevard, existing and future noise levels were calculated to be below the FHWA/DOT maximum noise limit of 72 dBA during peak traffic hours. Vehicular traffic noise levels at Location A, 100 feet from the roadway, are expected to increase by less than 2 dB in the future without the project. A traffic noise decrease of less than 1 dB due to the project is expected because many vehicles will utilize the proposed Hanua Street extension. A 3 dB change is not considered to be significant.

Noise Prediction Location B

Future year traffic projections show that traffic noise levels at the proposed Kapolei West residential development at least 100 feet from the proposed Kapolei Parkway extension (Location B) are expected to equal the FHWA/DOT maximum noise limit of 67 dBA both with and without the project. The increase in traffic noise due to the Kapolei Harborside Center project is expected to be minimal.

Noise Prediction Locations C

Future year traffic projections without the project show that traffic noise levels at the proposed Kapolei West residential development at least 150 feet from the proposed Hanua Street extension (Location C) are expected to be below the FHWA/DOT maximum noise limit of 67 dBA. The projected increase in traffic noise due to the Kapolei Harborside Center

project is approximately 3 dB and noise levels are expected to approach the FHWA/DOT maximum noise limit.

Noise Prediction Location D

Year 2018 projections of traffic volumes along the H-1 corridor with the project indicate an increase in traffic noise of less than 1 dB, which is not a significant noise increase.

5.3.2 Vehicular Traffic Noise Impacts on the Project

The industrial parcels on the eastern edge of the project site adjacent to the proposed Hanua Street are expected to experience noise levels within the FHWA/DOT maximum noise limit of 72 dBA during peak traffic hours. Vehicular traffic noise levels are expected to increase by 3 dB or less in the future due to the Kapolei Harborside Center project and will comply with the FHWA/DOT maximum noise limit.

5.4 Compliance with EPA Noise Guidelines

The EPA has an existing design goal of $L_{dn} \leq$ 65 dBA and a future design goal $L_{dn} \leq$ 55 dBA for exterior noise levels. The results from the long-term noise measurements conducted at the proposed Kapolei Harborside Center project site show an average calculated day-night level, L_{dn}, of 57 dBA which exceeds the future EPA design goal. In the future, industrial noises will contribute to the overall noise level in addition to increased traffic noise throughout the project site due to Hanua, Lauwiliwili, and Opakapaka Street extensions and additional service roads. Noise levels at the project site may exceed the existing EPA design goal of 65 dBA depending on the type of industrial activities and proximity to roadways. It is important to note that the EPA noise guidelines are design goals and not enforceable regulations. However, these guidelines and design goals are useful tools for assessing the noise environment.

5.5 Compliance with FAA and HDOT Airports Division Guidelines

The Kapolei Harborside Center project site is outside of the 55 L_{dn} noise contour. Therefore, the project will not be impacted by aircraft noise.

6.0 NOISE IMPACT MITIGATION

6.1 Mitigation of Construction Noise

In cases where construction noise exceeds, or is expected to exceed the State's "maximum permissible" property line noise levels [Reference 1], a permit must be obtained from the State DOH to allow the operation of vehicles, cranes, construction equipment, power tools, etc., which emit noise levels in excess of the "maximum permissible" levels.

In order for the State DOH to issue a construction noise permit, the Contractor must submit a noise permit application to the DOH, which describes the construction activities for the project. Prior to issuing the noise permit, the State DOH may require action by the Contractor to incorporate noise mitigation into the

construction plan. The DOH may also require the Contractor to conduct noise monitoring or community meetings inviting the neighboring residents and business owners to discuss construction noise. The Contractor should use reasonable and standard practices to mitigate noise, such as using mufflers on diesel and gasoline engines, using properly tuned and balanced machines, etc. However, the State DOH may require additional noise mitigation, such as temporary noise barriers, or time of day usage limits for certain kinds of construction activities.

Specific permit restrictions for construction activities [Reference 1] are:

> "No permit shall allow any construction activities which emit noise in excess of the maximum permissible sound levels ... before 7:00 a.m. and after 6:00 p.m. of the same day, Monday through Friday."
>
> "No permit shall allow any construction activities which emit noise in excess of the maximum permissible sound levels... before 9:00 a.m. and after 6:00 p.m. on Saturday."
>
> "No permit shall allow any construction activities which emit noise in excess of the maximum permissible sound levels on Sundays and on holidays."

The use of hoe rams and jack hammers 25 lbs. or larger, high pressure sprayers, chain saws, and pile drivers are restricted to 9:00 a.m. to 5:30 p.m., Monday through Friday. In addition, construction equipment and on-site vehicles or devices whose operations involve the exhausting of gas or air, excluding pile hammers and pneumatic hand tools weighing less than 15 pounds, must be equipped with mufflers [Reference 1].

The DOH noise permit does not limit the noise level generated at the construction site, but rather the times at which noisy construction can take place. Therefore, noise mitigation for construction activities should be addressed using project management, such that the time restrictions within the DOH permit are followed.

6.2 Mitigation of Kapolei Harborside Center Generated Noise

The design of the new industrial development should give consideration to controlling the noise emanating from mechanical equipment so as to comply with the State Department of Health *Community Noise Control* rules [Reference 1]. An acoustical wall that surrounds the industrial facility may be required to reduce noise levels at adjoining properties. In addition, buildings that are enclosed and include air-conditioning may emit less noise than buildings that are naturally ventilated. The most effective noise mitigation is to properly plan the project site by creating a buffer zone between noisy industrial activities and noise sensitive areas.

Accordingly, light or low noise industrial activities should be planned for the parcels that border the north and northwest property lines and should only occur during the day so there will be a minimal noise impact on the neighboring

residential developments. Light industrial activities include warehousing, light manufacturing or processing, and packaging or repair establishments.

6.3 Mitigation of Vehicular Traffic Noise

The Kapolei Harborside Center project will not be impacted by vehicular traffic noise from roadways within and surrounding the project. Therefore, mitigation of traffic noise is not necessary at the project site.

Vehicular traffic noise from Kapolei Parkway and Hanua Street extensions may exceed the FHWA/DOT maximum permissible noise limit at the planned neighboring residential development, Kapolei West. Although the development does not yet exist, a traffic noise impact is expected in the future. Therefore, design of the residential development should take into account appropriate setbacks from the aforementioned two roads in order to comply with the FHWA's maximum exterior Leq noise limit of 67 dBA. Other possible mitigation measures include construction of noise barriers (i.e., earth berms, walls, etc.) and air conditioning the impacted residences.

6.4 Mitigation of Aircraft Noise

The Kapolei Harborside Center project site is well outside the L_{dn} 55 dBA noise contour. Therefore, noise mitigation to attenuate aircraft noise is not necessary.

REFERENCES

1. Chapter 46, *Community Noise Control*, Department of Health, State of Hawaii, Administrative Rules, Title 11, September 23, 1996.

2. *Toward a National Strategy for Noise Control*, U.S. Environmental Protection Agency, April 1977.

3. *Department of Transportation, Federal Highway Administration Procedures for Abatement of Highway Traffic Noise*, Title 23, CFR, Chapter 1, Subchapter J, Part 772, 38 FR 15953, June 19, 1973; Revised at 47 FR 29654, July 8, 1982.

4. *Federal Highway Administration's Traffic Noise Model*, FHWA-RD-77-108; U.S. Department of Transportation, December 1978.

5. *Noise Analysis and Abatement Policy*, Department of Transportation, Highways Division, State of Hawaii, June 1977.

6. FAA Regulations on Airport Noise Compatibility Planning Programs, Code of Federal Regulations, Title 14, Chapter 1, Subchapter 1, Part 150; Issued by 49 FR 49269, December 18, 1984; corrected by 50 FR 5063, February 6, 1985; amended by 53 FR 8723, March 16, 1988; corrected by 53 FR 9726, March 24, 1988.

7. *Honolulu International Airport Master Plan Update and Noise Compatibility Program*, State of Hawaii Department of Transportation, Airports Division, Vol. 2, December 1989.

8. *Kalaeloa Airport Master Plan,* State of Hawaii Department of Transportation, Airports Division, November 1998.

9. *Federal Highway Administration's Traffic Noise Model Look-up Tables Software*, Ver. 2.5; U.S. Department of Transportation, December 17, 2004.

10. *Kapolei Harborside Center Traffic Impact Analysis Report Appendices,* Wilbur Smith Associates, March 30, 2006.

TABLE 1:
FAR Part 150 Recommendations for Land Use Compatibility in Yearly Day-Night Average Sound Levels

TYPE OF LAND USE	Yearly Day-Night Average Sound Level (L_{dn})					
	< 65	65-70	70-75	75-80	80-85	> 85
RESIDENTIAL:						
Residential (except mobile homes & transient lodgings)	Y	N(1)	N(1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
PUBLIC USE:						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Government services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
COMMERCIAL USE:						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale/Retail:(bldg. Mater., hardware, & farm equip.)	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade – general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
MANUFACTURING AND PRODUCTION:						
Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
RECREATIONAL USE:						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N	N	N
Golf courses, riding stables and water recreation	Y	Y	25	30	N	N

Note: Numbers in parentheses refer to the following notes.

(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor-to-indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.
(2) Measures to achieve NLR 25 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
(3) Measures to achieve NLR 30 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
(4) Measures to achieve NLR 35 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
(5) Land use compatible provided special sound reinforcement systems are installed.
(6) Residential buildings require a NLR of 25.
(7) Residential buildings require a NLR of 30.
(8) Residential buildings are not permitted.

Abbreviations:
Y(Yes) = Land Use and related structures compatible w/o restrictions.
N(No) = Land Use and related structures are not compatible and should be prohibited.
NLR = Noise Level Reduction (outdoor-to-indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25, 30, or 35 = Land use and related structures general compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structures.

Regulatory Note.
The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, State, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

Source: FAR Part 150, Appedix A, Table 1. "Land Use Compatibility with Yearly Day-Night Average Sound Levels."

TABLE 2:
State Department of Transportation Airports Division Recommendations for Local Land Use Compatibility in Yearly Day-Night Average Sound Levels (Ldn)

	Yearly Day-Night Average Sound Level (L_{dn})					
TYPE OF LAND USE	**< 60**	**60-65**	**65-70**	**70-75**	**75-80**	**80-85**
RESIDENTIAL:						
Low density residential, resorts, & hotels (w/ outdoor fac)	Y(a)	N(b)	N	N	N	N
Low density apartment w/ moderate outdoor use	Y	N(b)	N	N	N	N
High density apartment with limited outdoor use	Y	N(b)	N(b)	N	N	N
Transient lodgings (w/limited outdoor use)	Y	N(b)	N(b)	N	N	N
PUBLIC USE:						
Schools, day care centers, libraries, and churches	Y	N(c)	N(c)	N(c)	N	N
Hospitals, nursing homes, clinics, and health facilities	Y	Y(d)	Y(d)	Y(d)	N	N
Indoor auditoriums, and concert halls	Y(c)	Y(c)	N	N	N	N
Government services and offices serving the public	Y	Y	Y(d)	Y(d)	N	N
Transportation and parking	Y	Y	Y(d)	Y(d)	Y(d)	Y(d)
COMMERCIAL USE:						
Offices - government, business and professional	Y	Y	Y(d)	Y(d)	N	N
Wholesale/Retail: bldg. Mater., hardware, & heavy equip.	Y	Y	Y(d)	Y(d)	Y(d)	Y(d)
Airport businesses - car rental, ticketing, lei stands, etc	Y	Y	Y(d)	Y(d)	N	N
Retail trade, restaurants, shp. Centers, financial inst., etc	Y	Y	Y(d)	Y(d)	N	N
Power plants, sweage treatment plants, & base yards	Y	Y	Y(d)	Y(d)	Y(d)	N
Studios w/o outdoor sets, broadcasting & Production fac	Y(c)	Y(c)	N	N	N	N
MANUFACTURING AND PRODUCTION:						
Manufacturing, general	Y	Y	Y(d)	Y(d)	Y(d)	N
Photographic and optical	Y	Y	Y(d)	Y(d)	N	N
Agriculture (except livestock) and forestry	Y	Y(e)	Y(e)	Y(e)	Y(e)	Y(e)
Livestock farming and breeding	Y	Y(e)	Y(e)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
RECREATIONAL USE:						
Outdoor sports arenas and spectator sports	Y	Y(f)	Y(f)	N	N	N
Outdoor music shells, amphitheaters	Y(f)	N	N	N	N	N
Nature exhibits and zoos, neighborhood parks	Y	Y	Y	N	N	N
Amusements, beach parks, active playgrounds, etc	Y	Y	Y	Y	N	N
Public golf courses, riding stables, cemeteries, gardens, etc	Y	Y	N	N	N	N
Professional/resort sports facil., media event facil., etc	Y(f)	N	N	N	N	N
Extensive natural wildlife and recreation areas	Y(f)	N	N	N	N	N

Note: Letters in parentheses refer to the following notes.

(a) A noise level of 60 L_{dn} does not eliminate all risks of adverse noise impacts from aircraft noise. However, the 60 L_{dn} planning level has been selected by the State Airports Division as an appropriate compromise between the minimal risk of level of 55 L_{dn} and the significant risk level of 65 L_{dn}.

(b) Where the community determines that these uses should be allowed, Noise Level Reduction (NLR) measures to achieve interior levels of 45 L_{dn} or less should be incorporated into building codes and be considered in individual approvals. Normal local construction employing natural ventilation can be expected to provide an average NLR of approximately 9 dB. Total closure plus air conditioning may be required to provide additional outdoor-to-indoor NLR, but will not eliminate outdoor noise problems.

(c) Because the L_{dn} noise descriptor system represents a 24-hour average of individual aircraft noise events, each of which can be unique in respect to amplitude, duration, and tonal content, the NLR requirements should be evaluated for the specific land use, interior acoustical requirements, and properties of the aircraft noise events. NLR requirements should not be based solely upon the exterior L_{dn} exposure level.

(d) Measures to achieve required NLR must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

(e) Residential buildings require NLR. Residential buildings should not be located where exterior noise is greater than 65 L_{dn}.

(f) Impact of amplitude, duration, frequency, and tonal content of aircraft noise events should be evaluated.

Abbreviations:
Y(Yes) = Land Use and related structures compatible without restrictions.
N(No) = Land Use and related structures are not compatible and should be prohibited.

Source: Airports Division, Department of Transportation, State of Hawaii

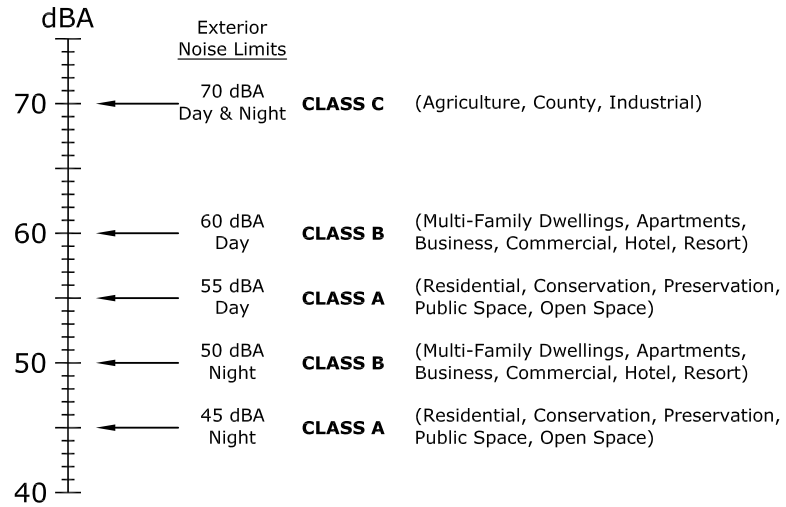
TABLE 3:
Predicted Traffic Noise Levels With and Without the Project and Resulting Increases Due to the Project[+]

Noise levels shown in the table are based on peak-hour traffic volumes, and are expressed in A-weighted decibels (dBA).

	Location A[*]		Location B[*]		Location C[*]		Location D[*]	
	AM	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
Existing (Calculated)	69.4	67.3	N/A	N/A	N/A	N/A	N/A	N/A
Future Without Project (2018)	70.9	69.4	65.1	66.5	64.3	60.0	68.0	68.4
Future With Project (2018)	70.6	68.7	65.3	67.0	66.5	62.8	68.5	68.9
Future Increase Without Project (2018)	1.5	2.1	N/A	N/A	N/A	N/A	N/A	N/A
Future Increase With Project (2018)	1.2	1.4	N/A	N/A	N/A	N/A	N/A	N/A
Future Increase Due to Project (2018)	**-0.3**	**-0.7**	**0.2**	**0.5**	**2.2**	**2.8**	**0.5**	**0.5**

[+] The noise level calculations were based on the traffic study provided by the Traffic Consultant [Reference 10].
[*] Location A - 100 feet east of Kalaeloa Boulevard edge of pavement
Location B - 100 feet north of the Kapolei Parkway edge of pavement
Location C - 150 feet west of the proposed Hanua Road edge of pavement
Location D - 100 feet south of the H-1 Freeway edge of pavement

Zoning District	**Day Hours** (7 AM to 10 PM)	**Night Hours** (10 PM to 7 AM)
CLASS A Residential, Conservation, Preservation, Public Space, Open Space	55 dBA (Exterior)	45 dBA (Exterior)
CLASS B Multi-Family Dwellings, Apartments, Business, Commercial, Hotel, Resort	60 dBA (Exterior)	50 dBA (Exterior)
CLASS C Agriculture, Country, Industrial	70 dBA (Exterior)	70 dBA (Exterior)



Hawaii Maximum Permissible Sound Levels for Various Zoning Districts

Kapolei Harborside Center

Not to Scale

Figure No 1

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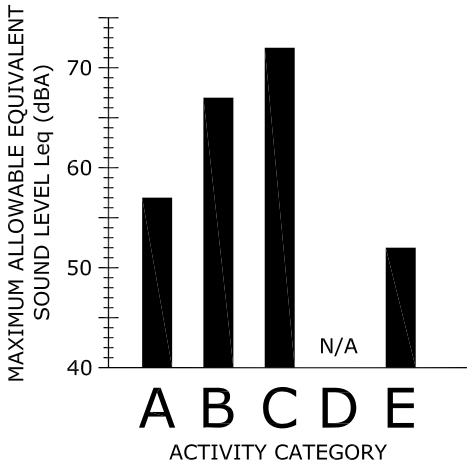
Date	Project No.	Drawn By
June 2006	06-13	TRB

ACTIVITY CATEGORY	ACTIVITY CATEGORY DESCRIPTION	MAXIMUM EQUIVALENT SOUND LEVEL $L_{eq(h)}$
A	LANDS ON WHICH SERENITY AND QUIET ARE OF EXTRAORDINARY SIGNIFICANCE AND SERVE AN IMPORTANT PUBLIC NEED AND WHERE THE PRESERVATION OF THOSE QUALITIES IS ESSENTIAL IF THE AREA IS TO CONTINUE TO SERVE ITS INTENDED PURPOSE.	57 dBA (EXTERIOR)
B	PICNIC AREAS, RECREATION AREAS, PLAYGROUNDS, ACTIVE SPORT AREAS, PARKS, RESIDENCES, MOTELS, HOTELS, SCHOOLS, CHURCHES, LIBRARIES, AND HOSPITALS.	67 dBA (EXTERIOR)
C	DEVELOPED LANDS, PROPERTIES, OR ACTIVITIES NOT INCLUDED IN ACTIVITY CATEGORIES A OR B ABOVE.	72 dBA (EXTERIOR)
D	UNDEVELOPED LAND	N/A
E	RESIDENCES, MOTELS, HOTELS, PUBLIC MEETING ROOMS, SCHOOLS, CHURCHES, LIBRARIES, HOSPITALS, AND AUDITORIUMS.	52 dBA (INTERIOR)



Federal Highways Administration Recommended Equivalent Hourly Sound Levels Based on Land Use

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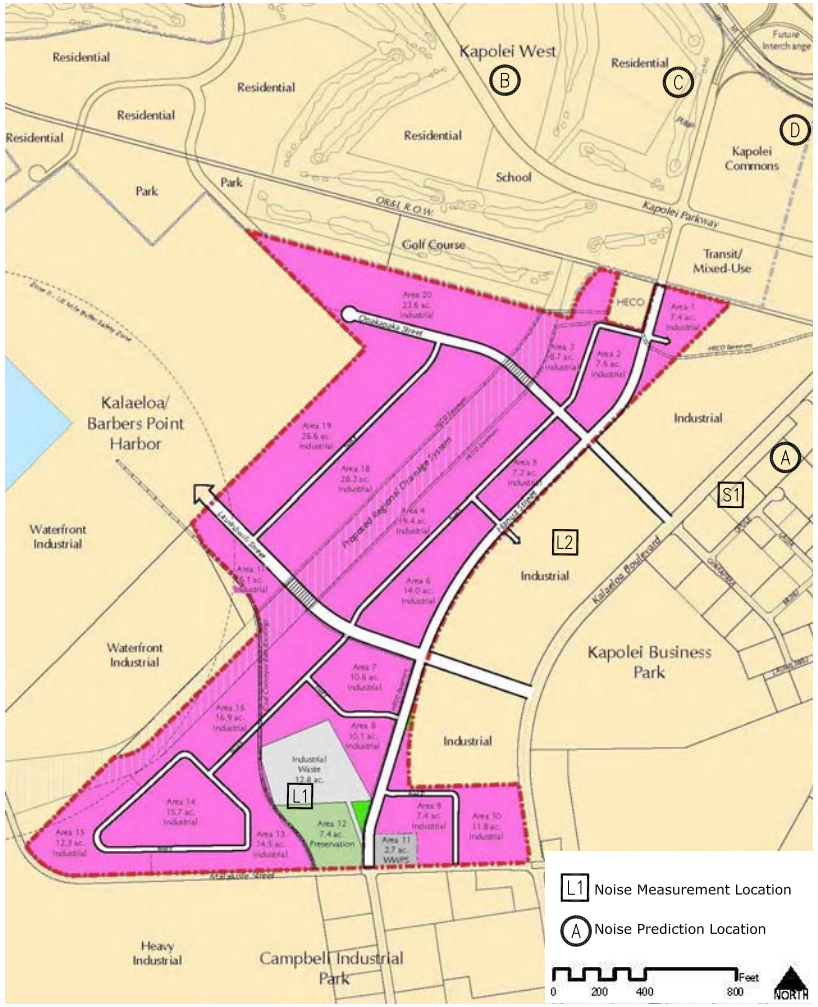
Kapolei Harborside Center

Not to Scale

Date	Project No.	Drawn By
June 2006	06-13	TRB

Figure No 2



Noise Measurement and Prediction Locations

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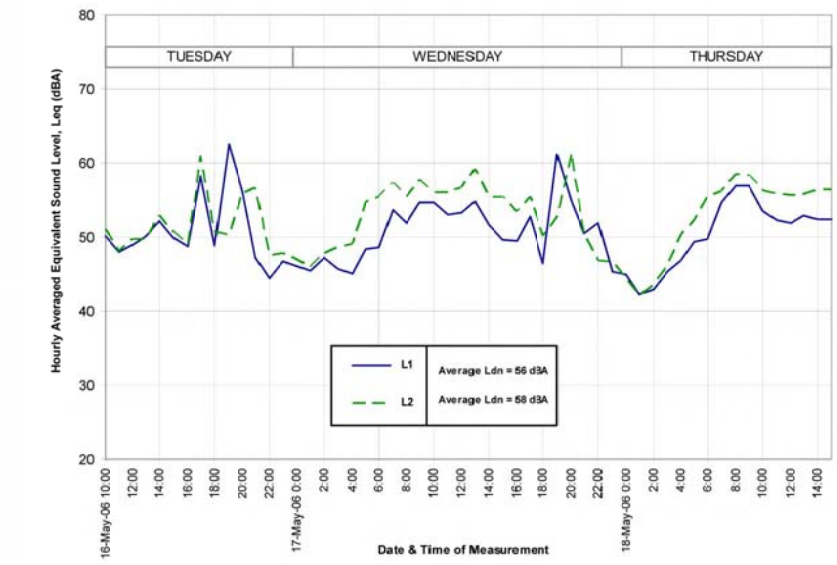
Kapolei Harborside Center

Not to Scale

Date	Project No.	Drawn By
June 2006	06-13	DFD

Figure No 3



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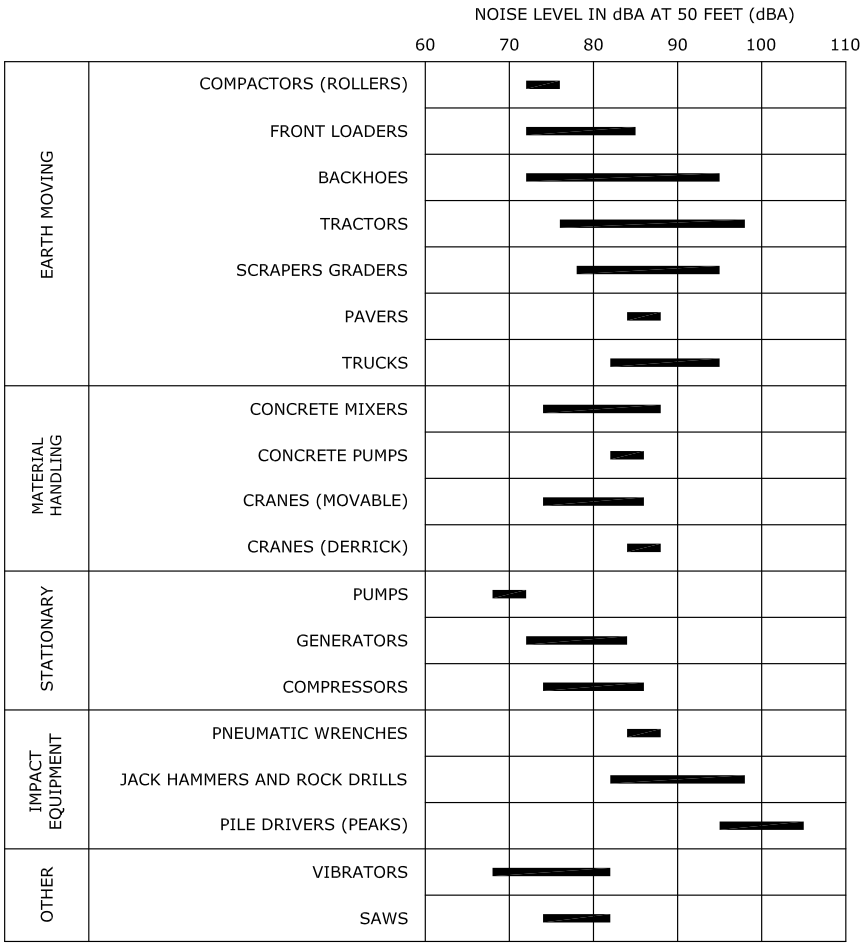
Graph of Long Term Noise Measurements

Kapolei Harborside Center

Not to Scale

Date	Project No.	Drawn By
June 2006	06-13	DFD

Figure No 4



NOTE: BASED ON LIMITED AVAILABLE DATA SAMPLES

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Typical Sound Levels from Construction Equipment

Kapolei Harborside Center

not to scale

Date	Project No.	Drawn By
June 2006	06-13	TRB

Figure No 5

APPENDIX A

Acoustic Terminology

Acoustic Terminology

Sound Pressure Level

Sound, or noise, is the term given to variations in air pressure that are capable of being detected by the human ear. Small fluctuations in atmospheric pressure (sound pressure) constitute the physical property measured with a sound pressure level meter. Because the human ear can detect variations in atmospheric pressure over such a large range of magnitudes, sound pressure is expressed on a logarithmic scale in units called decibels (dB). Noise is defined as "unwanted" sound.

Technically, sound pressure level (SPL) is defined as:

$$SPL = 20 \log (P/P_{ref}) \text{ dB}$$

where P is the sound pressure fluctuation (above or below atmospheric pressure) and P_{ref} is the reference pressure, 20 μPa, which is approximately the lowest sound pressure that can be detected by the human ear. For example:

If P = 20 μPa, then SPL = 0 dB
If P = 200 μPa, then SPL = 20 dB
If P = 2000 μPa, then SPL = 40 dB

The sound pressure level that results from a combination of noise sources is not the arithmetic sum of the individual sound sources, but rather the logarithmic sum. For example, two sound levels of 50 dB produce a combined sound level of 53 dB, not 100 dB. Two sound levels of 40 and 50 dB produce a combined level of 50.4 dB.

Human sensitivity to changes in sound pressure level is highly individualized. Sensitivity to sound depends on frequency content, time of occurrence, duration, and psychological factors such as emotions and expectations. However, in general, a change of 1 or 2 dB in the level of sound is difficult for most people to detect. A 3 dB change is commonly taken as the smallest perceptible change and a 6 dB change corresponds to a noticeable change in loudness. A 10 dB increase or decrease in sound level corresponds to an approximate doubling or halving of loudness, respectively.

A-Weighted Sound Level

Studies have shown conclusively that at equal sound pressure levels, people are generally more sensitive to certain higher frequency sounds (such as made by speech, horns, and whistles) than most lower frequency sounds (such as made by motors and engines)[1] at the same level. To address this preferential response to frequency, the A-weighted scale was developed. The A-weighted scale adjusts the sound level in each frequency band in much the same manner that the

[1] D.W. Robinson and R.S. Dadson, "A Re-Determination of the Equal-Loudness Relations for Pure Tones," *British Journal of Applied Physics*, vol. 7, pp. 166 - 181, 1956. (Adopted by the International Standards Organization as Recommendation R-226.

human auditory system does. Thus the A-weighted sound level (read as "dBA") becomes a single number that defines the level of a sound and has some correlation with the sensitivity of the human ear to that sound. Different sounds with the same A-weighted sound level are perceived as being equally loud. The A-weighted noise level is commonly used today in environmental noise analysis and in noise regulations. Typical values of the A-weighted sound level of various noise sources are shown in Figure A-1.

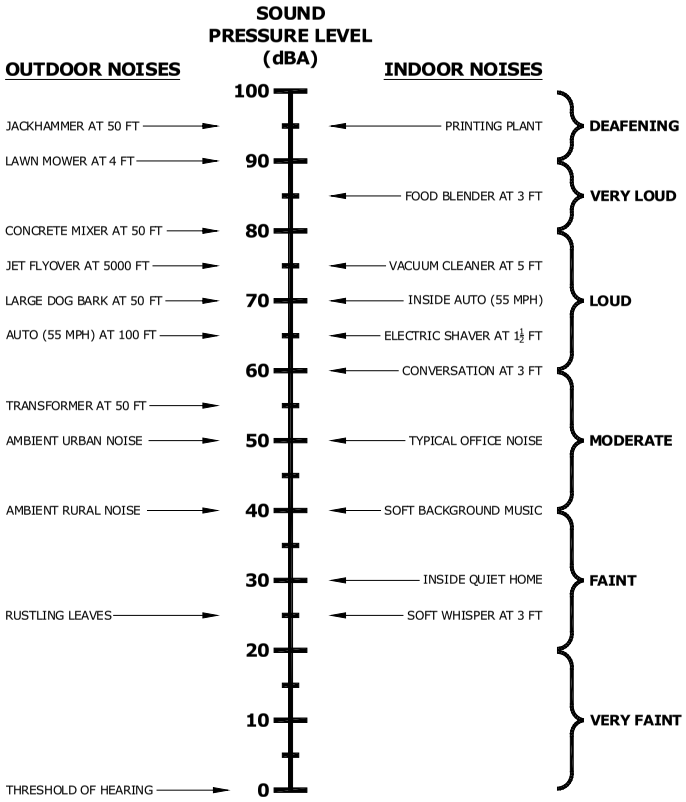

Figure A-1. Common Outdoor/Indoor Sound Levels

Equivalent Sound Level

The Equivalent Sound Level (L_{eq}) is a type of average which represents the steady level that, integrated over a time period, would produce the same energy as the actual signal. The actual *instantaneous* noise levels typically fluctuate above and below the measured L_{eq} during the measurement period. The A-weighted L_{eq} is a common index for measuring environmental noise. A graphical description of the equivalent sound level is shown in Figure A-2.

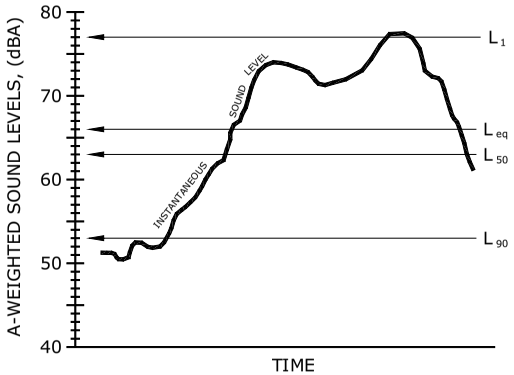

Figure A-2. Example Graph of Equivalent and Statistical Sound Levels

Statistical Sound Level

The sound levels of long-term noise producing activities such as traffic movement, aircraft operations, etc., can vary considerably with time. In order to obtain a single number rating of such a noise source, a statistically-based method of expressing sound or noise levels has been developed. It is known as the Exceedence Level, L_n. The L_n represents the sound level that is exceeded for n% of the measurement time period. For example, L_{10} = 60 dBA indicates that for the duration of the measurement period, the sound level exceeded 60 dBA 10% of the time. Typically, in noise regulations and standards, the specified time period is one hour. Commonly used Exceedence Levels include L_{01}, L_{10}, L_{50}, and L_{90}, which are widely used to assess community and environmental noise. A graphical description of the equivalent sound level is shown in Figure A-2.

Day-Night Equivalent Sound Level

The Day-Night Equivalent Sound Level, L_{dn}, is the Equivalent Sound Level, L_{eq}, measured over a 24-hour period. However, a 10 dB penalty is added to the noise levels recorded between 10 p.m. and 7 a.m. to account for people's higher sensitivity to noise at night when the background noise level is typically lower. The L_{dn} is a commonly used noise descriptor in assessing land use compatibility, and is widely used by federal and local agencies and standards organizations.

APPENDIX B

Photographs at Project Site

Location L1:
Approximately 350 feet west of Hanua Road, adjacent to the 7.4 acre preservation area.

Location L2:
Approximately 400 feet west of Kalaeloa Boulevard on the vacant parcel between Kapolei Business Park and the proposed Kapolei Harborside Center project.

Appendix K
Hazardous Materials Summary

Environmental Summary Report
Kapolei Harborside Center
Former Hawaiian Western Steel Waste Pile
Malakole Road Parcel North of Chevron Refinery
Kapolei, Hawaii

July 6, 2006
005-11083-00

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EXECUTIVE SUMMARY

Former Hawaiian Western Steel Wastepile

Beginning in 1959, Hawaiian Western Steel (HWS) built and operated a secondary steel mill in the Campbell Industrial Park to convert scrap metal into steel reinforcement bar (rebar). In approximately 1970, HWS began using the Waste Pile area for the disposal of plant-generated waste (e.g. wet scrubber material, mill scale [iron oxide], slag, scrap steel, electrode remnants, and furnace bricks). In 1976, a baghouse was installed at the plant site to collect arc furnace off-gasses and dust, and the baghouse dust was disposed in the Waste Pile area. HWS discontinued disposal operations at the Waste Pile in 1986; plant operations ceased in 1991. A total of approximately 100,800 cubic yards of material had been disposed at the Waste Pile during its operation.

On February 24, 1992, the Environmental Protection Agency (EPA), Region IX issued an Administrative Order on Consent ("the Order") pursuant to Sections 104 and 106 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA Order Number 92-10) as amended by United States Code Sections 9604 and 9606. The Order required HWS to conduct waste removal at other HWS locations; consolidate the waste at the Waste Pile; grade and compact the waste materials; and install a CERCLA cap over the waste as part of closure of the Waste Pile. In November 1992, construction of a cap over the Waste Pile was initiated. The waste was graded, and a 6- to 8-inch layer of compacted coral fines was placed over the waste. A 30 and 40-mil high-density polyethylene (HDPE) geomembrane liner was then installed, and subsequently covered with a 6- to 9-inch layer of compacted coral fines. Closure activities were completed in January 1993.

LFR Inc. (LFR) implemented a Resource Conservation and Recovery Act (RCRA) facility investigation and closure plan in 1995. The investigation consisted of a geophysical survey, trenching, installation of soil borings and monitoring wells/piezometers, collection and analysis of soil and ground-water samples, and water-table elevation monitoring. The investigation identified waste material beyond the limits of the CERCLA cap at the north and south ends of the west lobe of the Waste Pile and at the southwest end of the east lobe. LFR recommended capping the three additional areas with coral fines and asphalt in conjunction with final closure of the Waste Pile. The final closure was performed in accordance with the revised *RCRA Closure Plan*, and included the following tasks: installing a perimeter drainage pipe; extending the geomembrane liner to the Hanua Street Extension roadway; installing the five remaining layers of the cap; extending the coverage of the cap to include the three additional areas; and disposing of sinkhole soil and construction-derived residuals.

Subsequent to closure and in accordance with the Landfill Administrative Order, a Waste Pile Post-Closure Plan was prepared and submitted to the EPA on January 23, 1996; it describes post-closure activities, including groundwater monitoring. Nine monitoring events were conducted during the closure and post-closure period of

January 1996 through May 1999. Based on the results of nine rounds of groundwater monitoring, LFR concluded that there was no evidence of migration of significant amounts of lead or cadmium from the waste pile into the groundwater. Furthermore, there was no indication of migration from the site of the low levels of total lead detected in the groundwater. LFR recommended that groundwater monitoring at the Waste Pile be discontinued and that the monitoring wells be properly abandoned in accordance with EPA approved procedures. In May 1998, LFR prepared a Certification of Low Potential for Migration of Hazardous Waste. The results of the January and May 1999 sampling events were consistent with the assumptions included in the certification. EPA allowed HWS to suspend groundwater monitoring activities from 1999 to 2005 when EPA approved the termination of groundwater monitoring and authorized the abandonment of the monitoring wells. EPA also approved semi-annual cap inspections as a modification of the inspection requirements detailed in the post-closure requirements of the Initial Decision/Order dated December 3, 1992.

Malakole Street Area North of Chevron Refinery

The area of petroleum affected soil and groundwater adjacent to the Chevron refinery represents the northern fringe of a large plume of phase-separated hydrocarbon (PSH) underlying the storage tank farm and adjacent areas of the refinery. The PSH plume was believed to be caused by tank overfill incidents, pipeline releases, or historical releases of various petroleum products leaking through the sidewall or bottom of the above-ground bulk fuel storage tanks before they were retrofitted with double-walled construction between 1985 and 2005.

In 1996 Chevron conducted an investigation of the area north of Malakole road to define the boundary of the PSH plume and collect information required to design a remediation system for the portion of the plume that was not on Chevron property. An active skimming remediation system consisting of three trenches containing horizontal slotted collection pipes which sloped to sumps outfitted with hydrophobic density skimmer pumps was installed and operated until the yield of PSH declined to levels that indicated skimming was no longer effective. The remediation effort was conducted with oversight from the EPA Region 9, and the DOH, and resulted in the recovery of approximately 6,500 gallons of PSH and groundwater.

A December 2005 soil and groundwater investigation indicated that no remaining PSH was found at the site and remaining concentrations is soil and groundwater had dropped below the current DOH environmental action levels (EALs).The only exception to the decreasing chemical concentrations was observed in soil boring/well F2-OBLO20A in an area where there was previously 0.2 to 0.4 feet of PSH. TPHg concentrations in the soil and groundwater samples from this location were above the DOH EALs.

Overall, the results indicate that the active remediation skimming system was quite successful in reducing the amount of PSH in the soil and in reducing the source of dissolved petroleum compounds in the groundwater. The results also indicate that

natural bioattenuation is occurring at the site and the remaining affected soil and dissolved plume are stable and slowly receding.

1.0 INTRODUCTION

Kapolei Property Development, LLC (KPD) retained Group 70 International to prepare a draft Environmental Impact Statement (EIS) as part of a petition for a State Land Use Boundary Amendment from Agricultural to Urban District and a subsequent County Change of Zone request. As part of the EIS process, LFR was asked to prepare a summary of the environmental condition of two parcels within the project area which are impacted by petroleum hydrocarbons or hazardous waste (the Site).

1.1 Objectives and Scope of Work

The objective of the Environmental Summary Report is to provide a concise evaluation of the nature and extent of the impacted areas, the history of releases which affected the soil and groundwater, the actions which were taken to contain and remediate the areas, the present condition of the sites, the status of regulatory agency decisions and involvement, and the nature of potential environmental or exposure risks, if any.

The two sites which were evaluated are the former Hawaiian Western Steel (HWS) Waste Pile located on the Hanua Street extension north of Malakole Road, and the land on the north side of Malakole Road immediately adjacent to the Chevron Refinery.

2.0 REVIEW OF BACKGROUND INFORMATION

Relevant background information pertaining to the physical setting of the Site and surrounding properties was obtained from readily available records. This information includes local topography, a description of the local soil and geologic characteristics, a description of groundwater at the Site, and land use.

2.1 Site Description

The former (HWS) Waste Pile located on Hanua Street extension north of Malakole Road, and the land on the north side of Malakole Road immediately adjacent to the Chevron Refinery are shown in Figure 1.

The HWS waste pile is located on an approximately 6.5 acre parcel of land within the Campbell Industrial Park, Kapolei, Oahu, Hawaii (Figure 2). The waste pile is associated with the Former Hawaiian Western Steel facility and is located one mile north of the HWS plant site (91-150 Hanua Street), just north of Malokole Road. The Waste Pile is bounded by the remnants of a large coral pile to the west and a wholesale nursery to the east. Hanua Street Extension, providing access to the Grace Pacific rock quarry to the north, bisects the Waste Pile. Historical information related to waste disposal activities at the waste pile and previous environmental investigations is presented below in Section 3.0.

The area located on the north side of Malakole Road, adjacent to the Chevron Refinery, occupies approximately 25 acres within TMK Parcel 9-1-014:033 (Figure 3). TMK Parcel 9-1-014:033 is owned by the Estate of James Campbell (Campbell Estate) and encompasses an area of approximately 137 acres. The parcel is leased by Grace Pacific for use as a sand and gravel storage area, and by Hawaiian Earth Products, Ltd. for use as a green waste composting facility. A pipeline corridor is also located along the Malakole side of the parcel with pipelines owned and operated by Tesoro, Chevron, and Hawaiian Electric Company (HECO) (D&M 1997a). Historical information related to previous releases and environmental investigations conducted in the area north of Malakole Road is presented below in Section 4.0.

2.2 Geology

Regional

The island of Oahu is the weathered and eroded remnant of two major coalescing shield volcanoes, the Waianae and Koolau. Extrusive igneous rocks (lava flows) are in contact with karstic coralline limestone formations in the vicinity of Campbell Industrial Park. These carbonate formations are a result of marine sedimentation and precipitation with subsequent partial dissolution. The Site is located south of the Waianae Range on the southwestern Ewa coastal plain of Oahu. The Ewa coastal plain is situated on an extensive formation of interbedded carbonate and terrigenous sediments with a thick vertical component that is referred to as a “caprock”. The geologic substrate underlying the Site is comprised of relatively homogeneous coral deposits. There are no known structural discontinuities (i.e., faults) in this area. Because there has not been any recent tectonic activity, dipping or folding of the deposits has not occurred.

Local

Based on a review of the United States Geological Survey (USGS) Ewa, Hawaii 7.5-minute quadrangle map (USGS, 1983), the regional topography is relatively flat, but sloping gently toward the Pacific Ocean located to the south and west of the Site. Ground surface elevations at the Site range from approximately 6 to 15 feet above mean sea level (msl).

The soil in the vicinity of the Site has been classified by the U.S. Department of Agriculture, Soil Conservation Service (USDA) as "coral outcrop." The material consists of coral or cemented calcareous sand. This material is composed primarily of calcium carbonate. The coral outcrop is highly permeable with hydraulic conductivities reportedly ranging between 2,000 and 10,000 feet per day (HLA, 1989). The USDA indicates that a thin layer of friable, red soil material formed as alluvium (Mamala Series) occurs in cracks, crevices, and depressions within the coral.

2.3 Hydrogeology

The Site is located on the seaward-side (makai) of the Underground Injection Control (UIC) line established by the DOH, Safe Drinking Water Branch. The UIC line is located approximately 0.5 mile north and inland from the Site. Therefore, the Site is assumed to immediately overlie groundwater that is not a source or potential source of drinking water.

Data presented in Aquifer Identification and Classification for Oahu: Groundwater Protection Strategy for Hawaii (Mink and Lau 1990) indicates groundwater within the Site vicinity occurs within the Ewa Aquifer System of the Pearl Harbor Aquifer Sector in an upper and lower aquifer. The uppermost aquifer is unconfined and comprised of caprock sediments that flank the Waianae basalt. The regional groundwater has a moderate salinity (1,000 to 5,000 milligrams/liter [mg/l] chlorides), is currently in use and is replaceable with a high vulnerability to contamination.

The underlying aquifer is classified as a basal flank, confined aquifer with low salinity water (250 to 1,000 mg/l chlorides) and is currently in use. The deep aquifer is neither ecologically important, nor used for drinking water purposes and is irreplaceable with a high vulnerability to contamination.

Nearby Drinking Water Wells

The well information presented below has been obtained from Sheet O-6 (Ewa Quadrangle) of the Underground Injection Control (UIC) Program Map Series of the State of Hawaii Department of Land and Natural Resources (DLNR). These data indicate the following:

The nearest drinking water supply well (DLNR well number 3-2004-05) is located approximately 2.2 miles northeast and hydraulically up gradient of the Site.

Nearest Surface Water Bodies

The nearest natural surface water body is the Pacific Ocean, located 0.37 miles west-southwest of the lot to the north of Malakole Street and 0.8 miles west-southwest of the HWS waste pile. Consequently, groundwater flow beneath the Site is most likely west-southwest towards the ocean. Due to the Site's proximity to the ocean, the water table beneath the Site is tidally influenced.

There are no lakes, rivers, or creeks within a one-mile radius of the Site, except for manmade drainage channels (Drains B and C) which receive stormwater runoff from the Industrial Park. Drain B is located approximately 0.75 mile south of the Site and Drain C is approximately 0.5 mile southeast of the Site.

Annual Rainfall

The average annual rainfall in the Site vicinity is approximately 24 inches.

3.0 FORMER HAWAIIAN WESTERN STEEL WASTE PILE

A summary of available historical information related to waste disposal activities at the waste pile and previous environmental investigations is presented below.

3.1 History of Hazardous Waste Disposal Activities

This section summarizes Hawaiian Western Steel (HWS) operations that led to the disposal of hazardous wastes at the Waste Pile Site. Volumes of hazardous wastes present at the Waste Pile are also discussed.

3.1.1 Hawaiian Western Steel Operations

Beginning in 1959, HWS built and operated a secondary steel mill in the Campbell Industrial Park to convert scrap metal into steel reinforcement bar (rebar); the property was previously undeveloped. Prior to demolition in 1995, structures at the HWS Plant Site consisted of a Furnace Melt Shop which included an electric arc furnace (EAF) and its associated baghouse; a Rolling Mill; a maintenance building; and a one-story office building. The EAF was first used in the Melt Shop in 1960. From 1974 until the baghouse went on-line, a wet scrubber system was used to collect furnace dust. In 1976, a baghouse system was installed for collection of furnace dust, and was in-service until 1991, at which time HWS ceased operations.

In approximately 1970, HWS began using the Waste Pile area for the disposal of plant-generated waste (e.g. wet scrubber material, mill scale [iron oxide], slag, scrap steel, electrode remnants, and furnace bricks). HWS discontinued disposal operations at the Waste Pile in 1986.

3.1.2 Waste Pile Landfill Inventory

The waste pile area is a monofill; it does not contain any containerized wastes. The western portion of the waste pile was estimated to span approximately 3.2 acres at an average depth of 10.6 feet prior to initiation of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) remedial activities (HLA 1989). This represented a volume of approximately 55,240 cubic yards of waste. Upon completion of CERCLA remedial activities by REMCOR at the HWS Plant Site, an additional 26,570 cubic yards of waste were added to the west portion of the waste pile. An estimated volume of 3,750 cubic yards of waste is also estimated to be present beneath the Hanua Street extension. The eastern portion of the waste pile spans 1.1 acres at an average depth of 9 feet, which represents approximately 15,250 cubic yards. The total volume waste material buried at the waste pile is thus estimated to be 100,800 cubic yards.

3.2 Investigation and Remediation Activities

Investigative activities have been conducted at the site under CERCLA and the Resource Conservation and Recovery Act (RCRA). A summary of investigations and remedial activities are listed below:

3.2.1 Preliminary Ground-Water Quality Assessment, Hawaiian Western Steel Waste Pile. June 16, 1989

Three ground water monitoring wells were installed within the waste pile area by Harding Lawson and Associates during a 1989 water quality investigation (HLA, 1989). Analysis of water samples indicated that cadmium was not present above detection levels of 0.001 mg/l. Lead was detected in one of the three samples at a concentration of 0.009 mg/l and below detection levels of 0.001 in the other two samples. The wells were subsequently abandoned during activities pursuant to the 1992 CERCLA order (Section 3.2.2).

3.2.2 EPA Administrative Order on Consent, Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Order Number 92-10. February 24, 1992

On February 24, 1992, the Environmental Protection Agency (EPA), Region IX issued an Administrative Order on Consent ("the Order") pursuant to Sections 104 and 106 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA Order Number 92-10) as amended by United States Code Sections 9604 and 9606. The Order required HWS to conduct waste removal at other HWS locations; consolidate the waste at the Waste Pile; grade and compact the waste materials; and install a CERCLA cap over the waste as part of closure of the Waste Pile.

3.2.3 Expanded Work Plan, Hawaiian Western Steel Limited, Ewa Beach, Oahu, Hawaii. March 18, 1992

Beginning in April 1992, HWS conducted investigation and cleanup activities at the plant site and other HWS locations. HWS' cleanup activities included removal of approximately 26,570 cubic yards (cy) of baghouse dust, slag, mill scale, and chemically-impacted soil and sediment for disposal at the Waste Pile. Including this material, a total of approximately 100,800 cy of material had been disposed at the Waste Pile during its operation (Remcor August 6, 1993). In accordance with Paragraph 29 of the Order, the waste was subsequently segregated, consolidated, and compacted in preparation for the installation of the CERCLA cap.

In November 1992, construction of a cap over the Waste Pile was initiated. The waste was graded, and a 6- to 8-inch layer of compacted coral fines was placed over the waste. A 30 and 40-mil high-density polyethylene (HDPE) geomembrane liner was then installed followed by an 6- to 9-inch layer of compacted coral fines; Later during

RCRA closure activities in 1995 five additional capping layers were added. RCRA closure activities were completed in November 1995 (See section 3.2.5).

3.2.4 Resource Conservation and Recovery Act (RCRA) Facility Investigation

LFR implemented an RCRA facility investigation in 1995. The investigation consisted of a geophysical survey, trenching, installation of soil borings and monitoring wells/piezometers, collection and analysis of soil and ground-water samples, and water-table elevation monitoring. The investigation identified waste material beyond the limits of the CERCLA cap at the north and south ends of the west lobe of the Waste Pile and at the southwest end of the east lobe. The investigation findings were reported in Levine•Fricke's *Phase I - Sampling and Analysis Report* (LFR, 1995).

3.2.5 RCRA Closure Plan Implementation

LFR recommended capping the three additional areas with coral fines and asphalt in conjunction with final closure of the Waste Pile. The final construction of the RCRA cap over the Waste Pile was performed in accordance with the revised *RCRA Closure Plan* (LFR, 1994b) by LFR between July and October 1995. The five remaining layers of the cap were installed, including, from bottom to top: a polypropylene non-woven geotextile; a 6-inch layer of coral base material; asphalt prime coat; a 2.5 to 3.0-inch layer of asphaltic concrete; and asphalt seal coat. In conjunction with completion of the cap, a perimeter drainage pipe was installed, the HDPE geomembrane liner was extended to the Hanua Street Extension roadway, and the coverage of the cap was increased. LFR also directed the disposal of sinkhole soil and construction-derived residuals.

Closure activities were summarized in the *Waste Pile Closure Certification Report* (LFR, 1996a).

3.2.6 Ground Water Monitoring Program

Based on the results of nine rounds of groundwater monitoring between October 1995 and May 1999, LFR concluded that there was no evidence of migration of significant amounts of lead or cadmium from the waste pile into the groundwater. Furthermore, there was no indication of migration from the site of the low levels of total lead detected in the groundwater. LFR recommended that groundwater monitoring at the Waste Pile be discontinued and that the monitoring wells be properly abandoned in accordance with Environmental Protection Agency (EPA) approved procedures. In May 1998, LFR prepared a Certification of Low Potential for Migration of Hazardous Waste. The results of the January and May 1999 sampling events were consistent with the assumptions included in the certification. EPA allowed HWS to suspend groundwater monitoring activities from 1999 to 2005 when EPA approved the termination of groundwater monitoring and authorized the abandonment of the monitoring wells.

3.2.7 *Post Closure Cap Inspections and Maintenance*

Inspections were conducted on a quarterly basis from 1996 to 1998, have been conducted on a semi annual basis since 1998, and will continue for the remainder of the 30 year post closure period. An inspection form is completed at the time of the inspection and a brief inspection report to file is written following inspection and completion of any required maintenance and repairs.

Periodic maintenance was planned and budgeted for as part of the post-closure plan for the waste pile facility. The asphalt cap is scheduled to be re-sealed in years 5, 10, 15, 20, 25 and 30 although the actual frequency is based on the results of the periodic inspections. Two major repair events, requiring the replacement of the asphalt seal coat over significant portions of the cap were also anticipated and will be preformed as-needed based on the periodic inspections.

3.3 Current Regulatory Status of the Site

The facility is currently in its tenth year of post closure- care of a thirty year period required by the RCRA program. An application for a RCRA Post Closure Permit has been prepared and will be submitted to the Hawaii Department of Health in 2006.

3.4 Current Conditions

The waste material is encapsulated in a 2 to 3 foot thick engineered containment, consisting of compacted coral, a geomembrane, a geotextile and a 2.5 to 3.0 inch asphaltic concrete cap. The portion of the waste pile that is transected by Hanua Street Extension is lined with concrete bollards to prevent vehicular entrance to the site. The facility is inspected on a semi-annual basis and repairs are made as needed.

4.0 MALAKOLE STREET SITE ADJACENT TO CHEVRON REFINERY

The area of petroleum affected soil and groundwater adjacent to the Chevron refinery represents the northern fringe of a large plume of phase-separated hydrocarbon (PSH) underlying the storage tank farm and adjacent areas of the refinery. The PSH plume was believed to be caused by historical releases of various petroleum products from tank overfill incidents and from product leaking through the shell or bottom of the above-ground bulk fuel storage tanks. Releases from pipelines represented a third potential source of the product present in the soil and groundwater at the site (Wagner, 1997a).

4.1 Previous Site Investigations

In the mid 1990s, Chevron conducted an investigation of the area north of Malakole road and designed a remediation system for the portion of the plume that was not on

Chevron property. The following is a summary of the most significant environmental investigations previously conducted at the Site.

4.1.1 *August 1996 Chevron Site Assessment*

Between August and October 1996 Chevron conducted an investigation of the area north of Malakole road to define the boundary of the PSH plume and collect information required to conduct a risk assessment (Dames and Moore, 1997a). Chevron installed 26 soil borings to depths ranging from 14 to 27 feet below ground surface (bgs), and converted five of the borings into permanent groundwater monitoring wells. Chevron collected soil samples from each boring near the surface and at the interval in the vadose zone immediately above the water table. Chevron analyzed the samples for benzene, toluene, ethylbenzene, and total xylenes (BTEX) and polynuclear aromatic hydrocarbons (PAHs). Chevron also measured the thickness of the PSH in the wells and borings, and collected groundwater samples from the monitoring wells.

PSH was measured in seven of the 26 temporary monitoring wells/piezometers at apparent thicknesses ranging from 0.25 feet to 0.77 feet (3 to 9 inches). The extent of the PSH plume was estimated to be less than 450 feet north of Malakole road and covered a maximum of 1,600 feet in the east/west direction along Malakole road (Figure 3). Dissolved levels of BTEX compounds and PAHs in soil and groundwater were present at levels above the DOH action levels in areas where the PSH plume was present. Outside the plume boundary, the soil and groundwater concentrations were below the action levels. Groundwater in the vicinity was found to flow from the east to the west. Additional chemical data collected during the investigation indicated that conditions were favorable for natural biological processes to degrade and consume the hydrocarbons in areas outside the PSH plume resulting in decreasing extent and concentrations over time.

4.1.2 *Chevron 1997 Refined Conceptual Site Model, Technical Memorandum, and Tier II Risk Evaluation*

Following the 1996 investigation of areas outside the boundaries of the Chevron refinery, Chevron recognized that the soil and groundwater underlying property that was not owned by Chevron was impacted by significant levels of chemicals of potential concern (COPCs) and light nonaqueous phase liquid (LNAPL). In conjunction with the off-site investigation of the area north of Malakole road, Chevron conducted the initial phases of an ecological and human-health risk assessment (Dames & Moore 1997b). The “conceptual site model” identified the potential sources of soil and groundwater contamination as the LNAPL plume from the refinery, the petroleum pipelines located on the northern side of Malakole road, dredge spoils that were deposited on the site during the construction of the Barbers Point deep draft harbor, and run-off from the roadway. COPCs that were identified in the soil and groundwater included benzene, chrysene (a PAH), and arsenic. COPCs in the LNAPL included BTEX, six PAHs, and four heavy metals including arsenic.

The conceptual site model also identified potential pathways and exposure routes that contaminants might follow that could lead to receptors. The potential ecological receptors identified were birds and mammals (the mongoose), while potential human receptors included trespassers, construction workers, outdoor workers, and future indoor workers (in buildings that might be built on the site in the future). The technical memorandum identified construction workers and future indoor workers as receptors that could be exposed to chemicals through complete exposure pathways, and recommended that a Tier II risk assessment be completed.

Additional air sampling was conducted adjacent to three off-site locations including sampling locations on the south side of Malakole road immediately opposite the Campbell Estate property. In June 1997 Chevron submitted the Tier II Risk Evaluation (Dames & Moore 1997c) to the DOH and U.S. EPA. The risk assessment report concluded that there were no significant completed exposure pathways from the off-refinery plume that would result in ecological risk. The risk assessment also concluded that potential construction worker exposure could be adequately addressed using "institutional controls" (in this case a health and safety plan for the construction activities and personal protective equipment.) Finally, the risk assessment concluded that indoor air vapor inhalation by future indoor workers in a commercial building at the site would not pose an unacceptable health risk. The excess risk posed by the carcinogenic chemical benzene was 1×10^{-7} while the excess risk range that EPA uses to set clean-up levels for sites requiring remediation is between 1×10^{-4} to 1×10^{-6}. The Hazard Index for non-cancer causing chemicals calculated for the site was 0.02 compared with the EPA benchmark of 1.0 for sites requiring clean-up.

While Chevron argued that on the basis of the risk assessment no off-site remediation was required, negotiations with DOH, EPA, and the Campbell Estate resulted in Chevron agreeing to install and operate an active skimming remediation system at the Site.

4.1.3 Chevron 1997 Product Recovery System Design and Implementation

An active skimming remediation system consisting of three trenches containing approximately 950 linear feet of horizontal slotted collection pipe was installed in the area north of Malakole Road in the autumn of 1997, began PSH recovery on January 27, 1998 and was officially shut down on May 8, 2000. PSH that drained by gravity into the horizontal collection pipe flowed into six sumps outfitted with hydrophobic density skimmer pumps and was pumped into a 10,000 gallon storage tank located within a high-density polyethylene (HDPE) lined earthen containment enclosure (Dames & Moore 1997d).

The remediation system was expected to operate for a period of three to five years and was to be shut down when the product recovery rate dropped below levels that could be economically justified. The terms of operation of the system were specified in an Access Agreement between Campbell Estate and Chevron (Agreement No. A01086200, dated October 30, 1997) which granted Chevron access to the site for four years and eleven months from the date of system start-up, and specified that the system

could be shut down (1) when the LNAPL recovery rate decreased to 10% of the initial recovery rate, or (2) by July 1, 2002.

Chevron's agreement with DOH and the EPA specified four criteria for shut-down of the remediation system: (1) recovery rates less than 10% of the initial recovery rate; (2) recovery rates of less than 200 gallons per trench per week; (3) an elapsed time of four years and 11 months; or, (4) less than 0.04 feet of product (PSH) in the recovery sumps or wells at low tide.

4.1.4 Chevron Product Recovery System Remediation Results

The results of the operation of the remediation system are summarized in an "Operation and Maintenance Review" letter report prepared for Chevron in December 2000 (URS, 2000). Data in the letter report indicates that the system operated for a total of 707 days between January 27, 1998 and May 8, 2000 and recovered a total of 6,494 gallons of "product". (The report did not specify what portion of the product was petroleum and what portion, if any, was water.) During that period, the recovery system was operational for 669 days and experienced 38 days of downtime (94.6% uptime).

As expected, product recovery began at a high rate and quickly tapered off to minimal rates. During the first full month of operation in February 1998 the system recovered 2,609 gallons of product; in March 1998 an additional 1163 gallons of product was recovered, while monthly recovery rates for the remainder of 1998 ranged from 0 to 626 gallons per month. The average recovery rate for the first half of 1998 was 853 gallons per month and had declined to less than 10% of the initial rate by the end of 1999: (99 gallons per month for 2nd half of 1998; 116 gallons per month for 1st half 1999; and, 6 gallons per month for 2nd half of 1999.) Between November 1999 and May 2000, no product was recovered from the skimming system. Product recovery data is summarized in Appendix A.

At the time that the skimming system was shut-down in May 2000, several of the shut-down performance criteria had been achieved: the final recovery rate (6 gallons per month) was less than 10% of the initial recovery rate; and, the rate was far below 200 gallons per week. URS recommended permanent shut-down and removal of the recovery system in their December 2000 report. URS was not certain how the remediation system was decommissioned. However, during an investigation conducted in December 2005, URS observed that the above-ground storage tank, the containment system and the above-ground piping had been removed, some areas of the site had been graded, and there were no remnants of many of the original monitoring wells. The access agreement with Campbell Estate called for the sumps to be cut-off two feet below the ground surface and filled with rock or grout, but it is not certain that this requirement was fulfilled. LFR has assumed that the sumps and the horizontal collection pipes were left in the ground on-site.

4.2 Source Control Actions and Remediation Results

Chevron retrofitted two thirds of the 65 above-ground storage tanks (ASTs) at the Oahu refinery with double-walled construction between 1985 and 1995. The remaining ASTs were scheduled to be retrofitted between 1995 and 2005 (Wagner, 1997a). Chevron also installed ultrasonic level indicators and improved operating procedures to prevent tank overfills. Chevron reported having conducted inspections of 95% of the above-ground and below-ground product piping at the refinery in a 1996 Sitewide Assessment Status Report to the U.S. EPA.

Product skimmer pumps installed in sumps located inside the Chevron Refinery recovered between 8,000 to 36,000 gallons per month of total fluids between October 1995 and April 1996. Approximately 80% to 90% of the total fluids were PSH consisting of weathered crude oil, diesel, and gasoline.

4.3 Current Conditions and Status of the Site

In December 2005 Chevron installed soil borings and temporary monitoring wells near 13 of the locations where wells and borings had been installed in 1996 (Figure 3). Chevron collected soil and groundwater samples from each of the soil borings/monitoring wells, measured the thickness of PSH in the new wells, and analyzed the samples for total petroleum hydrocarbons as gasoline (TPHg), total petroleum hydrocarbons as diesel (TPHd), BTEX, and PAHs (URS, 2006a). The results of the 2005 sampling indicate that the concentrations of BTEX and PAHs have decreased significantly in most of the areas that were sampled with the sampling locations around the former remediation system showing the greatest change. No measurable thickness of PSH was detected in any of the wells.

The only exception to the decreasing chemical concentrations was observed in soil boring/well F2-OBLO20A which is located 110 feet upgradient from most upgradient (northeasterly) former recovery trench in an area where there was previously 0.2 to 0.4 feet of PSH. The ethylbenzene and naphthalene concentrations measured in the soil samples from this location increased from 8.4 to 11.6 milligrams per kilogram (mg/kg) for ethylbenzene and from $<$ 0.4 mg/kg to 5.06 mg/kg for naphthalene. TPHg concentrations in this soil sample were above the current DOH environmental action levels (EALs). The measured concentrations of TPHg in the groundwater sample from this location also exceeded the EALs. This result is not unexpected, but indicates the persistence of hydrocarbon compounds in areas where LNAPL was most recently present. Analytical results from the December 2005 sampling are summarized in Table 1 and Table 2. Full analytical results are presented in Appendix B.

Overall, the results indicate that the active remediation skimming system was quite successful in reducing the amount of LNAPL in the soil and in reducing the source of dissolved petroleum compounds in the groundwater. The results also indicate that natural bioattenuation is occurring at the site and the area of impacted soil and the dissolved plume are stable and slowly receding.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The former HWS waste pile and the area north of Malakole Street adjacent to the Chevron refinery are both areas where past releases of hazardous chemicals were addressed through a combination of institutional controls, containment, and remediation. In both areas residual chemical concentrations require that the institutional controls and containment systems be maintained. At the former HWS waste pile, the integrity of the engineered containment system must be maintained through the post-closure period and the deed restrictions controlling access and excavation must be maintained in perpetuity.

Remaining elevated petroleum hydrocarbon concentrations in a limited portion of the area north of Malakole road will also require some on-going institutional controls. Specifically, future subsurface utility work or building construction which includes excavation to depths greater than four (4) feet in the vicinity of boring/well F2-OBLO20A will require the following precautions. First, construction workers at the site must have hazardous materials training (HAZWOPER) as required by 40 CFR 1910.120, and must prepare a health and safety plan prior to conducting any work at the site. Any soil that is excavated from depths greater than four feet will have to be sampled and characterized for proper re-use on site or off-site disposal. Finally, any groundwater that is pumped during de-watering activities must be treated before it is disposed on-site or off-site to avoid worker exposure or regulatory violations.

LIMITATIONS

The opinions and recommendations presented in this report are based upon the scope of services, information obtained through the performance of the services, and the schedule as agreed upon by LFR and the party for whom this report was originally prepared. This report is an instrument of professional service and was prepared in accordance with the generally accepted standards and level of skill and care under similar conditions and circumstances established by the environmental consulting industry. No representation, warranty, or guarantee, express or implied, is intended or given. To the extent that LFR relied upon any information prepared by other parties not under contract to LFR, LFR makes no representation as to the accuracy or completeness of such information. This report is expressly for the sole and exclusive use of the party for whom this report was originally prepared for a particular purpose. Only the party for whom this report was originally prepared and/or other specifically named parties have the right to make use of and rely upon this report. Reuse of this report or any portion thereof for other than its intended purpose, or if modified, or if used by third parties, shall be at the user's sole risk.

Results of any investigations or testing and any findings presented in this report apply solely to conditions existing at the time when LFR's investigative work was performed. It must be recognized that any such investigative or testing activities are inherently limited and do not represent a conclusive or complete characterization. Conditions in other parts of the project site may vary from those at the locations where data were collected. LFR's ability to interpret investigation results is related to the availability of the data and the extent of the investigation activities. As such, 100% confidence in environmental investigation conclusions cannot reasonably be achieved.

LFR, therefore, does not provide any guarantees, certifications, or warranties regarding any conclusions regarding environmental contamination of any such property. Furthermore, nothing contained in this document shall relieve any other party of its responsibility to abide by contract documents and applicable laws, codes, regulations, or standards.

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TABLES

TABLE 1
Soil Analytical Results
Area North of Malakole Street

Sample Number	Date Sampled	TPHg[1]	TPHd[2]	VOCs[3]				SVOCs[5]	
				Benzene	Toluene	Ethylbenzene	Total Xylenes[4]		
E2-OBL002A-6.5-7.0	12/19/2005	**10.4**	**1490**	nd<0.00994[6]	nd<0.00994	nd<0.00994	nd<0.01988	Acenaphthene Anthracene Benzo(a)anthracene Benzo(a)pyrene Chrysene Fluoranthene Fluorene Naphthalene Phenanthrene Pyrene	**0.563** **1.74** **0.125** **0.0768** **0.230** **0.0704** **0.841** **2.67** **1.56** **0.31**
E2-OBL011A-6.5-8.0	12/16/2005	342	52.1	nd<0.1	nd<0.1	nd<0.1	0.4771	Acenaphthene Anthracene Chrysene Fluorene Naphthalene Phenanthrene	**0.0389** **0.0994** **0.0114** **0.0581** **0.474** **0.0892**
E2-OWL012A-8.5-10.0	12/16/2005	**nd< 100**	**172**	nd<0.492	nd<0.492	nd<0.492	nd<0.984	Acenaphthene Anthracene Chrysene Naphthalene Phenanthrene Pyrene	**0.0457** **0.12** **0.0143** **0.16** **0.108** **0.0163**
E2-OWL030A-8.5-9.0	12/12/2005	nd<1.68	nd<4.92	nd<0.00933	nd<0.00933	nd<0.00933	nd<0.01866	nd(dlv)[7]	
F1-OWL027A-7.0-7.5	12/12/2005	nd<1.73	nd<4.82	nd<0.00874	nd<0.00874	nd<0.00874	nd<0.01748	nd(dlv)	
F2-OBL006A-7.5-9.0	12/21/2005	144	**57.6**	nd<0.5	nd<0.5	nd<0.5	nd<1	Acenaphthene Fluorene Naphthalene Phenanthrene	**0.0257** **0.0359** **0.228** **0.0519**
F2-OBL035A-7.5-9.0 (duplicate of F2-OBL006A 7.5-9.0)	12/21/2005	**nd< 100**	**293**	nd<0.5	nd<0.5	nd<0.5	nd<1	Acenaphthene Chrysene Fluoranthene Fluorene Naphthalene Phenanthrene Pyrene	**0.454** **0.0167** **0.0196** **0.778** **0.726** **1.21** **0.0457**
F2-OBL015A-11.0-11.5	12/15/2005	**nd< 100**	**7.76**	nd<0.474	nd<0.474	nd<0.474	nd<0.948	nd(dlv)	
F2-OWL019A-7.5-8.0	12/13/2005	**232**	**121**	nd<0.476	nd<0.476	nd<0.476	nd<0.952	Acenaphthylene Anthracene Fluorene Naphthalene Phenanthrene Pyrene	**0.0101** **0.0922** **0.0404** **0.146** **0.0785** **0.00684**
F2-OBL020A-9.5-10.0	12/13/2005	**1590**	**1130**	nd<0.351	nd<0.351	**11.6**	1.28	Acenaphthylene Benz(a)anthracene Chrysene Fluoranthene Fluorene Naphthalene Pyrene	**0.134** **0.0106** **0.0202** **0.0202** **0.513** **5.06** **0.0473**
F2-OBL021A-12.0-12.5	12/15/2005	**nd< 100**	**872**	nd<0.477	nd<0.477	nd<0.477	nd<0.954	Acenaphthene Anthracene Benz(a)anthracene Chrysene Fluoranthene Naphthalene Phenanthrene Pyrene	**0.942** **0.389** **0.00933** **0.0203** **0.197** **4.75** **0.0891** **0.0443**
F3-OBL004A-7.0-7.5	12/19/2005	**nd<1.66**	**nd<4.88**	nd<0.00873	nd<0.00873	nd<0.00873	nd<0.01746	nd(dlv)	
G2-OWL016A-10.5-11.0	12/20/2005	nd<2.07	nd<4.73	nd<0.00969	nd<0.00969	nd<0.00969	nd<0.01938	nd(dlv)	
G3-OBL008A-6.0-6.5	12/20/2006	nd<1.73	nd<4.67	nd<0.00912	nd<0.00912	nd<0.00912	nd<0.01824	nd(dlv)	
DOH EAL's[8]		**1000**	**5000**	**0.53**	**29**	**33**	**180**	**ALV[9]**	

Notes:
(1) TPHg = Total petroleum hydrocarbons as gasoline analyzed using EPA Method 8015M
(2) TPHd = Total Petroleum Hydrocarbons as diesel analyzed using EPA Method 8015M
(3) VOCs = Volatile organic compounds analyzed using EPA Method 8260
(4) Total Xylenes includes m, p, and o-xylenes
(5) SVOCs = Semi-Volatile Organic compounds analyzed using EPA Method 8270
(6) nd = Not detected above indicated reporting limit
(7) nd(dlv) = Not detected; detection limit varies with analytes
(8) EALs = DOH environmental action levels (EALs) for sites located >150m from a surface water body, drinking water source threatened (DOH, May 2005)
(9) ALV = Action level varies

Bold value indicates concentration above laboratory reporting level
Bold/red value indicates concentration above EAL
All values in milligrams per liter

Prepared by: OAM Date: 7/5/2006

Checked by: MLB Date: 7/5/2006

TABLE 2
Groundwater Analytical Results
Area North of Malakole Street

Sample Number	Date Sampled	TPHg[1]	TPHd[2]	VOCs[3]				SVOCs[5]	
				Benzene	Toluene	Ethylbenzene	Total Xylenes[4]		
E2-OBL002A	1/4/2006	**1.56**	**0.674**	nd<0.005[6]	nd<0.005	**0.0155**	nd<0.01	Acenaphthene Fluorene Naphthalene Phenanthrene	**0.00228** **0.00119** **0.0335** **0.00149**
E2-OBL011A	1/3/2006	nd<1.0	nd<0.250	nd<0.005	nd<0.005	**0.00914**	nd<0.01	Acenaphthene Naphthalene	**0.000244** **0.00485**
E2-OWL012A	1/4/2006	**1.32**	**0.278**	nd<0.005	nd<0.005	**0.00703**	nd<0.01	Acenaphthene Fluorene Naphthalene Phenanthrene	**0.000614** **0.000213** **0.00382** **0.000308**
E2-OWL030A	1/3/2006	nd<1.0	nd<0.255	nd<0.005	nd<0.005	nd<0.005	nd<0.01	nd(dlv)[7]	
F1-OWL027A	1/6/2006	nd<1.0	nd<0.258	nd<0.005	nd<0.005	nd<0.005	nd<0.01	nd(dlv)	
F2-OBL006A	1/5/2006	nd<1.0	**0.768**	nd<0.005	nd<0.005	nd<0.005	nd<0.01	Acenaphthene Acenaphthylene Fluorene Naphthalene Phenanthrene	**0.00288** **0.000548** **0.000949** **0.0131** **0.000799**
F2-OBL035A	1/5/2006	**1.12**	**0.59**	nd<0.005	nd<0.005	nd<0.005	nd<0.01	Acenaphthene Acenaphthylene Fluorene Naphthalene Phenanthrene	**0.00304** **0.000611** **0.000954** **0.0165** **0.000806**
F2-OBL015A	1/6/2006	**1.24**	**0.41**	nd<0.005	nd<0.005	**0.0193**	nd<0.01	Acenaphthene Fluorene Naphthalene Phenanthrene	**0.000904** **0.000345** **0.0224** **0.00039**
F2-OWL019A	1/3/2006	**1.43**	**0.367**	nd<0.005	nd<0.005	**0.165**	nd<0.01	Acenaphthene Fluorene Naphthalene Phenanthrene	**0.00107** **0.000332** **0.00727** **0.000540**
F2-OBL020A	1/3/2006	**7.53**	**0.815**	nd<0.005	nd<0.005	**0.192**	0.00745	Acenaphthene Fluorene Naphthalene Phenanthrene	**0.00125** **0.000804** **0.0307** **0.000955**
F2-OBL021A	1/4/2006	**1.7**	**0.954**	nd<0.005	nd<0.005	nd<0.005	nd<0.01	Acenaphthene Acenaphthylene Fluorene Naphthalene Phenanthrene	**0.00256** **0.000568** **0.000856** **0.0117** **0.00134**
F3-OBL004A	1/6/2006	**1.01**	**0.572**	nd<0.005	nd<0.005	nd<0.005	nd<0.01	Acenaphthene Fluorene Naphthalene Phenanthrene	**0.000442** **0.000241** **0.0121** **0.000436**
G2-OWL016A	1/5/2006	nd<1.0	nd<0.250	nd<0.005	nd<0.005	nd<0.005	nd<0.01	nd(dlv)	
G3-OBL008A	1/13/2006	nd<1.0	nd<0.258	nd<0.005	nd<0.005	nd<0.005	nd<0.01	nd(dlv)	
DOH EAL's[8]		**5**	**2.5**	**1.6**	**0.4**	**0.3**	**2**	**ALV[9]**	

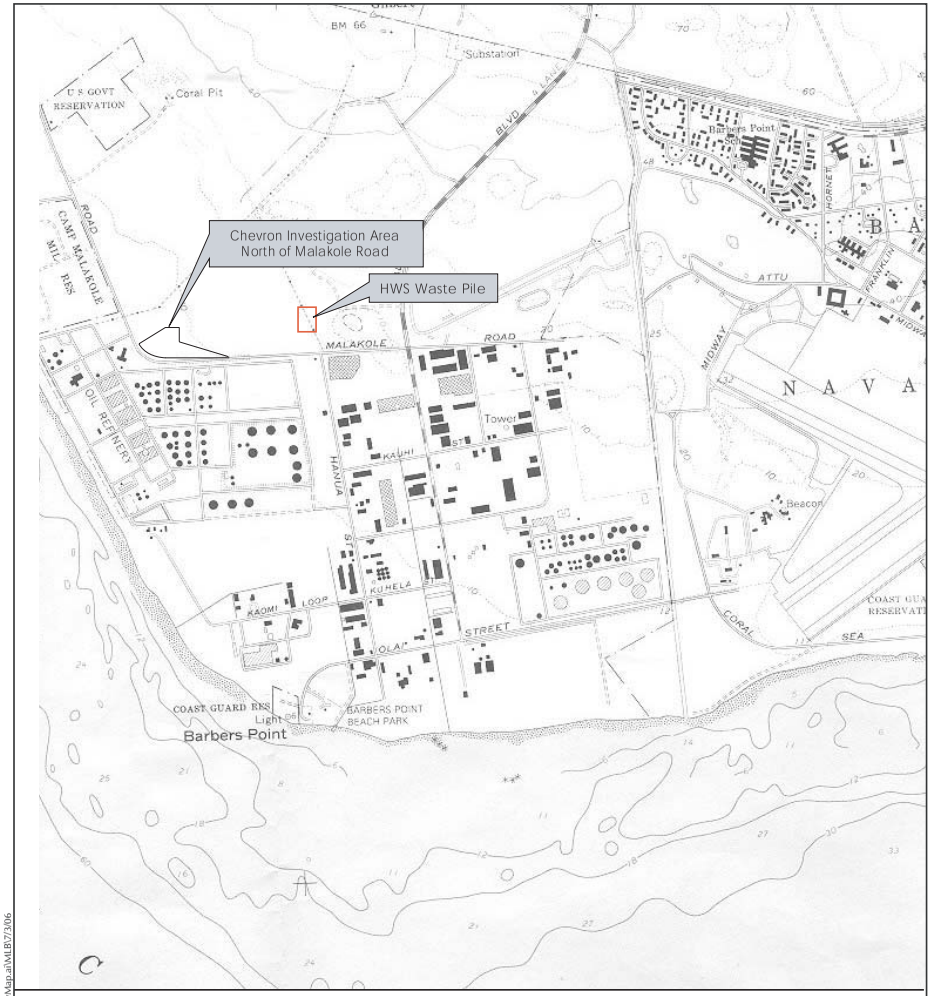
Notes:
(1) TPHg = Total petroleum hydrocarbons as gasoline analyzed using EPA Method 8015M
(2) TPHd = Total Petroleum Hydrocarbons as diesel analyzed using EPA Method 8015M
(3) VOCs = Volatile organic compounds analyzed using EPA Method 8260
(4) Total Xylenes includes m, p, and o-xylenes
(5) SVOCs = Semi-Volatile Organic compounds analyzed using EPA Method 8270
(6) nd = Not detected above indicated reporting limit
(7) nd(dlv) = Not detected; detection limit varies with analytes
(8) EALs = DOH environmental action levels (EALs) for sites located >150m from a surface water body, drinking water source threatened (DOH, May 2005)
(9) ALV = Action level varies

Bold value indicates concentration above laboratory reporting level
Bold/red value indicates concentration above EAL
All values in milligrams per liter

Prepared by: OAM Date: 7/5/2006

Checked by: MLB Date: 7/5/2006

FIGURES



MAP SOURCE: U.S.G.S Topographic Map, 7.5' Quadrangle, Honolulu, Ewa 1983.

N

0 500 1,000 2,000 feet

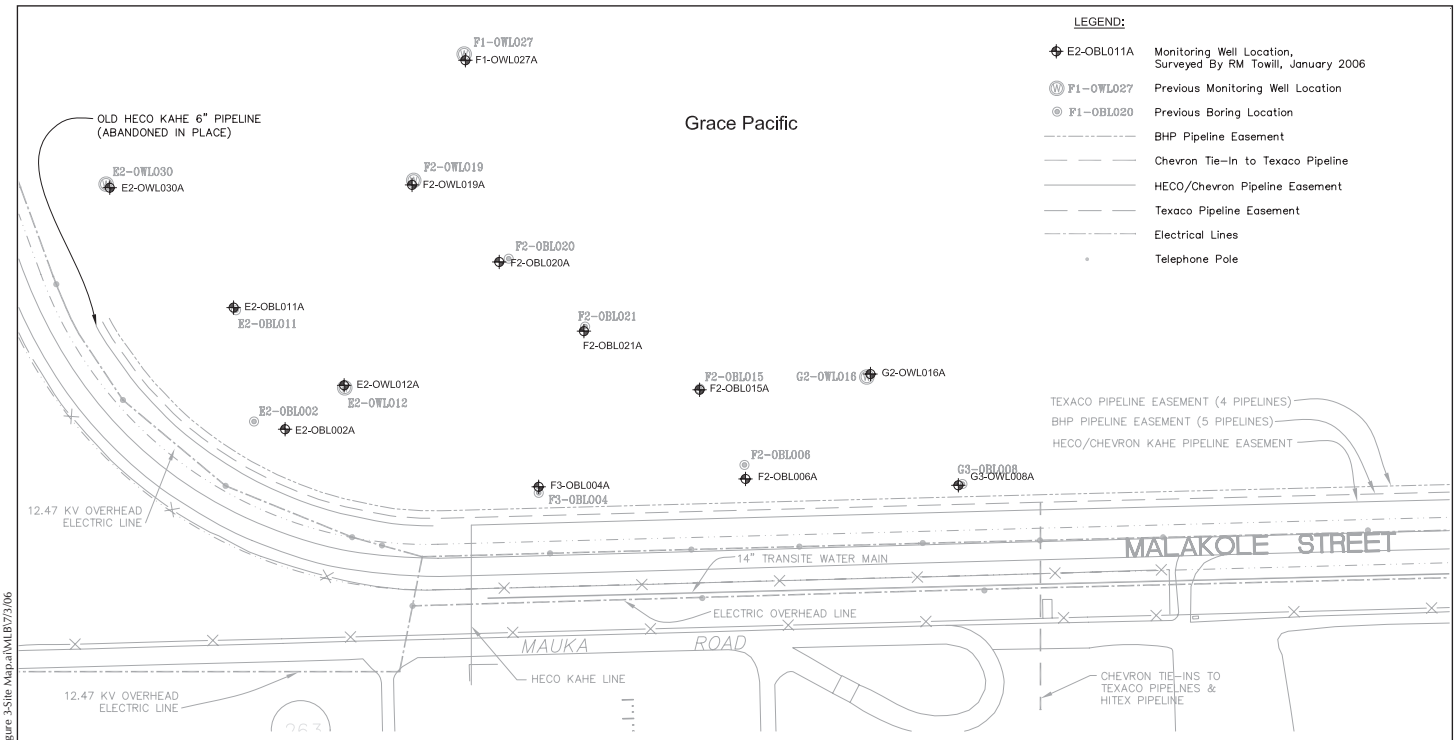
Hawaiian Western Steel Waste Pile and Chevron Investigation Area North of Malakole Road

Site Vicinity Map

LFR Project 005-11083-00

Figure 1

005-11083-00 Kapolei Harborside\Figure1 - SiteVicinityMap.ai\MLB\7/3/06



NOTES:

1. Base map established by survey performed by R.M. Towill in 1996.
2. Horizontal and vertical locations of boring established by survey performed by R.M. Towill in January 2006.
3. Utility locations are depicted schematically, exact locations have not been verified.

Map Source: URS Dec. 5, 2005

N

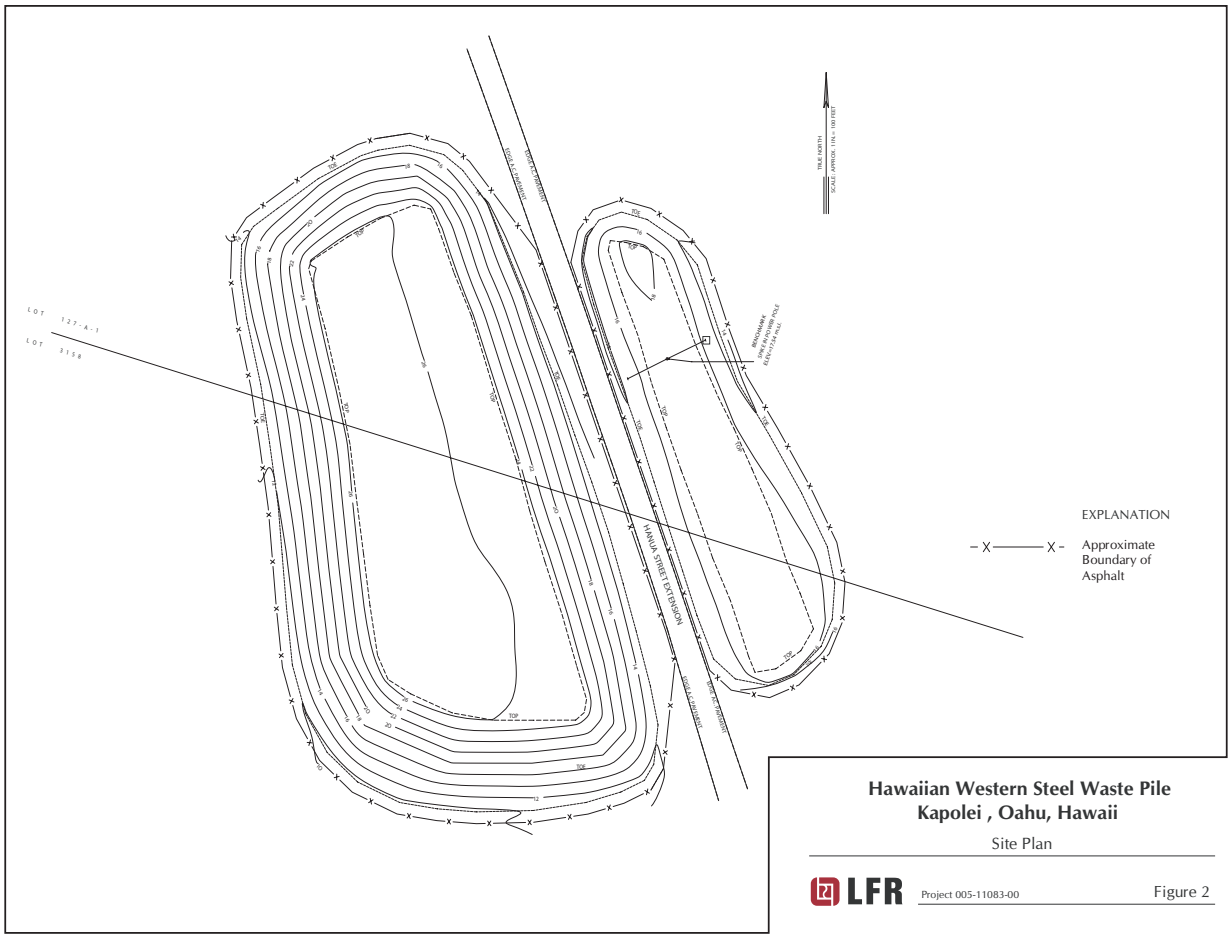
0 120 240
FEET

005-11083-00 Kapolei Harborside\Figure 3-Site Map.ai\MLB\7/3/06

Chevron Investigation Area North of Malakole Road
Kapolei, Oahu, Hawaii

Site Plan

LFR 005-11083-00 Figure 3



005-11083-00\Kapolei Harborside\Figure2 - Site Plan.ai\MLB\7/3/06

Hawaiian Western Steel Waste Pile
Kapolei , Oahu, Hawaii

Site Plan

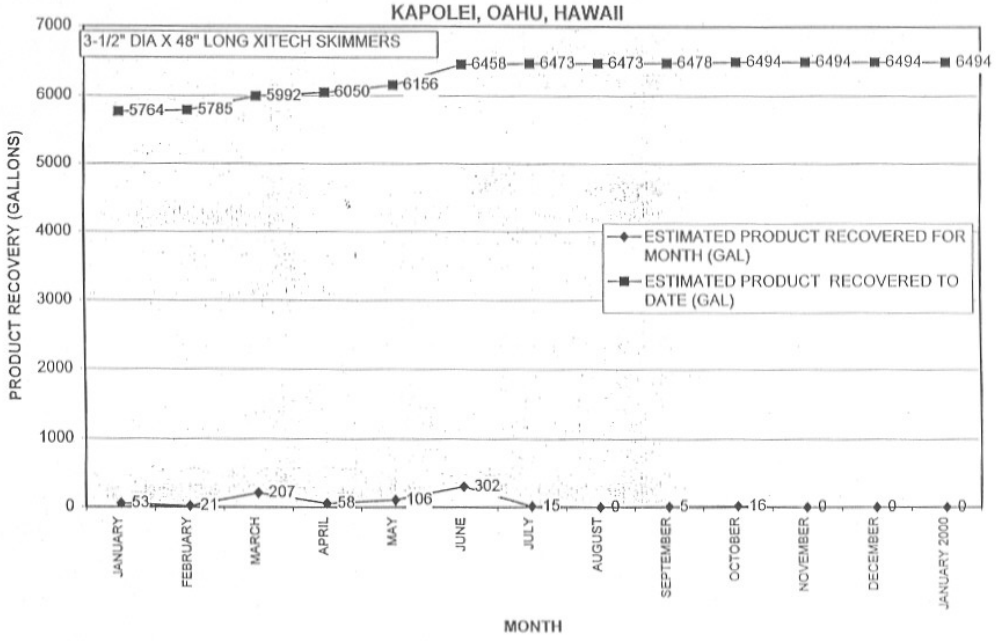
LFR Project 005-11083-00 Figure 2

APPENDICES

APPENDIX A

Product Recovery Summaries for 1998, 1999, and 2000 (Area North of Malakole)

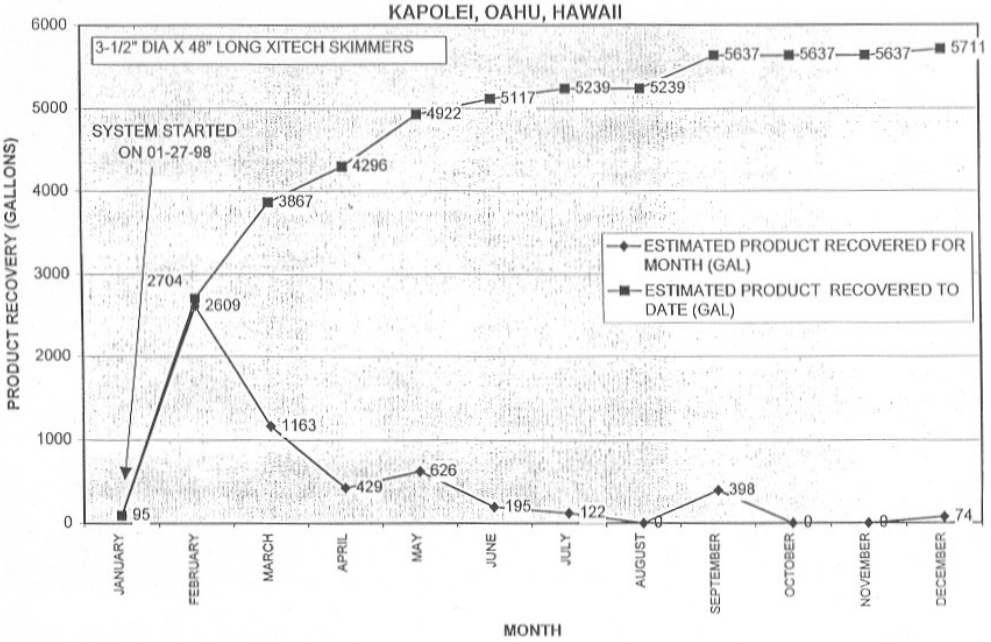
FIGURE 1
PRODUCT RECOVERY SUMMARY FOR 1999
AREA NORTH OF MALAKOLE (ANM)
CHEVRON HAWAII REFINERY
KAPOLEI, OAHU, HAWAII



DAMES & MOORE

(00HON-042Fig99.xls:16000-573-0106-011)

FIGURE 1
PRODUCT RECOVERY SUMMARY FOR 1998
AREA NORTH OF MALAKOLE (ANM)
CHEVRON HAWAII REFINERY
KAPOLEI, OAHU, HAWAII



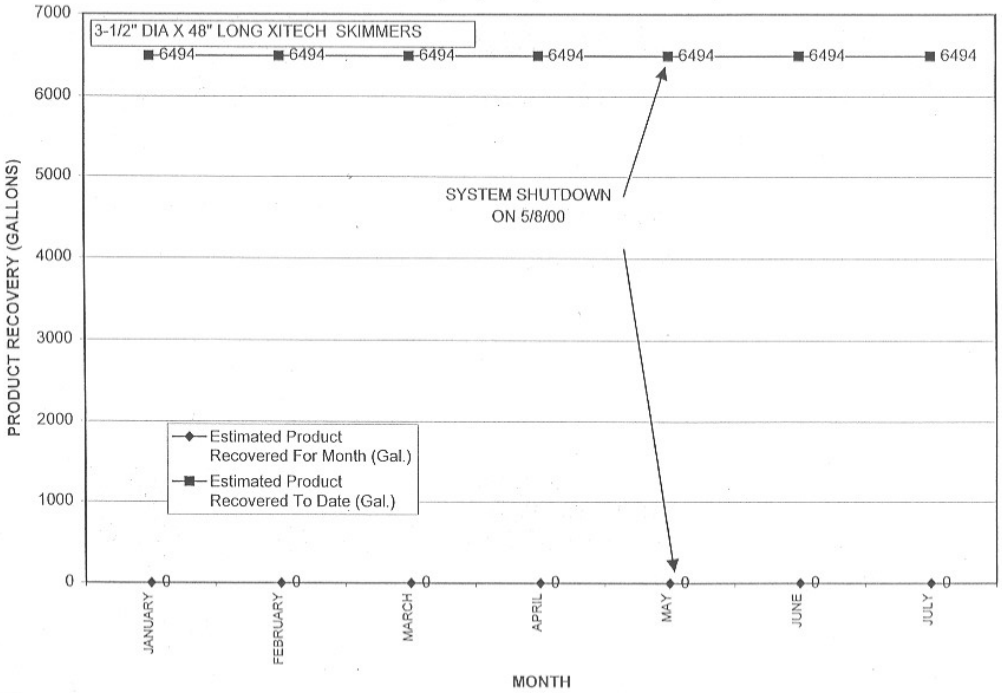
DAMES & MOORE

(00HON-042Fig98.xls:16000-573-0106-011)

APPENDIX B

Soil and Groundwater Results

FIGURE A-1
Product Recovery Summary for 2000
Area North of Malakole (ANM)
Chevron Hawaii Refinery
Kapolei, Oahu, Hawaii



URS

(00HON-278.xls:16000-573-0106-011)

Table 1
SUMMARY DETECTIONS - SOIL ANALYTICAL RESULTS
Area North of Malakole Street
Kapolei, Oahu, Hawaii
(Page 2 of 3)

Location / Date / Analyte	UNITS	DOH Tier 1 Soil Action Levels	DOH EALs	F2-OBL015A-11.0-11.5 12/15/2005	G2-OWL016A-10.5-11.0 12/20/2005	F2-OWL019A-7.5-8.0 12/13/2005	F2-OBL020A-9.5-10.0 12/13/2005	F2-OBL021A-12.0-12.5 12/15/2005
Volatile Organics (EPA 8260)								
Benzene	mg/kg	1.7	0.53	ND (<0.474)	ND (<0.00969)	ND (<0.476)	ND (<0.351)[2]	ND (<0.477)
Ethylbenzne	mg/kg	0.5	33	ND (<0.474)	ND (<0.00969)	ND (<0.476)	**11.6**[2]	ND (<0.477)
m,p-xylene	mg/kg	20[1]	180[1]	ND (<0.474)	ND (<0.00969)	ND (<0.476)	ND (<0.703)[2]	ND (<0.477)
o-xylene	mg/kg			ND (<0.474)	ND (<0.00969)	ND (<0.476)	1.28[2]	ND (<0.477)
Toluene	mg/kg	34	29	ND (<0.474)	ND (<0.00969)	ND (<0.476)	ND (<0.351)[2]	ND (<0.477)
Total Petroleum Hydrocarbons (EPA 8015M)								
TPH-Gasoline	mg/kg	2,000	1000[3]	ND (<100)	ND (<2.07)	232	1590	ND (<100)
TPH-Diesel	mg/kg	5,000	5000[3]	7.76 UJ	ND (<4.73)	121 J	1130 J	872 J
Semivolatile Organics (EPA 8270)								
Acenaphthene	mg/kg	18	130	ND (<0.0067)	ND (<0.00667)	ND (<0.00652)	ND (<0.00662)	0.942
Acenaphthylene	mg/kg	NS	130	ND (<0.0067)	ND (<0.00667)	0.0101	0.134	ND (<0.0067)
Anthracene	mg/kg	NS	2.8	ND (<0.0067)	ND (<0.00667)	0.0922	ND (<0.00662)	0.399
Benz(a)anthracene	mg/kg	NS	6.2	ND (<0.0067)	ND (<0.00667)	ND (<0.00652)	0.0106	0.00933 UJ
Benzo(a)pyrene	mg/kg	1	0.62	ND (<0.0067)	ND (<0.00667)	ND (<0.00652)	ND (<0.00662)	ND (<0.0067)
Benzo(b)fluoranthene	mg/kg	NS	6.2	ND (<0.0067)	ND (<0.00667)	ND (<0.00652)	ND (<0.00662)	ND (<0.0067)
Benzo(g,h,I)perylene	mg/kg	NS	27	ND (<0.0067)	ND (<0.00667)	ND (<0.00652)	ND (<0.00662)	ND (<0.0067)
Benzo(k)fluoranthene	mg/kg	NS	37	ND (<0.0067)	ND (<0.00667)	ND (<0.00652)	ND (<0.00662)	ND (<0.0067)
Chrysene	mg/kg	NS	23	ND (<0.0067)	ND (<0.00667)	ND (<0.00652)	0.0202	0.0203
Dibenz(a,h)anthracene	mg/kg	NS	0.62	ND (<0.0067)	ND (<0.00667)	ND (<0.00652)	ND (<0.00662)	ND (<0.0067)
Fluoranthene	mg/kg	11	40	ND (<0.0067)	ND (<0.00667)	ND (<0.00652)	0.0202	0.197
Fluorene	mg/kg	NS	160	ND (<0.0067)	ND (<0.00667)	0.0404	0.513	ND (<0.0067)
Indeno(1,2,3-cd)pyrene	mg/kg	NS	6.2	ND (<0.0067)	ND (<0.00667)	ND (<0.00652)	ND (<0.00662)	ND (<0.0067)
Naphthalene	mg/kg	41	18	ND (<0.0067)	ND (<0.00667)	0.146	5.06	4.75
Phenanthrene	mg/kg	NS	18	ND (<0.0067)	ND (<0.00667)	0.0785	ND (<0.00662)	0.0991
Pyrene	mg/kg	NS	85	ND (<0.0067)	ND (<0.00667)	0.00694	0.0473	0.0443

Notes:
[1] - Action levels are based on total xylenes (m,p-xylene and o-xylene)
[2] - BTEX results in the associated sample were analyzed by EPA Method 8021A in order to present reporting limits below DOH action levels. Analysis via EPA Method 8021A was done in parallel with the TPH - Gasoline analysis by EPA 8015M. The BTEX results obtained from using EPA Method 8260B required large dilutions for this sample due to hydrocarbon interference, that caused the reporting limits to exceed the DOH
[3] - TPH Soil Action Levels: Alternative action level based on potential leaching concerns. Alternative action levels for comercial/industrical properties applied to soils situated at least one meter below the ground surface (DOH, 2005. Screening for Envrionmental Concerns at Sites with Contaminated Soil and Groundwater).
Bold - Analytical result exceeds DOH Tier 1 Soil Action Levels for Sites receiving less than 200 centimeters of rainfall and drinking water not threatened
BTEX - Benzene, toluene, ethylbenzene, and xylenes
DOH - State of Hawaii Department of Health
EALs - Environmental Action Levels
EPA - United States Environmental Protection Agency
J - Reported conentrations are estimated based on Level III data validation
mg/kg - Milligrams per kilogram
ND (<reporting limit) - Analytical result not detected above stated reporting limit
NS - No standard
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TPH - Total petroleum hydrocarbons
UJ - Laboratory reporting limit flagged as estimated based on Level III data validation

Table 1
SUMMARY DETECTIONS - SOIL ANALYTICAL RESULTS
Area North of Malakole Street
Kapolei, Oahu, Hawaii
(Page 1 of 3)

Location / Date / Analyte	UNITS	DOH Tier 1 Soil Action Levels	DOH EALs	E2-OBL002A-6.5-7.0 12/19/2005	F3-0BL004A-7.0-7.5 12/19/2005	F2-OBL006A-7.5-9.0 12/21/2005	F2-OBL035A-7.5-9.0 12/21/2005 duplicate of F2-OBL006A-7.5-9.0	G3-OBL008A-6.0-6.5 12/20/2005	E2-OBL011A-6.5-8.0 12/16/2005	E2-OWL012A-8.5-10.0 12/16/2005
Volatile Organics (EPA 8260)										
Benzene	mg/kg	1.7	0.53	ND (<0.00994)	ND (<0.00873)	ND (<0.500)	ND (<0.500)	ND (<0.00912)	ND (<0.100)[2]	ND (<0.492)
Ethylbenzne	mg/kg	0.5	33	ND (<0.00994)	ND (<0.00873)	ND (<0.500)	ND (<0.500)	ND (<0.00912)	ND (<0.100)[2]	ND (<0.492)
m,p-xylene	mg/kg	20[1]	180[1]	ND (<0.00994)	ND (<0.00873)	ND (<0.500)	ND (<0.500)	ND (<0.00912)	ND (<0.200)[2]	ND (<0.492)
o-xylene	mg/kg			ND (<0.00994)	ND (<0.00873)	ND (<0.500)	ND (<0.500)	ND (<0.00912)	0.4771[2]	ND (<0.492)
Toluene	mg/kg	34	29	ND (<0.00994)	ND (<0.00873)	ND (<0.500)	ND (<0.500)	ND (<0.00912)	ND (<0.100)[2]	ND (<0.492)
Total Petroleum Hydrocarbons (EPA 8015M)										
TPH-Gasoline	mg/kg	2,000	1000[3]	10.4	ND (<1.66)	144	ND (<100)	ND (<1.73)	342	ND (<100)
TPH-Diesel	mg/kg	5,000	5000[3]	1490 J	ND (<4.98)	57.6J	293 J	ND (<4.67)	52.1 J	172 J
Semivolatile Organics (EPA 8270)										
Acenaphthene	mg/kg	18	130	0.563 J	ND (<0.00625) UJ	0.0257 J	0.454 J	ND (<0.00667)	0.0389	0.0457
Acenaphthylene	mg/kg	NS	130	ND (<0.0640) UJ	ND (<0.00625) UJ	ND (<0.00619) UJ	ND (<0.00644) UJ	ND (<0.00667)	ND (<0.00599)	ND (<0.00667)
Anthracene	mg/kg	NS	2.8	1.74 J	ND (<0.00625) UJ	ND (<0.00619) UJ	ND (<0.00644) UJ	ND (<0.00667)	0.0994	0.12
Benz(a)anthracene	mg/kg	NS	6.2	0.125 J	ND (<0.00625) UJ	ND (<0.00619) UJ	0.00934 J	ND (<0.00667)	ND (<0.00599)	ND (<0.00667)
Benzo(a)pyrene	mg/kg	1	0.62	0.0768 J	ND (<0.00625) UJ	ND (<0.00619) UJ	ND (<0.00644) UJ	ND (<0.00667)	ND (<0.00599)	ND (<0.00667)
Benzo(b)fluoranthene	mg/kg	NS	6.2	ND (<0.0640) UJ	ND (<0.00625) UJ	ND (<0.00619) UJ	ND (<0.00644) UJ	ND (<0.00667)	ND (<0.00599)	ND (<0.00667)
Benzo(g,h,I)perylene	mg/kg	NS	27	ND (<0.0640) UJ	ND (<0.00625) UJ	ND (<0.00619) UJ	ND (<0.00644) UJ	ND (<0.00667)	ND (<0.00599)	ND (<0.00667)
Benzo(k)fluoranthene	mg/kg	NS	37	ND (<0.0640) UJ	ND (<0.00625) UJ	ND (<0.00619) UJ	ND (<0.00644) UJ	ND (<0.00667)	ND (<0.00599)	ND (<0.00667)
Chrysene	mg/kg	NS	23	0.230 J	ND (<0.00625) UJ	ND (<0.00619) UJ	0.0167 J	ND (<0.00667)	0.0114	0.0143
Dibenz(a,h)anthracene	mg/kg	NS	0.62	ND (<0.0640) UJ	ND (<0.00625) UJ	ND (<0.00619) UJ	ND (<0.00644) UJ	ND (<0.00667)	ND (<0.00599)	ND (<0.00667)
Fluoranthene	mg/kg	11	40	0.0704 J	ND (<0.00625) UJ	ND (<0.00619) UJ	0.0196 J	ND (<0.00667)	ND (<0.00599)	ND (<0.00667)
Fluorene	mg/kg	NS	160	0.941 J	ND (<0.00625) UJ	0.0359 J	0.779 J	ND (<0.00667)	0.0581	ND (<0.00667)
Indeno(1,2,3-cd)pyrene	mg/kg	NS	6.2	ND (<0.0640) UJ	ND (<0.00625) UJ	ND (<0.00619) UJ	ND (<0.00644) UJ	ND (<0.00667)	ND (<0.00599)	ND (<0.00667)
Naphthalene	mg/kg	41	18	2.67 J	ND (<0.00625) UJ	0.228 J	0.726 J	ND (<0.00667)	0.474	0.16
Phenanthrene	mg/kg	NS	18	1.56 J	ND (<0.00625) UJ	0.0519 J	1.21 J	ND (<0.00667)	0.0892	0.108
Pyrene	mg/kg	NS	85	0.31 J	ND (<0.00625) UJ	ND (<0.00619) UJ	0.0457 J	ND (<0.00667)	ND (<0.00599)	0.0163

Notes:
[1] - Action levels are based on total xylenes (m,p-xylene and o-xylene)
[2] - BTEX results in the associated sample were analyzed by EPA Method 8021A in order to present reporting limits below DOH action levels. Analysis via EPA Method 8021A was done in parallel with the TPH - Gasoline analysis by EPA 8015M. The BTEX results obtained from using EPA Method 8260B required large dilutions for this sample due to hydrocarbon interference, that caused the reporting limits to exceed the DOH
[3] - TPH Soil Action Levels: Alternative action level based on potential leaching concerns. Alternative action levels for comercial/industrical properties applied to soils situated at least one meter below the ground surface (DOH, 2005. Screening for Envrionmental Concerns at Sites with Contaminated Soil and Groundwater).
Bold - Analytical result exceeds DOH Tier 1 Soil Action Levels for Sites receiving less than 200 centimeters of rainfall and drinking water not threatened
BTEX - Benzene, toluene, ethylbenzene, and xylenes
DOH - State of Hawaii Department of Health
EALs - Environmental Action Levels
EPA - United States Environmental Protection Agency
J - Reported conentrations are estimated based on Level III data validation
mg/kg - Milligrams per kilogram
ND (<reporting limit) - Analytical result not detected above stated reporting limit
NS - No standard
Shaded - Analytical result exceeds DOH EALs
TPH - Total petroleum hydrocarbons
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Table 2
SUMMARY DETECTIONS - GROUNDWATER ANALYTICAL RESULTS
Area North of Malakole Street
Kapolei, Oahu, Hawaii
(Page 1 of 2)

Location / Date / Analyte	UNITS	DOH Tier 1 Soil Action Levels	DOH EALs	E2-OBL002A 1/4/2006	F3-OBL004A 1/6/2006	F2-OBL006A 1/5/2006	F2-OBL035A 1/5/2006 duplicate of F2-OBL006A-7.5-9.0	G3-OBL008A 1/13/2006	E2-OBL011A 1/3/2006	E2-OWL012A 1/4/2006	F2-OBL015A 1/6/2006
Volatile Organics (EPA 8260)											
Benzene	mg/L	1.7	1.6	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)
Ethylbenzne	mg/L	0.14	0.3	0.0155	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	0.00914	0.00703	0.0193
m,p-xylene	mg/L	10[1]	2[1]	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)
o-xylene	mg/L			ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)
Toluene	mg/L	2.1	0.4	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)
Total Petroleum Hydrocarbons (EPA 8015M)											
TPH-Gasoline	mg/L	NS	5	1.560 UJ	1.010 UJ	ND (<1.000)	1.120 UJ	ND (<1.000)	ND (<1.000)	1.320 UJ	1.240 UJ
TPH-Diesel	mg/L	NS	2.5	0.674 UJ	0.572 UJ	0.769 UJ	0.590 UJ	ND (<0.258)	ND (<0.250)	0.278 UJ	0.410 UJ
Semivolatile Organics (EPA 8270)											
Acenaphthene	mg/L	0.32	0.2	0.00228 J	0.000442	0.00289	0.00304	ND (<0.000205)	0.000244 J	0.000614 J	0.000904
Acenaphthylene	mg/L	NS	0.3	ND (<0.000211)	ND (<0.000205)	0.000549	0.000611	ND (<0.000205)	ND (<0.000211)	ND (<0.000209)	ND (<0.000219)
Anthracene	mg/L	NS	0.00073	ND (<0.000211)	ND (<0.000205)	ND (<0.000205)	ND (<0.000205)	ND (<0.000205)	ND (<0.000211)	ND (<0.000209)	ND (<0.000219)
Benz(a)anthracene	mg/L	NS	0.000027[2]	ND (<0.000211)	ND (<0.000205)	ND (<0.000205)	ND (<0.000205)	ND (<0.000205)	ND (<0.000211)	ND (<0.000209)	ND (<0.000219)
Benzo(a)pyrene	mg/L	0.0002	0.000014[2]	ND (<0.000105)	ND (<0.000103)	ND (<0.000103)	ND (<0.000103)	ND (<0.000103)	ND (<0.000105)	ND (<0.000104)	ND (<0.000109)
Benzo(b)fluoranthene	mg/L	NS	0.000092[2]	ND (<0.000211)	ND (<0.000205)	ND (<0.000205)	ND (<0.000205)	ND (<0.000205)	ND (<0.000211)	ND (<0.000209)	ND (<0.000219)
Benzo(g,h,i)perylene	mg/L	NS	0.0001[2]	ND (<0.000211)	ND (<0.000205)	ND (<0.000205)	ND (<0.000205)	ND (<0.000205)	ND (<0.000211)	ND (<0.000209)	ND (<0.000219)
Benzo(k)fluoranthene	mg/L	NS	0.00040	ND (<0.000211)	ND (<0.000205)	ND (<0.000205)	ND (<0.000205)	ND (<0.000205)	ND (<0.000211)	ND (<0.000209)	ND (<0.000219)
Chrysene	mg/L	NS	0.00035	ND (<0.000211)	ND (<0.000205)	ND (<0.000205)	ND (<0.000205)	ND (<0.000205)	ND (<0.000211)	ND (<0.000209)	ND (<0.000219)
Dibenz(a,h)anthracene	mg/L	NS	0.00025	ND (<0.000211)	ND (<0.000205)	ND (<0.000205)	ND (<0.000205)	ND (<0.000205)	ND (<0.000211)	ND (<0.000209)	ND (<0.000219)
Fluoranthene	mg/L	0.013	0.040	ND (<0.000211)	ND (<0.000205)	ND (<0.000205)	ND (<0.000205)	ND (<0.000205)	ND (<0.000211)	ND (<0.000209)	ND (<0.000219)
Fluorene	mg/L	NS	0.300	0.00119	0.000241	0.000949	0.000954	ND (<0.000205)	ND (<0.000211)	0.000213	0.000345
Indeno(1,2,3-cd)pyrene	mg/L	NS	0.000092[2]	ND (<0.000211)	ND (<0.000205)	ND (<0.000205)	ND (<0.000205)	ND (<0.000205)	ND (<0.000211)	ND (<0.000209)	ND (<0.000219)
Naphthalene	mg/L	0.77	0.210	0.0335	0.0121	0.0131	0.0165	ND (<0.000205)	0.00495	0.00392	0.0224
Phenanthrene	mg/L	NS	0.0077	0.00149	0.000436	0.000799	0.000906	ND (<0.000205)	ND (<0.000211)	0.000308	0.000390
Pyrene	mg/L	NS	0.0020	ND (<0.000211)	ND (<0.000205)	ND (<0.000205)	ND (<0.000205)	ND (<0.000205)	ND (<0.000211)	ND (<0.000209)	ND (<0.000219)

Notes:
[1] - Action levels are based on total xylenes (m,p-xylene and o-xylene)
[2] - In cases where an EAL for a specific chemical is less than the laboratory method reporting limit for that chemical, it is generally acceptable to consider the method reporting limit in place of the screening level (DOH, 2005. *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater*).

Bold - Analytical result exceeds DOH Tier 1 Soil Action Levels for Sites receiving less than 200 centimeters of rainfall and drinking water not threatened
DOH - State of Hawaii Department of Health
EALs - Environmental Action Levels
EPA - United States Environmental Protection Agency
J - Reported conentrations are estimated based on Level III data validation
mg/L - Milligrams per liter
ND (<reporting limit) - Analytical result not detected above stated reporting limit
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TPH - Total petroleum hydrocarbons
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Table 1
SUMMARY DETECTIONS - SOIL ANALYTICAL RESULTS
Area North of Malakole Street
Kapolei, Oahu, Hawaii
(Page 3 of 3)

Location / Date / Analyte	UNITS	DOH Tier 1 Soil Action Levels	DOH EALs	F1-OWL027A-7.0-7.5 12/12/2005	E2-OWL030A-8.5-9.0 12/12/2005
Volatile Organics (EPA 8260)					
Benzene	mg/kg	1.7	0.53	ND (<0.00874)	ND (<0.00933)
Ethylbenzne	mg/kg	0.5	33	ND (<0.00874)	ND (<0.00933)
m,p-xylene	mg/kg	20[1]	190[1]	ND (<0.00874)	ND (<0.00933)
o-xylene	mg/kg			ND (<0.00874)	ND (<0.00933)
Toluene	mg/kg	34	29	ND (<0.00874)	ND (<0.00933)
Total Petroleum Hydrocarbons (EPA 8015M)					
TPH-Gasoline	mg/kg	2,000	1000[3]	ND (<1.73)	ND (<1.69)
TPH-Diesel	mg/kg	5,000	5000[3]	ND (<4.92)	ND (<4.92)
Semivolatile Organics (EPA 8270)					
Acenaphthene	mg/kg	19	130	ND (<0.00628)	ND (<0.00635)
Acenaphthylene	mg/kg	NS	130	ND (<0.00628)	ND (<0.00635)
Anthracene	mg/kg	NS	2.9	ND (<0.00628)	ND (<0.00635)
Benz(a)anthracene	mg/kg	NS	6.2	ND (<0.00628)	ND (<0.00635)
Benzo(a)pyrene	mg/kg	1	0.62	ND (<0.00628)	ND (<0.00635)
Benzo(b)fluoranthene	mg/kg	NS	6.2	ND (<0.00628)	ND (<0.00635)
Benzo(g,h,i)perylene	mg/kg	NS	27	ND (<0.00628)	ND (<0.00635)
Benzo(k)fluoranthene	mg/kg	NS	37	ND (<0.00628)	ND (<0.00635)
Chrysene	mg/kg	NS	23	ND (<0.00628)	ND (<0.00635)
Dibenz(a,h)anthracene	mg/kg	NS	0.62	ND (<0.00628)	ND (<0.00635)
Fluoranthene	mg/kg	11	40	ND (<0.00628)	ND (<0.00635)
Fluorene	mg/kg	NS	160	ND (<0.00628)	ND (<0.00635)
Indeno(1,2,3-cd)pyrene	mg/kg	NS	6.2	ND (<0.00628)	ND (<0.00635)
Naphthalene	mg/kg	41	19	ND (<0.00628)	ND (<0.00635)
Phenanthrene	mg/kg	NS	19	ND (<0.00628)	ND (<0.00635)
Pyrene	mg/kg	NS	85	ND (<0.00628)	ND (<0.00635)

Notes:
[1] - Action levels are based on total xylenes (m,p-xylene and o-xylene)
[2] - BTEX results in the associated sample were analyzed by EPA Method 8021A in order to present reporting limits below DOH action levels. Analysis via EPA Method 8021A was done in parallel with the TPH - Gasoline analysis by EPA 8015M. The BTEX results obtained from using EPA Method 8260B required large dilutions for this sample due to hydrocarbon interference, that caused the reporting limits to exceed the DOH
[3] - TPH Soil Action Levels: Alternative action level based on potential leaching concerns. Alternative action levels for comercial/industrical properties applied to soils situated at least one meter below the ground surface (DOH, 2005. Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater).

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BTEX - Benzene, toluene, ethylbenzene, and xylenes
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LFR LEVINE•FRICKE

October 4, 2006

005-11083-00

Jeffrey H. Overton
Group 70 International, Inc.
925 Bethel Street, Fifth Floor
Honolulu, HI 96813

Subject: Response to Comments on the Environmental Summary Report for the Proposed Kapolei Harborside Center Industrial Park including the Former Hawaiian Western Steel Waste Pile and the Petroleum Hydrocarbon Affected Area North of Malakole Road.

Dear Mr. Overton:

LFR Inc. (LFR) is pleased to present responses to the three comments which were received from the Office of Environmental Quality Control (OEQC) and the Hawaii Department of Health (DOH) Hazard Evaluation and Emergency Response (HEER).

(1) OEQC comment on volatility of subsurface plume

2. ***Subsurface Product Plume:*** **The product plume on the Malakole Road Parcel possibly consists of gasoline and diesel as well as other petroleum related constituents. Please discuss the possibility of volatilization of the product plume past the ground surface and the additional possibility of an ignitability and/or explosive hazard from such volatilization.**

Response: The hazards associated with the product plume were addressed in the Technical Memorandum, Tier II Evaluation of the Off-site Area, Kapolei, Hawaii, prepared by Dames and Moore for Chevron and dated June 13, 1997, and in subsequent correspondence between Chevron and the Estate of James Campbell (Campbell Estate). Chevron reported in a 1997 letter from Patricia Wagner to Susan Sublett-Graham (June 20, 1997) that U.S. Environmental Protection Agency (U.S. EPA) and Hawaii Department of Health (DOH) were currently reviewing the Tier II Evaluation.

During the review conducted in 1997, Campbell Estate and LFR asked Chevron and Dames and Moore (letter dated July 8, 1997) if there were any ignitability or explosive hazard risks posed by volatile hydrocarbons or methane gas (which might be produced by the biological break-down of the petroleum). Chevron assured LFR and Campbell Estate that Dames and Moore had measured the concentrations of flammable gases in samples collected on site and in samples collected on the south side of Malakole Road (closer to the Chevron Refinery, where conditions would

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Table 2
SUMMARY DETECTIONS - GROUNDWATER ANALYTICAL RESULTS
Area North of Malakole Street
Kapolei, Oahu, Hawaii
(Page 2 of 2)

Location / Date / Analyte	UNITS	DOH Tier 1 Soil Action Levels	DOH EALs	G2-OWL016A 1/5/2006	F2-OWL019A 1/3/2006	F2-OBL020A 1/3/2006	F2-OBL021A 1/4/2006	F1-OWL027A 1/6/2006	E2-OWL030A 1/3/2006
Volatile Organics (EPA 8260)									
Benzene	mg/L	1.7	1.6	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)
Ethylbenzne	mg/L	0.14	0.3	ND (<0.00500)	0.0165	**0.192**	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)
m,p-xylene	mg/L	10[1]	2[1]	ND (<0.00500)	ND (<0.00500)	0.00745	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)
o-xylene	mg/L			ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)
Toluene	mg/L	2.1	0.4	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)	ND (<0.00500)
Total Petroleum Hydrocarbons (EPA 8015M)									
TPH-Gasoline	mg/L	NS	5	ND (<1.000)	1.430 UJ	**7.530**	1.700	ND (<1.000)	ND (<1.000)
TPH-Diesel	mg/L	NS	2.5	ND (<0.250)	0.367 UJ	0.815 UJ	0.954 J	ND (<0.258)	ND (<0.255)
Semivolatile Organics (EPA 8270)									
Acenaphthene	mg/L	0.32	0.2	ND (<0.000205)	0.00107 J	0.00125 J	0.00256 J	ND (<0.000211)	ND (<0.000205) UJ
Acenaphthylene	mg/L	NS	0.3	ND (<0.000205)	ND (<0.000203)	ND (<0.000215)	0.000569	ND (<0.000211)	ND (<0.000205)
Anthracene	mg/L	NS	0.00073	ND (<0.000205)	ND (<0.000203)	ND (<0.000215)	ND (<0.000200)	ND (<0.000211)	ND (<0.000205)
Benz(a)anthracene	mg/L	NS	0.000027[2]	ND (<0.000205)	ND (<0.000203)	ND (<0.000215)	ND (<0.000200)	ND (<0.000211)	ND (<0.000205)
Benzo(a)pyrene	mg/L	0.0002	0.000014[2]	ND (<0.000103)	ND (<0.000102)	ND (<0.000109)	ND (<0.000100)	ND (<0.000105)	ND (<0.000103)
Benzo(b)fluoranthene	mg/L	NS	0.000092[2]	ND (<0.000205)	ND (<0.000203)	ND (<0.000215)	ND (<0.000200)	ND (<0.000211)	ND (<0.000205)
Benzo(g,h,I)perylene	mg/L	NS	0.0001[2]	ND (<0.000205)	ND (<0.000203)	ND (<0.000215)	ND (<0.000200)	ND (<0.000211)	ND (<0.000205)
Benzo(k)fluoranthene	mg/L	NS	0.00040	ND (<0.000205)	ND (<0.000203)	ND (<0.000215)	ND (<0.000200)	ND (<0.000211)	ND (<0.000205)
Chrysene	mg/L	NS	0.00035	ND (<0.000205)	ND (<0.000203)	ND (<0.000215)	ND (<0.000200)	ND (<0.000211)	ND (<0.000205)
Dibenz(a,h)anthracene	mg/L	NS	0.00025	ND (<0.000205)	ND (<0.000203)	ND (<0.000215)	ND (<0.000200)	ND (<0.000211)	ND (<0.000205)
Fluoranthene	mg/L	0.013	0.040	ND (<0.000205)	ND (<0.000203)	ND (<0.000215)	ND (<0.000200)	ND (<0.000211)	ND (<0.000205)
Fluorene	mg/L	NS	0.300	ND (<0.000205)	0.000332	0.000804	0.000856	ND (<0.000211)	ND (<0.000205)
Indeno(1,2,3-cd)pyrene	mg/L	NS	0.000092[2]	ND (<0.000205)	ND (<0.000203)	ND (<0.000215)	ND (<0.000200)	ND (<0.000211)	ND (<0.000205)
Naphthalene	mg/L	0.77	0.210	ND (<0.000205)	0.00727	0.0307	0.0117	ND (<0.000211)	ND (<0.000205)
Phenanthrene	mg/L	NS	0.0077	ND (<0.000205)	0.000540	0.000955	0.00134	ND (<0.000211)	ND (<0.000205)
Pyrene	mg/L	NS	0.0020	ND (<0.000205)	ND (<0.000203)	ND (<0.000215)	ND (<0.000200)	ND (<0.000211)	ND (<0.000205)

Notes:
[1] - Action levels are based on total xylenes (m,p-xylene and o-xylene)
[2] - In cases where an EAL for a specific chemical is less than the laboratory method reporting limit for that chemical, it is generally acceptable to consider the method reporting limit in place of the screening level (DOH, 2005. *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater*).

Bold - Analytical result exceeds DOH Tier 1 Soil Action Levels for Sites receiving less than 200 centimeters of rainfall and drinking water not threatened
DOH - State of Hawaii Department of Health
EALs - Environmental Action Levels
EPA - United States Environmental Protection Agency
J - Reported concentrations are estimated based on Level III data validation
mg/L - Milligrams per liter
ND (<reporting limit) - Analytical result not detected above stated reporting limit
NS - No standard
TPH - Total petroleum hydrocarbons
UJ - Laboratory reporting limit flagged as estimated based on Level III data validation

presumably be worse), and the results indicated that there were no ignitability or explosive hazard risks.

This assertion is supported by the Organic Vapor Analyzer (OVA) results listed in Table 2 of the Dames and Moore 1997 Technical Memorandum which lists the highest concentration of volatile organic vapors in gas samples collected using surface isolation flux chambers as 170 ppmv in sample number F3-A04. The lower explosive limit (LEL) for gasoline is 14,000 ppmv.

In 1997, before the remediation was conducted, there was a plume of separate phase petroleum in the ground at the site at measured thicknesses up to one foot. After the remediation was completed, Chevron installed additional soil borings and monitoring wells in December 2005 in the subject area. No measurable thickness of separate phase petroleum was detected in any of the wells during the 2005 investigation. It is likely that the vapor concentrations now are significantly lower than they were in 1997.

(2) DOH – HEER comments on vapor and volatility

Industrial Landfill Area
Discuss the need to address potential vapor intrusion concerns for future buildings constructed in vicinity of the landfill. The landfill has been permanently capped and there are no plans to disturb the area during the proposed redevelopment. Direct-exposure to contaminated soil or other hazardous material that might be present in the landfill is therefore not likely to pose a concern to future workers in the redevelopment area. Vapors emitted from landfills can intrude into utility trenches or nearby buildings and pose potential explosion and toxicity concerns, (e.g., methane, petroleum and volatile organic compounds). The potential for these concerns to exist around the subject landfill needs to be discussed in the EIS, based on the nature of material disposed of in the landfill and data from past vapor studies. The presence or absence of vapors in the landfill was probably incorporated into the cap design so the information needed for the EIS should already exist.

Petroleum Contamination Area
Discuss the need to address potential vapor intrusion concerns for future buildings constructed in vicinity of the landfill. The nature and magnitude of remaining petroleum contamination along the southern margin of the site is not clearly discussed in the EIS. In some cases, the breakdown of petroleum in soil and groundwater over time can lead to the buildup of methane and potentially explosive condition in utility trenches and under buildings or other covered areas. This may require that engineered controls be included into the design of new utility trenches and buildings in areas where significant petroleum contamination is present.

Response: Industrial Landfill Area – The industrial landfill associated with the former Hawaiian Western Steel operations is a monofill comprised of scrap steel, wet scrubber material, mill scale [iron oxide], slag, electrode remnants, furnace bricks and inorganic baghouse dust containing iron, zinc, lead and cadmium. There were no records or evidence of any petroleum products or any appreciable amount of organic material being disposed of in the landfill. The design of the landfill cap was not required to incorporate provisions for the collection or venting of landfill gasses. With the exception of one area on the south slope of the west lobe of the waste pile where a buried tree stump was discovered and removed in 1995, there has been no evidence (such as bubbles or heaving of the asphalt) that gas has been generated in the landfill.

Response: Petroleum Contamination Area – Please see the response to the OEQC question, above. Additionally, the nature and magnitude of the remaining petroleum contamination was investigated in 2005 by the installation of four soil borings and monitoring wells located within 30 feet of the pipeline corridor along the southern boundary of the site. The results of the 2005 sampling indicate that no concentrations of BTEX and PAHs were detected in these wells or borings above the DOH environmental action levels (EALs). No measurable thickness of PSH was detected in any of the wells.

As noted in LFR's July 6, 2006 report, remaining elevated petroleum hydrocarbon concentrations in a limited portion of the area north of Malakole road will also require some on-going institutional controls. Specifically, future subsurface utility work or building construction which includes excavation to depths greater than five feet in the vicinity of boring/well F2-OBLO20A will require the following precautions. First, construction workers at the site must have hazardous materials training (HAZWOPER) as required by 40 CFR 1910.120, and must prepare a health and safety plan prior to conducting any work at the site. The health and safety plan should include requirements to monitor the LEL in the work area and monitor for hydrocarbon concentrations in the breathing zone. Any soil that is excavated from depths greater than four (4) feet will have to be sampled and characterized for proper re-use on site or off-site disposal. Finally, any groundwater that is pumped during de-watering activities may require treatment before it is disposed on-site or off-site to avoid worker exposure or regulatory violations.

If you have questions regarding these responses, please call me at (808) 522-0321.

Sincerely,

Jeffrey C. Morrell, P.E.
Principal Engineer, Operations Manager

Appendix L
Arthropod Survey

ARTHROPOD INVENTORY AND ASSESSMENT
KAPOLEI HARBORSIDE CENTER SITE
‘EWA DISTRICT, O’AHU, HAWAI’I

October 2006

Prepared for

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ARTHROPOD INVENTORY AND ASSESSMENT KAPOLEI HARBORSIDE CENTER SITE 'EWA DISTRICT, O'AHU, HAWAI'I

October 2006

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II. EXECUTIVE SUMMARY

Kapolei Property Development, LLC is proposing to develop approximately 345 acres of land near Barbers Point, 'Ewa District, O'ahu, Hawai'i for industrial-business uses. The project site is in an industrial area, and comprises land previously used for sugar cane cultivation and coral mining operations.

A survey of arthropods on the Kapolei Harborside Center project site was conducted September 22 through September 29, 2006. Ten sampling methods were used to detect arthropods to ensure a thorough coverage of the existing fauna. Special attention was given to searching for Blackburn's Sphinx moth larvae (*Manduca blackburni*) on tree tobacco (*Nicotiana glauca*), a known host plant that occurs on the site. Special searches were also conducted for *'Ōpae'ula* (*Halocaridina rubra*) in sink holes, and for native snail species, especially in the proposed sinkhole reserve.

One hundred and ninety-five species of insects representing sixteen orders were collected at the site. An additional nineteen species of spiders, three species of other arthropods, and five species of fossilized snail shells were also collected. The most productive sampling methods were aerial netting and foliage beating. Night sampling with UV lights was disappointing, probably due to the time of year of the sampling. Nearly two hundred tree tobacco plants were searched for caterpillars of Blackburn's Sphinx moth and none were found. Despite repeated searching of the one sinkhole found with water, no *'Ōpae'ula* (*Halocaridina rubra*) were found. Fossilized snail shells were found below the litter layer and there was no evidence of extant species.

About thirty-five percent of the arthropod species in Hawai'i are non-indigenous (Nishida 1997). More than ninety percent of the species collected in the Kapolei Harborside Center project site survey were non-indigenous. Many are cosmopolitan, weedy species found throughout the Pacific and the World. The large proportion of non-indigenous species is an indication of the amount of habitat degradation that resulted from the various agricultural and mining operations that have occurred at the site.

The Blackburn's sphinx moth (*Manduca blackburni*) is only listed invertebrate species historically known from O'ahu. While caterpillars of other

species of sphinx moths were observed in May 2006 during the botanical and avian surveys (David and Guinther 2006), no caterpillars or adults of Blackburn's sphinx moth have been observed on the Kapolei Harborside Center project site. This species has not been recorded from the island since the 1940's despite significant efforts to relocate the species on the island (Federal Register 2003). In recent consultation with biologists familiar with this species and with this area, the likelihood that this species is present on the subject property or within the 'Ewa plains area, which has been extensively studied over the past 20-years, is highly unlikely (R. David, pers. com.).

The results of the arthropod survey indicate there are no special concerns or legal constraints related to invertebrate resources in the project area. Although several species of Hawaiian endemic arthropods may occur on the 'Ewa plain, these species are not likely to be abundant in the highly disturbed quarry and dredged spoil disposal areas around Kalaeloa/Barbers Point Harbor or on the former agriculture lands further inland that comprise the Kapolei Harborside Center project site. 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 at the project site (DLNR 1997, Federal Register 1999, 2005).

III. INTRODUCTION

Kapolei Property Development, LLC is proposing to develop approximately 345 acres of land in Honouliuli, 'Ewa District, Kapolei, O'ahu as an industrial business park. The project area was first proposed as an industrial area in the more than 50 years ago. The area was chosen for urban and industrial uses because of its proximity to Kalaeloa/Barbers Point Harbor and the City of Kapolei. The project is consistent with published City and County of Honolulu (the County) and the goals to create more jobs and a Secondary Urban Center in the Kapolei area.

A range of industrial-business uses is proposed at the Kapolei Harborside Center. There will be supporting infrastructure (e.g., roads, storm drain systems, and utilities), a hazardous materials area and an area set aside for preservation.

Historical accounts indicate that prior to contact by Europeans, Hawaiians occupied the *ahupua'a* of Honouliuli. The early inhabitants harvested the marine and estuarine resources at the coast, and the forest resources in the nearby Wai'anae Mountains. They also used the lowlands for wetland cultivation (McDermott et al. 2006).

By the early 1800's the landscape had changed dramatically. Over-harvesting of the sandalwood forest and the introduction of sheep, goats, cattle, and exotic plant species had displaced much of the native vegetation (Cuddihy and Stone 1990). By the late 1800's the area was being used for cattle ranching and sugar cultivation. Since 1995 when sugar cultivation ended different areas of the site have been used for mining limestone, composting green waste, and for a wholesale nursery.

Pacific Analytics, LLC was contracted to conduct an inventory and assessment of the arthropod fauna at the Kapolei Harborside Center site as part of the Environmental Impact Statement process. Pacific Analytics personnel have extensive experience with ecological research, wildlife inventory, monitoring, and consulting. Pacific Analytics personnel have many years of professional experience in tropical and temperate ecosystems.

The intended purpose of this study is to conduct a survey of arthropod residents at the site to determine if there are any resident Federal or State listed endangered, threatened, proposed, or candidate species of arthropods and other invertebrates on the Kapolei Harborside Center site (DLNR 1997, Federal Register 1999, 2005).

A site reconnaissance was conducted on September 21. Sampling of arthropods was approved in a permit obtained from the Department of Land and Natural Resources (DLNR). Sampling began on September 22 and was completed on September 29, 2003.

The nomenclature used in this report follows the Hawaiian Terrestrial Arthropod Checklist, Third Edition (Nishida 1997). Hawaiian and scientific names are italicized.

Species are discussed as being endemic, indigenous, non-indigenous, adventive, and purposely introduced. These terms are defined as:

Endemic – A species native to, or restricted to Hawai'i.

Indigenous – A species native to Hawai'i but that naturally occurs outside of Hawai'i as well.

Non-indigenous – A species not native to Hawai'i.

Adventive – Not native, a species transported into a new habitat by natural means or accidentally by human activity.

Purposely introduced – A species released in Hawai'i for a particular purpose, usually to control a weedy plant or another insect.

IV. PROJECT DESCRIPTION

The Project consists of nine tasks. The tasks were:

Task I) Visual reconnaissance of the site to determine habitats of interest and the special collecting methods that may be deployed.

Task II) Locate and inspect potential hosts plants when found for larval stages of Blackburn's Sphinx Moth and record locality and abundance estimate. Document and voucher with photographs when possible.

Task III) Using an UV light and white sheet, sample for night-flying moths and other taxa. Note occurrences of Blackburn's Sphinx Moth and document and voucher with photographs when possible. Collect specimens for identification.

Task IV) Set pitfall traps in various habitat types present at the site, at least six traps per habitat type, with additional traps if necessary for a thorough survey. Pitfall traps will be open for 5 days. Collect specimens for identification.

Task V) Sample foliage, especially Hawaiian native plant species, using beating sheets and sweep nets for insects. Collect specimens for identification.

Task VI) Sample special habitats that may occur on the site. Collect specimens for identification.

Task VII) Identify and sample sinkholes that contain water that may occur on the site for *'Ōpae'ula* (*Halocaridina rubra*) and land snails. Collect specimens for identification.

Task VIII) Laboratory identification and curation of specimens collected.

Task IX) Preparation of a Final Report of Findings.

V. METHODS

Site Description

The Kapolei Harborside Center project site consists of 345 acres of primarily vacant land in Honouliuli, 'Ewa District, Kapolei, on the Island of O'ahu. It is bound by vacant land, Kalaeloa Boulevard and Kapolei Business Park on the east, Malakole Road and Campbell Industrial Park to the south, Kalaeloa/Barbers Point Harbor and industrial facilities to the west, and a Honolulu Advertiser building and primarily vacant land to the north.

There are several commercial and industrial operations on the project site including a wholesale nursery, a greenwaste collection and composting business, a fill material stockpiling area, a coal conveyor belt, an abandoned coral mining operation, and a sealed .

There are three distinct vegetation zones: 1) the quarry and dredged material tailings, 2) abandoned former sugarcane fields, and 3) *kiawe* (*Prosopis pallida*) and buffelgrass (*Cenchrus ciliaris*) lowland forest and savannah (David and Guinther 2006).

The quarry and dredged material tailings cover most of the western half of the project site. There are extensive areas of calcareous soil and sediment deposits and evidence of seasonal flooding and ponding. The area has patches of weedy non-indigenous vegetation with a concentration of tree tobacco plants (*Nicotiana glauca*) and Russian thistle (*Salsola tragus*).

The abandoned former sugarcane fields on the eastern third of the project site contain ruderal weeds (Char & Associates 1989).

The southern third of the project site is the location of the wholesale nursery and greenwaste collection and composting operations. North of these operations is the *kiawe* lowland forest and savannah. Some of this area has dense growth shrub growth of koa haole (*Leucaena leucocephala*).

There is a concentration of karst sinkholes within an approximately 6 acre fenced reserve on the project site. One of these sinkholes contained water and was search specifically for *'Ōpae'ula* (*Halocaridina rubra*).

There are neither unique floral habitats nor unique avian and mammalian faunal habitats on the project site and a

survey for botanical, avian, and mammalian resources found no threatened endangered, or species endemic to Hawai'i at the site (David and Guinther 2006).

Sampling

Pitfall Traps

Ethylene glycol pitfall traps were used to sample the arthropod ground fauna. Ethylene glycol pitfall traps are cups placed into the ground so that the lip of the cup is level with the substrate. A small amount of ethylene glycol was placed into the trap to kill and preserve specimens that fall into the traps. Ethylene glycol was used because it has a low evaporation rate and because it prevents specimen decomposition during the sampling period. Additionally, it is easily cleaned from the specimens. A 15 cm x 15 cm aluminum cover was placed over the traps and elevated above the ground approximately 15 mm with nails in each corner.

The target of pitfall trapping in this study was ground-active arthropod species. Twenty-two pitfall traps were set at the site, sampling the three vegetation zones with five or more traps per zone. The locations of the pitfall traps are reported in Figure 1. Traps were open for 6 to 7 days, September 22 through September 29.

Yellow Pan Traps

Yellow pan traps were used to sample flying insects attracted to flowers. It has been shown that many small day-active insects are attracted to the color yellow. This trapping method uses small yellow dishes filled with ethylene glycol and the dishes are placed on the ground in conspicuous places. When flying insects land on the surface of the water they rapidly sink and drown. At the end of the collecting period, the solution is strained through a fine sieve and the specimens are retrieved. Yellow pan traps were placed adjacent to each pitfall trap and opened for the same period as they pitfall traps.

Bait Trapping

Meat is a good attractant for some flies, ants, and beetles. They will be attracted to the smell of the rotting meat and come to the trap. The trap consisted of a small plate filled with ethylene glycol with a rock in the center covered with Spam© (Hormel Foods Corporation). The bait traps were open for 4 days, with two traps in each of the 3 vegetation zones. The locations of the bit traps are reported in Figure 1.

Foliage Sampling

Aerial Netting - We spent approximately four hours per day for five days walking transects through

different areas of the project site. The entire site, except for the wholesale nursery and greenwaste composting operation was sampled. Flying insects were captured in aerial nets and placed into killing jars. After the specimens died they were transferred into collecting vials and processed in the laboratory at the end of each day.

Sweep Netting - Grasses, small shrubs and other low-lying vegetation was sampled with a sweep net. The heavy net was brushed along the top of the vegetation or grass, capturing insects. The insects were placed into killing jars, and later into collecting vials for processing.

Foliage Beating -Foliage was sampled using beating sheets. A 0.5 m square sheet was placed under a branch and the stem was struck with a short stick. Arthropods on the foliage were dislodged and fell onto the sheet where they were collected with an aspirator into vials.

Visual Inspection – Plants were visually inspected for arthropods that were not collected by other methods. Tree tobacco plants were especially selected for inspection in an effort to detect any Blackburn's Sphinx moth caterpillars that may be on the site.

Litter Sifting

We turned over rocks and sorted through leaf litter to locate and collect arthropods. We also collected in sinkholes and sifted through the top layer of soil to detect soil-dwelling insects. Arthropods were collected into vials using an aspirator or forceps.

Night Sampling

We used UV lights to attract moths and other nocturnal insects. A cloth sheet was hung on a rope at night with an ultraviolet fluorescent tubes placed at the top of the sheet. As insects were attracted and alighted on the sheet, they were captured in vials. We also tried placing the sheet on the ground with the light suspended a few feet above it to attract a larger variety of insects.

The phases of the moon can influence the attraction of insects to artificial light (Williams et al. 1956). A bright moon may compete with the light source resulting in a reduced catch. The moon was waxing, with approximately 6-8 percent illumination, a phase that during which a large number of nocturnal insects should be flying (Southwood 1984).

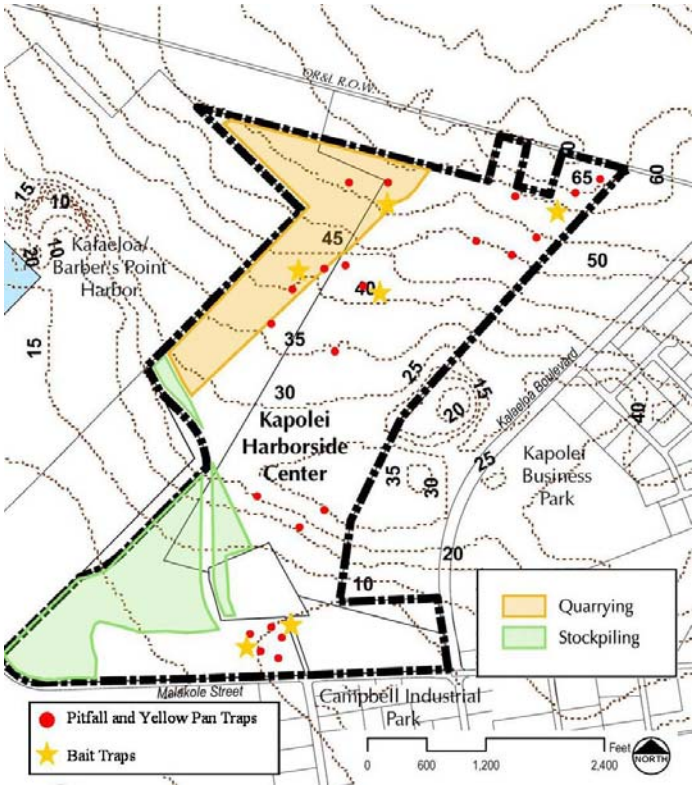

Figure 1. Trap Locations. The locations of Pitfall Traps, Yellow Pan Traps, and Bait Traps

Specimen Curation

The contents of the traps were cleaned in 70% ethyl alcohol and sorted into the morpho-species for identification. Hard-bodied species, such as beetles, true bugs, large flies and wasps were mounted on pins, either by pinning the specimen or by gluing the specimens to paper points. Soft-bodied specimens, such as immature stages, spiders, Collembola, Psyllids, Aphids, small flies and wasps, and centipedes, were stored in vials filled with 70% ethyl alcohol.

Identification

Identification to the species level for all specimens was not feasible in the time frame for this project. Important groups of endemic species, species of concern, and potentially threatening non-indigenous species were given first priority for identification. Other specimens will continue to be identified and the results of those identifications will be reported as an addendum to this report at a later date. Specimens will be deposited in the B.P. Bishop Museum.

Species identification of those specimens identified to genus or species level are unconfirmed and subject to change after comparison to specimens in museums. However, the discussion of the results will not be impacted by changes in species identification because many of the species captured occurred in very low numbers and were not major components of the overall arthropod community.

References for general identification of the specimens included Fauna Hawaiiensis (Sharp (ed) 1899-1913) and the 17 volumes of Insects of Hawai'i (Zimmerman 1948a, 1948b, 1948c, 1948d, 1948e, 1957, 1958a, 1958b, 1978, Hardy 1960, 1964, 1965, 1981, Tentorio 1969, Hardy and Delfinado 1980, Christiansen and Bellinger 1992, Liebherr and Zimmerman 2000, and Daly and Magnacca 2003). Other publications that were useful for general identification included The Insects and Other Invertebrates of Hawaiian Sugar Cane Fields (Williams 1931), Common Insects of Hawai'i (Fullaway and Krauss 1945), Hawaiian Insects and Their Kin (Howarth and Mull 1992), and An Introduction to the Study of Insects Sixth Edition (Borror, Triplehorn, and Johnson 1989).

For specific groups specialized keys were necessary. Keys used to identify Heteroptera included those by Usinger (1936, 1942), Ashlock (1966), and Gagné (1997). Keys used to identify Hymenoptera included Cushman (1944), Watanabe (1958), Townes (1958), Beardsley (1961, 1969, 1976), Yoshimoto and Ishii (1965), and Yoshimoto (1965a, 1965b).

VI. RESULTS AND DISCUSSION

General Observations

One hundred and ninety-five species of insects representing sixteen orders and at least seventy-five families were collected at the site. An additional nineteen species of spiders, three species of other arthropods, and five species of fossilized snail shells were also collected.

The entire site is disturbed by mining, agriculture, and commercial activities, and the vegetation is generally non-indigenous, weedy species. This is reflective of the overall arthropod community which is more than ninety percent non-indigenous. The arthropod fauna in each of the three vegetation zones had a few unique species, but most species were found throughout the site.

Plants that were in bloom attracted pollen and nectar feeders, especially bees and butterflies. Other insects were found feeing on plant juices, under leaves and on stems. Ants were the most abundant insect on the ground.

The most productive sampling methods were aerial netting and foliage beating. Night sampling with UV lights was disappointing, probably due to the time of year of the sampling.

Previous Studies

There have been no previous arthropod surveys at the project site and a search of literature revealed no references for arthropod studies in the Barbers Point vicinity. The nearest, and most complete comparative survey found in the literature was conducted at the Lualualei Naval Magazine 16 km (~10 miles) from the project site (Evenhuis 1997). This one-year study collected 637 species in 23 orders and 120 families.

The Lualualei site had similar vegetation in some areas as that found at the Kapolei Harborside Center site, i.e., land drastically altered by agriculture, cattle grazing, feral animals, and invasive, weedy plants, but also contained large patches of native vegetation that does not occur at the Kapolei Harborside Center site. The species at Lualualei were 21% endemic, and no federally listed species were found. Some rare species were detected in areas of native vegetation (Nishida 1995). None of these rare species were found at the Kapolei Harborside Center site.

Current Study

About thirty-five percent of the arthropod species in Hawai'i are non-indigenous (Nishida 1997). More than ninety percent of the species collected in the Kapolei Harborside Center project site survey were non-indigenous. Many are cosmopolitan, weedy species found throughout the Pacific and the World. The large proportion of non-indigenous species is an indication of the amount of habitat degradation that resulted from the various agricultural and mining operations that have occurred at the site.

The following is a discussion of the arthropods that were detected during the survey of the Kapolei Harborside Center project site.

Class Arachnida

Order Acari
Mites

There are 572 species of Acari (mites) reported in Hawai'i (Nishida 1997). They may be sorted into two major groups, free-living and parasitic. Free-living mites can be further classified into predaceous, phytophagous (plant-feeding), mycophagous (fungi-feeding), saprophagous (feeding on dead tissue), and coprophagous (dung-feeding) forms.

Mites perform important functions in ecosystems. They help breakdown plant litter and implement nutrient recycling. Predaceous mites feed on other arthropods and help to balance their populations.

Their diversity in form, habitat, and behavior make mites difficult to identify taxonomically. One morpho-species of mite was identified from pitfall traps during this study. They were relatively rare, and occurred in only three traps in the quarry and dredged material tailings vegetation zone.

Order Araneae
Spiders

Spiders are abundant arthropods at the Kapolei Harborside Center site. Nineteen species were collected, mostly from vegetation where they prey upon insects.

Class Chilopoda
Centipedes

Centipedes are elongate, flattened arthropods with 15 or more pairs of legs, one pair per body segment. They occur in a variety of habitats, where they feed on spiders and insects.

There are 24 species of centipedes reported in Hawai'i, and eleven from O'ahu. Two specimens of centipedes were collected in this study; both were *Otostigmus scaber* Porat, a non-indigenous species.

Class Insecta

Order Blattodea
Cockroaches

There are nineteen species of cockroaches in Hawai'i, all adventive species. Four species were detected at the Kapolei Harborside Center site.

Order Coleoptera
Beetles

Beetles are the most diverse group of arthropods in Hawai'i. There are 1,983 species of beetles reported in Hawai'i (Nishida 1997). Sixty-two species representing at least seventeen families were found during this study. Only one was identified as endemic to Hawai'i. The other species are adventive or purposely introduced biological control species.

Order Dermaptera
Earwigs

There are twenty-four species of earwigs in Hawai'i, nine that are endemic. Two species of earwigs were captured during this survey, both apparently adventive species of the family Labiidae.

Order Diptera
Flies

Diptera is the second most diverse order of insects in Hawai'i, with 1,449 species representing fifty-seven families. Some of the families, such as Dolichopodidae and Drosophilidae, showed remarkable species radiations and unusual evolutionary developments (Howarth and Mull 1992).

During this study, seventeen species of flies were captured. The most abundant were non-indigenous species of Muscidae (house flies).

Several specimens of Phoridae (hump-backed flies), Drosophilidae (pomace flies, and Sciaridae (dark-winged fungus gnats) were collected. Some of these may be endemic species, but individuals from these families were not abundant in traps or during the visual reconnaissance.

Order Embiidina
Webspinners

Two species of webspinners are known from Hawai'i, both are non-indigenous. One species came to the UV lights during our night sampling.

Order Heteroptera
True Bugs

The order Heteroptera contains 408 species in Hawai'i, 304 of which are endemic. Most species feed on plants, inserting their straw-like mouth parts into the plant to extract the juices. Some species are predaceous. One species, the Wēkiu bug, *Nysius wekiuicola*, has made a remarkable evolutionary modification, adapting to high elevations on Mauna Kea and

feeding on wind-blown insects instead of seeds like its closest relatives.

We detected twenty-three species of true bugs in eight different families. Two are endemic species of the families Miridae and Lygaeidae. Neither of these species is rare.

Order Homoptera
Psyllids, Aphids, and Hoppers

The order Homoptera is another large and diverse group of insects. There are 695 species of Homoptera found in Hawai'i, 386 considered endemic (Nishida 1997). All species feed on plant juices and like the Heteroptera, they use their straw-like mouthparts to feed.

Twelve species of Homoptera were found during this study, two leaf hoppers (family Cicadellidae), and one planthopper (family Cixiidae).

Order Hymenoptera
Bees and Wasps

Bees and wasps are common in Hawai'i. There are 1,270 species that occur in Hawai'i. Of these species, 652 are endemic to Hawai'i and comprise largely small parasitic wasps, mud-daubers, and yellow-faced bees. The yellow-faced bees (family Colletidae) are important pollinators of native plants (Howarth and Mull 1992). Many of the non-indigenous species were purposely released for biological control of agricultural pests.

Another important group of Hymenoptera is the ants (family Formicidae). There are no endemic ants in Hawai'i, but at least forty-four species that now occur here. All were accidentally transported to Hawai'i where they have become a major threat to native arthropods. Four species of worker ants were found during this study, and three species of reproductives. The reproductives were especially abundant during the UV light sampling.

At least forty-four species of Hymenoptera were collected during this study. Many were very small parasitic wasps that are difficult to identify with current keys.

Four species of endemic parasitic wasps of the family Bethylidae were found emerging from seedpods where they were feeding on beetles. Three species of endemic yellow-faced bees (Genus *Hylaeus*) were collected from sourbush (*Pluchia carolinensis*) where they were foraging for nectar.

Order Isoptera
Termites

There are six species of these destructive introduced insects in Hawai'i. Only one species was found during this study, *Crytotermes cynocephalus*.

Order Lepidoptera
Moths and Butterflies

There are 1,148 species of moths and butterflies found in Hawai'i, a majority (1957) of which are endemic. Many of the endemic species are small moths with a wingspan of less than 1 cm (Howarth and Mull 1992).

Endemic Lepidoptera in Hawai'i have made a remarkable feeding adaptation. In most of the World, butterfly and moth larvae are plant feeders. In Hawai'i several species of butterflies and moths have been found to be insectivorous. Larvae of some forest inch worms (family Geometridae) species are ambush predators that blend imperceptibly into their surroundings. Small hairs and nerves on their backs indicate the presence of prey. In a fraction of a second the caterpillar can snap backward and grab its meal with pincer-tipped forelegs.

Five species of butterflies were seen on the Kapolei Harborside Center project site, none of them indigenous to Hawai'i. In addition, three species of macro-moths and fourteen species of micro-moths were captured.

The Blackburn's sphinx moth (*Manduca blackburni*) is only listed invertebrate species historically known from O'ahu. This species has not been recorded from the island since the 1940's despite significant efforts to relocate the species on the island (Federal Register 2003).

While caterpillars of other species of sphinx moths were observed in May 2006 during the botanical and avian surveys (David and Guinther 2006), no caterpillars of Blackburn's sphinx moth have been observed on the Kapolei Harborside Center project site. Nearly two hundred tree tobacco plants were searched for caterpillars of Blackburn's Sphinx moth and none were found.

No adult Blackburn's sphinx moths come to the UV lights during night sampling.

Order Mantodea
Mantids

There are six species of mantids in Hawai'i, all adventive. Two species were found during this study. These species are considered beneficial because they are predators on other insects.

Order Neuroptera
Lacewings

Most of the fifty-eight species of Neuroptera found in Hawai'i are endemic. Two endemic species were found on the Kapolei Harborside Center project site, one green lacewing

(family Chrysopidae) and one brown lacewing (family Hemerobiidae).

Order Odonata
Dragonflies

Nine species of dragonflies are known from Hawai'i, two that are endemic. Five dragonfly species were detected on the Kapolei Harborside Center project, all adventive. They are apparently breeding at temporary ponds or in the drainage ditch. No other sources of water were observed on the site that was capable of sustaining these species.

Order Orthoptera
Grasshoppers and Crickets

More than 275 species of grasshoppers and crickets occur in Hawai'i. Most of the species are endemic crickets, a highly diverse group of Hawaiian insects.

During the survey of the Kapolei Harborside Center project site, two species of grasshoppers, two species of cadydids and two species of crickets were found. All are adventive species.

Order Psocoptera
Psocidss

Psocids are small, soft-bodied insects, less than 6 mm long. Sometimes called barklice, these insects can be found under bark and stones or in dead leaves where they feed on lichens and algae. Two species of barklice were found on the Kapolei Harborside Center project site.

Order Thysanoptera
Thrips

Thrips are minute, slender-bodies insects 0.5-5 mm in length. They feed on plants, and are especially fond of flowers and buds. Two species of these minute insects were found in this study.

Class Malacostraca

Order Isopoda
Sowbugs and Woodlice

Sowbugs, sometimes called pillbugs, can usually be found under stones, boards, and bark. They are important pests of cultivated crops and can be difficult to control.

There are no confirmed endemic sowbugs among the 20 species known in Hawai'i. One species was found to be particularly abundant on the Kapolei Harborside Center project site.

Special Species Searches

'Ōpae'ula (Halocaridina rubra)

This species lives in underground (hypogeal) environments and in anchialine ponds which have a mix of freshwater and seawater through underground connections to the sea.

They reach 1.5 centimeters (0.5 inch) in length and are herbivores that graze on algal, bacterial, and diatom films growing on rocks and other hard substrates. They can also filter feed in mid-water and at the surface.

Despite repeated searching of the one sinkhole found with water, no 'Ōpae'ula (*Halocaridina rubra*) were found.

Hawaiian Snails

While searching the litter under *Kiawe* (*Prosopis pallida*) trees in the sinkhole reserve a rich deposit of fossilized land snail shells was found below the litter layer. Fossilized snail shells have been known from the karstic 'Ewa Plain at Barbers Point since 1976 (Sinoto 1976). The species diversity of these shells has been studied extensively, most recently being used to document ecological change from human disturbance (Christensen and Kirch 1986, Dye and Tuggle 1998). At least five species of fossilized snail shells were collected in the sinkhole reserve during the current study. There was no evidence of live snails in the area, and there is no reported evidence that land snail species still occur in the vicinity of the Barbers Point.

Summary of the Arthropod Fauna

The arthropods species that were collected during this study would be considered typical of what would be found in lowland, disturbed sites with little or no native vegetation. No species were found that are locally unique to the site. Nor were any species found whose habitat would be threatened by the proposed development at the site

The diversity of the arthropod fauna at the Kapolei Harborside Center project site is somewhat less than what was reported in the Lualualei survey (Evenhuis 1997). This could be expected given the fact that most of the site is disturbed by mining agricultural and commercial activities, while much of the Lualualei survey was in large tracts of native vegetation. Also, the current survey was conducted over a ten day period in late September.

The median annual rainfall in the Barbers Point region is 50 cm (20 inches). Most of the rain falls in the winter months. From May through September the median monthly rainfall is 1.25 cm (0.5 inches) (Christensen and Kirch 1986). Because the arthropod survey was conducted near the end of the dry season, the list of species may not include all species that occur on the site. The pollen- and nectar-feeding species may be underrepresented because of the lack of abundant flowering at the time of the survey. Foliage-feeding species such as caterpillars and true bugs may

also be underrepresented on the list. Only one Noctuid moth came to the UV lights during 4 nights of sampling and no plant bugs (Miridae) were found on foliage during the day. Both could be expected in greater abundance and species diversity earlier in the year. For example, during an arthropod study conducted at the Lualualei Naval Base fourteen plant bugs and nineteen noctuid moths were observed during a full year of sampling (Evenhuis 1997).

The results of this arthropod survey at the Kapolei Harborside Center project site indicate there are no special concerns or legal constraints related to invertebrate resources in the project area. Although several species of Hawaiian endemic arthropods may occur on the 'Ewa plain, these species are not likely to be abundant in the highly disturbed quarry and dredged spoil disposal areas around Kalaeloa/Barbers Point Harbor or on the former agriculture lands further inland that comprise the Kapolei Harborside Center project site. 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 at the project site (DLNR 1997, Federal Register 1999, 2005).

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Appendix M
Affordable Housing Study

MIKIKO
CORPORATION

Ewa and Oahu's Affordable For-Sale Housing

SUMMARY OF RECENT MARKET CONDITIONS

Prepared for:
Helber Hastert & Fee, Planners

September 29, 2005

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Study Background and Summary of Findings

Study Background

Aina Nui Corporation, an affiliate of the Estate of James Campbell, proposes to develop some 547 acres as a residential and recreational community known as Kapolei West. Kapolei West is located within the City's Ewa Development Plan area, between Ko Olina Resort and the City of Kapolei. While State entitlements are in place for some 373 acres of the project, Aina Nui is petitioning the State Land Use Commission (LUC) to redesignate 174.2 acres for urban uses.

In discussions with LUC staff, the Ewa area's role in providing affordable housing for Oahu has emerged as a topic of interest. Thus Aina Nui requested Mikiko Corporation to prepare this overview of affordable housing conditions on the island of Oahu and the ongoing and recent contributions of the Ewa Development Plan area to meeting needs of the for-sale segment of this market.[1]

Approach

Mikiko Corporation collected and analyzed information on households, housing demand, household incomes and residential sales transactions within a recent twelve-month period (August 1, 2004 through July 31, 2005) and for the twelve months of 2000. Data were collected for the island of Oahu and for Tax Map Key areas 1-9-1 and 1-9-2, which approximate the Ewa Development Plan Area.[2]

The Ewa DP Area stretches from Ko Olina to Ewa Beach, and encompasses existing primary residential areas such as the Villages of Kapolei, Ewa by Gentry, Ewa Marina, Ewa Villages, Kapolei Knolls, Makaiwa Hills, Makakilo, and Ewa Beach. It also includes Ko Olina Resort, which markets resort/second homes as well as primary residences.

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[1] *The for-sale segment of "affordable housing" is defined herein as that estimated to be affordable to households earning between 80% and 140% of the Honolulu County median income for any given period, under then-prevailing lending conditions. See Appendices 1 and 2 for further details.*

[2] *See Appendices 8 and 9 for display of Development Plan area as defined by the City and as approximated by tax map key codes. The additional lands covered by the tax map definition include relatively few housing units.*
Within this report, the Ewa DP Area is also sometimes referred to as "Ewa."

Executive Summary

The Ewa DP Area has played a very significant role in meeting the island's affordable housing needs, particularly in the for-sale market segment. In 2000 and recent months, the Ewa DP Area:

1) **Recorded a higher share of affordable sales than did the island** - Sales recorded in Ewa between August 2004 and July 2005 show about 51% affordable to families earning 80% to 140% of the County median, compared to only 44% for Oahu as a whole.

2) **Increased its number of sales at affordable prices** - In the recent 12-month period, the Ewa DP Area recorded 1,258 home sales at prices considered affordable to households earning 80% to 140% of the median, compared to 712 sales in 2000.

3) **Has served far more than its "fair share"** - While Ewa is home to some 6% to 7% of Oahu households, it provided 22% of Oahu's affordable home sales recently, and 17% in 2000. Thus, in terms of number of households, Ewa served more than three times its "fair share" of affordable housing in recent months.

All of these conclusions hold when considered separately for single- and multi-family homes. The significance of Ewa is particularly pronounced in the single-family market, where its provision of affordable ownership opportunities has been one of the most important developments in island housing in recent years.[3]

It should also be noted that the Ewa data shown are skewed by the very active sales programs of higher-priced resort/second homes at Ko Olina Resort in recent months. If it were not for these sales, the Ewa DP Area would show an even greater predominance of sales at affordable prices, as well as lower average and median sales prices.

These findings, and observations on pent-up demand are shown on the following pages. Also attached are appendices that present the analyses on which these conclusions are based.

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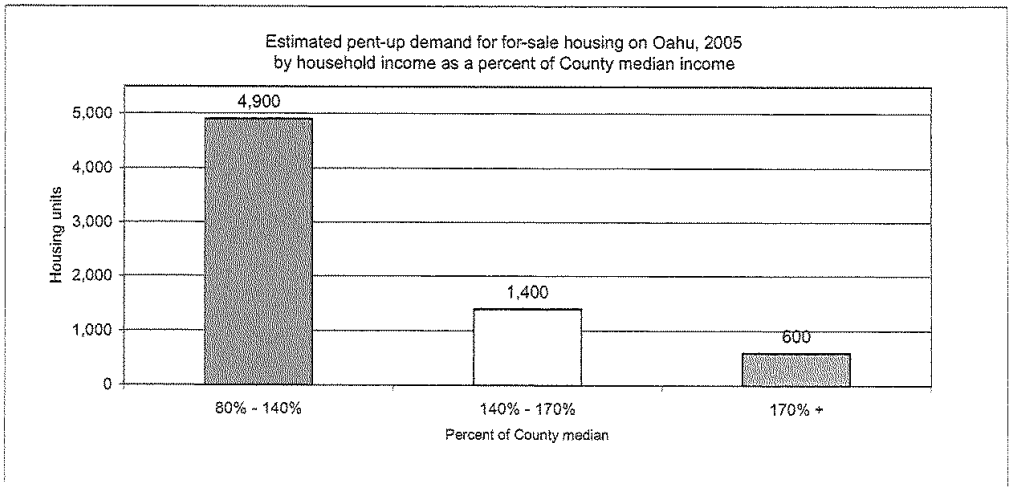
[3] *An apparent drop in the share of Ewa DP Area single-family affordable home sales (from 64% in 2000 to 41% recently, see Appendix 5) is attributable to the relatively few sites available for new housing development and the ending of the buy-back provisions imposed on area housing in prior years. Thus, most of the units transacting in the recent period are resales, which have been affected by the state-wide rapid increase in prices.*

Significant Pent-Up Demand Island-wide

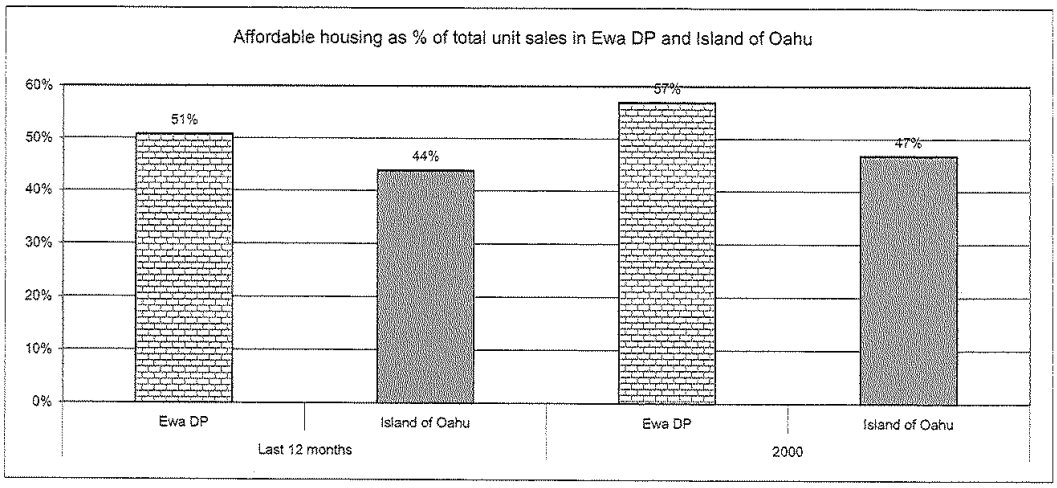
There is strong pent-up demand to purchase housing on Oahu. In total, some 16,300 housing units are estimated to be desired but not available at affordable prices. The greatest need among potential buyer markets is among households earning 80% to 140% of the County median income, or about $54,000 to $95,000 in 2005. Some 4,900 such potential households island-wide are thought to be doubled-up or otherwise unserved for financial reasons. This group is expected to be able to afford housing priced from about $200,000 to $440,000 in the current market.



Notes: Buyer markets assumed to be composed of households earning 80% or more of County median income ($54,000 or more in 2005), with the "affordable" segment those earning 80% to 140%. See Appendix 3 for derivation of numbers shown.

The Ewa DP Area Offers Relatively More Affordable Housing than Oahu

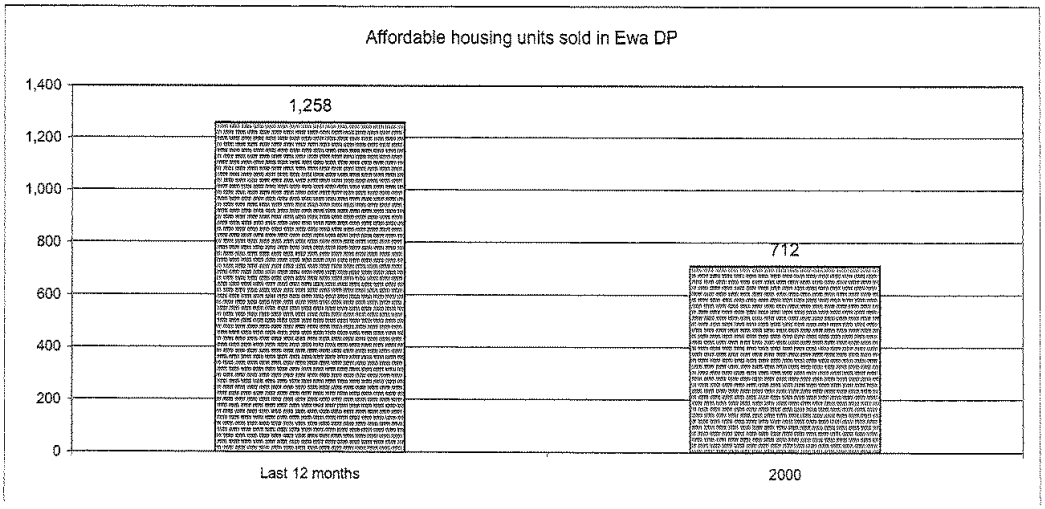
The Ewa DP Area sells a greater share of units within the affordable housing category than does the island as a whole. Although the ability of both geographic areas to deliver affordable housing has been dampened by the recent housing "boom," as a percent of total units sold, Ewa has offered **7% to 10% more affordable units** than the island as a whole.



Notes: Ewa Development Plan Area is approximated by tax map keys 1-9-1 and 1-9-2 for purposes of this analysis.
"Last 12 months" refers to units that closed escrow between 08/01/2004 and 07/31/2005.
Affordable housing markets defined as those estimated to be financially accessible to those earning between 80% and 140% of the County median income for 2005 and 2000, respectively, under then-prevalent lending conditions. See Appendices 1, 2 and 4 for further information.

The Ewa DP Area is Offering More Affordable Housing Units Than Previously

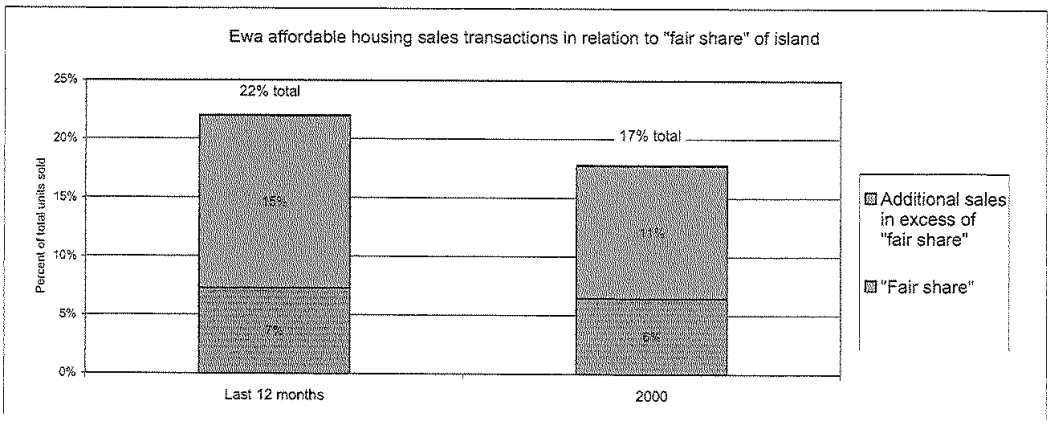
The Ewa Area is selling significantly more affordable housing units than in the past. Compared to 2000, Ewa homes sold in the recent 12-month period represented **77% more units** affordable to those in the 80% to 140% of median income category.



Notes: Ewa Development Plan Area is approximated by tax map keys 1-9-1 and 1-9-2 for purposes of this analysis.
"Last 12 months" refers to units that closed escrow between 08/01/2004 and 07/31/2005.
Affordable housing markets defined as those estimated to be financially accessible to those earning between 80% and 140% of the County median income for 2005 and 2000, respectively, under then-prevalent lending conditions. See Appendices 1, 2 and 4 for further information.

The Ewa DP Area Offers More than its "Fair Share" of Affordable Housing

The Ewa DP Area has been satisfying an increasing share of Oahu's affordable housing needs, well in excess of its "fair share." Based on affordability parameters relevant in 2000, Ewa was home to 17% of the island's for-sale affordable housing transactions in that year. Under current conditions, the district is hosting **about 22% of the island's affordable for-sale housing** transactions. Considering the relative number of households in Ewa and the island as a whole, the district's "fair share" would have been about 6% in 2000, and only 7% during the recent 12-month period.



Notes: Ewa Development Plan Area is approximated by tax map keys 1-9-1 and 1-9-2 for purposes of this analysis.
"Last 12 months" refers to units that closed escrow between 08/01/2004 and 07/31/2005.
Affordable housing markets defined as those estimated to be financially accessible to those earning between 80% and 140% of the County median income for 2005 and 2000, respectively, under then-prevalent lending conditions. See Appendices 1 and 2 for further details.
"Fair share" based on estimated percent of island households living in the Ewa DP Area in 2005 and 2000, as provided by Claritas, Inc., May 2005. See Appendix 4 for base data.

Appendices

Appendix 1: Oahu Housing Affordability Parameters: 2005

Based on estimated median County income in 2005

		80% of median	100% of median	140% of median	170% of median	200% of median
Ability to pay[1]:						
Annual income	$67,750 County median	$54,000	$68,000	$95,000	$115,000	$135,000
Monthly housing budget[2]	30%	$1,350	$1,700	$2,375	$2,875	$3,375
Less tax & insurance[3]		-$225	-$244	-$300	-$333	-$363
Net payable to mortgage		$1,125	$1,456	$2,075	$2,542	$3,013
Approximate purchase terms[4]:	5.8% interest					
Affordable purchase price		$200,000	$260,000	$440,000	$540,000	$640,000
Assumed down payment		$10,000	$13,000	$88,000	$108,000	$128,000

NAP = Not applicable

[1] *Based on 2005 HUD median income of $67,750 for an Oahu family of four, as shown on www.huduser.org/Datasets/IL/IL005/hi fy2005.pdf*

[2] *Percent of monthly income, including allowance for various adjustments shown and after allowance for typical other debt.*

[3] *Assumes $100 per month mortgage insurance, $75 per month homeowners' insurance, and real property taxes based on approximate purchase price and Honolulu County real property tax rates in FY05 of $3.75 per $1,000 assessed value less $40,000 exemption for owner-occupants. Further exemptions for elderly, disabled or other categories of buyers may also be available.*
http://www3.hawaii.gov/DBEDT/images/User_Files/images/databook/db04

[4] *Based on 30 -year mortgage term, 5% down payment for households earning up to 120% of County median, and 20% down for those at higher income levels. Based on Fannie Mae terms applicable as of May 2005.*

Appendix 2: Oahu Housing Affordability Parameters: 2000

Based on estimated median County income in 2000

		80% of median	100% of median	140% of median	170% of median	200% of median
Ability to pay[1]:						
Annual income	$60,900 County median	$49,000	$61,000	$85,000	$104,000	$122,000
Monthly housing budget[2]	30%	$1,225	$1,525	$2,125	$2,600	$3,050
Less tax & insurance[3]		-$207	-$219	-$259	-$283	-$304
Net payable to mortgage		$1,018	$1,306	$1,866	$2,317	$2,746
Approximate purchase terms[4]:	8.0% interest					
Affordable purchase price		$150,000	$190,000	$320,000	$390,000	$470,000
Assumed down payment		$7,500	$9,500	$64,000	$78,000	$94,000

NAP = Not applicable

[1] *Based on 2000 HUD median income or an Oahu family of four, as shown on www.huduser.org/datasets/il/fmr00/hud00hi.txt.*

[2] *Percent of monthly income, including allowance for various adjustments shown and after allowance for typical other debt.*

[3] *Assumes $100 per month mortgage insurance, $75 per month homeowners' insurance, and real property taxes based on approximate purchase price and Honolulu County real property tax rates in FY00 of $3.65 per $1,000 assessed value less $40,000 exemption for owner-occupants. Further exemptions for elderly, disabled or other categories of buyers may also be available. http://www.hawaii.gov/dbedt/db99/index.html*

[4] *Based on 30 -year mortgage term, 5% down payment for households earning up to 120% of County median, and 20% down for those at higher income levels. Based on Fannie Mae terms applicable as of May 2005.*

Appendix 3: Estimated Pent-Up Demand for Housing

Island of Oahu, 2005

Households by percent of median income:	Maximum household income[1]	Target maximum home price[1]	Percent of households[2]	Potential number of households[3]	Est. % pent-up demand[4]	Est. units, pent-up demand[5]
Principally rental market -						
Less than 80%	$54,000	$200,000	50%	157,000	6.0%	9,400
Potential buyer markets -						
Between 80% and 140%	**$95,000**	**$440,000**	**26%**	**82,000**	**6.0%**	**4,900**
Between 140% and 170%	$115,000	$540,000	12%	38,000	3.6%	1,400
170% or more	> $115,000	> $540,000	12%	37,000	1.5%	600
Total			**100%**	**314,000**	**5.2%**	**16,300**

Note: Totals might not add due to rounding.

[1] *As shown in Appendix 1.*

[2] *Based on estimates of Oahu households by household income as provided by Claritas Inc., May 27, 2005.*

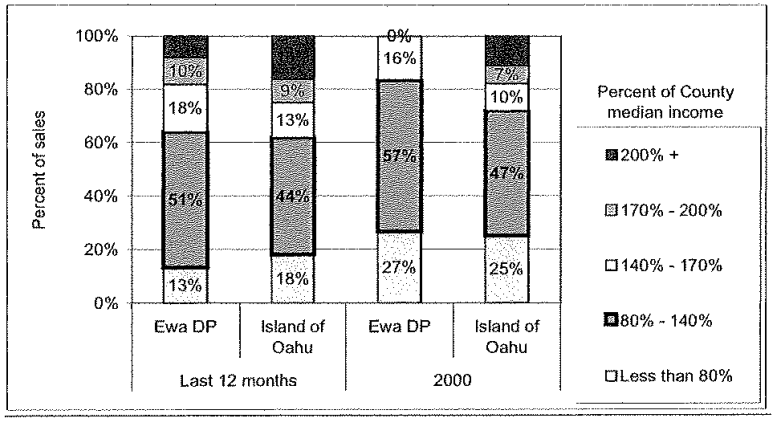
[3] *Represents demand for household formation based on population growth, household size trends and other factors, with total as shown in SMS, Inc., "Hawaii Housing Policy Study 2003," Page Section 1A-B-11, August 2003. (See also Mikiko Corporation, "Market Assessment for Residential Uses at the Proposed Kapolei West," May 21, 2004, Page 65.) Distribution based on percent of households shown.*

[4] *Share of households in each group estimated to be unable to find suitable housing due to affordability factors.*

[5] *Total as shown in Mikiko Corporation, "Market Assessment for Residential Uses at the Proposed Kapolei West," May 21, 2004, Page 65.*

Appendix 4: Total Home Sales by Affordability
Ewa DP and Island of Oahu

	Last 12 months[1]		2000	
	Ewa DP[2]	Island of Oahu	Ewa DP[2]	Island of Oahu
Average sales price	$398,758	$446,975	$200,552	$287,998
Median sales price	$384,858	$369,000	$199,500	$232,000
Number of sales by target income group[3]:				
Less than 80% of median	328	2,348	332	2,143
80% - 140% of median	1,258	5,725	712	4,001
140% - 170% of median	443	1,714	205	877
170% - 200% of median	250	1,143	1	565
200% of median +	202	2,124	1	964
Total	**2,481**	**13,054**	**1,251**	**8,550**



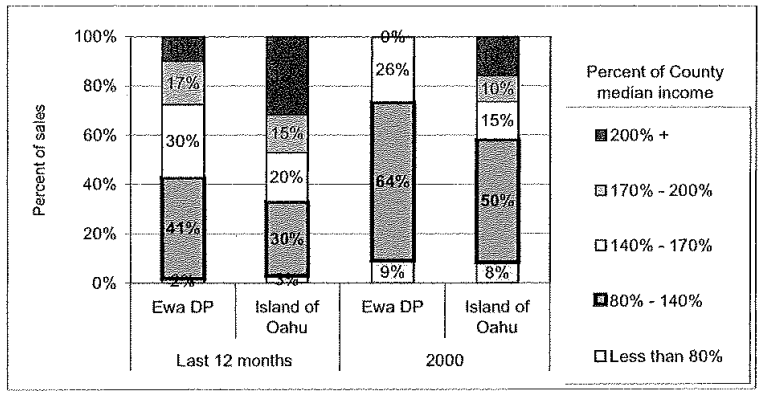
Note: Includes fee simple single- and multi-family unit sales recorded at the Bureau of Conveyances within the periods shown. Excludes sales of multi-unit apartment buildings, which are presumed to be investment/rental properties.

[1] *For the time period from 08/01/2004 through 07/31/2005.*
[2] *Ewa Development Plan Area, as approximated by tax map keys 1-9-1 and 1-9-2.*
[3] *Households grouped by their income in relation to County median for 2005 or 2000; number of sales occurring within price ranges affordable to each. See Appendices 1, 2 and 7.*

Source: Hawaii Information Service.

Appendix 5: Single-Family Home Sales by Affordability
Ewa DP and Island of Oahu

	Last 12 months[1]		2000	
	Ewa DP[2]	Island of Oahu	Ewa DP[2]	Island of Oahu
Average sales price	$478,403	$634,357	$237,617	$369,880
Median sales price	$460,000	$525,000	$238,100	$293,000
Number of sales by target income group[3]:				
Less than 80% of median	20	144	67	368
80% - 140% of median	478	1,606	483	2,183
140% - 170% of median	345	1,069	199	679
170% - 200% of median	204	824	1	456
200% of median +	119	1,694	1	705
Total	**1,166**	**5,337**	**751**	**4,391**



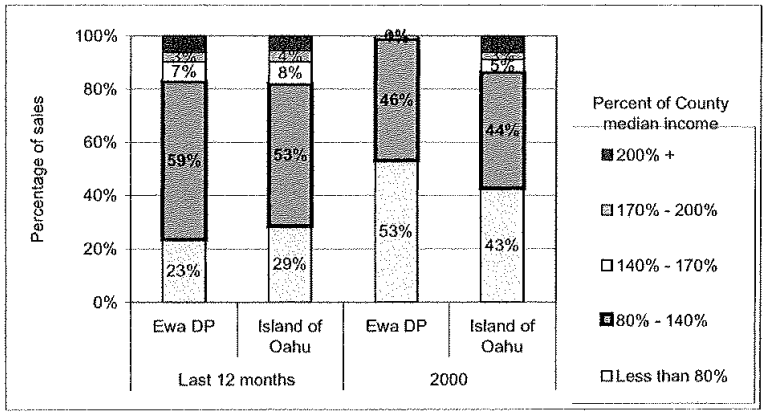
Note: Includes fee simple single- and multi-family unit sales recorded at the Bureau of Conveyances within the periods shown. Excludes sales of multi-unit apartment buildings, which are presumed to be investment/rental properties.

[1] *For the time period from 08/01/2004 through 07/31/2005.*
[2] *Ewa Development Plan Area, as approximated by tax map keys 1-9-1 and 1-9-2.*
[3] *Households grouped by their income in relation to County median for 2005 or 2000; number of sales occurring within price ranges affordable to each. See Appendices 1, 2 and 7.*

Source: Hawaii Information Service.

Appendix 6: Multi-Family Home Sales by Affordability
Ewa DP and Island of Oahu

	Last 12 months[1]		2000	
	Ewa DP[2]	Island of Oahu	Ewa DP[2]	Island of Oahu
Average sales price	$328,137	$317,383	$144,881	$201,548
Median sales price	$284,466	$265,000	$125,450	$170,000
Number of sales by target income group[3]:				
Less than 80% of median	308	2,204	265	1,775
80% - 140% of median	780	4,119	229	1,818
140% - 170% of median	98	645	6	198
170% - 200% of median	46	319	0	109
200% of median +	83	430	0	259
Total	**1,315**	**7,717**	**500**	**4,159**



Note: Includes fee simple single- and multi-family unit sales recorded at the Bureau of Conveyances within the periods shown. Excludes sales of multi-unit apartment buildings, which are presumed to be investment/rental properties.

[1] *For the time period from 08/01/2004 through 07/31/2005.*
[2] *Ewa Development Plan Area, as approximated by tax map keys 1-9-1 and 1-9-2.*
[3] *Households grouped by their income in relation to County median for 2005 or 2000; number of sales occurring within price ranges affordable to each. See Appendices 1, 2 and 7.*

Source: Hawaii Information Service.

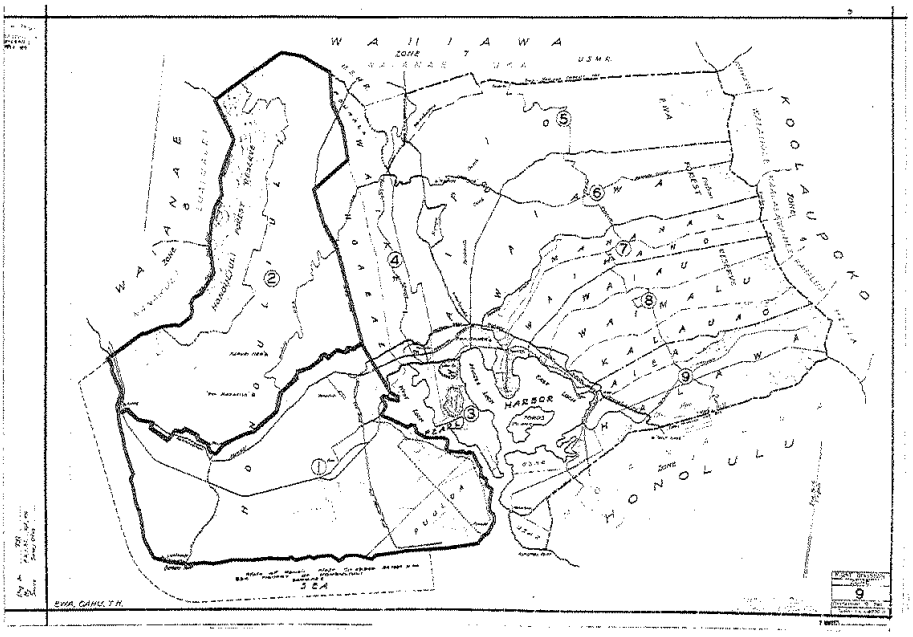
Appendix 7: Home Sales by Price in the Ewa DP and Island of Oahu

	Ewa DP[1]			Oahu		
	Multi Family	Single-Family	Total	Multi Family	Single-Family	Total
Last 12 months[2]:						
Below $200,000	308	20	328	2,204	144	2,348
$200,000 - $259,999	259	13	272	1,550	187	1,737
$260,000 - $319,999	271	60	331	1,154	270	1,424
$320,000 - $439,999	250	405	655	1,415	1,149	2,564
$440,000 - $539,999	98	345	443	645	1,069	1,714
$540,000 - $639,999	46	204	250	319	824	1,143
$640,000 +	83	119	202	430	1,694	2,124
Total	1,315	1,166	2,481	7,717	5,337	13,054
2000:						
Below $150,000	265	67	332	1,775	368	2,143
$150,000 - $189,999	55	114	169	574	386	960
$190,000 - $229,999	123	99	222	576	516	1,092
$230,000 - $319,999	51	270	321	668	1,281	1,949
$320,000 - $389,999	6	199	205	198	679	877
$390,000 - $469,999	0	1	1	109	456	565
$470,000 +	0	1	1	259	705	964
Total	500	751	1,251	4,159	4,391	8,550

[1] *Ewa Development Plan Area, as approximated by tax map keys 1-9-1 and 1-9-2.*
[2] *For the time period from 08/01/2004 through 07/31/2005.*

Source: Hawaii Information Service. See also Appendices 1 and 2 for derivation of price thresholds.

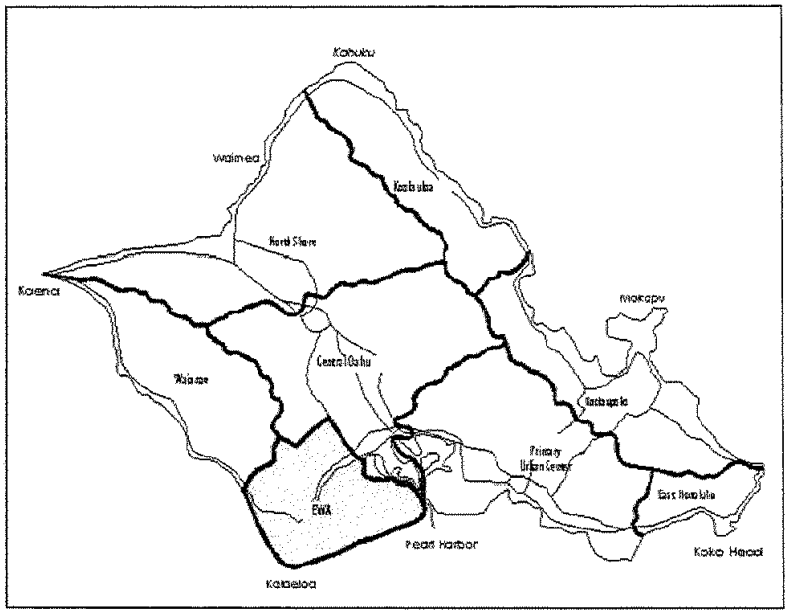
Appendix 8: Ewa DP Area as Approximated by Tax Map Key Classification



Source: Hawaii Information Service. See Appendix 9 for actual boundaries of Ewa DP Area as defined by the City.

Appendix 9: Ewa Development Plan and Other Community Plan Areas

As defined by City and County of Honolulu, Department of Planning & Permitting



Source: City and County of Honolulu, Department of Planning and Permitting, "Ewa Development Plan," August 1997 (revised May 2000,) as referenced at http://honoluludpp.org/planning/Ewa/Ewa1.pdf