FILE COPY SEP 23 2011

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY AND COUNTY OF HONOLULU
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TELEPHONE: (808) 768-3486 • FAX: (808) 768-3487 • WEBSITE: http://envhonolulu.org

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OFC. OF ENVIRONMENTAL QUALITY CONTROL

PETER B. CARLISLE
MAYOR

TIMOTHY E. STEINBERGER, P.E.
DIRECTOR

MANUEL S. LANUEVO, P.E., LEED AP
DEPUTY DIRECTOR

ROSS S. TANIMOTO, P.E.
DEPUTY DIRECTOR

IN REPLY REFER TO:
RE 11-037

September 13, 2011

Mr. Gary Hooser, Director
State of Hawaii
Office of Environmental Quality Control
235 South Beretania Street, Room 702
Honolulu, Hawaii 96813

Dear Mr. Hooser:

Subject: Final Environmental Impact Statement (EIS) for the
In-Vessel Composting Facility, Waialua, Oahu, Hawaii

The City and County of Honolulu Department of Environmental Services (ENV) has accepted the Final Environmental Impact Statement (EIS) for the subject project. The Final EIS has been prepared to meet the content requirements specified in Chapter 343, Hawaii Revised Statutes and Chapter 11-200-2, Hawaii Administrative Rules. Please publish notice of this Final EIS in the September 23, 2011, issue of *The Environmental Notice*.

Enclosed are the following items:

1. One (1) hardcopy of the Final EIS;
2. OEQC publication form;
3. Final EIS distribution list; and
4. One (1) CD containing Items 1 through 3.

If you have any questions, please call Steven Serikaku of the Department of Environmental Services, Refuse Division at 768-3428.

Sincerely,

Timothy E. Steinberger, P.E.
Director

Enclosures

cc: Mr. Greg Apa, Hawaiian Earth Recycling LLC
Mr. Earl Matsukawa, Wilson Okamoto Corporation

Publication Form
The Environmental Notice
Office of Environmental Quality Control

Instructions: Please submit one hardcopy of the document along a with determination letter from the agency. On a compact disk, put an electronic copy of this publication form and a PDF of the EA or EIS. Mahalo.

Name of Project: In-Vessel Composting Facility

Applicable Law: Chapter 343, Hawaii Revised Statutes and Chapter 11-200-2, Hawaii Administrative Rules

Type of Document: Final Environmental Impact Statement (EIS)

RECEIVED
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OFC. OF ENVIRONMENTAL QUALITY CONTROL

Island: Oahu

District: Waialua

TMK: 6-5-002: 026

Permits Required: State of Hawaii

Department of Health:
- National Pollutant Discharge Elimination System (NPDES) for Storm Water Associated with Construction Activity
- Solid Waste Management Permit
- Temporary Non-Covered Source Permit
- Air Pollution Control Permit

Department of Land and Natural Resources:
- Well Construction Permit

Department of Transportation:
- Permit for Transportation of Oversized and Overweight Equipment Loads

City & County of Honolulu

- Conditional Use Permit (Major)
- Special Use Permit
- Zoning Variance (Height)
- Building Permit
- Grading, Grubbing and Stockpiling Permit

Name of Applicant or Proposing Agency: Hawaiian Earth Recycling, LLC

Address: 91-400 Malakole Street
City, State, Zip: Kapolei, HI 96707
Contact and Phone: Gregory Apa 792-0126

Approving Agency or Accepting Authority:	City and County of Honolulu Department of Environmental Services
Address	1000 Uluohia Street, Suite 212
City, State, Zip	Kapolei, HI 96707
Contact and Phone	Steven Serikaku 768-3428
Consultant	Wilson Okamoto Corporation
Address	1907 South Beretania St., Suite 400
City, State, Zip	Honolulu, HI 96813
Contact and Phone	Earl Matsukawa 946-2277

Project Summary: Summary of the direct, indirect, secondary, and cumulative impacts of the proposed action (less than 200 words).

Hawaiian Earth Recycling LLC (HER) proposes to construct an in-vessel composting facility in Waialua on the island of Oahu. The proposed project site is owned by Cedar Grove Hawaii LLC and encompasses approximately 112 acres. The in-vessel composting facility will process up to 150,000 tons per year of green waste, food waste, and dewatered sewage sludge and produce marketable products such as compost, soil amendments, potting mixes, and erosion control materials. This project will be an important and integral part of Oahu's overall Solid Waste Management System, as private companies, such as HER, assist the City and County of Honolulu's efforts to direct materials for reuse.

Final Environmental Impact Statement

IN-VESSEL COMPOSTING FACILITY

Waialua, Oahu, Hawaii

Applicant:
Hawaiian Earth Recycling LLC

Approving Agency:
Department of Environmental Services
City & County of Honolulu

Prepared by:
Wilson Okamoto Corporation

September 2011

FINAL
ENVIRONMENTAL IMPACT STATEMENT

IN-VESSEL COMPOSTING FACILITY
Waialua, Oahu, Hawaii

Applicant:
Hawaiian Earth Recycling LLC

Approving Agency:
Department of Environmental Services
City & County of Honolulu

Prepared by:
Wilson Okamoto Corporation

September 2011

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Appendix D	Air Quality Impact Assessment, B.D. Neal & Associates, March 9, 2011
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Appendix I	Traffic Impact Report for the In-Vessel Composting Facility, Wilson Okamoto Corporation, February 2011.
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Appendix N~~M~~	Letter from Wahiawa Community & Business Association, May 20, 2011

PREFACE

Hawaiian Earth Recycling LLC (HER) proposes to construct and operate an in-vessel composting facility in the rural area between Wahiawa and Waialua on the island of Oahu. The proposed project site is located on land owned by Cedar Grove Hawaii LLC and encompasses approximately 112 acres.

The City and County of Honolulu, Department of Environmental Services (ENV) issued a Request for Proposals for the Financing, Design, Engineering, Construction, Testing and Operations/Maintenance of a Green Waste, Food Waste and Sewage Sludge In-Vessel Conversion Facility for the City and County of Honolulu, (Request for Proposal Number: RFP-ENV-53314) on July 31, 2009.

HER submitted a Proposal to ENV to compost these materials with a GORE™ Cover In-Vessel Composting System on January 21, 2010. On October 6, 2010, the ENV issued the Notice to Proceed (NTP) to HER for the permitting phase of the Project.

As part of the contractual requirements between ENV and HER, the environmental documentation requirements prescribed under Chapter 343, Environmental Impact Statements, Hawaii Revised Statutes (as amended) and Hawaii Administrative Rules Chapter 200 (Environmental Impact Statement Rules) Title 11, of the State of Hawaii Department of Health, as amended (State of Hawaii 1996) have been~~will be~~ followed for this project.

Notice of availability of the Draft Environmental Impact Statement (EIS) was published in June 23, 2011 issue of The Environmental Notice. The public comment period ended on August 6, 2011.

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SUMMARY

APPLICANT:	Hawaiian Earth Recycling LLC 91-400 Malakole Street Kapolei, Hawaii 96707 Contact: Mr. Gregory Apa
ACCEPTING AGENCY:	Department of Environmental Services City & County of Honolulu 1000 Uluohia Street, Suite 308 Kapolei, Hawaii 96707 Contact: Mr. Steven Serikaku
AUTHORIZED AGENT:	Wilson Okamoto Corporation 1907 S. Beretania Street, Suite 400 Honolulu, Hawaii 96826 Contact: Mr. Earl Matsukawa
PROJECT LOCATION:	Waialua, Oahu, Hawaii
TAX MAP KEY:	6-5-002: 026
AREA:	Approximately 112 acres
EXISTING USE:	Agricultural lands
STATE LAND USE DESIGNATION:	Agricultural
ZONING DESIGNATION:	Agriculture (AG-~~2~~1)
SUSTAINABLE COMMUNITIES PLAN DESIGNATION:	Agriculture
PROPOSED ACTION:	Construct and operate an in-vessel composting facility that will process green waste, food waste, and dewatered sewage sludge and produce marketable products such as compost, soil amendments, potting mixes, and erosion control materials.
DETERMINATION:	As part of the contractual requirements between ENV and HER, the environmental documentation requirements prescribed under Chapter 343, Environmental Impact Statements, Hawaii Revised

Statutes (as amended) and Hawaii Administrative Rules Chapter 200 (Environmental Impact Statement Rules) Title 11, of the State of Hawaii Department of Health, as amended (State of Hawaii 1996) have beenwill be followed for this project.

PARTIES CONSULTED DURING DRAFT ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE (EISPN):

Federal
U.S. Army Corps of Engineers
U.S. Fish & Wildlife Service
Department of Army, Schofield Barracks

State
Department of Agriculture
Department of Accounting & General Services
Department of Business, Economic Development & Tourism (DBEDT)
DBEDT, Office of Planning
DBEDT, Energy Division
Department of Defense
Department of Education
Department of Health
Department of Housing Finance and Development Corporation
Department of Human Services
Department of Land & Natural Resources (DLNR)
DLNR, State Historic Preservation Division
Department of Labor and Industrial Relations
Office of Hawaiian Affairs
Department of Transportation
Department of Hawaiian Home Lands
University of Hawaii, Environmental Center

City & County of Honolulu
Board of Water Supply
Department of Design & Construction
Department of Environmental Services
Department of Facility Maintenance
Department of Planning & Permitting
Department of Transportation Services
North Shore Neighborhood Board
Wahiawa – Whitmore Village Neighborhood Board

Elected Officials
Representative Marcus Oshiro, District 39
Representative Gil Riviere, District 46
Senator Donavon Dela Cruz, District 22
Councilmember Ernie Martin, District 2

Other
Castle & Cooke
Dole Food Company Inc.
Wahiawa Rainbow Seniors
Wahiawa Community & Business Association
Honolulu Star-Advertiser

Legislative Reference Bureau
Hawaii State Library
Wahiawa Library
Waialua Library
University of Hawaii, Hamilton Library

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1.0 INTRODUCTION

1.1 Background

The City and County of Honolulu, Department of Environmental Services (ENV) issued a Request for Proposals for the Financing, Design, Engineering, Construction, Testing and Operations/Maintenance of a Green Waste, Food Waste and Sewage Sludge In-Vessel Conversion Facility for the City and County of Honolulu, (Request for Proposal Number: RFP-ENV-53314) on July 31, 2009.

Hawaiian Earth Recycling (HER) submitted a Proposal to ENV to compost these materials with a GORE™ Cover In-Vessel Composting System on January 21, 2010. On October 6, 2010, the ENV issued the Notice to Proceed (NTP) to HER for the permitting phase of the Project.

Hawaiian Earth Recycling LLC (HER) proposes to construct and operate an in-vessel (enclosed) composting facility in Waialua on the island of Oahu (see Figure 1-1).

Currently, the City and County of Honolulu's (CCH~~&C~~) Curbside Green Waste Collection Program; individual homeowners; commercial tree trimmers and landscape maintenance contractors, and governmental property maintenance agencies deliver green wastes to one of two Hawaiian Earth Products' (HEP is an affiliated company of HER) Department of Health (DOH)-permitted composting/transfer locations, located at Campbell Industrial Park and Kapaa Quarry, respectively. HEP also composts pre-consumer food waste at Campbell Industrial Park. This pre-consumer food waste is generated prior to purchase by the retail consumer and does not include waste food that has been prepared for consumption by restaurants. HEP recycles over 85,000 tons of green waste per year from both facilities, however HEP's current DOH Permit allows HEP to process up to 136,000 tons per year at Campbell Industrial Park.

The CCH's Kailua Regional Wastewater Treatment Plan and Honouliuli Wastewater Treatment Plan presently collects and processes sludge through digesters, dewaters the processed sludge using centrifuges and, transports dewatered sewage sludge (biosolids) from both treatment plants to Waimanalo Gulch Landfill for disposal.

1.2 Project Location

HER proposes to construct an in-vessel (enclosed) composting facility in Waialua on the island of Oahu, as shown in Figure 1-1). The project site is located on Tax Map Key (TMK) 6-5-002: 026, owned by Cedar Grove Hawaii LLC and encompasses approximately 112 acres (see Figure 1-2). The project site lies on a gentle grade (955 foot elevation), with steep slopes and gullies near Kaukonahua Gulch. The project site elevations range from 955 feet to 880 feet, with the lowest point of the property at the southeastern end at approximately 800 feet. The project site has not been in agricultural production since late 2004. HEP currently has existing open windrow composting operations (DOH Permit No. CO-0091-08) (see Figure 1-3).

The project site is surrounded by Agricultural and Military Preservation zoned land. It is bordered by Wilikina Drive and agricultural lands to the north and agricultural lands to the east and west (see Figure 1-4). Along the southern boundary are more agricultural lands. Beyond the southern agricultural lands are Kaukonahua Gulch located 1/4-mile away and Schofield Barracks across from Kaukonahua Gulch, with nearest structures approximately one mile from southern boundary of project site.

1.3 Purpose and Project Need

In 2008, the CCH prepared the *Integrated Solid Waste Management Plan Update* (ISWMP). The ISWMP identifies objectives and initiatives to design an integrated system that will maximize the recovery of solid waste and minimize the amount of waste that requires landfill disposal."

To increase the amount of solid waste recovered through recycling, reuse, and composting, the City proposed several initiatives, including seeking a vendor to compost up to 150,000 tons of green waste, sewage sludge and food waste. The ENV issued a Request for Proposals for the Financing, Design, Engineering, Construction, Testing and Operations/Maintenance of a Green Waste, Food Waste and Sewage Sludge In-Vessel Conversion Facility for the City and County of Honolulu, (Request for Proposal Number: RFP-ENV-53314) on July 31, 2009. The purpose of the project is to create sustainable programs by providing for the beneficial reuse of green waste, food waste and sewage sludge as an alternative to landfill disposal.

As mentioned earlier, the CCH transports processed, dewatered sewage sludge (biosolids) from Kailua Regional Wastewater Treatment Plant and Honouliuli Wastewater Treatment Plant to Waimanalo Gulch Landfill for disposal. According to the ISWMP, Section 5.6 Sewage Sludge states:

> *"Industry research suggests that the greatest opportunity for increased diversion from Hawaii's waste stream is through the recovery of organic materials. It can reduce landfill reliance, while promoting growth opportunities for local businesses and products of value to Hawaii's tourism, agricultural, and landscape businesses."*

According to the ISWMP, several alternatives to disposal, including commercial co-composting (biosolids or food waste, open or in-vessel systems), have been implemented in Hawaii and throughout the country.

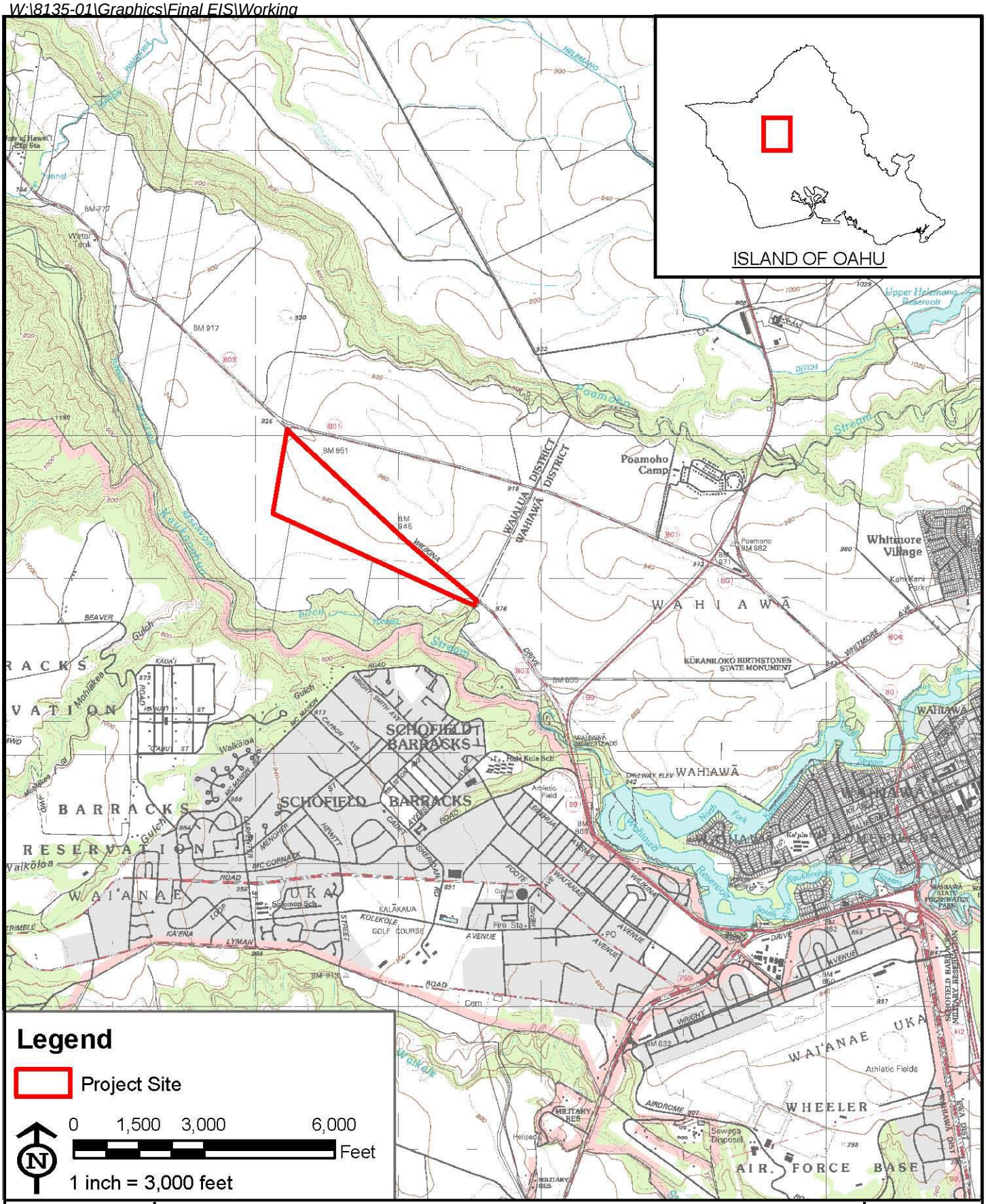
Currently, HEP recycles green wastes and pre-consumer food at their DOH-permitted composting facility at Campbell Industrial Park, where itHEP currently leases approximately 39 acres at Campbell Industrial Park for their existing composting operations. The lease expires in 2015 and the amount of lands that can be leased will be reduced to 14 acres. As a result, HER must relocate their composting operations

and downsize current operations at Campbell Industrial Park. HEP will continue to operate at Campbell Industrial Park and Kapaa Quarry as transfer stations.

The proposed site in Waialua is an ideal location for HER's composting operations as it will be centrally located to Oahu's agricultural industry. The Waialua site has a DOH Permit (Permit No. C0-0091-08) for existing open windrow composting operations. HER will produce organic products that would be utilized by the agricultural industry. The soils have been stripped of nutrients from decades of sugar cane and pineapple cultivation and the use of chemical fertilizers. The agricultural industry would have much more access to these organic soil amendments with the project's location.

~~As mentioned earlier, HEP recycles over 85,000 tons of green wastes and pre-consumer food per year from both facilities.~~ By recycling and reusing organic materials, this waste, which once was disposed of at Oahu's only landfill, is being turned into a beneficial product, such as compost, soil amendments, potting mixes, fertilizer replacement/enhancement, gardening and landscaping products. This Project will be an important and integral component of Oahu's overall Integrated Solid Waste Management System, as private companies, such as HEP, assist the ~~City and County~~CCH ~~of Honolulu~~'s efforts to direct materials for reuse. Without this proposed composting facility, approximately 5,000 to 10,000 tons per year of food waste and 15,000 to 20,000 tons per year of sewage sludge would continue to be placed in Oahu's only landfill.

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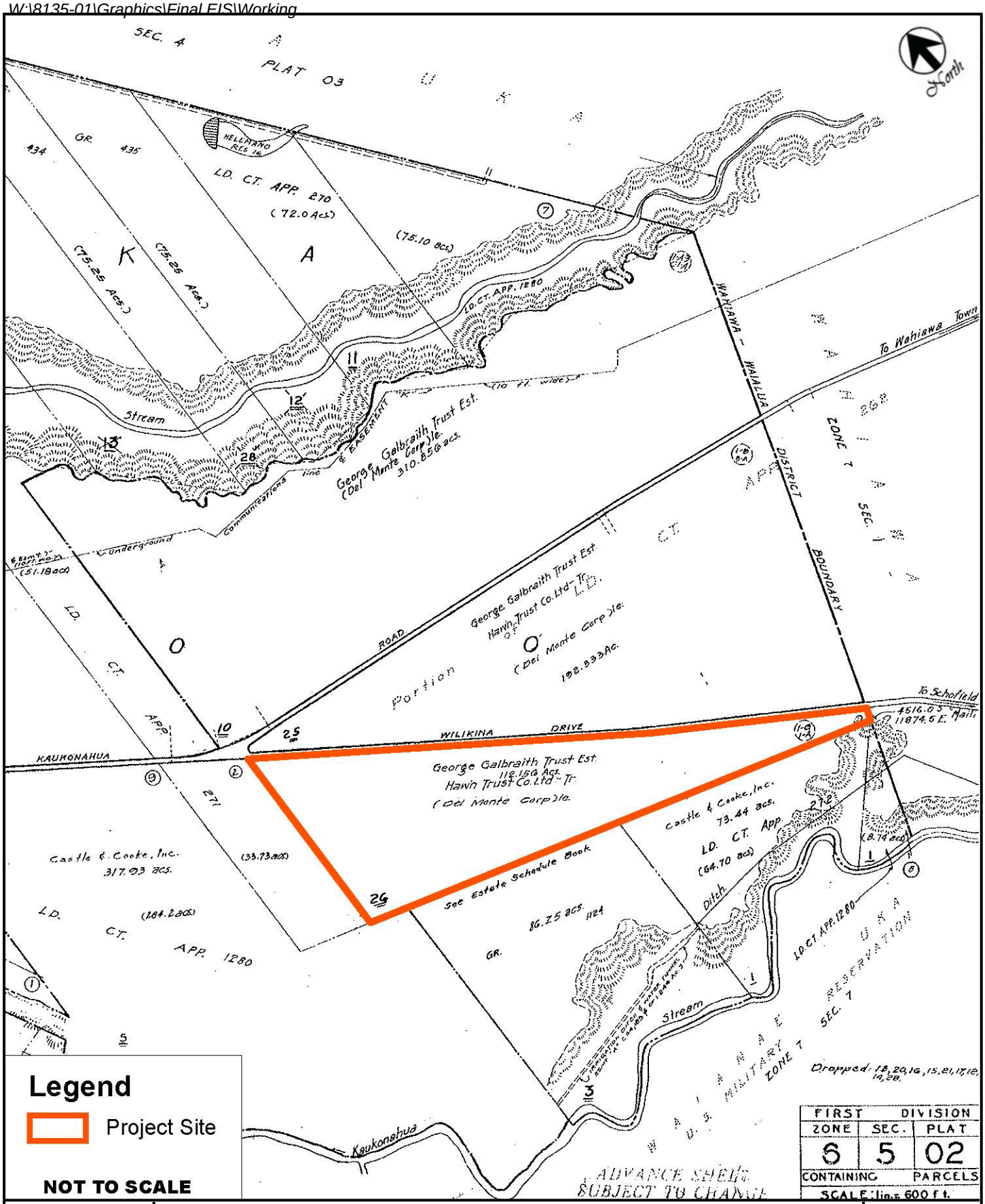
IN-VESSEL COMPOSTING FACILITY

PROJECT LOCATION MAP

FIGURE 1-1

WILSON OKAMOTO CORPORATION
ENGINEERS • PLANNERS

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IN-VESSEL COMPOSTING FACILITY

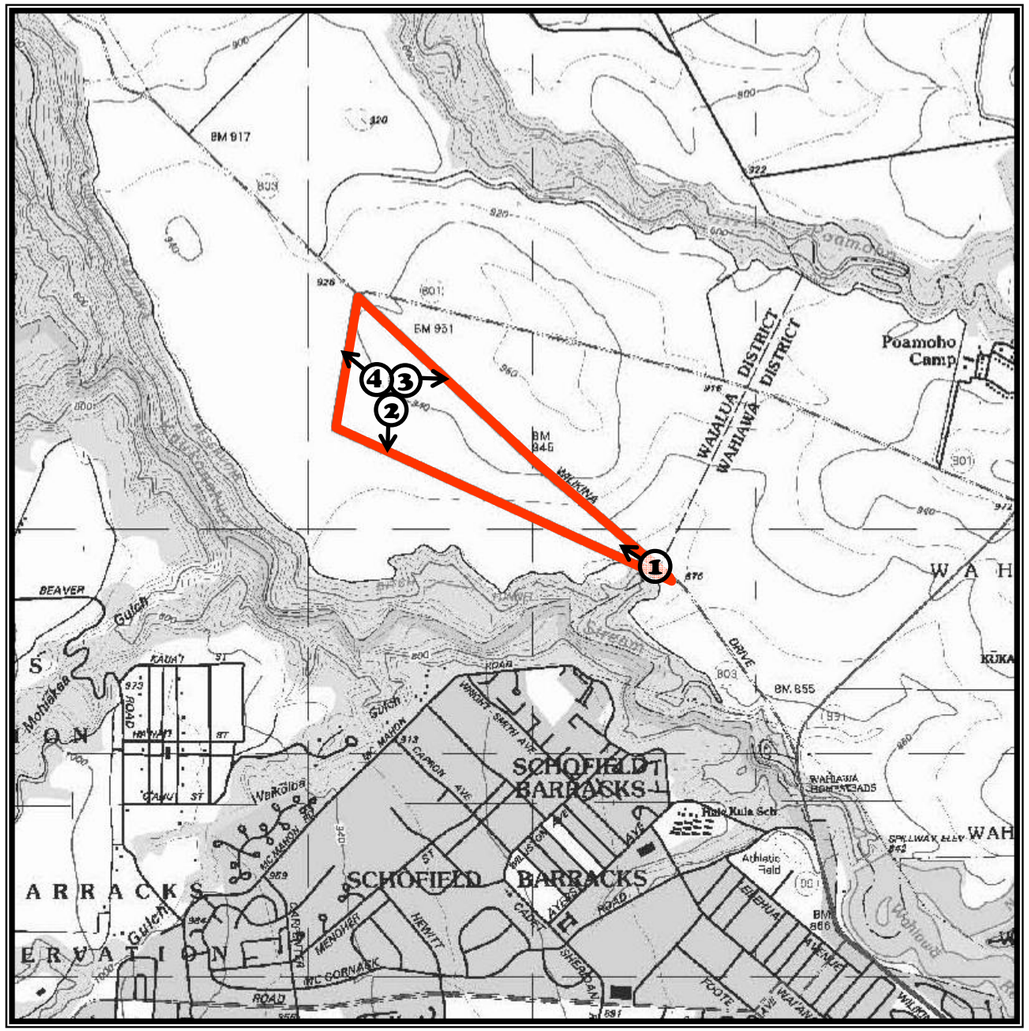
TAX MAP KEY 6-5-02: 026

FIGURE 1-2

WILSON OKAMOTO CORPORATION
ENGINEERS • PLANNERS

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NOT TO SCALE

Legend

Project Site

North

1



2



3



4



WILSON OKAMOTO CORPORATION
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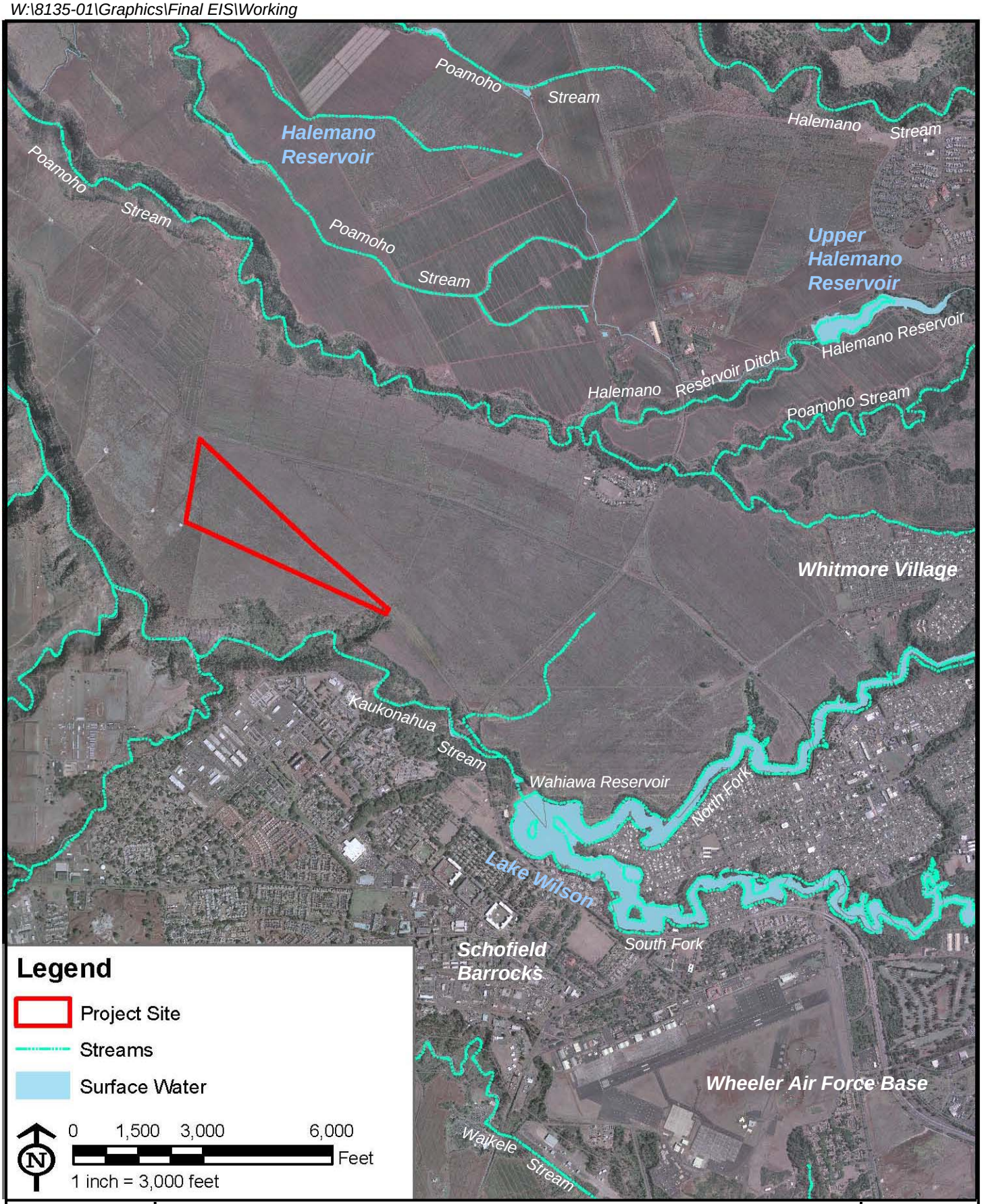
IN-VESSEL COMPOSTING FACILITY

PROJECT SITE PHOTOS

FIGURE 1-3

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WILSON OKAMOTO CORPORATION ENGINEERS • PLANNERS	IN-VESSEL COMPOSTING FACILITY	FIGURE 1-4
	SURROUNDING LAND USES	

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2.0 PROJECT DESCRIPTION

2.1 No Action

The No Action alternative would involve not constructing a new composting facility in Waialua. The 85,000 tons per year of green and pre-consumer food wastes would not be reused beneficially and disposed of in Oahu's only landfill with no alternatives. In addition, approximately 5,000 to 10,000 tons per year of food waste and 15,000 to 20,000 tons per year of sewage sludge would continue to be placed in Oahu's only landfill with no alternatives.

2.2 Alternative Site

Property owned by the City and County of Honolulu (CCH) was included in ENV's RFP for consideration by any proposer for the project. This alternative site encompasses 8.65 acres and is further identified as TMK: 9-1-026: 035, adjacent to the Covanta Waste to Energy Plant in Campbell Industrial Park. This site was not proposed because it was too small to accommodate the projected compost volumes the type of composting facility HER proposed and a protected plant species is located on the parcel where preserving it would divide the property, making it more difficult to operate a composting facility.

2.3 Proposed Action

The proposed in-vessel composting facility will be able to process up to 150,000 tons per year (TPY) of green waste, food waste, and dewatered sewage sludge and produce marketable products such as compost, soil amendments, potting mixes, and erosion control materials. By weight, this total amount is estimated to consist of approximately 70 to 80 percent green waste, 5 to 10 percent food waste and 15 to 20 percent dewatered sewage sludge.

Green waste will continue to come from the CCH's Curbside Green Waste Collection Program; individual homeowners; commercial tree trimmers and landscape maintenance contractors, and governmental property maintenance agencies on the island of Oahu. Food waste will be delivered from a soon to be developed CCH food waste collection program and by private haulers and businesses. Dewatered sewage sludge will come from the CCH's Honouliuli and Kailua Regional Wastewater Treatment Facilities. In the future, dewatered sewage sludge may come from other wastewater treatment facilities. Per ENV's National Pollutant Discharge Elimination System (NPDES) Permit, the ENV tests the sewage sludge for hazardous chemicals on an annual basis. The final composted product, that being both the green waste and food waste combined composted material and the separately composted dewatered sewage sludge and green waste combined composted material, will be tested to meet both US Composting Council USCC and Process to Further Reduce Pathogens (PFRP) standards, which is conducted by a third-party independent review of its chemical composition.

The in-vessel composting facility will utilize the GORE™ Cover System for the composting process. The GORE™ Cover System ("System") technology is a widely used composting system in the United States and the world with more than 150 operating systems world-wide. The System is suitable for varied climate conditions and is highly effective in managing and controlling odors and emissions.

The in-vessel composting facility will consist of the following: truck weighing scales, office buildings, parking areas, enclosed receiving building for sorting and processing, leachate storage tanks, and open composting area where the GORE™ Cover System will be installed. These facilities will encompass approximately 13 acres of the 112 acre site. The remainder of the site will be used for two storm water ponds, a retention basin, product storage area, existing open windrow composting operations (green waste and pre-consumer food waste only), and crop production area demonstrating the benefits of using compost for crops and farming operations (see Figures 2-1 and 2-2).

The System's composting process is summarized as follows and depicted in Figure 2-2. Incoming vehicles will be weighed and enter the enclosed receiving building where the vehicles will be unloaded, or "tipped." The receiving building will encompass approximately 31,250 square feet (125 feet by 250 feet) of land and stand 3638 feet high at the building's center line. The building will accommodate temporary storage (up to two days of incoming materials) and preparation of the incoming materials. The receiving facility will operate under a negative air pressure system, which will prevent odors from escaping the building by directing air within the building to biofilters that will remove odors. The building's concrete floor slab will be impermeable and designed to collect all leachate generated inside the facility. This leachate will be collected and stored in a double-walled storage tanks on-site. The collected leachate will be reused by mixing it in with the materials to be composted.

Within the receiving building, incoming materials will be separated into two areas 1) green and food waste, and 2) dewatered sewage sludge (biosolids), as shown in Figure 2-1. The incoming materials are prepared by removing non-compostable debris and separated to create two processing streams, one that contains dewatered sewage sludge and one that does not. The green and food waste is loaded into a grinder located in the receiving building. The grinder shreds the waste into mulch and then transported to GORE™ Cover System concrete slab for composting.

As previously mentioned, ENV will be delivering dewatered sewage sludge to the facility for composting. Per ENV's National Pollutant Discharge Elimination System (NPDES) Permit, the ENV tests the sewage sludge for hazardous chemicals on an annual basis. The final composted product, that being both the green waste and food waste combined composted material and the separately composted dewatered sewage sludge and green waste combined composted material, will be tested to meet both US Composting Council USCC and Process to Further Reduce Pathogens (PFRP) standards, which is conducted by a third-party independent review of its chemical composition.

With the dewatered sewage sludge, the material is received in a separate area within the receiving facility. The sewage sludge is mixed with bulking material, primarily ground wood, within the enclosed facility. Then the mixed material is handled in the same manner as the green and food waste, but on separate GORE™ pad, as described below.

From the receiving building, each stream will be transported to a specially designed GORE™ Cover System concrete slab for composting. The entire GORE™ pad consists of an impermeable concrete or asphalt slab, which allows for the collection of all storm water and leachate generated under the GORE™ Cover.

The segregated materials will be placed on either of two GORE™ pads (one for materials containing dewatered sewage sludge and the other for material with green and food waste) and arranged in windrows over an imbedded air distribution channels that aerate the composting material and collect leachate generated. The dimension of each GORE™ pad is approximately 538 feet by 378 feet (approximately 203,400 square feet). Each GORE™ pad can accommodate up to 32 windrows. Each windrow is approximately 26 feet wide at the base, 166 feet long and 10 feet in height, and contains approximately 1,000 cubic yards of composting material. Each windrow will be covered by a GORE™ Cover fabric, which will be secured around each windrow perimeter, hence the reference to “in-vessel” (enclosed) composting.

The patented GORE™ Cover fabric has the unique property of allowing water vapor to pass through it and yet it will shed rainfall. The GORE™ Cover will also control dust and keep vectors out of the composting material. Rainfall shedding off the GORE™ Cover will be collected and directed to storm water ponds from which water will be drawn to assist the maintenance of proper moisture content of the composting material and irrigation for crops. The GORE™ Cover provides separation of storm water and leachate. The leachate collected from inside the GORE™ Cover will be handled by the aforementioned separate leachate collection system.

After each succeeding stage of composting, the composted materials will be transported, mixed and reformed into windrows on another area of the concrete slab, re-covered with the GORE™ Cover and allowed to further decompose. Throughout this process, the two streams of materials (with or without sewage sludge) remain segregated.

In the first phase, the material will be allowed to aerobically decompose for 21-28 days under the GORE™ Cover (Steps 1 and 2 as shown in Figure 2-2). From phase 1, the material will be moved to phase 2, also under the GORE™ Cover for an additional 14 – 28 days, then moved to a third and final phase for 21 – 28 days. In the third phase, the composted green waste and food waste will not be covered (see Steps 3 – 5 in Figure 2-2). The third phase of composted dewatered sewage sludge will be under the GORE™ Cover. Appendix A includes detailed information on the GORE™ Cover

System. More information is available at the GORE™ website: http://www/gore.com/en_xx/products/fabrics/swt.index.html.

The finished composted product, both 1) the green waste and food waste combined composted material and 2) the separately co-composted dewatered sewage sludge combined with green waste and/or wood waste, will be tested to meet both US Composting Council (USCC) and EPA Process to Further Reduce Pathogens (PFRP) standards, which is conducted by a USCC approved third-party independent laboratory. These two separately composted finished products will be tested separately every thirty days using the Test Methods for the Examination of Compost and Composting Manual (TMECC) jointly published by the USDA and the US Composting Council (2002 publishing as a part of the USDA National Resource Conservation Technical Bulletin Series). Compliance with USCC will be assured by collecting and testing finished product samples after the final stage of composting. These two finished, composted products will be analyzed for the following properties: pH, soluble salts, nutrient content (total N, P2O5, K2O, Ca, Mg), moisture content, organic matter content, bioassay (maturity), stability (respirometry), particle size (report only), pathogen (fecal coliform or salmonella), and trace metals (Part 503 regulated metals).

These testing results will be received before the composted finished products are made available to the agricultural or commercial business and/or residents. In the event that a batch test fails to meet any one of the above standards, the entire batch will be re-introduced into the first phase of the composting process for either green and food waste composting or dewatered sewage sludge composting. Once again as a finished compost product, the material will be re-tested until it can meet all USCC STA (Seal of Testing Assurance) and PFRP testing standards.

The finished material for sale includes soil conditioners, compost and mulches, will be packaged and distributed to end users. The material will also be sold in bulk.

As previously mentioned, rainfall collected will be directed to two storm water ponds and a retention basin on the project site from which water will be drawn to assist the maintenance of proper moisture content of the composting material and irrigation of crops. The volume of storm water collected will be insufficient for the composting operation so supplemental water will be drawn from an on-site well. A well will be drilled and a pump installed.

The storm water ponds, retention basin, and perimeter berm will be designed to collectively capture and retain runoff from a 100-year, 24 hour storm event within the project site and comply with “zero net charge” requirement. The storm water ponds and retention basin will have the combined capacity to store 10.1 million gallons (mg).

Any leachate collected from the receiving building and the GORE™ covered windrows will be directed to the leachate collection system for re-processing and will not be discharged to the storm water collection system. No discharge from retention basin is

anticipated as the amount of water required for operation will exceed the amount stored. Supplemental water from the on-site well will make up the balance. As a result of storm water remaining on-site, HER will be requesting an exemption from requiring a NPDES for Storm Water Associated with Industrial Activities.

2.4 Project Schedule and Cost

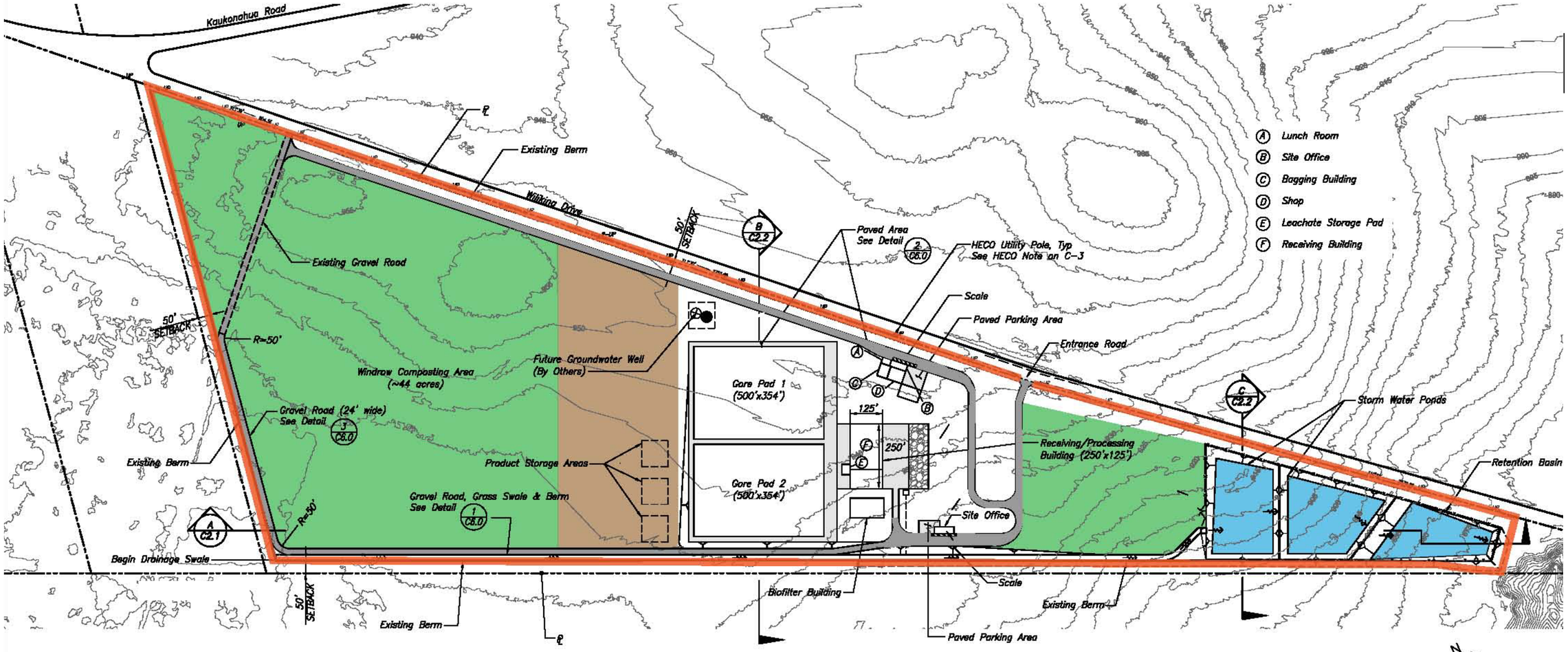
Construction of the project is planned to commence once this environmental document is completed and other environmental clearances and permits obtained. Construction of the proposed project is anticipated to take approximately one year. The facility will be in operation by the end of early 2013 to accept 100,000 tons of green waste, food waste and dewatered sewage sludge annually. ~~And~~The facility will be capable to accept up to 150,000 tons annually. The estimated construction cost is $40 million.

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LEGEND

- Access Roads
- Retention Ponds
- Berm/Landscaping Treatment
- Crops
- Product Storage Area



NOT TO SCALE

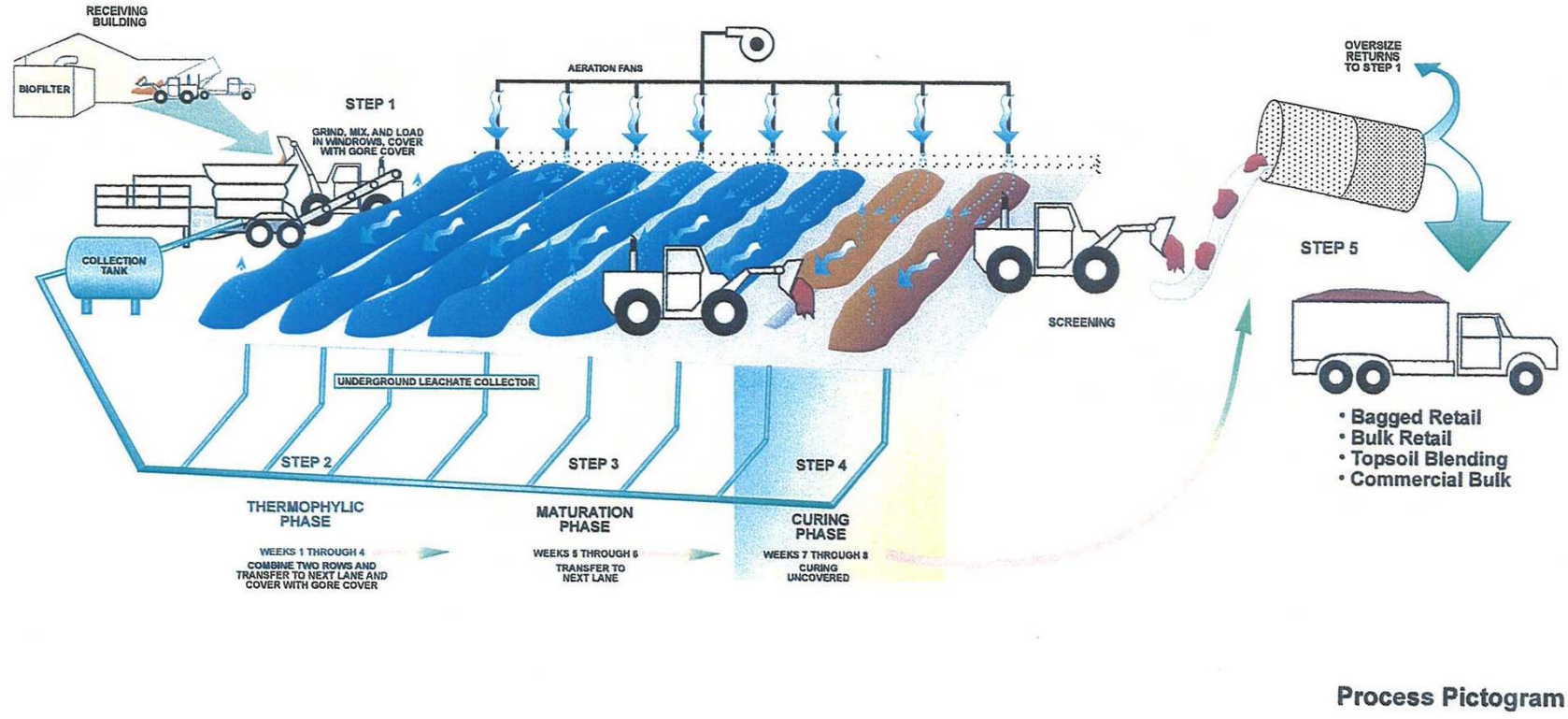
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IN-VESSEL COMPOSTING FACILITY

SITE PLAN

FIGURE 2-1

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Process Pictogram

WILSON OKAMOTO CORPORATION ENGINEERS • PLANNERS	IN-VESSEL COMPOSTING FACILITY	FIGURE 2-2
	IN-VESSEL COMPOSTING PROCESS	

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IN-VESSEL COMPOSTING FACILITY

EXAMPLE OF COMPOSTING FACILITY IN EVERETT, WA

FIGURE

2-3

3.0 DESCRIPTION OF THE EXISTING ENVIRONMENT, PROJECT IMPACTS AND MITIGATION MEASURES

The following is a description of the existing environment, assessment of potential impacts and proposed measures to mitigate potential adverse impacts resulting from the project.

3.1 Climate

The climate of Oahu is characterized by abundant sunshine, persistent tradewinds, relatively uniform temperatures, moderate humidity, and infrequent storms throughout the year.

Northeasterly trade winds prevail throughout the year. The mean temperature measured at Honolulu International Airport ranges from 70 degrees Fahrenheit (°F) in the winter to 84 °F in the summer. The project site has an average annual rainfall of 69.63 inches. 24 hour storm rainfall is as follows 10 year – 7 inches; 25 year – 12 inches; 100 year- 14 inches. Relative humidity ranges between 70 to 80 percent.

Impacts and Mitigation Measures

The proposed facilities will not affect regional climate; however, replacing the undeveloped project site with GORE™ pads, a receiving building, compost product storage area, storm water ponds and a retention basin may slightly alter the microclimate of the site.

3.2 Geology, Topography, and Soils

The island of Oahu was formed by two shield volcanoes which are now the Koolau Range on the east and the Waianae Range on the west. Lava from the younger Koolau Volcano banked against the already eroded flank of the Waianae Volcano to form the gently sloping surface of the Schofield Plateau. Due to erosion, both ranges have lost most of their original shield shape and now appear as long narrow ridges (Stearns, 1985).

The project site lies on a gentle grade (955 foot elevation), with steep slopes and gullies near Kaukonahua Gulch to the south/southwest and Poamoho Gulch to the north. The lowest point of the property is at the southeastern end at approximately 800 feet. The project site has been highly disturbed due to almost 100 years of agricultural use.

According to the U.S. Natural Resources Conservation Service (1972), the soils in the project site belong to the Helemano-Wahiawa association, "*Deep, nearly level to moderately sloping, well drained soils that have a fine textured subsoil; on uplands.*"

The following soil types are found in the project area (see Figure 3-1):

- Wahiawa silty clay, 0 to 3 percent slopes (WaA) – This soil is similar to Makalapa clay, 2 to 6 percent slopes, except that it occurs on fans. This soil occurs on

smooth, broad interfluves. In a representative profile the surface layer is very dusky red and dusky red silty clay about 12 inches thick. Permeability is moderately rapid. Runoff is slow, and the erosion hazard is no more than slight.

- Wahiawa silty clay, 3 to 8 percent slopes (WaB) – On this soil, runoff is slow and the erosion hazard is slight. This soil is used for sugarcane, pineapple, and pasture.

- Helemano silty clay, 30 to 90 percent slopes (HLMG) – This soil is on the sides of V-shaped gulches. In a representative profile the surface layer is dark reddish-brown silty clay about 10 inches thick. Permeability is moderately rapid. Runoff is medium to very severe.

The *Detailed Land Classification – Island of Oahu* published by the University of Hawaii Land Study Bureau (LSB) (1972), evaluates the quality of productive capacity of certain lands on Oahu for selected crops and overall suitability in agricultural use. A five class productivity rating system was established with "A" representing the highest productivity and "E" the lowest. Majority of the project site is rated "B". The "B" rating indicates good productivity for most agricultural uses (see Figure 3-2). A very small portion is rated "E."

The *Agricultural Lands of Importance in the State of Hawaii (ALISH) Map,* prepared by the State Department of Agriculture, classifies lands into three categories: 1) prime agricultural land, 2) unique agricultural land, and 3) other important agricultural land. Most of the project site is classified as "unique agricultural land" (see Figure 3-3).

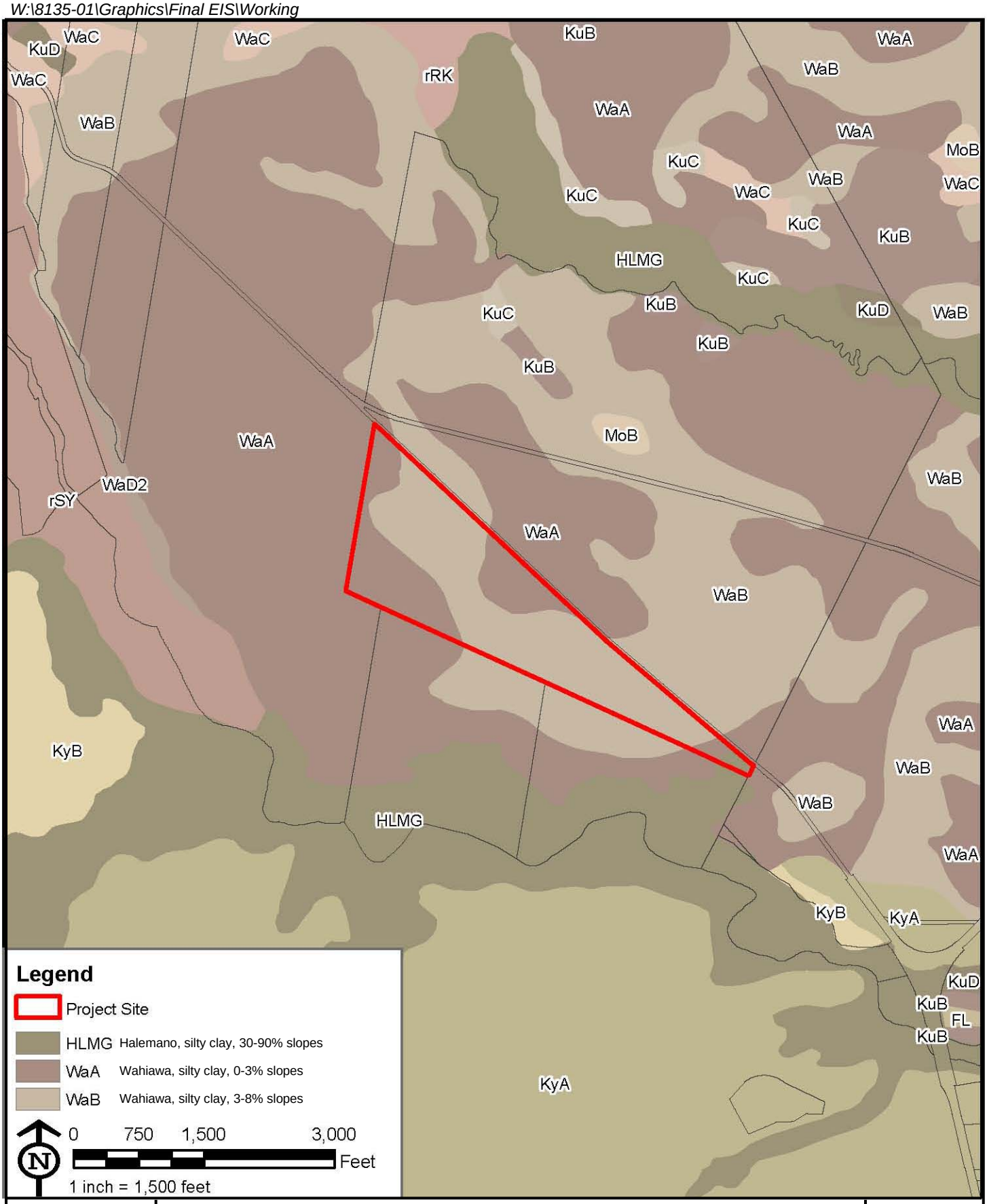
Impacts and Mitigation Measures

No significant impact on the geology, overall topography, or soils of the project site is anticipated during the construction of the proposed facilities. Construction of the proposed facilities will require grading activities and excavation for building foundations, concrete pads for windrow system and utilities. The lowest elevation of the site layout is 875 feet. Graded and excavated areas will be built-over, paved-over, or backfilled and landscaped.

Excavation and grading activities associated with construction will be in compliance with the City and County of Honolulu grading ordinance and the National Pollutant Discharge Elimination System (NPDES) permit program administered by the State Department of Health (DOH).

A NPDES Notice of Intent (NOI) for Storm Water Associated with Construction Activities will be required for construction of the project as the area of soil disturbance from activities such as clearing and grading will be in excess of one acre. The permit requires site-specific Best Management Practices (BMP) Plan which, in turn requires compliance with City ordinances pertaining to grading, grubbing, stockpiling, soil erosion

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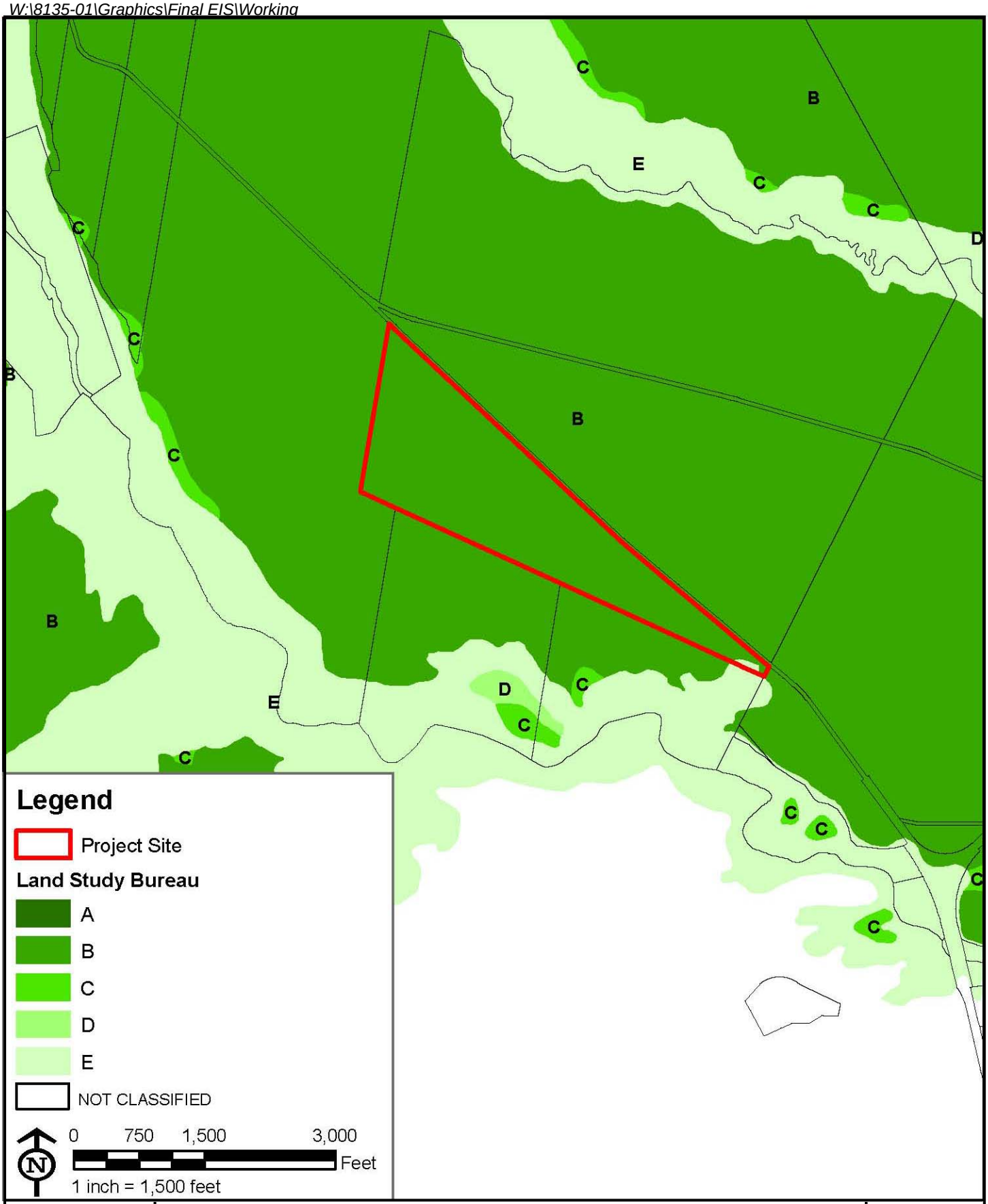
IN-VESSEL COMPOSTING FACILITY

SOILS MAP

FIGURE

3-1

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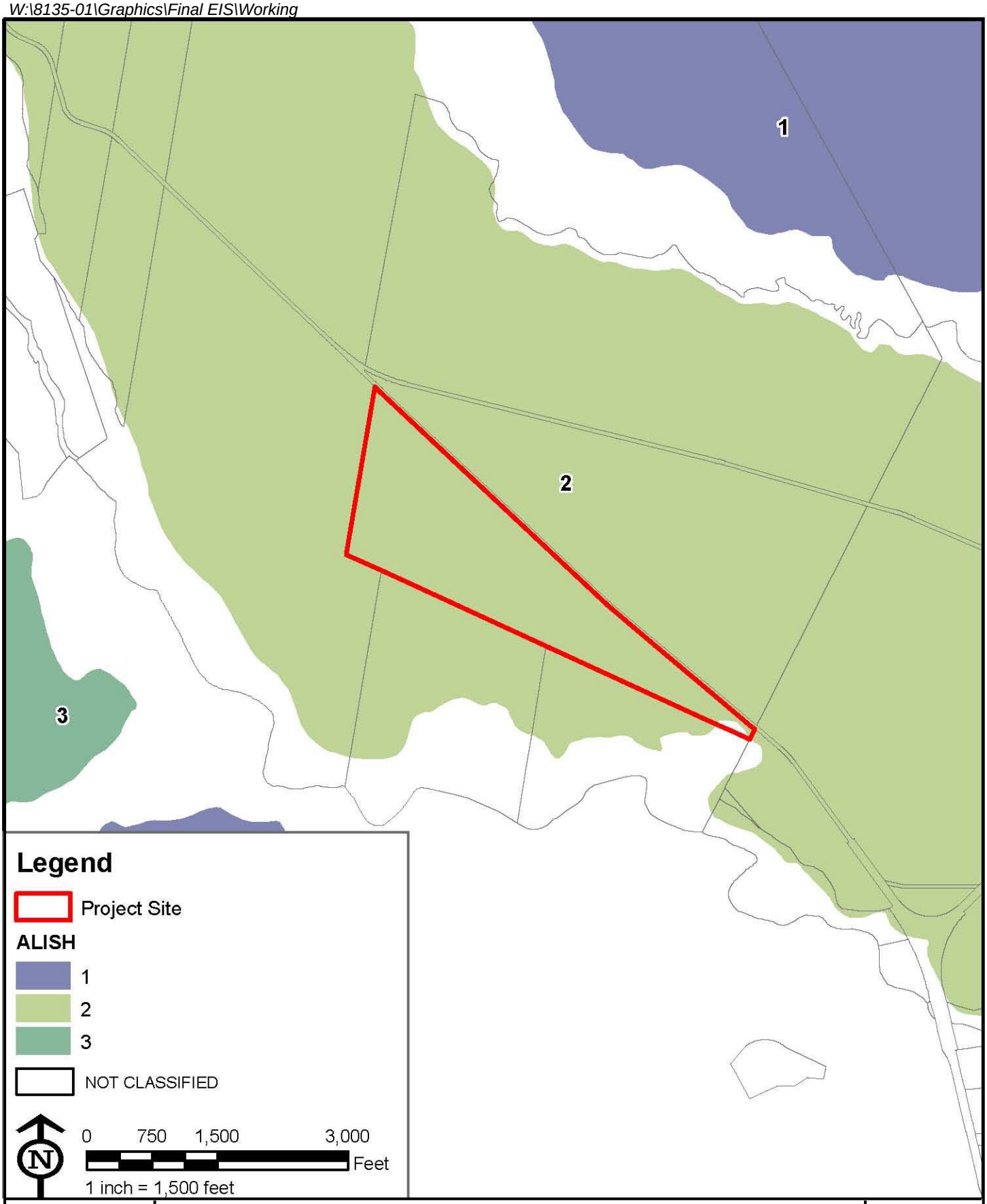
IN-VESSEL COMPOSTING FACILITY

LAND STUDY BUREAU MAP (LSB)

FIGURE

3-2

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IN-VESSEL COMPOSTING FACILITY

AGRICULTURAL LAND OF IMPORTANCE IN HAWAII (ALISH) MAP

FIGURE

3-3

and sedimentation. Site-specific erosion and sediment control measures of the BMP plan may include construction of berms to detain run-off and installation of silt fences and/or Filtexx™ erosion control socks to filter silt from run-off.

To minimize potential short-term erosion impacts during construction activities, various erosion control measures are available for implementation. Erosion control measures considered to minimize effects during construction may include: use of temporary sprinklers in non-active construction areas; stationing water trucks on the site during construction to provide immediate sprinkling in active construction areas; use of temporary silt fencing, Filtrexx™ erosion control socks, sand bags, or screens; thorough watering of graded areas after construction activity has ceased for the day; or sodding or planting of affected areas immediately after site work has been completed.

No significant long-term impacts on soils are anticipated as a result of the project. Areas disturbed during construction will be built-over, paved, or landscaped to minimize erosion and sedimentation.

The facility will provide separate storm water and leachate collection and reuse systems. Rainfall collected will be directed to storm water ponds and a retention basin on the project site from which water will be drawn to assist the maintenance of proper moisture content of the composting material and irrigation of crops. The storm water ponds, retention basin, and perimeter berm will be designed to collectively capture and retain runoff from a 100-year, 24 hour storm event within the project site and comply with “zero net charge” requirement. The storm water ponds and retention basin will have the combined capacity to store 10.1 million gallons (mg).

No discharge from storm water ponds and retention basin is anticipated as the amount of water required for operation will exceed the amount stored. Supplemental water from the on-site well will make up the balance. As a result of storm water remaining on-site, HER will be requesting an exemption from requiring a NPDES for Storm Water Associated with Industrial Activities.

Any leachate collected from the receiving building and the GORE™ covered windrows will be directed to the leachate collection system for re-processing and will not be discharged to the storm water collection system.

3.3 Hydrology

3.3.1 Ground Water

The Island of Oahu is divided into five groundwater sectors consisting of the North Sector, Windward Sector, Honolulu Sector, Pearl Harbor Sector, and the Central Sector. The Sectors are divided into aquifer systems which are areas defined by hydrological continuity, particularly hydraulic connections among units.

The project site is located within the Central Sector. The Wahiawa aquifer system (30501) makes up the Central Sector. Only high level groundwater occurs in this Section. The total sustainable yield of the Wahiawa aquifer is 23 million gallon per day (mgd) (CWRM, August 28, 2008).

The project site is situated above the State Department of Health's Underground Injection Control Line (UIC).

Impacts and Mitigation Measures

No significant impacts to groundwater underlying the project site are anticipated during construction of the proposed facility. Construction activities are not likely to introduce, nor release from the soil any materials which could adversely affect groundwater, including groundwater sources for domestic use.

Storm runoff from the project site during site preparation will be controlled in compliance with the City and County of Honolulu, *Rules Relating to Storm Drainage Standards* and Department of Health regulations for storm water. Typical mitigation measures include: appropriately stockpiling materials on-site to prevent runoff; building over, or establishing landscaping as early as possible on disturbed soils to minimize length of exposure.

To minimize potential short-term erosion impacts during construction activities, various erosion control measures are available for implementation. Erosion control measures considered to minimize effects during construction may include: use of temporary sprinklers in non-active construction areas; stationing water trucks on the site during construction to provide immediate sprinkling in active construction areas; use of temporary silt fences, Filtexx™ erosions control socks, sand bags, or screens; thorough watering of graded areas after construction activity has ceased for the day; or sodding or planting of affected areas immediately after site work has been completed.

The facility will provide separate storm water and leachate collection and reuse systems. Rainfall collected will be directed to two storm water ponds and a retention basin on the project site from which water will be drawn to assist the maintenance of proper moisture content of the composting material and irrigation of crops. The storm water ponds, retention basin, and perimeter berm will be designed to collectively capture and retain runoff from a 100-year, 24 hour storm event within the project site and comply with "zero net charge" requirement. The storm water ponds and retention basin will have a combined capacity to store 10.1 million gallons (mg).

No discharge from storm water ponds and the retention basin is anticipated as the amount of water required for operation will exceed the amount stored. Supplemental water from the on-site well will make up the balance. As a result of storm water remaining on-site, HER will be requesting an exemption from requiring a NPDES for Storm Water Associated with Industrial Activities.

Any leachate collected from the receiving building and the GORE™ covered windrows will be directed to the leachate collection system for re-processing and will not be discharged to the storm water collection system.

A well will be drilled and a pump installed for the project. HER received a Well Construction Permit from the Commission on Water Resource Management (CWRM), Department of Land and Natural Resources (DLNR) (see Appendix B). HER will be able to pump up to 3559,000 gallons per day (gpd).

In addition, HER will propose to utilize R-2 water from Dole Food Company Hawaii for the irrigation of crops on the project site. R-2 water contains fecal coliform and therefore, R-2 water cannot be used for the composting process.

The project should not result in substantial increases for potable water demand that may significantly impact ground water resources.

3.3.2 Surface Water

The nearest surface water is Lake Wilson Reservoir, approximately 1 mile to the southeast, as shown in Figure 1-4, which is up gradient of the project site. The natural drainage course for the project site is Kaukonahua Gulch/Stream, which is designated Class 2 Inland, located ½ mile to the south. Poamoho Stream is ¾ miles to the north. There are no wetlands or identified sensitive environments within the immediate vicinity of the project site.

Impacts and Mitigation Measures

No significant impacts to surface waters are anticipated as a result of the project. Storm runoff from the project site during site preparation will be controlled in compliance with the City and County of Honolulu, *Rules Relating to Storm Drainage Standards* and DOH regulations for storm water. Excavation and grading activities associated with construction of the project will be regulated by the City's grading and ordinance. Typical mitigation measures may include: appropriately stockpiling materials on-site to prevent runoff; building over, or establishing landscaping as early as possible on disturbed soils to minimize length of exposure.

The project will comply with Hawaii Administrative Rules, Chapters 11-54 and 11-55 as applicable to the protection of State waters. The area of soil disturbance within the project site will exceed one acre, therefore, pursuant to HAR Chapter 11-55, a NPDES NOI for Storm Water Associated with Construction Activities will be required from the State DOH. A site-specific BMP Plan will be prepared in conjunction with the NPDES permit application.

Hydrotesting and dewatering is not anticipated at this time. Should discharges from dewatering and hydrotesting be required, a separate NPDES permit will be submitted to State DOH.

The facility will provide separate storm water and leachate collection and reuse systems. Rainfall collected will be directed to two storm water ponds and a retention basin on the project site from which water will be drawn to assist the maintenance of proper moisture content of the composting material and irrigation of crops. The storm water ponds, retention basin, and perimeter berm will be designed to collectively capture and retain runoff from a 100-year, 24 hour storm event within the project site and comply with "zero net charge" requirement. The storm water ponds and retention basin will have a combined capacity to store 10.1 million gallons (mg).

No discharge from storm water ponds and the retention basin is anticipated as the amount of water required for operation will exceed the amount stored. Supplemental water from the on-site well will make up the balance. As a result of storm water remaining on-site, HER will be requesting an exemption from requiring a NPDES for Storm Water Associated with Industrial Activities.

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In addition, HER will propose to utilize R-2 water from Dole Food Company Hawaii for the irrigation of crops on the project site. R-2 water contains fecal coliform and, therefore, R-2 water cannot be used for the composting process.

3.4 Flood Hazard

Based on the Flood Insurance Rate Map ("FIRM"), Community Panel Number 15003C0335 F and 15003C120F (revised September 30, 2004) the project site is located within Zone D: Areas in which flood hazards are undetermined, but possible.

Impacts and Mitigation Measures

No impacts related to flooding are anticipated given the project site's elevation. The project will increase the impervious surface area (approximately 13 acres of the 112 acres), which may marginally increase storm runoff. Proposed drainage improvements, including on site retention basin will be designed to accommodate on-site runoff.

3.5 Flora and Fauna

A Biological Survey was conducted in February 2011 by Rana Biological Consulting, Inc. and AECOS Consultants to determine if there are any botanical, avian or mammalian species currently listed, or proposed for listing under either federal or State of Hawaii endangered species statutes within or adjacent to the project area. The study is summarized below and included as Appendix C.

Botanical Resources: A Botanical Survey was conducted on February 15, 2011 consisting of a pedestrian transect that traversed much of the site. The survey was conducted during the wet season and plants typical of this area, especially annuals, were readily observed and identified. For species not immediately recognized in the field, photographs were taken and/or material collected for identification in the laboratory.

The project area presently supports only weedy growth on the margins of a plowed field. The plowed area is dominated by fungal mushrooms (predominantly *Coprinus curtus*), a result of admixing of compost into the soil. A few seedlings were evident in the field and stored compost, but these are recently germinated. A slightly different mix of ruderal herbs occur along the verge of the highway, which is regularly mowed, however, most of the plants that occur here were observed on the soil berms surrounding the parcel as well.

A total of 41 species of flowering plants were identified during the survey. With the exception of three indigenous species (7%), all the rest are naturalized species. *Pōpolo* (*Solanum americanum*) and *ʻuhaloa* (*Waltheria indica*) are common and very widespread natives in Hawaii. *Kou* (*Cordia subordata*), a common indigenous tree, was seen here only as a seedling germinating in a compost pile.

From a botanical perspective, there are no resources that are special or unique present on this site. No plant species currently listed or proposed for listing under either federal or State of Hawaii endangered species programs were detected during the course of this survey.

Avian Resources: Five avian count stations were evenly spaced along a linear transect running the length of the project site. A single 8-minute avian point count was made at each count station. Field observations were made with the aid of Leica 10 x 42 binoculars and by listening for vocalizations. The count and subsequent search of the remainder of the site was conducted between 8:00 am and 11:00 am. Time not spent counting the point count stations was used to search the rest of the site for species and habitats not detected during the point count. Weather conditions were ideal, with no rain, unlimited visibility and winds of between 1 and 5 kilometers (km) an hour.

A total of 250 individual birds of 17 species, representing 13 separate families, were recorded during station counts. An additional two species, Mallard x Hawaiian Duck hybrid (*Anas platyrhynchos x A. wyvilliana*), and Ruddy Turnstone (*Arenaria interpres*) were recorded as incidental observations while transiting between count stations. Three of the species detected, Mallard x Hawaiian Duck hybrid, Pacific Golden-Plover (*Pluvialis fulva*), and Ruddy Turnstone are native species. Of the 19 species recorded during both station counts and as incidental observations, 16 are considered to be alien to the Hawaiian Islands.

One avian species detected, Mallard x Hawaiian Duck hybrid is currently listed as an endangered species under both federal and State of Hawaii endangered species statutes. Two birds were seen flying over the site in a south to north direction. No other avian species detected during the course of this survey are protected or proposed for protection under either the federal or State of Hawaii endangered species statutes.

Four species, Red Avadavat (*Amanadava amandava*), Pacific Golden-Plover, Common Waxbill (*Estrilda astrild*) and Sky Lark (*Alauda arvensis*) accounted for 53% of all birds recorded during station counts. The most commonly recorded species was Red Avadavat, which accounted for 16% of the total number of individual birds recorded. An average of 50 individual birds was recorded per station count.

Although no seabirds were detected during the course of this survey, several seabird species potentially overfly the site on occasion. The primary cause of mortality in resident seabirds is thought to be predation by alien mammalian species at the nesting colonies. Collision with man-made structures is considered to be the second most significant cause of mortality in locally nesting seabird species in Hawaii. Nocturnally flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting. When disoriented, seabirds often collide with man-made structures, and if they are not killed outright, the dazed or inured birds are easy targets of opportunity for feral mammals.

There are no known nesting colonies of any of the resident seabird species present on Oahu on or within close proximity of the project site.

Mammalian Resources: With the exception of the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), or *ʻōpeʻapeʻa* as it is known locally, all terrestrial mammals currently found on the island of Oahu 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 sign. A running tally was kept of all terrestrial vertebrate mammalian species detected within the project area.

The only terrestrial mammalian species detected on site during the course of this survey was dog (*Canis f. familiaris*). Tracks of one animal were encountered along the dirt road immediately abutting the grass verge between the plowed field and Wilikina Drive.

Although no rodents were detected during the course of this survey, it is likely that the four established alien *muridae* found on Oahu, roof rat (*Rattus r. rattus*), Norway rat (*Rattus norvegicus*), European house mouse (*Mus musculus domesticus*) and possibly Polynesian rats (*Rattus exulans hawaiiensis*) use various resources found within the general project area on a seasonal basis. All of these introduced rodents are deleterious to native ecosystems and the native faunal species dependant on them.

No mammalian species currently protected or proposed for protection under either the federal or State of Hawaii endangered species programs were detected during the

course of this survey, nor were any expected. No Hawaiian hoary bats were detected during the course of this survey. Given the lack of documented records of this species on Oahu and the complete lack of suitable roosting vegetation on the project site, the chance that any Hawaiian hoary bats use resources on the subject property is extremely low.

Impacts and Mitigation Measures

Botanical Resources: No plants of any concern or having protective status were observed and none is to be expected on the site.

Avian Resources: The principal potential impact that the operation of the proposed project poses to listed waterbird species is disturbance to any nests that could potentially occur on the site if birds are attracted to the storm water ponds and retention basin.

To minimize the potential that protected waterbird species that may be attracted to the storm water ponds and retention basin could be disturbed by facility operations, HER will develop and implement an Endangered Waterbird Management Plan (EWMP). The EWMP would include a training module, which would be given to all employees on an annual basis that educates them about the protected waterbird species, details any restriction and Best Management Practices (BMP) that will be followed when, and if, protected waterbirds are present on the site, as well as an emergency response and reporting process that will be followed in the unlikely event that anything untoward happens to a protected waterbird species on the property.

The principal potential impact that construction and operation of the proposed project poses to protected seabirds is the increased threat that birds will be downed after becoming disoriented by lights associated with the project during the nesting season. The two main areas that outdoor lighting could pose a threat to these nocturnally flying seabirds is if, 1) during construction it is deemed expedient, or necessary to conduct nighttime construction activities, 2) following build-out, the potential operation of facility security lighting during the seabird nesting season.

If nighttime construction activity or equipment maintenance is proposed during the construction phases of the project, all associated lights should be shielded, and when large flood/work lights are used, they should be placed on poles that are high enough to allow the lights to be pointed directly at the ground. If facility or security lighting is installed in conjunction with the project, lights should be shielded to reduce the potential for interactions of nocturnally flying seabirds with external lights and man-made structures.

Critical Habitat: There is no federally delineated Critical Habitat present on or adjacent to the property. Thus, the development and operation of proposed project will not result in impacts to federally designated Critical Habitat. There is no equivalent statute under State law.

3.6 Air Quality

An Air Quality Impact Assessment was prepared by B.D. Neal and Associates in March 2011. The results are summarized below and the assessment is included as Appendix D.

The State of Hawaii Department of Health (DOH) has six monitoring stations throughout the island of Oahu. Each monitoring station typically does not monitor the full complement of air quality parameters. For selected criteria pollutants, the State of Hawaii has established its State ambient air quality standards which are somewhat more stringent than the federal standards under Hawaii Administrative Rules, Title 11, Chapter 59. Hawaii Ambient Air Quality Standards (AAQS) are more restrictive than federal standards for carbon monoxide (CO), nitrogen oxide (NO_2), and ozone (O_3). In addition, Hawaii regulates emissions of hydrogen sulfide (H_2S), for which there are no federal standards. Hawaii has adopted the National Ambient Air Quality Standards (NAAQS) for particle matter less than 10 micrometers (PM_{10}), sulfur dioxide (SO_2), and lead (Pb). A summary of the federal and Hawaii ambient air quality standards that apply to the project area is presented in Table 3-1.

Table 3-1
State and Federal Ambient Air Quality Standards

Air Pollutant	Averaging Time	Hawaii AAQS	Federal (NAAQS)	
			Primary	Secondary
Carbon Monoxide (CO)	1-hour 8-hour	9 ppm 4 ppm	35 ppm 9 ppm	-- --
Lead (Pb)	Quarterly	1.5 $\mu g/m^3$	1.5 $\mu g/m^3$	1.5 $\mu g/m^3$
Nitrogen Dioxide (NO_2)	Annual	0.04 ppm	0.05 ppm	0.05 ppm
Ozone (O_3)	1-hour 8-hour	-- 0.08 ppm	0.12 ppm 0.075 ppm	0.12 ppm 0.075 ppm
Particulate Matter ≤10 micrometers in diameter (PM_{10})	Annual 24-hour	50 $\mu g/m^3$ 150 $\mu g/m^3$	50 $\mu g/m^3$ 150 $\mu g/m^3$	50 $\mu g/m^3$ 150 $\mu g/m^3$
Particulate Matter ≤2.5 micrometers in diameter ($PM_{2.5}$)	Annual 24-hour	-- --	15 $\mu g/m^3$ 35 $\mu g/m^3$	15 $\mu g/m^3$ 35 $\mu g/m^3$
Hydrogen Sulfide (H_2S)	1-hour	0.025 ppm	--	--
Sulfur Oxides (SO_2)	Annual 24-hour 3-hour	0.03 ppm 0.14 ppm 0.50 ppm	0.03 ppm 0.14 ppm --	-- -- 0.50 ppm (1,300 $\mu g/m^3$)

Source: State Department of Health, 2008

Air quality in the vicinity of the project presently is mostly affected by emissions from vehicular sources which emit carbon monoxide, nitrogen oxides, hydrocarbons and other air pollutants. Air quality data from the nearest monitoring stations operated by the State of Hawaii DOH suggest that all State and national air quality standards are currently being met in the downtown Honolulu area.

Two existing sources in the area are motor vehicle traffic and agricultural field burning. Both sources have typically short-term impacts with former producing elevated carbon

monoxide levels during peak traffic hours and the latter producing high particulate matter concentrations during field burning.

According to the State DOH's *2009 Annual Summary Hawai'i Air Quality Data* (September 2010), the state's air quality "continues to be one of the best in the nation, and criteria pollutant levels remain well below State and federal ambient air quality standards." The report contains five-year trends based on annual averages for particulates, sulfur dioxide and nitrogen dioxide, annual averages of daily maximum 1- and 8-hour values recorded for carbon monoxide, and annual averages of daily maximum 8-hour values recorded for ozone concentrations from 2005 to 2009. During this period, the averages were well below both the federal and, the, more stringent, State standards for carbon monoxide and nitrogen dioxide.

An odor study was also conducted in May 2011 by ENVIRON International Corporation to determine the nature and degree of any odor impacts from the proposed project on Schofield Barracks and the surrounding areas. The study is summarized below and included as Appendix E.

Odor Concepts: There are characteristics of an odor that determine the nature and extent of the impact of that odor. Without quantifying these characteristics, it's difficult to distinguish minor or insignificant odors from more significant odor exposures. The following discussion provides a brief explanation of odor characteristics.

Odor is quantified by the following:

1. Nature or the odor. The scale for the pleasantness or unpleasantness of the nature of the odor is called the hedonic tone. It is a simple scale that is very subjective from person to the next. In odor investigations of this nature, the hedonic tone is not typically used given its subjectivity.

2. Strength of the odor. There are numerous ways of quantifying strength of an odor. Odors stem from chemical concentrations in the air, it is the exception, rather than the rule, when chemical measurements can be used to define the strength of an odor. This is because most real odors experienced are complex mixtures of chemicals in the air. Chemical concentrations in the air can be measured, but the interpretation of those results is very difficult, because of the uncertainty of which mixture of chemicals is responsible for the odor observed.

3. Duration of the odor. The duration of the odor is the length of time that an odor persisted at a particular location.

4. Frequency of the odor. Related to, but different from duration, frequency refers to how often an odor was present at a particular location.

As previously discussed, the interpretation of strength of odor is very subjective. There are two primary methods of attempting to take the subjectivity out of this odor strength measure:

a. Odor intensity. The simplest way to quantify strength is to create a simple 5 or 10 point scale. Instead of using this very subjective scale, intensity is determined by concentration of a reference odorant, usually butyl alcohol (butanol) in air. This method does not lend itself to computer modeling, thus it was not used for this study.

b. Dilutions to threshold. The dilution to threshold (D/T) is somewhat a more mathematical quantification of odors than the intensity measurement. The D/T is based on the concept that all odors can be diluted by mixing with a certain amount of odor-free air to the point where the odor can just barely be detected by 50% of the population. This point where 50% of the population can detect a particular odor is called "threshold of detection" and varies from chemical to chemical and is even less defined for mixtures of chemicals. Nonetheless, even with complex mixtures of chemicals that produce odors, mixture with odor-free air eventually drops the mixture to the point where it can just barely be detected. The D/T is then the amount of dilution that is necessary to get to this point.

   The D/T is typically used to quantify and evaluate odors. The threshold of detection is 1.0 D/T, and while it reflects the level in a laboratory where a person could just barely detect an odor, it typically takes a somewhat higher odor before the average person will notice it in the environment. As a result, a somewhat higher odor level is used called the "threshold of annoyance" when it is assumed that the average person would notice the odor and assuming the odor was unpleasant, would find the odor objectionable. A value of 4 D/T is commonly used for this purpose. This is not to suggest that 4 D/T is a strong odor, but rather that at a level of 4 D/T most people would notice it and if prolonged or continuous exposure were present, would find it objectionable.

An additional concept to be introduced is "Odor Units" (OU). OU are a non-dimensional mass. One odor unit is the quantity of odorous material needed to be added to once cubic meter of air to bring the odor level in the mixture to one D/T. Accordingly, one D/T is equivalent to one OU per cubic meter (OU/m^3). Odor Units are measured quantities at a facility used to characterize a source of odor emissions.

Methodology: The fundamental method used in the odor analysis is a computer program called an air quality model. Air quality models have been widely used for odor and other types of air quality studies for 40 years or more. There are many factors that vary to allow an odor investigation to be based solely on an existing facility. While there are other composting facilities and the information gathered from them in odor modeling

study, the facilities differ in terms of their design, size, orientation, and waste stream. Also the environmental setting is different from facility to the next. Factors such as wind speeds and directions are also unique to each facility/setting.

The air quality model relies on the three types of information in conducting the analysis:

1. Source data – information about the location, configuration, and emission release rates of the proposed facility
2. Meteorological data – information on the wind speeds, wind directions, temperatures, atmospheric conditions and other meteorological parameters that are present in the proposed location.
3. Receptor data – receptors are the locations at which concentrations are to be calculated and coordinate locations as well as terrain elevations are needed.

Impacts and Mitigation Measures

The proposed project will have short-term construction-related impacts on air quality, including the generation of dust and emissions from construction vehicles, equipment and commuting construction workers. During construction, activities such as grading and excavation at the project site will generate dust while vehicles and equipment will produce exhaust emissions. Dust control measures stipulated by Department of Health Administrative Rules, Title 11, Chapter 60, "Air Pollution Control" regulations will be employed, as appropriate.

Adequate fugitive dust control will be accomplished by the establishment of a frequent watering program to keep bare-dirt surfaces in active construction areas from becoming significant sources of dust. On days without rainfall, construction areas will be watered at least twice during the workday to help keep dust to a minimum. Open-bodied trucks should be covered at all times when in motion if they are transporting materials likely to give rise to airborne dust. Haul trucks tracking dirt onto paved streets from unpaved areas are oftentimes a significant source of dust in construction areas. Some means to alleviate this problem, such as tire washing or road cleaning, may be appropriate. Dust monitoring could be considered as a means to quantitatively evaluate the effectiveness of dust control measures.

In the long-term, dust on access roads and internal roads will be mitigated by use of a water truck and/or sprinklers. Loads of finished materials leaving the facility are generally moist. Outgoing loads will be monitored and may be sprayed with water as needed, and are also required to be covered to minimize dust from trucks.

Emissions from construction equipment, trucks and commuting construction workers are short-term and not anticipated to significantly impact ambient air quality. No air pollutants that may be generated at the project site are anticipated to exceed federal or State ambient air quality standards in the vicinity. Slow-moving construction vehicles, however, can disrupt peak hour traffic, increasing congestion and resulting in vehicular

emissions. Traffic congestion and resulting emissions will be mitigated by transporting slower construction equipment during off-peak traffic hours.

The facility operation plan and recommended mitigation measures for dust control and fire protection will also be included as part of the DOH Solid Waste Management Permit. Given HEP's long operating history at the Campbell location, similar adequate and appropriate dust and fire control procedures will be implemented at the proposed facility.

In the long-term, the primary air quality concern will be from vehicular emissions associated with motor vehicle traffic occurring at the project site. Carbon monoxide emissions are usually the primary issue, and public areas near traffic-congested intersections are the main concern, however, considering the small project-related traffic volumes that are expected (see Section 3.10 Traffic), traffic from the proposed project should have no measurable long-term impacts on air pollution levels in the project area.

Odor: The proposed facility will receive green waste, food waste and dewatered sewage sludge. Although these materials will naturally degrade through microbial activity, by processing the waste and placing it in a controlled aerobic environment, the composting operation accelerates the natural biological degradation process and produces an organically-rich soil-like product, which is used in horticulture and agriculture.

Any microbial degradation process produces gases. For the proposed facility, the primary gases given off are carbon dioxide and water vapor, but there are small quantities of other gases, including some that have distinct odors. Some of the notable gases produced by green waste composting include the family of compounds known as "terpenes" that have a woody character.

The potential sources of odor from the proposed project are:

1. Receiving building – the material will enter the facility with an odor and the initial handling of material can release odorous gases to the atmosphere.

2. Mixing/Grinding – the mechanical disturbance of the material can generate odors.

3. Decomposing phase - the traditional method of windrowing involves placing the composting materials in long piles called windrows in the open air where the natural air movement would provide the oxygen necessary for aerobic bacteria to flourish and decompose the waste. The piles are periodically turned to mix and allow fresh air to get to the interior of the pile. It this decomposing phase that has the greatest potential for creating odors that may be released into the surrounding environment.

4. Product handling and storage – although the bacterial level is greatly reduced in the final product, these materials do still have an odor and when handled and stored can be a minor source of odor release.

The proposed facility will utilize modern techniques to eliminate odors from the facility where possible. The key elements of the facility's odor management program include the following:

1. Receiving building – the receiving area will be completely enclosed building. In addition the building will include a negative air system that will draw air in through the receiving doors and capture any odors generated by the receiving operation. The captured air will be sent to a biofilter for treatment prior to release to the atmosphere. Biofiltration is a process whereby odorous air is passed through a bed of completed compost. The active bacteria in the biofilter consume any odors in the air. These systems have been widely used throughout the world for odor control and are effective at reducing odors from many types of facilities including composting facilities, transfer stations, wastewater treatment plants and others. The proposed biofilter will be a two (2) train system. That is, if one half of the biofilter is down for maintenance the other half of the biofilter will handle the incoming volume of air from the receiving building.

2. Mixing/Grinding – Similar to the receiving operation, the mixing/grinding will be done within the enclosed receiving building with any odors captured and treated with a biofilter prior to release to the atmosphere.

   The mixed materials are then bucket loaded via a wheel loader approximately 100 feet from the receiving building to the GORE™ pad. Delivery by wheel loaders of the mixed materials to the GORE™ pad is the best management practice for odor control, instead of the use of conveyors.

   Conveyors would spread the materials in a thin layer and then deposit the mixed material in a pile to then be wheel loaded into a windrow. The conveyor method increases the volume of air mixing with the materials, releasing more odors versus an 8 cubic yard wheel loader bucket full of the mixed materials being transported over a short distance from the receiving building to the GORE™ pad.

3. Decomposition – The main composting area will use GORE™ cover system technology. The GORE™ cover system involves placing the composting material in windrows with a forced positive air system underneath the windrow. But instead of having the windrows in the open air, the windrows will be completed covered by a GORE™ fabric that acts as a barrier to formed odors. The mesh size of the GORE™ material is such that air can escape, but a moisture layer develops on the interior of the fabric that acts as a barrier to much of the odor in the air. The moisture barrier forms and reforms over time as drops of moisture, containing the odorous chemicals, fall back on the pile inside the

GORE™ enclosure. Although not blocking all odors, the GORE™ system has been demonstrated to block much of the odor (95%) from escaping the composing process.

4. Product Handling and Storage – By this stage the odors are minor and there is no odor management techniques implemented at this stage. As with screening of the finished product, again at this stage odors are minor and no odor management techniques are implemented during screening.

Odorous gases, when released by composting operations, mix with the surrounding air and can be carried by wind to surrounding areas. Any odorous gas, when mixed with odor-free air has a concentration called the threshold of detection, as previously discussed, where the concentrations of the odorous gas are just high enough in the mixture to be detectable by 50% of the human population. If concentrations are above this threshold at the initial point of release, then an odor has been created in that body of air. As the mixture of odorous gases and air is carried downwind it continues to mix with surrounding air and the concentration of these odorous compounds decreases. In addition, the odorous compounds may chemically react or deposit out on various surfaces as they travel downwind, further reducing the odorous compound concentration. Eventually, the level of odorous compounds in the air will drop below the detection threshold and the odor can no longer be perceived.

The results of the odor investigation are depicted in Figures 3-4 and 3-5 for two threshold values of 1.0 D/T and 4.0 D/T, respectively. Both figures show that odors would be very infrequent at Schofield Barracks, the nearest residential area to the project site. Odors may reach the threshold of detection, but less than 1% of the time, and would not reach the threshold of annoyance even 0.1% of the time at Schofield Barracks.

While the process of composting organic matter, including dewatered sewage sludge, does create odorous gases, the enclosure of the operation within the receiving building, controlled with a biofilter, and the main composting area, controlled by GORE™ cover system technology, will substantially block, and control these odorous gases.

The results of the air quality modeling analysis indicate that any off-site odors would be very infrequent, less than 0.5% occurrence and unlikely to cause or contribute to any odor complaints in the surrounding community, including Schofield Barracks.

In the long-term no significant impacts on air quality, for both normally identified air pollutants and odors are anticipated as result of the construction and operation of the proposed project.

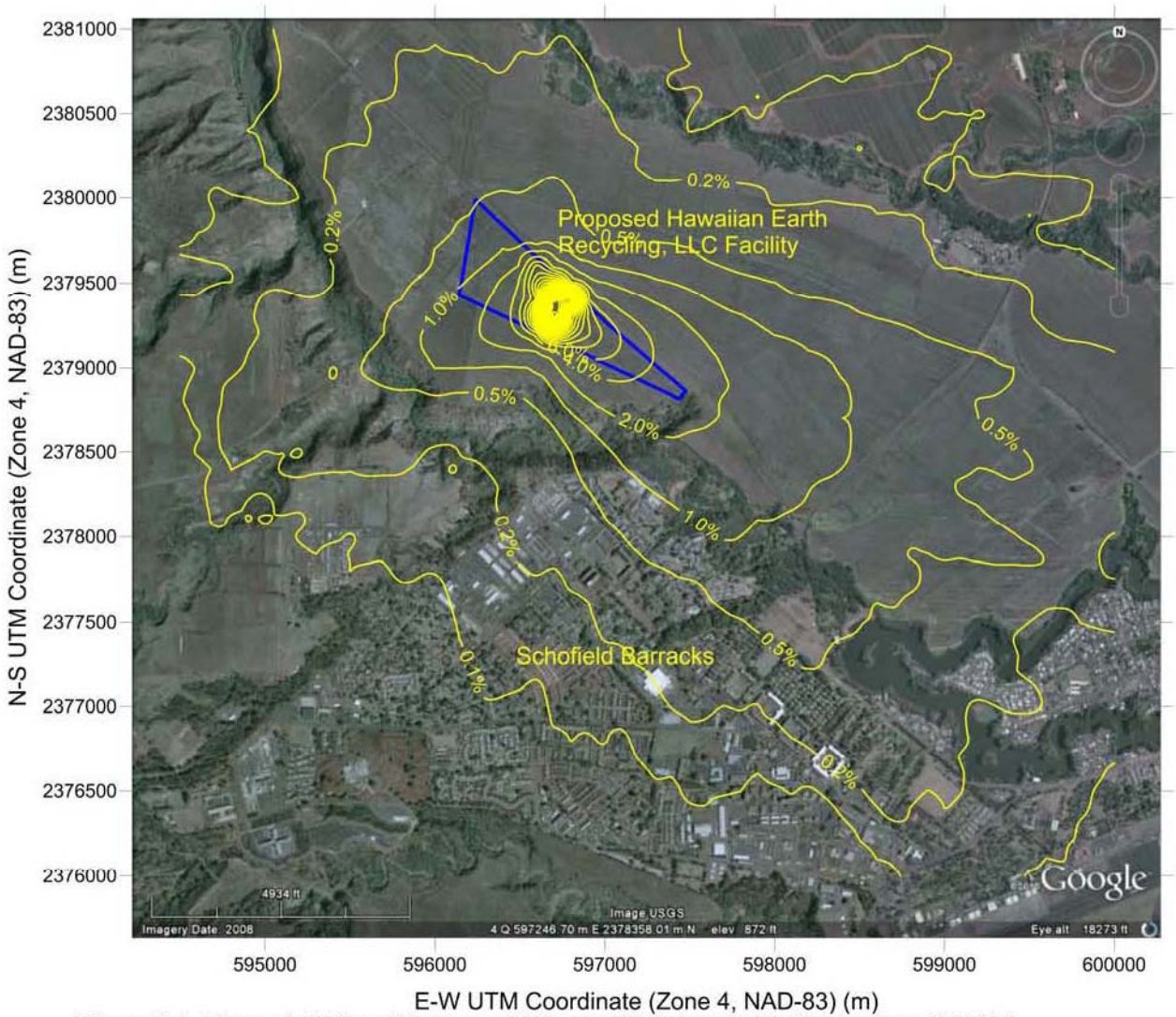


Figure 6-1. Percent of Time Odors would Exceed the Threshold of Detection (1.0 D/T)

WILSON OKAMOTO CORPORATION ENGINEERS • PLANNERS	**IN-VESSEL COMPOSTING FACILITY**	**FIGURE**
	PERCENT OF TIME ODORS WOULD EXCEED THE THRESHOLD OF DETECTION 1.0D/T	**3-4**

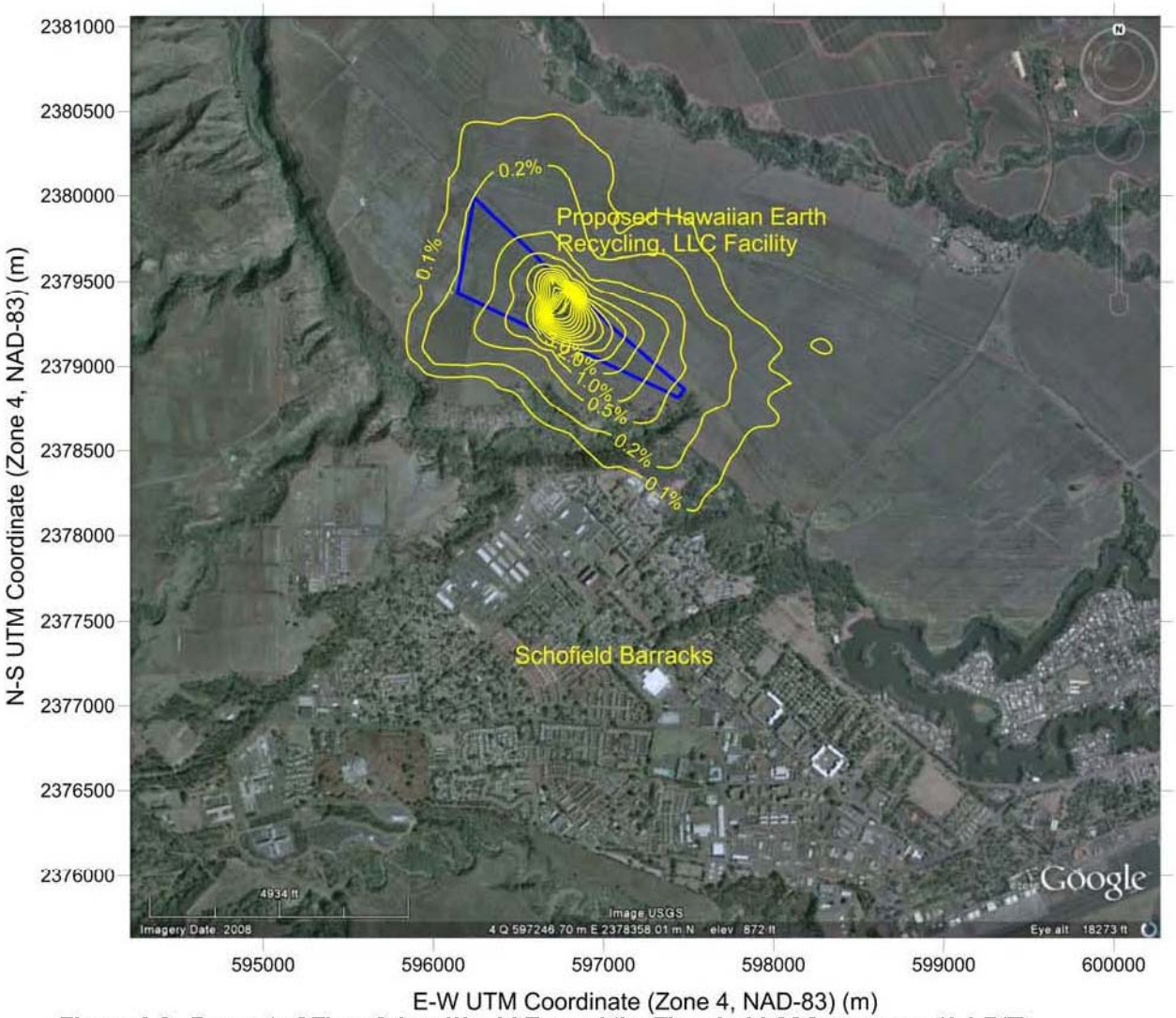


Figure 6-2. Percent of Time Odors Would Exceed the Threshold Of Annoyance (4.0 D/T)

WILSON OKAMOTO CORPORATION ENGINEERS • PLANNERS	**IN-VESSEL COMPOSTING FACILITY**	**FIGURE**
	PERCENT OF TIME ODORS WOULD EXCEED THE THRESHOLD OF ANNOYANCE 4.0D/T	**3-5**

3.7 Noise

An Acoustic Study was conducted by Y. Ebisu & Associates in March 2011. The study is summarized below and is included as Appendix F.

Future noise levels associated with the proposed In-Vessel Composting Facility were evaluated for their potential impact on noise sensitive receptors in the project area. Future noise levels and potential impacts associated with In-Vessel Composting Facility operations and refuse vehicles were evaluated using available forecast data.

The noise descriptor currently used by federal agencies to assess environmental noise is the Day-Night Average Sound Level (DNL). This descriptor incorporates a 24-hour average of instantaneous A-Weighted sound levels as read on a standard Sound Level Meter. DNL values represent the average noise during a typical day of the year. DNL levels of 55 to 65 are typical of urbanized areas with medium to high levels of activity and street traffic. DNL exposure levels above 65 are representative of densely developed urban areas and areas fronting high volume roadways.

Existing background ambient noise levels in the project area are relatively low in areas removed from the major roadways because the area is presently undeveloped, former agricultural land. In these undeveloped areas removed from the existing roadways, existing noise levels are probably less that 55 DNL, and are probably controlled by the natural sounds of birds and vegetation moving in the wind, with occasional sounds of motor vehicles and aircraft. In residential areas, such as Poamoho camp and the military housing areas in Schofield Barracks, existing noise levels are probably 55 DNL if they are removed from major roadways and greater than 55 DNL if the housing areas front a major roadway.

Along existing roadways, such as Wilikina Drive, which are expected to service the proposed In-Vessel Composting Facility site, existing traffic noise levels are relatively high and greater than 70 DNL at 50 foot setback distance from the roadway's centerline. These levels of traffic noise are relatively high due to the relatively high speeds of motor vehicles using this roadway.

Impacts and Mitigation Measures

In the short-term, noise impacts associated with construction activities will be unavoidable. The various construction phases of the proposed project may generate significant amounts of noise, which may impact adjacent landowners.

Potential noise impacts resulting from the noise of diesel engine driven grinder operations or other activities at the proposed project site are not expected to exceed 55 DNL at the nearest military housing area at Schofield Barracks. However, if the large diesel engine driven grinder is located and operated near the center of the project site, such as the grinding of green waste, its noise level is predicted to exceed the state DOH 70 dBA limit by approximately 8 dBA at the closest property boundaries. For this

reason, mitigation of the high noise level from the diesel engine driven grinder is recommended, either through the addition of a noise quieting kit or through the alternate use of an enclosed, electric motor driven grinder. A noise quieting kit will applied to the grinder.

The State DOH regulates the noise levels from fixed machinery by imposing maximum allowable sound levels at the property boundaries for various zoning categories. Because of the Agricultural Zoning of the project site, the allowable noise level from fixed machinery on the project site is 70 dBA during the daytime and nighttime periods. The noise levels of portable or movable equipment (such as trucks, front end loaders, bulldozers, etc.) are not subject to the 70 dBA limit under DOH noise regulations.

The increases in noise levels attributable to project traffic in Calendar Year (CY) 2014 are predicted to be difficult to perceive and not significant along the south section of Wilikina Drive, which would service the proposed project. Due to the remoteness of the project site, project related traffic noise levels along the project's future entrance road should not cause traffic noise levels to exceed the 65 DNL FHA/HUD criteria at existing noise sensitive buildings in the project area. Risks of potential noise impacts from project related traffic are considered to be very low at existing noise sensitive receptors because of the large buffer distances between the noise sensitive buildings and the project's future entrance road, and because of the very small increases in traffic noise expected from project related traffic along Wilikina Drive (see Section 4.10 for further discussion on Traffic). For these reasons, existing noise sensitive buildings in the project area should not require sound attenuation measures as a result of the proposed project.

Noise levels associated with construction activities are anticipated to range between 45 to 55 dBA at the closest residences during the entire project construction period. Adverse impacts from construction noise are not expected to occur due to the large buffer distances (at least 2,400 feet) from the project site to the closest residences, and construction noise mitigation measures should not be required. Implementation of DOH construction noise permit procedures will require that noisy construction activities do not occur during the nighttime, Sundays, and holidays. Therefore, adverse noise impacts are not expected to occur from construction activities on the project site.

Construction noise impacts will be mitigated by compliance with provisions of the State of Hawaii DOH Administrative Rules, Title 11, Chapter 46, "Community Noise Control". State of Hawaii DOH rules limit construction activities to the hours between 7:00 am and 6:00 pm on weekdays, except holidays, and 9:00 am to 6:00 pm on Saturday. Heavy vehicles required for construction must comply with Title 11, Chapter 42 and "Vehicular Noise Control for Oahu". It shall be the contractor's responsibility to minimize noise by properly maintaining noise mufflers and other noise-attenuating equipment, and to maintain noise levels within regulated limits. If noise levels from construction activities are expected to exceed the allowable limits set forth in Chapter 46, a noise permit may be required.

In the long term, ambient noise levels in the immediate vicinity of the project site may marginally increase due to composting operations and the amount of trucks entering and exiting the site. The green and food wastes are loaded into a grinder that shreds the waste into mulch. The grinder will be located in the enclosed receiving building to minimize noise impacts. The dewatered sewage sludge will be loaded with green waste into a mixer that is located within the enclosed receiving building. Noise impacts due to operations will comply with DOH noise standards.

3.8 Archaeological Resources

An Archaeological Assessment was conducted by Cultural Surveys Hawaii, Inc. in December 2010. The study is summarized below and included as Appendix G.

The Archaeological Assessment involved historical research to include study of archival sources, historic maps, Land Commission Awards and previous archaeological reports to construct a history of land use and to determine if archaeological sites have been recorded on or near the project site and a field inspection of the project area to identify any surface archaeological features and to investigate and assess the potential for impact to such sites.

Analysis of the historical record is ultimately inconclusive about use of the project lands prior to c. 1900. Based on available information, by 1900 the present project area was part of the southern portion of three former land grants including: Land Grant 682 to S. N. Castle, Land Grant 848 to Kahoeka, and Land Grant 1125 to Kaiakawaha. The project area was in the “Kemoo” section of the Waialua Agricultural Company Ltd. sugar plantation.

For the most part, the nature of the Land Grants in the immediate area including the western portion of the present project lands were long thin rectangles with parallel sides. This form is not at all typical for traditional Hawaiian land holdings that are more commonly in the shape of irregular polygons. This suggests that the present project area may not have been an area of traditional, pre-contact Hawaiian land holding – at least not in the form in which the grants were issued. The pattern of residences and burials appear to have been nearer the coast.

Pedestrian inspection of the project area confirmed the findings of the background research. No pre-contact agricultural features, the most anticipated traditional Hawaiian archaeological remains in this area, were located during the field inspection.

Virtually the entire project area has been massively impacted by the present mulching operations (and decades of sugar and pineapple cultivation before that). Ground visibility is generally good in the sense that there is virtually no vegetation at all (only exotic grasses on the perimeter). On the other hand, virtually the entire project area is overlain with 25 cm to 30 cm (10” to 12”) of chipped green waste mulch that has been tilled into the soil. Thus, while visibility was “excellent”, only in perhaps 2% of the

project area was the natural soil surface visible. Perhaps 10% of the project area is presently under linear piles of mulch 3.0 to 3.5 m high. These piles of mulch were actively being "turned-over" by large earth moving equipment and it is thought that there is zero chance of significant cultural resources above the ground surface under these piles. Particular attention was addressed to a steep-sided gulch in the extreme southeast corner of the project area.

No historic properties, cultural deposits, or cultural material were identified within the 112-acre proposed project area. Land clearing for agricultural cultivation and agricultural activities themselves likely impacted or destroyed any possible surface or subsurface historic properties that may have existed within the project area.

Impacts and Mitigation Measures

No significant short- or long-term impacts on historic or archaeological resources are anticipated as a result of the construction and operation of the proposed improvements. Should any significant historic, archaeological or cultural resources be found during construction activities, all work shall cease within the immediate area and State of Hawaii Department of Land and Natural Resources Historic Preservation Division (SHPD) shall be notified immediately.

SHPD reviewed the archaeological assessment and issued a "no historic properties affected" determination per their May 23, 2011 letter (see Appendix G).

3.9 Cultural Resources

A Cultural Impact Assessment was conducted by Cultural Surveys Hawaii, Inc. in March 2011. The study is summarized below and included as Appendix H.

The Cultural Impact Assessment involved: examination of cultural and historical resources, including Land Commission documents, historic maps, and previous research reports, with 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; review of previous archaeological work at and near the project area that may be relevant to reconstructions of traditional land use activities and to the identification and description of cultural resources, practices, and beliefs associated with the project area; and consultation and interviews with knowledgeable parties regarding cultural and natural resources and practices at or near the project area, present and past uses of the project area, and/or other practices, uses, or traditions associated with the project area.

Hawaiian organizations, agencies and community members were contacted in order to identify potentially knowledgeable individuals with cultural expertise and/or knowledge of the project area and the vicinity. Organizations consulted included the State Historic Preservation Division (SHPD), the Office of Hawaiian Affairs, the Oahu Island Burial Council, Hui Malama I Na Kupuna O Hawaii Nei, the Hawaiian Civic Club of Wahiawa, the Wailua Hawaiian Civic Club, and community members of Kamananui Ahupuaa.

The Cultural Impact Assessment broadly included the entire *ahupua‘a* of Kamananui and more specifically the approximately 112 acres of private land of the project area, TMK: [1] 6-5-002:026. Kamananui Ahupua‘a was the political and ritual center of Waialua Moku until the 1820s, when the ruling chief re-drew the *ahupua‘a* boundaries with his shift in residence to Kawailoa Ahupua‘a and when the Kawailoa-based Protestant mission of Waialua “usurped the ritual hegemony from the temples of human sacrifice [*po‘okanaka*] that not long before had sanctified the landscape of Kamananui” (Sahlins 1992:21).

The cultural landscape of the entire *moku* (district) of Waialua has been severely destroyed or obscured during the past two centuries, especially due to the clearing and plowing under of coastal land and sloping uplands between gulches for sugarcane cultivation with the Waialua Agricultural Company (Sahlins 1992:17). Archaeological documentation of sites in the early to mid-twentieth century based in part on the recollections of old Hawaiian residents (McAllister 1933; Thrum 1906), combined with collected *mo‘olelo* (oral traditions) and documented observations, illuminate the cultural landscape — patterns of ancient habitation, subsistence, and *wahi pana* (sacred places) — for the *ahupua‘a* of Kamananui.

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

The project area is located far from the sea in a high, level saddle region between the two mountain ranges of Oahu. A network of trails traversed the region, connecting the *moku* (districts) of Waialua, Wai‘anae, ‘Ewa, and Kona (‘Ī‘ī 1959:99). These paths intersected at Kūkaniloko, a sacred ceremonial birthing place for the highest ranking chiefs and its associated *heiau* located about one mile southeast of the project area, an area that some people consider the *piko* (navel or center) of Oahu (Becket and Singer 1999:64).

Extensive cultivation took place in this saddle region, which suggests sizable populations of ancient Hawaiians (Handy and Handy 1972:464). The present town of Wahiawā, which is located about two miles southeast of the project area in Wai‘anae Uka Ahupua‘a, was an area of extensive irrigated sweet potato and yam cultivation

(Handy and Handy 1972:464–465). Closer to the project area, numerous *loʻi kalo* (irrigated taro terraces) were maintained at a place called Kukui-o-Lono; *moʻolelo* describe that an ancient high chief, Kūkaniloko, grew the first *loʻi* there (Handy and Handy 1972:465). Hawaiians most likely cultivated sweet potatoes and bananas in the *mauka* gulches of Kamananui Ahupuaʻa (Handy 1940:85), and there is evidence of former habitations on both sides of Kaukonahua Gulch about two miles northwest of the project area (McAllister 1933:133).

During the Māhele of 1848, the lands of the project area were purchased by S.N. Castle (Land Grant 682), Kahoeka (Land Grant 848), and Kaiakawaha (Land Grant 1125). Claims for Land Commission Awards reveal that Hawaiians used the land in the *mauka* portions of Kamananui Ahupuaʻa primarily to cultivate taro and *wauke* (paper mulberry) (Waihona ʻAina 2000).

Rice cultivation, extension of the railroad system toward Waialua, and the development of commercial sugarcane cultivation with the rise of the Waialua Agricultural Company (later named the Waialua Sugar Company) dramatically altered the landscape of Kamananui Ahupuaʻa during the last two decades of the nineteenth century. The lands surrounding the project area within the *ʻili* (land division smaller than an *ahupuaʻa*) of Kemoʻo were further modified during the early twentieth century through the development of a military post (Schofield Barracks), sugar cane cultivation (Kemoo Land Company), a piggery and dairy operation (Kemoʻo Farms), and the pineapple industry with its plantation settlements (Kemoo Camp) further re-shaped the landscape surrounding the project area.

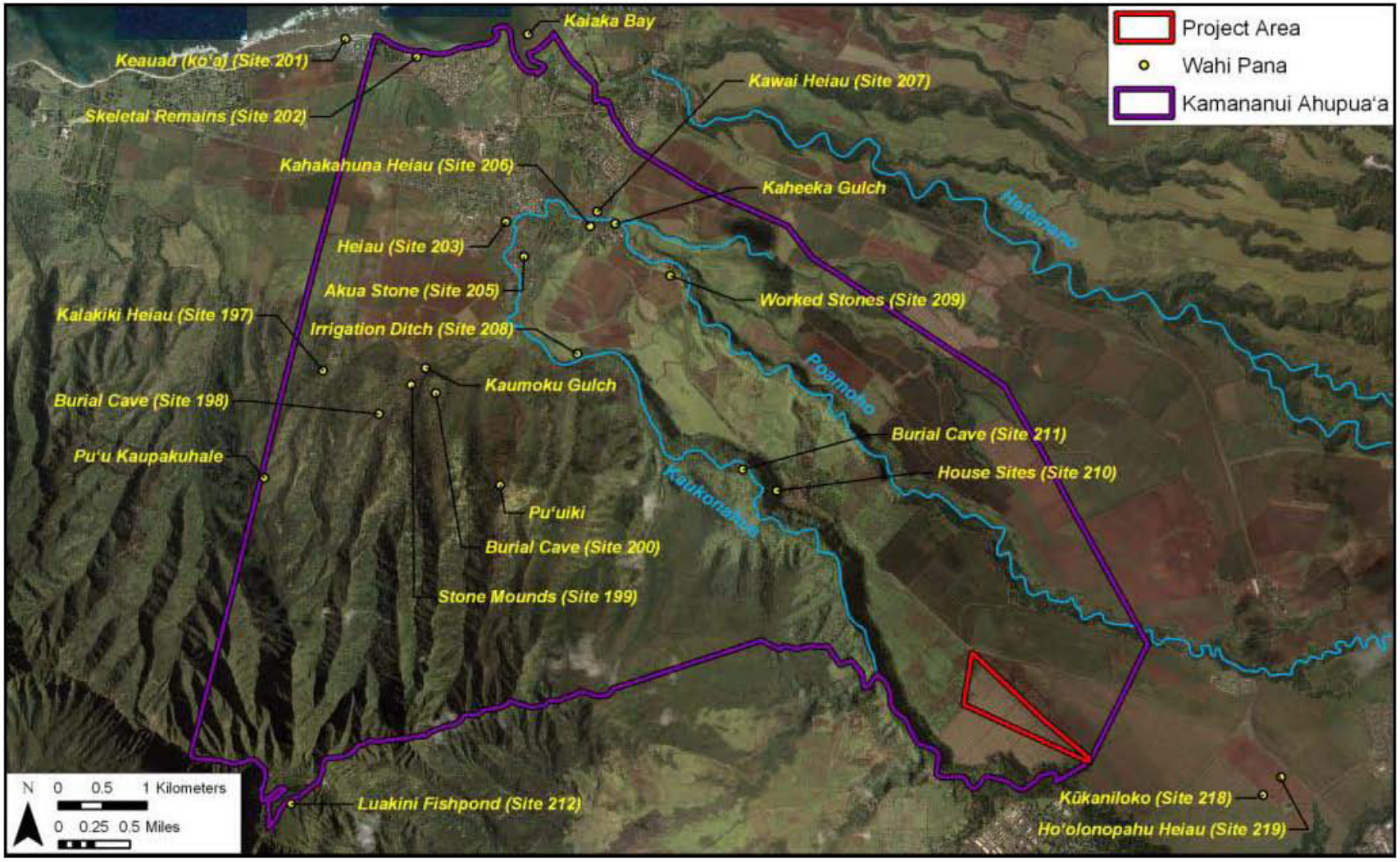
Two caves with skeletal remains (Site 211) are located along Kaukonahua Gulch about three miles northwest of the project area (McAllister 1933:133), but there is no documented evidence from archaeological surveys, historical records or oral traditions of *ilina* (burials) or *iwi kūpuna* (ancestral remains) within the project area (see Figure 3-6).

The sacred site of Kukaniloko Birthing Stones is located approximately one mile southeast of the project site. The site was listed on the National Register of Historic Places and the State Register of Historic Places in 1973.

Impacts and Mitigation Measures

Based on the information gathered for the cultural and historic background and community consultation, the proposed project is not anticipated to impact Native Hawaiian or other ethnic groups' cultural practices customarily and traditionally exercised for subsistence, cultural or religious purposes.

The project site is not visible from the Kukaniloko Birthing Stones State Monument. It is unlikely that the proposed receiving facility (approximately 36 feet tall) would be visible because of the intervening distance, existing tree lines and the undulating topography.



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ARCHAEOLOGY RESOURCES

FIGURE

3-6

Construction activities occurring at the project site may uncover cultural resources, including burials or burial sites or artifacts, during ground disturbances. Should any significant cultural resources be found during construction activities, all work shall cease within the immediate area and SHPD shall be notified immediately.

HER will update community members and organizations as the project design progresses. This on-going consultation should keep the community informed of any changes that could result in unanticipated adverse cultural impacts.

3.10 Traffic

A Traffic Impact Report was conducted by Wilson Okamoto Corporation in March 2011. The study is summarized below and study is included as Appendix I.

The Traffic Impact Report involved: evaluation of existing roadway and traffic operations in the vicinity; analysis of future roadway and traffic conditions without the proposed project; analysis and development of trip generation characteristics for the proposed project; superimposing site-generated traffic over future traffic conditions; identification and analysis of traffic impacts resulting from the proposed project; and recommendations of improvements, if appropriate, that would mitigate the traffic impacts resulting from the proposed project.

Field investigations were conducted on January 19 and February 1, 2011, and consisted of manual turning movement count surveys at the intersections of Wilikina Drive with Kamananui Road and Kaukonahua Road. The manual turning movement count surveys were conducted during morning peak hours of 6:00 am and 9:00 am, and afternoon peak hours of 3:00 pm and 6:00 pm. In addition, 24-hour mechanical count data was collected along Wilikina Drive in the vicinity of the project.

The highway capacity analysis is based on the concept of Level of Service (LOS). LOS is a quantitative and qualitative assessment of traffic operations. LOS are defined by LOS “A” through “F”; LOS “A” representing ideal or free-flow traffic operating conditions and LOS “F” representing unacceptable or potentially congested traffic operating conditions.

The proposed facility will be located adjacent to Wilikina Drive, a predominantly two-lane, two-way roadway that serves as a connector roadway between Kamehameha Highway and Kaukonahua Road. Southeast of the project site, Wilikina Drive intersects Kamananui Road. At this signalized T-intersection, the northbound approach has an exclusive left-turn lane and one through lane. Kamananui Road is a short two-way roadway that serves as a connector roadway between Wilikina Drive and Kamehameha Highway. At the intersection with Wilikina Drive, the Kamananui Road approach has exclusive left-turn and right-turn lanes.

Northwest of the intersection with Kamananui Road, Wilikina Drive intersects Kaukonahua Road. At this unsignalized T-intersection, the northbound approach of

Wilikina Drive, the Kaukonahua Road approach has exclusive left-turn and right-turn lanes.

The AM peak hour of traffic generally occurs between the hours of 7:15 am and 8:15 am while the PM peak hour of traffic generally occurs between the hours of 3:30 pm and 4:30 pm. The analysis is based on these peak hour time periods for each intersection.

Wilikina Drive and Kamananui Road: At the intersection with Kamananui Road, Wilikina Drive carries 192 vehicles northbound and 367 vehicles southbound during the am peak hour of traffic. During the pm peak hour of traffic, the overall traffic volume is higher with 539 vehicles traveling northbound and 252 vehicles traveling southbound. The critical movements on the Wilikina Drive approaches are the northbound approach and the southbound through traffic movement. The northbound approach operates at LOS "B" and LOS "C" during the AM and PM peak periods, respectively, while the southbound through traffic movement operates at LOS "A" and LOS "B" during the AM and PM peak periods, respectively. Traffic queues periodically formed on the Wilikina Drive approaches of the intersection with average queue lengths of 4-6 vehicles observed the approaches during both peak periods. These queues were observed to clear the intersection after each traffic signal cycle change.

The Kamananui road approach of the intersection carries 277 vehicles and 516 vehicles westbound during the AM and PM peak periods, respectively. The critical movement on this approach is the left-turn traffic movement which operates at LOS "B" and LOS "C" during the AM and PM peak periods, respectively. Traffic queues periodically formed on this approach during both peak periods with average queue lengths of 8-10 vehicles observed during both peak periods. These queues were observed during both peak periods. These queues were observed to clear the intersection after each traffic signal cycle change.

Wilikina Drive and Kaukonahua Road: At the intersection with Kaukonahua Road, Wilikina Drive carries 193 vehicles northbound and 447 vehicles southbound during the AM peak hour of traffic. During the PM peak hour of traffic, traffic volumes are higher with 540 vehicles traveling northbound and 314 vehicles traveling southbound. The critical movement on the Wilikina Drive approaches is the southbound left-turn traffic movement which operates at LOS "A" during both peak periods.

The Kaukonahua Road approach of the intersection carries 57 vehicles and 86 vehicles westbound during the AM and PM peak periods, respectively. The critical movement on this approach is the left-turn traffic movement which operates at LOS "C" during both peak periods. Traffic queues periodically formed on this approach during both peak periods.

Impacts and Mitigation Measures

A trip generation rate for the proposed facility was derived based on the highest monthly truck traffic data from the existing Campbell Industrial Park composting facility during

2010 provided by HEP. This locally derived trip generation rate more accurately reflects the anticipated traffic growth as a result of the proposed facility. Table 3-2 summarizes the project site trip generation characteristics for the AM and PM peak periods of traffic.

TABLE 3-2
PEAK HOUR TRIP GENERATION

		Projected Trip Ends
AM Peak	Enter	22
	Exit	4
	Total	26
PM Peak	Enter	6
	Exit	3
	Total	9

Almost all of the trips generated by the facility during the peak periods are expected to be trucks or other heavy vehicles either delivering to or picking up material from the facility. Most of these trucks will be traveling to/from their transfer stations or collection routes and are expected to utilize the Interstate H-2 Freeway to reach Waialua. As such, all entering vehicles are expected to travel northbound along Wilikina Drive to access the project driveway while all exiting vehicles are expected to turn right from the facility and travel southbound along Wilikina Drive.

The travel forecast developed for this study conservatively assumes the existing traffic volumes in the project vicinity will increase at a rate of 0.5% per year to the Year 2014. Using 2011, as the Base Year, a growth factor of 1.015 was applied to the existing traffic demands in the project vicinity to achieve the projected Year 2014 traffic demands.

Traffic operations under Year 2014 with project conditions are expected to remain similar to existing and Year 2014 without project conditions during both peak periods. The critical movements at the intersection of Wilikina Drive with Kamananui Road are expected to continue operating at LOS “B” or better during the AM peak period and LOS “C” or better during the PM peak period while those at the intersection with Kaukonahua Road are expected to continue operating at LOS “C” or better during both peak periods. At the intersection of the new project driveway with Wilikina Drive, the driveway approach of the intersection is expected to operate at LOS “B” and LOS “A” during the AM and PM peak periods, respectively, while the northbound approach of Wilikina Drive is expected to operate at LOS “A” during both peak periods. The existing and projected LOS traffic operating conditions with and without the proposed project is summarized in Table 3-3.

Based on the analysis of the traffic data, the following recommendations will be applied to the design of the facility:

1. Provide sufficient sight distance for motorists to safely enter and exit the project driveway.
2. Provide adequate on-site loading and off-loading service areas and prohibit off-site loading operations.
3. Provide adequate turn-around area for service, delivery, and refuse collection vehicles to maneuver on the project site to avoid vehicle-reversing maneuvers onto adjacent public roadways.
4. Provide sufficient turning radii at the project driveway to avoid or minimize vehicle encroachment to oncoming traffic lanes.
5. Ensure that the truck weighing scale is located a sufficient distance from the driveway to provide adequate queuing area for trucks waiting to be weighed and ensure that queues do not extend onto the adjacent public roadway.

TABLE 3-3
EXISTING AND PROJECTED (WITHOUT AND WITH PROJECT)
LOS TRAFFIC OPERATING CONDITIONS

Intersection	Critical Traffic Movement		AM			PM		
			Existing	Year 2014		Existing	Year 2014	
				w/out Proj	w/ Proj		w/out Proj	w/ Proj
Wilikina Dr/ Kamananui Rd	Westbound	LT	B	B	B	C	C	C
	Northbound	TH-RT	B	B	B	C	C	C
	Southbound	TH	A	A	A	B	B	B
Wilikina Dr/ Driveway	Eastbound	LT-RT	-	-	B	-	-	A
	Northbound	LT-TH	-	-	A	-	-	A
Wilikina Dr/ Kaukonhua Rd	Westbound	LT	C	C	C	C	C	C
	Southbound	LT	A	A	A	A	A	A

LT=Left Turn TH=Through RT=Right Turn
Source: Wilson Okamoto Corporation. *Traffic Impact Report For The In-Vessel Composting Facility.* March 2011.

Traffic operations under Year 2014 with project conditions are expected to remain similar to existing and Year 2014 without project conditions curing both peak periods. . The installation of a traffic signal along Wilikina Drive at the project access driveway does not appear to be warranted and may instead impact traffic flow along Wilikina Drive. However, the traffic signal operations at the adjacent intersection of Wilikina Drive and Kamananui Road should create gaps in the through traffic stream along Wilikina Drive that would allow ingress and egress maneuvers at the project's access driveway. These gaps would preserve through traffic flow along the roadway without the need of exclusive left-turn lanes, acceleration lanes, or other auxiliary lanes at the intersection of Wilikina Drive and the project's access driveway.

With the implementation of the aforementioned, the proposed facility is not expected to have a significant impact on traffic operations in the project vicinity. The critical movements at the study intersections in the project vicinity are expected to continue

operating at levels of service similar to existing and without project conditions. In addition, the total traffic volumes entering the study intersections along Wilikina Drive are expected to increase by 3% or less during both peak periods of traffic with the proposed facility. These increases in the total traffic volumes are in the range of daily volume fluctuations along this roadway and represent a minimal increase in overall traffic volumes.

3.11 Socio-Economic Characteristics

Population and Housing: The project falls within the North Shore Neighborhood Area. According to the Department of Planning Permitting (2000), the North Shore Neighborhood Area had a population of 18,380 in comparison to the overall population of Oahu of 876,156. Relative to Oahu as a whole, the North Shore Neighborhood Area population by age is about the same; has a racial mix with slightly more Whites and less Asian; slightly more number of family households; slightly lower homeownership rates; and, higher vacancy rates (See Table 3-4).

Economy: The project is within the Census tract 99.01 (Waialua-Mokuleia). According to the U.S. 2000 Census data, the 1999 median household income for Waialua-Mokuleia CT was $47,423, which is lower than the median household income of $51,914 for Honolulu (U.S. Census, 2000).

Impacts and Mitigation Measures

Population and Housing: No significant impacts to population or housing in the vicinity of the project site are anticipated as a result of the construction and operation of the project. The proposed facility is not expected to change the existing resident population in the community. No new residential units and no in-migration of residents are anticipated as a result of the proposed facility.

Economy: No significant impact to the economy within the vicinity of the project site are anticipated as a result of the construction and operation of the proposed facility. In the short-term, the project will confer some positive benefits to the local economy. Direct economic benefits will result from construction expenditures both through the purchase of materials from local suppliers and through the employment of local labor, thereby stimulating that sector of the economy. During construction, retail businesses in the vicinity of the project site may benefit from the increased presence of workers.

Some jobs will be shifted from the existing facility in Kalaeloa to the Waialua site. In addition, new jobs will be created for the Waialua site.

3.12 Visual Resources

According to the Open Space Map in the *North Shore Sustainable Communities Plan* (August 2010), there are panoramic views of the Waianae Range from Wilikina Drive/Kaukonahua Road.

During a site visit in February 2011, the grasses along the northeastern boundary along Wilikina Drive were about 6-feet tall, blocking the view of the Waianae Range.

Table 3-4
Demographic Characteristics: 2000

Subject	Neighborhood Area 27: North Shore		O'ahu	
	Number	Percent	Number	Percent
Total population	**18,380**	**100.0**	**876,156**	**100.0**
AGE				
Under 5 years	1,511	8.2	56,849	6.5
5 – 19 years	3,695	20.1	175,175	20.0
20 – 64 years	11,300	61.5	526,395	60.1
65 years and over	2,067	11.2	130,496	15.9
Median age (years)	31.3	--	35.7	--
RACE *(alone or in combination with other races)*				
White	9,874	53.7	308,838	35.2
Black or African American	864	4.7	29,764	3.4
American Indian and Alaska Native	500	2.7	15,921	1.8
Asian	8,358	45.6	539,384	61.6
Native Hawaiian and other Pacific Islander	9,808	20.7	189,292	21.6
Other	1,194	6.5	32,003	3.7
HOUSEHOLD (BY TYPE)				
Total Households	**5,983**	**100.0**	**286,450**	**100.0**
Family households (families)	4,361	74.0	205,672	71.8
With own children under 18 years	2,102	35.7	91,022	31.8
Married-couple family	3,314	56.2	156,195	54.5
With own children under 18 years	1,602	27.2	70,442	24.6
Female householder, no husband present	682	11.6	35,138	12.3
With own children under 18 years	337	5.7	15,235	5.3
Non – families	1,532	26.0	80,778	28.2
Living alone	1,023	17.4	61,963	7.1
65 years and over	275	4.7	20,021	7.0
Average persons per household	3.05	--	2.95	--
HOUSING OCCUPANCY AND TENURE				
Total Housing Units	**6,648**	**100.0**	**315,988**	**100.0**
Occupied units	5,893	88.6	286,450	90.7
By owner	2,595	39.0	156,290	49.5
By renter	3,298	49.6	130,160	41.2
Vacant units	755	11.4	29,538	9.3

Source: City & County of Honolulu, Department of Planning & Permitting, 2000

Impacts and Mitigation Measures

The receiving building is the tallest structure proposed and will stand 38 feet high at the centerline of building and approximately 33 feet high at the side walls. It will be setback approximately 310 feet from Wilikina Drive. According to Section 21-3.50-4 and Table 21-3.1 of the Land Use Ordinance, the maximum height for buildings in AG-~~2~~1 zoning is 25 feet, if height setbacks are provided. Since the receiving facility exceeds the maximum building height by 1~~3~~ feet it will require a Zoning Variance approved the DPP. The visual impact of the proposed building will be reduced as the project site will have a six-foot tall berm along its perimeter. In addition, if the natural vegetation (tall grasses) along Wilikina Drive is allowed to grow back to 6-feet it will screen motorists views of the receiving building (see Figures 3-7 and 3-8). Therefore, no significant impact on visual resources is anticipated as a result of the proposed project.

3.13 Public Services

Police: Police protection is provided by the City and County of Honolulu, through the Wahiawa Police Station, located at 330 North Cane Street, approximately two and half miles southeast from the project site.

Fire: Fire protection is provided by the City and County of Honolulu. The nearest station is the Wahiawa Fire Station, located at 640 California Avenue, immediately approximately two and half miles from the project site.

Medical: Wahiawa General Hospital is located in Wahiawa Town, approximately two and half miles southeast from project site.

Public Transit: Public transit is provided by the City's TheBus. TheBus does not operate along Wilikina Drive (State Highway 803) from Kamananui Road to Farrington Highway. Route 72 operates between Schofield Barracks, Wahiawa Town and Whitmore Village.

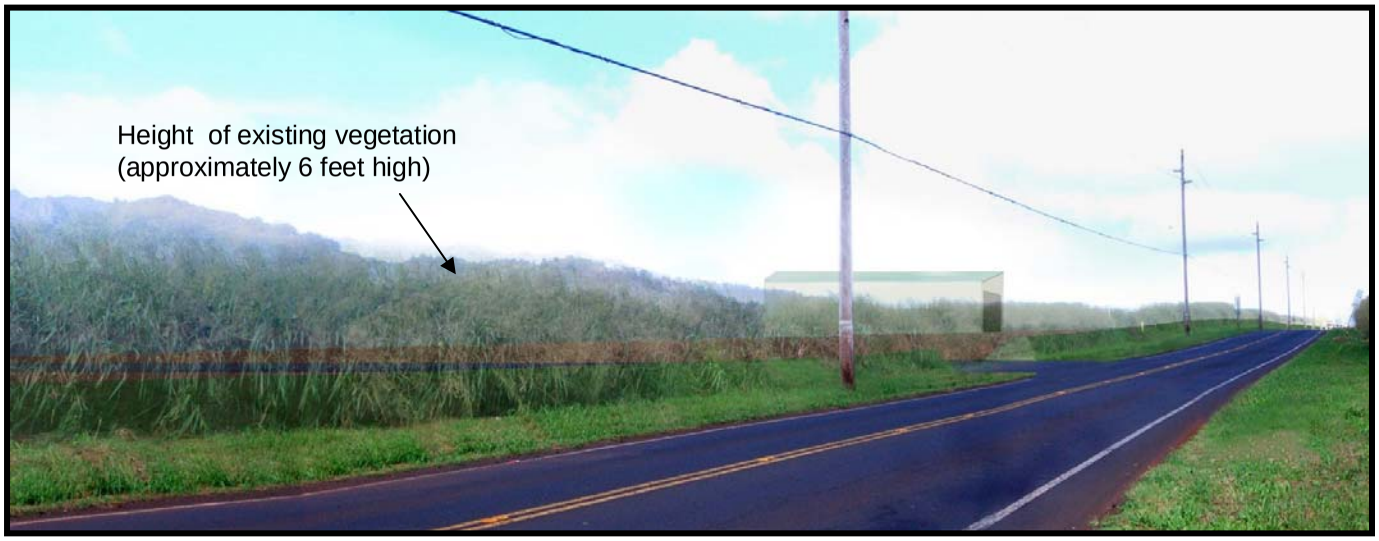
Impacts and Mitigation Measures

In the short-term, construction activities at the project site may increase potential demand for police services due to construction-related traffic, security of the construction site and the presence of more people associated with construction. The potential need for fire protection services would increase due to the presence of construction materials and equipment on the project site. The presence of construction workers and others at the project site would also increase the potential demand for emergency care services. These impacts, however, would be relatively insignificant within the overall context of the areas served by the respective public services.

In the long - term, operation of the proposed facility will not have a significant impact on police, fire, emergency services, and public transit. The project will be designed to meet fire code requirements.



Existing Photo: Wilikina Drive, North Shore bound



Rendering showing proposed receiving facility in the background overlaid with the existing 6-foot tall vegetation (berm).

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BEFORE AND AFTER NORTH SHORE BOUND

FIGURE

3-7



Existing photo: Wilikina Drive, Wahiawa bound.



Rendering showing proposed receiving facility in the background overlaid with the existing 6-foot tall vegetation (berm).

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BEFORE AND AFTER WAHIAWA BOUND

FIGURE

3-8

The facility Operation Plan and recommended mitigation measures for dust control and fire protection will also included, as part of the Department of Health Solid Waste Management Permit. Given HEP's long operating history at the Campbell location, similar adequate and appropriate dust and fire control procedures will be implemented at the proposed facility.

3.14 Infrastructure

Water: The project site is not serviced by the City & County of Honolulu's water system.

Wastewater: The project site is not serviced by the City & County of Honolulu's wastewater system.

Electrical and Communication: Hawaiian Electric Company (HECO) provides electrical services in the project area through overhead power lines. Hawaiian Telcom provides telephone and communication services.

Impacts and Mitigation Measures

Water: No significant impacts on the municipal water system are anticipated during construction and operation of the project.

The facility will provide separate storm water and leachate collection and reuse systems. Rainfall collected will be directed to two storm water ponds and a retention basin on the project site from which water will be drawn to assist the maintenance of proper moisture content of the composting material and irrigation of crops. The storm water ponds, retention basin, and perimeter berm will be designed to collectively capture and retain runoff from a 100-year, 24 hour storm event within the project site and comply with "zero net charge" requirement. The storm water ponds and retention basin will have a combined capacity to store 10.1 million gallons (mg).

No discharge from storm water ponds and retention basin is anticipated as the amount of water required for operation will exceed the amount stored. Supplemental water from the on-site well will make up the balance. As a result of storm water remaining on-site, HER will be requesting an exemption from requiring a NPDES for Storm Water Associated with Industrial Activities.

Any leachate collected from the receiving building and the GORE™ covered windrows will be directed to the leachate collection system for re-processing and will not be discharged to the storm water collection system.

A well will be drilled and a pump installed for the project. HER received a Well Construction Permit from the Commission on Water Resource Management (CWRM), Department of Land and Natural Resources (DLNR) (Appendix B). HER will be able to pump up to 3559,000 gallons per day.

In addition, HER will propose to utilize R-2 water from Dole Food Company Hawaii for the irrigation of crops on the project site. R-2 water contains fecal coliform and, therefore, R-2 water cannot be used for the composting process.

Wastewater: No significant impacts on the municipal wastewater system are anticipated during construction of the project. A septic system with leach field is proposed to accommodate wastewater. The DOH Wastewater Branch was consulted with.

Electrical: No significant impacts on the electrical system are anticipated during construction of the project. Additional energy requirements associated with the project will be accommodated via the existing distribution power lines.

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4.0 RELATIONSHIP TO LAND USE, POLICIES AND CONTROLS

The plans and policies relating to the proposed project range from broad program guidance to land use controls governing the project site. Construction of the proposed project is in consonance with the various plans, policies, and regulatory controls, as discussed below.

4.1 State of Hawaii

4.1.1 Hawaii State Plan

The Hawaii State Plan (Chapter 226, Hawaii Revised Statutes, as amended) provides the overall theme, goals, objectives, policies and priority guidelines for statewide planning. The Hawaii State Plan also directs the appropriate State agencies to prepare functional plans for their respective program areas. The proposed project supports and is consistent with the following State Plan objectives:

§226-15 Objectives and policies for facility systems – solid and liquid wastes:

(b)(2) Promote re-use and recycling to reduce solid and liquid wastes and employ a conservation ethic.

(b)(3) Promote research to develop more efficient and economical treatment and disposal of solid and liquid wastes.

Comment: The project will provide the City and homeowners a place to recycle green waste food waste and dewatered sewage sludge. HEP currently recycles over 85,000 tons of green and pre-consumer food waste per year from Campbell Industrial Park and Kapaa Quarry. By recycling and reusing organic materials, this waste which once was disposed of in Oahu's only landfill is being turned into beneficial products, such as soil enrichment, fertilizer replacement/enhancement, gardening and landscaping products. The proposed facility is anticipated to process up to 150,000 tons of green waste, food waste and dewatered sewage sludge per year.

§226-16 Objective and policies for facility systems – water.

(b)(3) Reclaim and encourage the productive use of runoff water and wastewater discharges.

Comment: The proposed project will compost dewatered sewage sludge, diverting it from landfill disposal and use it to produce beneficial agricultural product.

The facility will provide separate storm water and leachate collection and reuse systems. Rainfall collected will be directed to two storm water ponds and a retention basin on the project site from which water will be drawn to assist the maintenance of proper moisture content of the composting material and irrigation of crops. The storm water ponds, retention basin, and perimeter berm will be

designed to collectively capture and retain runoff from a 100-year, 24 hour storm event within the project site and comply with "zero net charge" requirement. The storm water ponds and retention basin will have a combined capacity to store 10.1 million gallons (mg).

No discharge from storm water ponds and retention basin is anticipated as the amount of water required for operation will exceed the amount stored. Supplemental water from the on-site well will make up the balance. As a result of storm water remaining on-site, HER will be requesting an exemption from requiring a NPDES for Storm Water Associated with Industrial Activities.

Any leachate collected from the receiving building and the GORE™ covered windrows will be directed to the leachate collection system for re-processing and will not be discharged to the storm water collection system.

A well will be drilled and a pump installed for the project. HER received a Well Construction Permit from the Commission on Water Resource Management (CWRM), Department of Land and Natural Resources (DLNR) (Appendix B). HER will be able to pump up to 35~~59~~,000 gallons per day.

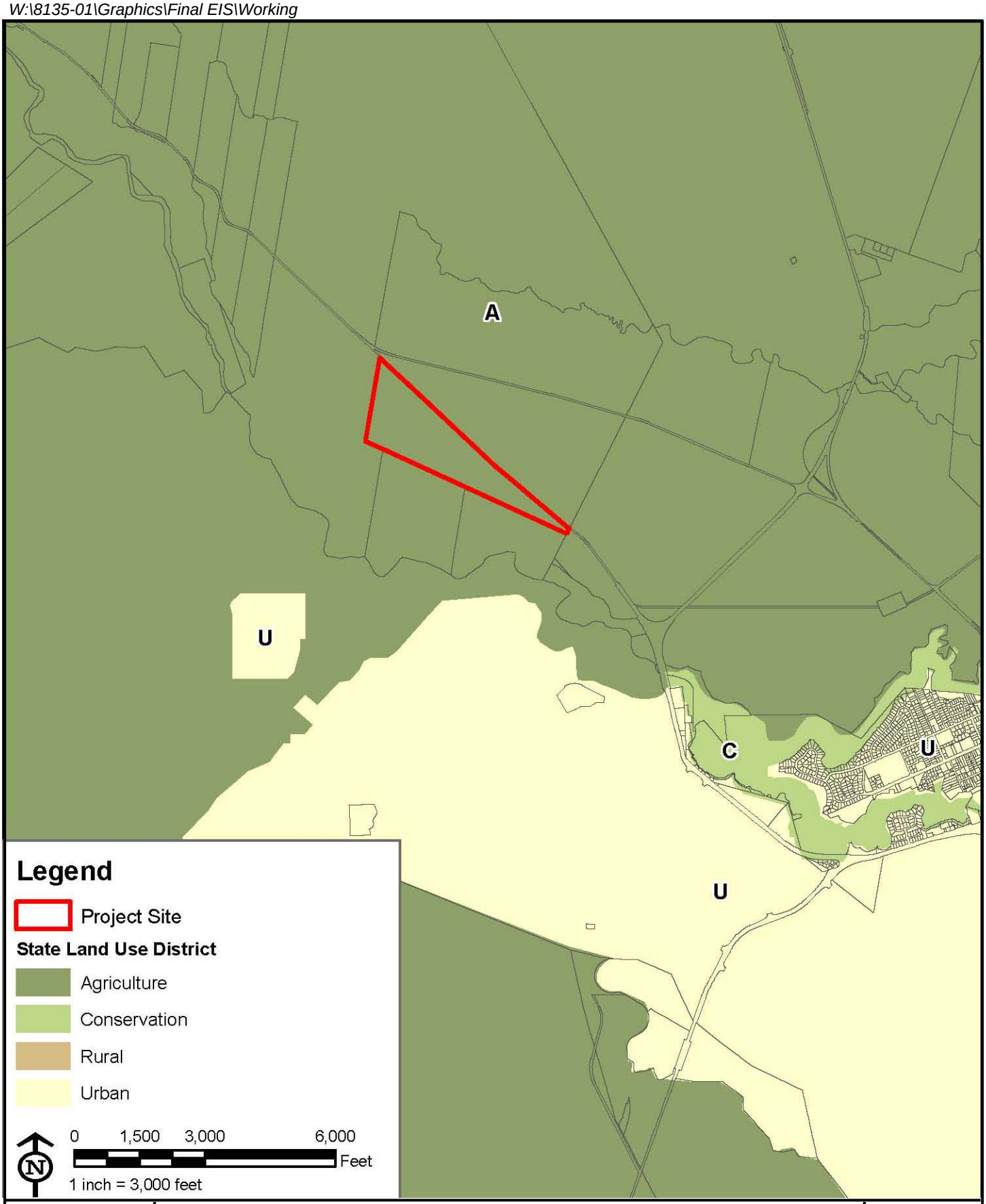
In addition, HER will propose to utilize R-2 water from Dole Food Company Hawaii for the irrigation of crops on the project site. R-2 water contains fecal coliform and, therefore, R-2 water cannot be used for the composting process.

4.1.2 State Land Use District

The State Land Use Law is intended to preserve, protect, and encourage the development of lands in the State for uses which are best suited to the public health and welfare of Hawaii's people. The Hawaii Land Use Law in Chapter 205, Hawaii Revised Statutes (HRS), classifies all land in the State into four land use districts: Urban, Agricultural, Conservation, and Rural. The project site lies within the Agricultural District, which includes "*lands for the cultivation of crops, aquaculture raising livestock, wind energy facility, timber cultivation, agriculture-supported activities (i.e., mills, employee quarters, etc.) and land with significant potential for agricultural uses. Uses permitted in the highest productivity agricultural categories are governed by statute. Uses in the lower productivity categories - C, D, E or U – are established by the Commission and include those allowed on A or B lands as well as those stated under Section 205-4.5 HRS.*" (see Figure 4-1).

Section 205-4.5 Permissible uses within the agricultural districts states *(a) Within the agricultural district, all lands with soil classified by the land study bureau's detailed land classification as overall (master) productivity rating class A or B shall be restricted to the following permitted uses:*

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STATE LAND USE DISTRICT (SLUD) MAP

FIGURE

4-1

(1) Cultivation of crops, including but not limited to crops for bioenergy, flowers, vegetables, foliage, fruits, forage, and timber;

(10) Buildings and uses, including but not limited to mills, storage, and processing facilities, maintenance facilities, and vehicle and equipment storage areas that are normally considered directly accessory to the above mentioned uses and are permitted under Section 205-2(d).

Comment: The majority of the project site is rated B, with a small portion unclassified as E, as shown in Figure 3-2. Therefore, the permissible use restriction applies to the project site. The City and County of Honolulu Department of Planning and Permitting (DPP) regards composting as a permissible use within the Agricultural District. DPP does not, however, regard composting of dewatered sewage sludge as a permissible use. Nevertheless, DPP has further determined that the proposed composting of dewatered sewer sludge can be permitted through a Special Use Permit (SUP) (see Appendix J). According to §205-6, the County Planning Commission may permit *"certain and unusual and reasonable uses within agricultural and rural districts other than those for which the district is classified"* if the amount of land involved is less than 15 acres. The facilities related to the composting of dewatered sewage sludge encompasses less than ~~13~~10 acres (see Figure 4-2).

4.2 City and County of Honolulu

4.2.1 General Plan

The General Plan for the City and County of Honolulu is a statement of the long-range social, economic, environmental, and design objectives for the general welfare and prosperity of the people of Oahu. The Plan is also a statement of broad policies that facilitate the attainment of the objectives of the Plan. Eleven subject areas provide the framework for the City's expression of public policy concerning the needs of the people and functions of government. These areas include population; economic activity; the natural environment; housing; transportation and utilities; energy; physical development and urban design; public safety; health and education; culture and recreation; and government operations and fiscal management.

As presented in Chapters 2 and assessed in Chapter 3 of this environmental assessment, the proposed action is in consonance with the following objectives and policies of the General Plan:

II. Economic Activity

Objective C: To maintain the viability of agriculture on Oahu.

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LEGEND

- Access Roads
- SUP Area

Kaukanahua Road

℄

Existing Berm

Willsing Drive

50' SETBACK

B C2.2

Paved Area See Detail 2 C6.0

HECO Utility Pole, Typ See HECO Note on C-3

Scale

Paved Parking Area

Entrance Road

C C2.2

Storm Water Ponds

Retention Basin

Existing Gravel Road

50' SETBACK

R=50'

Future Groundwater Well (By Others)

Windrow Composting Area (~44 acres)

AGRICULTURE USAGE AREA: 427,411 SF (~9.8 AC)

Gore Pad 1 (500' x 354')

Gravel Road (24' wide) See Detail 3 C6.0

Existing Berm

Product Storage Areas

Gore Pad 2 (500' x 354')

Gravel Road, Grass Swale & Berm See Detail 1 C6.0

A C2.1

R=50'

Site Office

Begin Drainage Swale

50' SETBACK

Existing Berm

℄

Biofilter Building

Scale

Existing Berm

Paved Parking Area

- (A) Lunch Room
- (B) Site Office
- (C) Bagging Building
- (D) Shop
- (E) Leachate Storage Pad
- (F) Receiving/Processing Building

N

NOT TO SCALE

WILSON OKAMOTO CORPORATION
ENGINEERS • PLANNERS

IN-VESSEL COMPOSTING FACILITY

SPECIAL USE PERMIT AREA (LESS THAN 15 ACRES)

FIGURE 4-2

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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 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.

Comment: The project will benefit the City and State by recycling up to 150,000 tons annually of green and food waste and dewatered sewage sludge. HEP currently recycles over 85,000 tons of green and pre-consumer food waste per year from Campbell Industrial Park and Kapaa Quarry. By recycling and reusing organic materials, this waste, which once was disposed of in Oahu's only landfill is being turned into beneficial products, such as soil enrichment, fertilizer replacement/enhancement, gardening and landscaping products.

The proposed site in Waialua is an ideal location for HER's composting operations as it will be centrally located to Oahu's agricultural industry. HEP currently and HER will produce organic products that would be utilized by the agricultural industry to introduce organic materials into soils that have been stripped of nutrients from decades of sugar cane and pineapple cultivation and the use of chemical fertilizers. The agricultural industry would have much more access to these organic soil amendments with the project's location.

The facility will provide separate storm water and leachate collection and reuse systems. Rainfall collected will be directed to two storm water ponds and a retention basin on the project site from which water will be drawn to assist the maintenance of proper moisture content of the composting material and irrigation of crops. The storm water ponds, retention basin, and perimeter berm will be designed to collectively capture and retain runoff from a 100-year, 24 hour storm event within the project site and comply with "zero net charge" requirement. The storm water ponds and retention basin will have a combined capacity to store 10.1 million gallons (mg).

No discharge from storm water ponds and retention basin is anticipated as the amount of water required for operation will exceed the amount stored. Supplemental water from the on-site well will make up the balance. As a result of

storm water remaining on-site, HER will be requesting an exemption from requiring a NPDES for Storm Water Associated with Industrial Activities.

Any leachate collected from the receiving building and the GORE™ covered windrows will be directed to the leachate collection system for re-processing and will not be discharged to the storm water collection system.

A well will be drilled and a pump installed for the project. HER received a Well Construction Permit from the Commission on Water Resource Management (CWRM), Department of Land and Natural Resources (DLNR) (Appendix B). HER will be able to pump up to 35~~59~~,000 gallons per day.

In addition, HER will propose to utilize R-2 water from Dole Food Company Hawaii for the irrigation of crops on the project site. R-2 water contains fecal coliform and, therefore, R-2 water cannot be used for the composting process.

V. Transportation and Utilities

Objective B: To meet the needs of the people of Oahu for an adequate supply of water and for environmentally sound systems of waste disposal.

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 of disposal.

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.

Comment: The project will benefit the City and State by recycling up to 150,000 tons annually of green and food waste and dewatered sewage sludge. HEP currently recycles over 85,000 tons of green and pre-consumer food waste per year from Campbell Industrial Park and Kapaa Quarry. By recycling and reusing organic materials, this waste which once was disposed of in Oahu's only landfill is being turned into beneficial products, such as soil enrichment, fertilizer replacement/enhancement, gardening and landscaping products.

The proposed project will compost dewatered sewage sludge, diverting it from landfill disposal and use it to produce beneficial agricultural product.

The facility will provide separate storm water and leachate collection and reuse systems. Rainfall collected will be directed to two storm water ponds and a retention basin on the project site from which water will be drawn to assist the maintenance of proper moisture content of the composting material and irrigation of crops. The storm water ponds, retention basin, and perimeter berm will be designed to collectively capture and retain runoff from a 100-year, 24 hour storm event within the project site and comply with "zero net charge" requirement. The storm water ponds and retention basin will have a combined capacity to store 10.1 million gallons (mg).

No discharge from storm water ponds and retention basin is anticipated as the amount of water required for operation will exceed the amount stored. Supplemental water from the on-site well will make up the balance. As a result of storm water remaining on-site, HER will be requesting an exemption from requiring a NPDES for Storm Water Associated with Industrial Activities.

Any leachate collected from the receiving building and the GORE™ covered windrows will be directed to the leachate collection system for re-processing and will not be discharged to the storm water collection system.

The storm water used will decrease the amount of potable water needed to operate the composting facility. Supplemental water from the well will be required to make up the balance.

A well will be drilled and a pump installed for the project. HER received a Well Construction Permit from the Commission on Water Resource Management (CWRM), Department of Land and Natural Resources (DLNR) (Appendix B). HER will be able to pump up to 35~~5~~9,000 gallons per day.

In addition, HER will propose to utilize R-2 water from Dole Food Company Hawaii for the irrigation of crops on the project site. R-2 water contains fecal coliform and, therefore, R-2 water cannot be used for the composting process.

4.2.2 Development and Sustainable Communities Plan

The City and County of Honolulu's Development/Sustainable Communities Plan program provides a framework for implementing the objectives and policies of the General Plan on an area wide basis. Eight community-oriented plans have been adopted covering the entire island. Each of the plans is intended to help guide public policy, investment, and decision making within their representative region.

4.2.2.1 North Shore Sustainable Communities Plan

The project site is located within the North Shore Sustainable Communities Plan, which extends from Kaena Point to Waialee Gulch near Kawela Bay, and from the shoreline slopes of the northerly ends of Waianae Koolauloa mountain ranges. The region consists mostly of agricultural lands and open space, which surround the country towns

of Haleiwa and Waialua and the rural residential communities of Mokuleia, Kawailoa, and Sunset/Pupukea.

The Honolulu City Council adopted the *North Shore Sustainable Communities Plan (SCP)* (August 2010) in April 2011. The North Shore SCP focuses on retaining the unique qualities that have defined the North Shore's attractiveness to residents and visitors alike; scenic open spaces, coastal resources, and the community's cultural and plantation heritage. Diversified agricultural also plays a role in sustaining the region's open space setting. The *North Shore SCP* provides a vision in the areas of land use, transportation, infrastructure, and public facilities. It also provides policies and guidelines for achieving that vision. The project is consistent with the following guidelines, policies and principles contained in the PUC Development Plan:

3.1.2.7 Scenic Resources and Scenic Views

According to the Open Space Map, there are panoramic views of the Waianae Range from Wilikina Drive/Kaukonahua Road.

> **Comment:** The receiving building is the tallest structure proposed and will stand approximately 36~~38~~ feet high at the centerline of building and approximately 33 feet high at side walls. It will be setback approximately 310 feet from Wilikina Drive. According to Section 21-3.50-4 and Table 21-3.1 of the Land Use Ordinance, the maximum height for buildings in AG-~~2~~1 zoning is 25 feet, if height setbacks are provided. Since the receiving facility exceeds the maximum building height by 1~~3~~ feet it will require a Zoning Variance approved the DPP.
>
> The visual impact of the proposed building will be reduced as the project site will have a six-foot tall berm along its perimeter. In addition, if the natural vegetation (tall grasses) along Wilikina Drive is allowed to grow back to 6-feet, it will screen motorists views of the receiving (see Figures 3-7 and 3-8). Therefore, no significant impact on visual resources is anticipated as a result of the proposed project.

3.2 Agriculture

3.2.1 Policies

- *Protect all productive, high-value agricultural lands, regardless of current crop production capabilities, from uses that would undermine or otherwise irreversibly compromise their agricultural potential and crop production capabilities.*
- *Promote the long-term viability of diversified agriculture on the North Shore and ensure the continued productive use of the land.*
- *Maintain a healthy and competitive industry that support a range of different types and scales of agriculture.*

- *Ensure that agriculture is the primary use of agricultural lands. Prohibit the improper use of agricultural lands, including the development or subdivision of agriculturally designated zoned lands for residential and other non-agricultural uses, unless accessory to agricultural use.*
- *Maintain the current agricultural land use and zoning designation of agricultural lands within the Community Growth Boundary that are in the State Agricultural District and zoned for agriculture, except for limited "infill" areas contiguous to Haleiwa and Waialua towns that are designated for future residential.*
- *Minimize soil erosion, pesticide and fertilizer runoff, and other nonpoint source contaminants that flow from agricultural lands to protect streams, wetlands and marine habitats.*
- *Maintain and upgrade the existing agricultural infrastructure.*
- *Encourage the development of regional agricultural support facilities at Waialua and Kawailoa through the use of economic tax incentives.*
- *Develop and enforce stringent set of criteria that define the minimum requirements for the meaningful and credible use of agricultural land.*
- *Encourage landowners to provide affordable long-term leases to farmers.*
- *Promote the development and provision of quality water resources that support bonafide agricultural operations and activities by providing economic incentives for farmers and landowners.*
- *Consider alternatives to the current tax rate structure to afford tax relief for farmers.*
- *Plan for the future of Oahu's agricultural industry and develop and island wide comprehensive agricultural development plan.*

Comment: Approximately 60 percent of the 77,000 total acres of land within the North Shore SCP region are located within the State Agricultural District (City & County of Honolulu, August 2010). The project site (112 acres) is rated "B and "E" and located outside of the North Shore SCP's Community Growth Boundary. The project site has been fallow since late 2004. HEP currently has existing open windrow composting operations (DOH Permit No. CO-0091-08) at the project site.

The proposed site in Waialua is an ideal location for HER's composting operations as it will be centrally located to Oahu's agricultural industry. HEP currently and HER will produce organic products that would be utilized by the agricultural industry to introduce organic materials into soils that have been stripped of nutrients from decades of sugar cane and pineapple cultivation and the use of chemical fertilizers. The agricultural industry would have much more access to these organic soil amendments with the project's location.

The facility will provide separate storm water and leachate collection and reuse systems. Rainfall collected will be directed to two storm water ponds and a retention basin on the project site from which water will be drawn to assist the

maintenance of proper moisture content of the composting material and irrigation of crops. The storm water ponds, retention basin, and perimeter berm will be designed to collectively capture and retain runoff from a 100-year, 24 hour storm event within the project site and comply with "zero net charge" requirement. The storm water ponds and retention basin will have a combined capacity to store 10.1 million gallons (mg).

No discharge from storm water ponds and retention basin is anticipated as the amount of water required for operation will exceed the amount stored. Supplemental water from the on-site well will make up the balance. As a result of storm water remaining on-site, HER will be requesting an exemption from requiring a NPDES for Storm Water Associated with Industrial Activities.

Any leachate collected from the receiving building and the GORE™ covered windrows will be directed to the leachate collection system for re-processing and will not be discharged to the storm water collection system.

The storm water used will decrease the amount of potable water needed to operate the composting facility. Supplemental water from the well will be required to make up the balance.

A well will be drilled and a pump installed for the project. HER received a Well Construction Permit from the Commission on Water Resource Management (CWRM), Department of Land and Natural Resources (DLNR) (Appendix B). HER will be able to pump up to 3559,000 gallons per day.

In addition, HER will propose to utilize R-2 water from Dole Food Company Hawaii for the irrigation of crops on the project site. R-2 water contains fecal coliform and, therefore, R-2 water cannot be used for the composting process.

The project should not result in substantial increases for potable water demand that may significantly impact ground water resources nor have any impacts on the surrounding environment.

The proposed land use is regulated as "major composting". Pursuant to Land Use Ordinance, Section 21-3.504(a), Table 21-3, a major composting facility is permitted in the AG-1 District subject to an approved Conditional Use Permit (major).

4.5 Solid Waste Handling and Disposal

4.5.1 Policies

- *Provide adequate resources for trash removal, cleanup of illegal dumps, and enforcement of antidumping laws.*

- *Promote recycling and other source reduction programs dedicated to minimizing the amount of solid waste generated.*

Comment: The proposed facility will provide the City and homeowners a place to recycle green and food waste and dewatered sewage sludge. HEP currently recycles over 85,000 tons of green and pre-consumer food waste per year from Campbell Industrial Park and Kapaa Quarry. By recycling and reusing organic materials, this waste which once was disposed of in Oahu's only landfill is being turned into beneficial products, such as soil enrichment, fertilizer replacement/enhancement, gardening and landscaping products. The proposed facility anticipates on handling up to 150,000 tons of green waste, food waste and dewatered sewage sludge per year.

4.2.3 Land Use Ordinance and Zoning

The City and County of Honolulu Land Use Ordinance (LUO) regulates land use in accordance with adopted land use policies, including the General Plan and DPs. The provisions are also referred to as the zoning ordinance. The project site is zoned AG-1 Restricted Agricultural District (see Figure 4-3~~2~~). The LUO defines *"composting, major minor" as a process in which organic materials are biological decomposed under controlled conditions to produce a stable humus-like mulch or soil amendment. The composting process includes, but is not limited to, receipt of materials, primary processing, decomposition activities, and final processing for sale and marketing. This term does not include bioremediation of fuel-contaminated soil."*

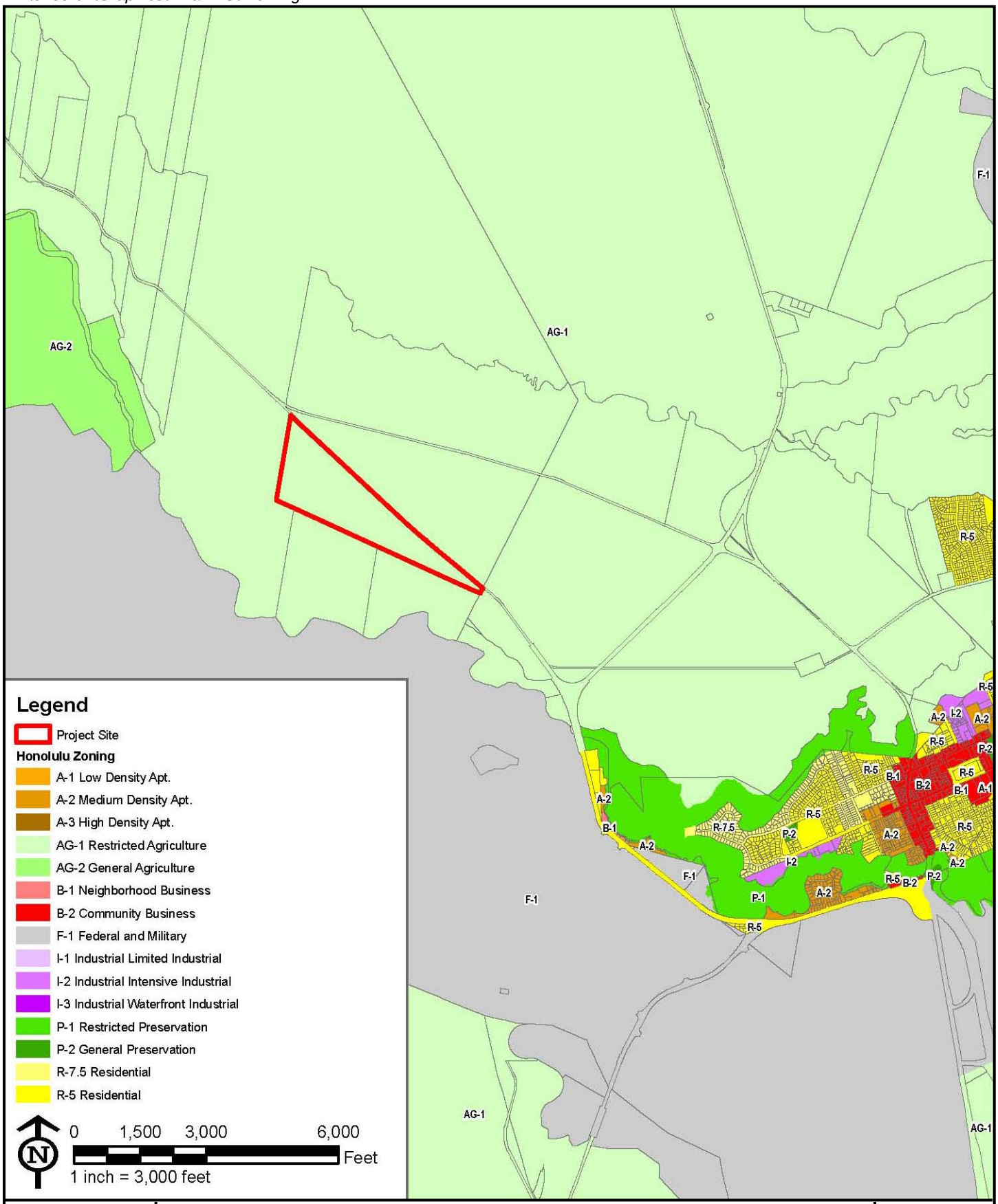
The LUO further defines major and minor composting:

- *Major composting operations involve more complex controls to manage odors, vectors and surface water contamination. For instance, in some cases, on-site odors may not be able to be completely mitigated. Major composting includes, but is not necessarily limited to, the composting of mixed solid waste, including solid waste facility residues (rubbish), sewage sludge, waste from animal food processing operations, and similar materials.*

- *Minor composting operations involve relatively simple management and engineering solutions to control odors, vectors and surface water contamination. Minor composting includes, but is not necessarily limited to, the composting of clean, source-separated organic materials, including but not necessarily limited to green waste, animal manure, crop residues, and waste from vegetable food processing operations.*

According to Section 21-3.50-4 and Table 21-3.1 of the Land Use Ordinance, the maximum height for buildings in AG-~~2~~1 zoning is 25 feet, if height setbacks are provided.

W:\8135-01\Graphics\Final EIS\Working



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ENGINEERS • PLANNERS

IN-VESSEL COMPOSTING FACILITY

CITY AND COUNTY OF HONOLULU ZONING MAP

FIGURE

4-3

Comment: The proposed project is considered "major composting", as dewatered sewage sludge will be processed. Pursuant to Land Use Ordinance, Section 21-3.504(a), Table 21-3, a major composting facility is permitted in the AG-1 District subject to an approved Conditional Use Permit (major) (See Appendix J).

The receiving building is the tallest structure proposed and will stand approximately 36~~38~~ feet high at the centerline of building and approximately 33 feet high at side walls. It will be setback approximately 310 feet from Wilikina Drive. According to Section 21-3.50-4 and Table 21-3.1 of the Land Use Ordinance, the maximum height for buildings in AG-~~2~~1 zoning is 25 feet, if height setbacks are provided. Since the receiving facility exceeds the maximum building height by 1~~3~~ feet it will require a Zoning Variance approved the DPP.

The visual impact of the proposed building will be reduced as the project site will have a six-foot tall berm along its perimeter. In addition, if the natural vegetation (tall grasses) along Wilikina Drive is allowed to grow back to 6-feet, it will screen motorists views of the receiving (see Figures 3-7 and 3-8). Therefore, no significant impact on visual resources is anticipated as a result of the proposed project.

4.2.4 Special Management Area

Coastal Zone Management objectives and policies (Section 205A-2, HRS) and the Special Management Area (SMA) guidelines (Section 25-3.2 ROH) have been developed to preserve, protect, and where possible, to restore the natural resources of the coastal zone of Hawaii. The project is outside of the SMA.

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5.0 ALTERANTIVES CONSIDERED

5.1 No Action

The No Action alternative would involve not constructing a new composting facility in Waialua. The 85,000 tons per year of green and pre-consumer food wastes would not be reused beneficially and disposed of in Oahu's only landfill with no alternatives. In addition, approximately 5,000 to 10,000 tons per year of food waste and 15,000 to 20,000 tons per year of sewage sludge would continue to be placed in the landfill with no alternatives.

5.2 Alternative Site

Property owned by the City and County of Honolulu was included on ENV's RFP for consideration for use by any proposer for the project. The alternative site encompasses 8.65 acres and is further identified as TMK: 9-1-026: 035, adjacent to the Covanta Waste to Energy Plant in Campbell Industrial Park. This site was not selected because it was too small to accommodate the projected compost volumes, the type of composting facility HER proposed, and a protected plant species is located on the parcel, where preserving it would divide the property, making it more difficult to operate a composting facility. That site was also disadvantageous for distributing the finished product in bulk to agricultural users, most of whom are located closer to the proposed Waialua site.

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6.0 CONTEXTUAL ISSUES

6.1 Relationship Between Local and Short-Term Uses of Humanity's Environment and the Maintenance of Long-Term Productivity

6.1.1 Short-Term Effects

Short-term uses and long-term productivity consist of the project's short-term construction phases and long-term benefits of the project after construction.

During construction, there will be short-term uses involving temporary and permanent alteration of the land for grading, site work and excavation for building foundations, concrete pads for windrow system and utilities. Short-term construction impacts can be avoided or mitigated by implementation of best management practices (BMPs). BMPs may include construction of berms to detain run-off and installation of silt fences to filter silt from run-off.

In the short-term, the propose project alternatives will also confer some positive economic benefits in the local area. Direct economic benefits will result from construction expenditures both through the purchase of materials from local suppliers and through the employment of local labor. Indirect economic impacts may include benefits to local retail businesses resulting from construction activities.

6.1.2 Long-Term Effects

In the long-term, the proposed project will have beneficial impacts on the environment by composting up to 150,000 tons per year of green waste, food waste and dewatered sewer sludge. By recycling and reusing organic materials, this waste is being turned into a beneficial product, such as compost, soil amendments, potting mixes, fertilizer replacement/enhancement, gardening and landscaping products. This Project will be an important and integral component of Oahu's overall Solid Waste Management System, as private companies, such as HEP, assist the City and County of Honolulu's efforts to direct materials for reuse. Use of product will also reduce reliance on imported fertilizers and soil amendments. Without this composting facility, approximately 5,000 to 10,000 tons per year of food waste and 15,000 to 20,000 tons per year of sewage sludge would continue to be placed in Oahu's only landfill with no other alternatives. Also, in the long-term, while the project initially will likely relocate workers from the existing operation at Campbell Industrial Park, the expanded facilities will create additional job opportunities.

6.2 Cumulative Impacts

Cumulative impacts are those that result from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions. Together with other existing and anticipated future development in the area, the project has the potential to generate cumulative impacts, including slight increases in overall traffic volumes on regional transportation facilities, operational and irrigation water demand,

demand for public services such as fire and police and reduction on abandoned agricultural open space.

A description of baseline human and natural environmental conditions in the project area and analysis of impacts are described in Chapter 3.

6.3 Secondary Impacts

Secondary impacts, or otherwise referred to as indirect effects, are described as those effects caused by a project, but occur later in time or farther removed in distance than direct impacts but are still reasonably foreseeable. Such effects may include impacts on environmental resources or public facilities that occur as a result of the project's influence on land use. For example, a new housing development would have a secondary impact on schools by increasing student enrollments at schools serving that area.

The proposed project is expected to have minimal, if any, secondary impacts on resident population, land use patterns, public facilities and infrastructure, and the natural environment in the project area.

Construction of the proposed project is expected to generate some short-term impacts associated with construction activities. Creation of short-term construction jobs are not expected to generate any permanent in-migrating of workers. Long-term job creation will not be so significant that residential in-migration would be anticipated.

6.4 Irretrievable and Irreversible Commitments of Resources

In the short-term, construction of the proposed project will require an irreversible and irretrievable commitment of a number of resources, including land, capital, construction materials, manpower, energy, fuel, and water. Financial, material and manpower resources will also be irretrievably committed to the planning and design of the proposed project.

There will be a long-term commitment to the use of land with the proposed action.

Effective operation of the project will also require irreversible and irretrievable commitments of labor, materials and resources (consumption of potable water and fuel). Financial resources used for construction and operation of the proposed project, once committed and used for the project, will not be available for other uses. The funds used for operation and maintenance of the facilities are largely irreversible and irretrievable upon expenditure.

In the long-term, the impact of undertaking these irreversible and irretrievable commitments of resources should be weighed against the environmental and public health benefits to be derived from the proposed project.

6.5 Probable Adverse Environmental Effects which Cannot be Avoided

Adverse impacts can be defined as short- and long-term effects relative to the construction and implementation of a specific use. Short-term impacts are usually construction-related impacts that will occur during the course of construction and cease upon completion of the project. Long-term impacts generally result from the implementation of the proposed project.

6.5.1 Short-Term Effects

Unavoidable short-term impacts, despite mitigation efforts, include those related to noise and air quality, and traffic inconveniences.

Noise: In the short-term, noise impacts associated with construction activities will be unavoidable. The various construction phases of the proposed project may generate significant amounts of noise, which may impact adjacent landowners.

Noise levels associated with construction activities are anticipated to range between 45 to 55 dBA at the closest residences during the entire project construction period. Adverse impacts from construction noise are not expected to occur due to the large buffer distances (at least 2,400 feet) from the project site to the closest residences, and construction noise mitigation measures should not be required. Implementation of DOH construction noise permit procedures will require that noisy construction activities do not occur during the nighttime, Sundays, and holidays. Therefore, adverse noise impacts are not expected to occur from construction activities on the project site.

Construction noise impacts will be mitigated by compliance with provisions of the State of Hawaii DOH Administrative Rules, Title 11, Chapter 46, "Community Noise Control". State of Hawaii DOH rules limit construction activities to the hours between 7:00 am and 6:00 pm on weekdays, except holidays, and 9:00 am to 6:00 pm on Saturday. Heavy vehicles required for construction must comply with Title 11, Chapter 42 and "Vehicular Noise Control for Oahu". It shall be the contractor's responsibility to minimize noise by properly maintaining noise mufflers and other noise-attenuating equipment, and to maintain noise levels within regulated limits. If noise levels from construction activities are expected to exceed the allowable limits set forth in Chapter 46, a noise permit may be required.

Air Quality: The proposed project will have short-term construction-related impacts on air quality, including the generation of dust and emissions from construction vehicles, equipment and commuting construction workers. During construction, activities such as grading and excavation at the project site will generate dust while vehicles and equipment will produce exhaust emissions. Dust control measures stipulated by Department of Health Administrative Rules, Title 11, Chapter 60, "Air Pollution Control" regulations will be employed, as appropriate.

Traffic: During construction, traffic along the respective corridors may be impacted for the period of the construction activity. The increased traffic from construction-related

vehicles should be insignificant during off-peak traffic periods, but may cause inconveniences to residents, businesses and motorists in the vicinity.

6.5.2 Long-Term Effects

Unavoidable long-term impacts resulting from development of the proposed ~~wastewater~~ facility improvements include those on air quality, noise, aesthetics, and energy consumption.

Air Quality: In the long-term, the primary air quality concern will be from vehicular emissions associated with motor vehicle traffic occurring at the project site. Carbon monoxide emissions are usually the primary issue, and public areas near traffic-congested intersections are the main concern, however, considering the small project-related traffic volumes that are expected, traffic from the proposed project should have no measurable long-term impacts on air pollution levels in the project area.

Odorous gases, when released by composting operations, mix with the surrounding air and can be carried by wind to surrounding areas. The results of the odor investigation depicted in Figures 3-4 and 3-5 for two threshold values of 1.0 D/T and 4.0 D/T, respectively. Both figures show that odors would be very infrequent in the Schofield Barracks, the nearest residential area to the project site. Odors may reach the threshold of detection, but less than 1% of the time, and would not reach the threshold of annoyance even 0.1% of the time in Schofield Barracks.

While the process of composting organic matter, including dewatered sewage sludge, does create odorous gases, the enclosure of the operation within the receiving building, controlled with a biofilter, and the main composting area, controlled by GORE™ cover system technology, will substantially block, and control these odorous gases.

The results of the air quality modeling analysis indicate that any off-site odors would be very infrequent, less than 0.5% occurrence and unlikely to cause or contribute to any odor complaints in the surrounding community, including Schofield Barracks.

Refer to Section 3.6 for further discussion.

Noise: In the long term, ambient noise levels in the immediate vicinity of the project site may marginally increase due to composting operations and the amount of trucks entering and exiting the site. The green and food wastes are loaded into a grinder that shreds the waste into mulch. The grinder will be located in the enclosed receiving building to minimize noise impacts. The dewatered sewage sludge will be loaded with green waste into a mixer that is located within the enclosed receiving building. Noise impacts due to operations will comply with DOH noise standards.

Potential noise impacts resulting from the noise of diesel engine driven grinder operations or other activities at the proposed project site are not expected to exceed 55 DNL at the nearest military housing area at Schofield Barracks.

The State of Hawaii Department of Health (DOH) regulates the noise levels from fixed machinery by imposing maximum allowable sound levels at the property boundaries for various zoning categories. Because of the Agricultural Zoning of the project site, the allowable noise level from fixed machinery on the project site is 70 dBA during the daytime and nighttime periods. The noise levels of portable or movable equipment (such as trucks, front end loaders, bulldozers, etc.) are not subject to the 70 dBA limit under DOH noise regulations.

Refer to Section 3.7 for further discussion.

Traffic: Almost all of the trips generated by the facility during the peak periods are expected to be trucks or other heavy vehicles either delivering to or picking up material from the facility. Traffic operations with project conditions are expected to remain similar to existing project conditions during both peak periods. No long-term impacts are anticipated.

Refer to Section 3.10 for further discussion.

Aesthetics: The receiving building is the tallest structure proposed and will stand 36~~38~~ feet high at the centerline of building and approximately 33 feet high at the side walls. The visual impact of the proposed building will be reduced as the project site will have a six-foot tall berm along its perimeter. In addition, if the natural vegetation (tall grasses) along Wilikina Drive is allowed to grow back to 6-feet it will screen motorists views of the receiving building. Therefore, no significant impact on visual resources is anticipated as a result of the proposed project.

Refer to Section 3.12 for further discussion.

6.6 Summary of Unresolved Issues

There are no unresolved issued at the time of the preparation of this EIS.

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7.0 LIST OF PERMIT APPROVALS

The following is a list of permits, approvals and reviews, which may be required, but not limited to, prior to construction of the project:

State of Hawaii

Department of Health:

- National Pollutant Discharge Elimination System (NPDES) for Storm Water Associated with Construction Activity
- Solid Waste Management Permit
- Temporary Non-Covered Source Permit
- Air Pollution Control Permit

Department of Land and Natural Resources:

- Well Construction Permit

Department of Transportation:

- Permit for Transportation of Oversized and Overweight Equipment Loads

City & County of Honolulu

- Special Use Permit, Less than 15 Acres
- Conditional Use Permit (Major)
- Building Permit
- Grading, Grubbing and Stockpiling Permit
- Zoning Variance (Height)

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8.0 CONSULTATION

8.1 Pre-Assessment Consultation

The following agencies and organizations were contacted during the pre-assessment consultation period. Of those who formally replied, some had no comments while others provided substantive comments as indicated by the ✓ and ✓✓, respectively. All written comments are reproduced herein (Appendix K).

Federal
U.S. Fish & Wildlife Service
Department of the Army, Schofield Barracks ✓✓

State
Department of Agriculture
Department of Accounting & General Services ✓
Department of Business, Economic Development & Tourism (DBEDT)
DBEDT, Office of Planning
DBEDT, Energy Division
Department of Health (DOH), Clean Water Branch ✓✓
DOH, Clean Air Branch ✓✓
Department of Land & Natural Resources (DLNR)
    Engineering Division ✓
    Division of Forestry and Wildlife ✓
DLNR, State Historic Preservation Division ✓✓
Office of Hawaiian Affairs ✓
Department of Transportation ✓
Department of Hawaiian Home Lands

City & County of Honolulu
Board of Water Supply ✓✓
Department of Planning & Permitting ✓✓
Department of Transportation Services ✓
North Shore Neighborhood Board
Wahiawa – Whitmore Village Neighborhood Board

Elected Officials
Representative Marcus Oshiro, District 39
Representative Gil Riviere, District 46
Senator Donavon Dela Cruz, District 22
Councilmember Ernie Martin, District 2

Other
Castle & Cooke

8.2 Environmental Impact Statement Preparation Notice Consultation

The following agencies and organizations were consulted during the Environmental Impact Statement Preparation Notice (EISPN). Consultation was conducted to solicit comments from the public regarding their concerns and agency requirements. Notice of availability of the EISPN was published in the March 8, 2011 issue of *The Environmental Notice*. The public comment period on the EIS Preparation Notice ran from March 9, 2011 to April 6, 2011. Of those who formally replied, some had no comments while others provided substantive comments as indicated by the ✓ and ✓✓, respectively. Copies of all written comments received along with response letters are reproduced herein as Appendix L.

Federal
U.S. Army Corps of Engineers
U.S. Fish & Wildlife Service
Schofield Barracks

State
Department of Accounting and General Services (DAGS) ✓
Department of Agriculture
Department of Business, Economic Development & Tourism (DBEDT)
DBEDT, Office of Planning
DBEDT, Energy Division
Department of Health (DOH)
DOH, Office of Environmental Quality Control ✓✓
DOH, Solid and Hazardous Waste Division ✓✓
Department of Land & Natural Resources (DLNR)
    DLNR, Engineering Division ✓
    DLNR, Division of Forestry and Wildlife ✓
DLNR, State Historic Preservation Division
Office of Hawaiian Affairs ✓✓
Department of Transportation ✓✓
Department of Hawaiian Home Lands ✓

City & County of Honolulu
Board of Water Supply ✓✓
Department of Facility Maintenance ✓
Department of Parks and Recreation
Department of Planning and Permitting
Department of Transportation Services ✓✓
North Shore Neighborhood Board
Wahiawa – Whitmore Village Neighborhood Board

Elected Officials
Representative Marcus Oshiro, District 39 ✓✓
Representative Gil Riviere, District 46

Senator Donavon Dela Cruz, District 22
Councilmember Ernie Martin, District 2

Other
Castle & Cooke

8.3 Draft EIS Consultation

~~Pursuant to Chapter 343, HRS and Title 11, Chapter 200, HAR consultation will be conducted during the Draft EIS comment period to solicit comments from public agencies, elected officials, and community organizations regarding their concerns and agency requirements.~~ The following agencies and organizations were consulted during the Draft EIS consultation process. Consultation was conducted to solicit comments from the public regarding their concerns and agency requirements. Notice of availability of the Draft EIS was published in June 23, 2011 issue of The Environmental Notice. The public comment period ended on August 6, 2011. Of those who formally replied, some had no comments while others provided substantive comments as indicated by the ✓ and ✓✓, respectively. Copies of all written comments received along with their respective responses are~~will be~~ reproduced ~~and included in the forthcoming Final EIS~~herein as Appendix M.

Federal
U.S. Army Corps of Engineers
U.S. Fish & Wildlife Service
Department of the Army, Schofield Barracks

State
Department of Accounting and General Services (DAGS) ✓
Department of Agriculture
Department of Business, Economic Development & Tourism (DBEDT)
DBEDT, Office of Planning
DBEDT, Energy Division
Department of Defense ✓
Department of Education ✓
Department of Health (DOH)
    Clean Water Branch ✓✓
Department of Housing Finance and Development Corporation
Department of Human Services ✓
Department of Land & Natural Resources (DLNR)
    Engineering Division ✓✓
    Division of State Parks ✓
    Commission on Water Resource Management ✓✓
DLNR, State Historic Preservation Division
Department of Labor and Industrial Relations ✓
Office of Hawaiian Affairs
Department of Transportation ✓✓

Department of Hawaiian Home Lands ✓
UH Environmental Center

City & County of Honolulu
Board of Water Supply ✓
Department of Design and Construction ✓
Department of Environmental Services
Department of Facility Maintenance ✓
Department of Planning and Permitting
Department of Transportation Services ✓✓

North Shore Neighborhood Board
Wahiawa – Whitmore Village Neighborhood Board

Elected Officials
Representative Marcus Oshiro, District 39 ✓✓
Representative Gil Riviere, District 46
Senator Donavon Dela Cruz, District 22
Councilmember Ernie Martin, District 2

Other
Castle & Cooke
Dole Food Company Inc.
Honolulu Star-Advertiser
Wahiawa Rainbow Seniors
Wahiawa Community & Business Association

Legislative Reference Bureau
Hawaii State Library
Wahiawa Library
Waialua Library
University of Hawaii, Hamilton Library

8.3.1 Meetings and/or Presentations with Elected Officials, Agencies and Stakeholders

Presentations were given to the following:

- Wahiawa – Whitmore Village on March 21, 2011 May 16, 2011, ~~and June 6, 2011~~, and June 20, 2011
- North Shore Neighborhood Board on March 22, 2011. ~~and~~ May 24, 2011, and June 28, 2011
- Wahiawa Community and Business Association on May 9, 2011 (see Appendix ~~M~~N)

- Wahiawa Rainbow Seniors on August 8, 2011

HER met with the following agencies and/or individuals:

- U.S. Army Garrison (Schofield Barracks) on May 26, 2011
- Senator Donovan DelaCruz on March 21, 2011
- Representative Gil Riviere on March 23, 2011
- Representative Marcus Oshiro on March 18, 2011 and September 2, 2011

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Appendix A

Documentation for the Approval of GORE™ Cover Systems As Enclosed Composting Systems, GORE™ Cover

DOCUMENTATION FOR THE APPROVAL OF *GORE® COVER* SYSTEMS AS ENCLOSED COMPOSTING SYSTEMS

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DOCUMENTATION FOR THE APPROVAL OF THE *GORE™ COVER* SYSTEMS AS ENCLOSED COMPOSTING SYSTEMS

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ENCLOSED 3
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ANNEX 1: CERTIFICATES OF THE HYGIENE TYPE VALIDATION SYSTEM 18
ANNEX 2: HUNGARIAN CERTIFICATE FOR "ENCLOSED SYSTEM" 19

Bear in mind that the demand for "enclosed" or "in-vessel" composting systems is increasing globally when determining the technical standards or legal requirements for composting and for individual approval of composting systems. This leads to the following question: which are the systems that can be considered as enclosed systems and how can an enclosed system be defined? The GORE® Cover system should be considered in detail in this document.

DEFINITIONS

COMPOSTING SYSTEM

A composting system is a system comprising functionally related components for favoring the microbiological decomposition processes of organic materials under aerobic conditions.

ENCLOSED

This term has various definitions in technical literature:

Definition 1: The term "Encapsulation" according to the composting handbook means: enclosing composting areas having a waste air treatment unit[1]

Definition 2: A system is considered to be enclosed when the materials does not have any contact with the environment as against an open system; exchange of energy is however possible[2].

Definition 3: "Enclosed" means a spatial separation of the system from its environment.

It is accepted that the term "enclosed system" must be modified for composting systems as these are normally in contact with the environment as far as materials and energy are concerned.

In order to adhere to the aerobic composting process, the gases (CO_2, steam) generated by the microorganisms continually need to be replaced by atmospheric oxygen. Irrespective of the waste air treatment system, waste air is constantly released in the environment.

[1] Composting handbook of the Bemkastel-Wittlich district administration, 2002

[2] http://wasser-wissen.de/abwasserlexikon/g/geschlossenessystem.htm

FUNCTIONING PRINCIPLE

Conventional composting technologies normally use two-stage *or* multi-stage functional units to reduce emissions:

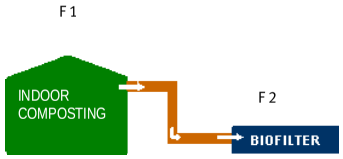
"Two-stage and multi-stage functional units":

Composting module (e.g. composting hall, composting tunnel) + biofilter or composting module + biofilter + washer

"Functional unit 1": composting module: decomposition of biogenic materials, hygienization

"Functional unit 2": waste gas collection and treatment plant: odor, aerosol and dust minimization

Example



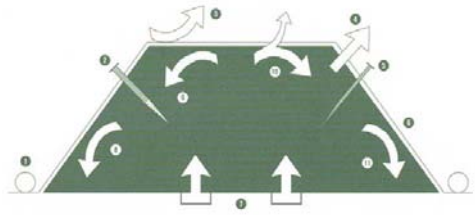
As far as emission control is concerned, "Functional unit 1" can be characterized as closed to a large extent when it is functioning properly. On the other hand, "Functional unit 2" is intended for the essential exchange of materials with the environment and, among other things, also releases residual odor emissions in the environment.

In comparison, the GORE® Cover system achieves the same emission control with a single-stage structure.

"Single-stage functional unit": (refer to pg. 5)

Functional unit: Composting module including waste gas collection and treatment system: Optimization of the organic decomposition process along with reduction in emissions (odors, germs, dust, bioaerosols)

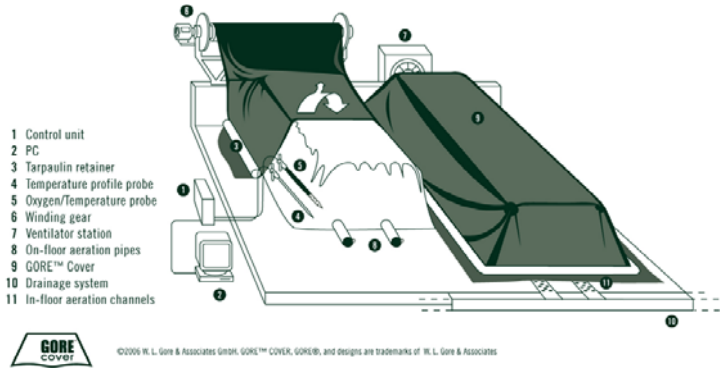
1	Enclosure suppression system
2	O_2 measuring probe
3	Weather
4	CO2
5	Temperature profile measuring stick
6	GORE® Cover
7	Air
8	Heat
9	Odor
10	Moisture
11	Germs/bacteria



THE *GORE® COVER* SYSTEM – A SINGLE-STAGE FUNCTIONAL UNIT

The GORE™ Cover system mainly consists of three components: GORE® Cover membrane enclosure, forced ventilation, control unit.

The combination of the membrane enclosure and regulated forced aeration ensures safe process control. The ventilators are controlled by the oxygen parameter. The relevant data, which is taken directly from the heap body using sensors, is processed in the computer and is subsequently used for the documentation of the operational procedure.
As soon as the mechanically pre-processed homogenized material has been placed on the aeration channels through front-end loaders and after the probes have been introduced in the composting material the GORE® Cover enclosure is pulled over the heap and sealed on the ground. The heap is not opened for the next four weeks.



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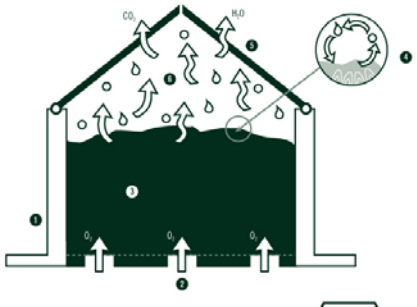
The membrane pore structure of the GORE® Cover enclosure ensures a lot more than just the function of encapsulation – the treatment process is optimized.

The GORE® Cover laminate is also used in the BIODEGMA® system:

SCHEMATIC DIAGRAM OF THE STRUCTURAL APPLICATION OF GORE™ COVER

The composting material is aerated by means of aeration ducts in the ground, while CO_2 and water vapour are extracted via the GORE™ Cover in the roof and doors. Odours and microbes are retained.

1 Side wall
2 In-floor aeration ducts
3 Composting material
4 Moisture roof construction and re-condensation
5 Mobile roof construction with mit GORE™ Cover
6 Moisture



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GORE® COVER LAMINATE STRUCTURE:

The GORE® Cover laminate consists of three layers firmly connected with each other:



100% PES, highly tenacious, olive

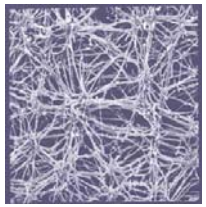
GORE ePTFE membrane

100% PES, highly tenacious, white

The core of the GORE™ Cover laminate includes the Gore ePTFE membranes specially developed for the waste industry and manufactured using the GORE-TEX® membrane production technology. They are laminated between two high-tenacity polyester layers. On the one hand, they protect the composting material from seeping rainwater, and on the other hand, permit CO_2 and water that develops during the composting process to escape.

THE GORE ePTFE MEMBRANE

The GORE® Cover membrane is made of three-dimensionally stretched **P**oly**t**etra**f**luoro**e**thylene (ePTFE). The pore size and even the air permeability, water-tightness, germ density and steam permeability are defined by this stretching process. For example: a drop of water has a diameter of approximately 0.1 to 3 mm and cannot seep through the pores; a steam molecule has a diameter of approximately 0.0003 µm and thus can easily seep through the membranes.



A microscopic view of a GORE® Cover ePTFE membrane

The GORE® Cover laminate works against gaseous substances that escape from the composting material as diffusion barriers. A condensate film that retains odors and other gaseous substances also develops during the composting process on the inner side of enclosures made from it. These gases mostly dissolve in the water film and drip back into the composting material where the bacteria are further decomposed. This in turn reduces the overall emission flux.
The correct choice of membranes also influences the moisture discharge during the composting process. On the one hand, it helps in preventing an excessively wet end product and on the other hand, the material contains sufficient moisture to enable adequate decomposition of biogenic materials, especially in arid zones. It is practically impossible for germs to pass through the Gore ePTFE membrane due to its microporous structure[3].

Germ reduction of > 99% could be proved in several microbiological tests: Industrial safety and safety of the residents is thus ensured. Thanks to the thermal insulation of the GORE® Cover enclosure and the temperature-distributing excess pressure in the system, the temperature required for material hygienization can be ensured throughout the pit even during winter. Pathogenous germs throughout the composting material are definitely killed.

As compared to a typical, structurally enclosed composting system with biofilter, only a maximum of a quarter or even less process air needs to be exchanged when the GORE® Cover system is used. Emission fluxes and energy consumption are proportionately lower.

[3] ANAWA Bioservice Scientific Laboratories GmbH, Report 951282

OBJECTIVES OF CLOSED COMPOSTING SYSTEMS

Closed composting systems are required to meet the objective of protecting humans, animals, plants as well as water, soil and air from emissions such as odor, aerosols and dust.

ODOR RETENTION

Without any emission reduction measures, concentration of odorous substances within a range of 1,000 to 40,000 odor units per m^3 waste air can be measured in composting systems.

For the reduction of odors, odor concentration limit values or odor reduction rates are prescribed in technical norms or approvals from time to time. Both limiting values do not always lead to effective protection of the environment from odors. The limiting concentration ignores the odor flux decisive for the odor perception in the environment; the reduction rate does not consider the typical curve progression of odor formation during the composting process.

However, whether and how frequently odors are sensed, and how disturbing these are found to be ("hedonic tone"), is critical for the protection of the residents.
The odor exposure guideline (GIRL (OEG)) applicable in Germany sets corresponding limiting values for the frequency with which odors can be perceived from a system in the nearest area. Residents should not sense odors for more than 10% (in residential and mixed areas) and 15% (in trade and industrial areas) of the total number of hours in a year[4].

Evaluation of the GORE® Cover system
In the year 2000, the German Federal Foundation for Environment (DBU) supported a research project in cooperation with the University of Stuttgart and BIODEGMA GmbH, Stuttgart related to: "Price-worthy composting under semipermeable enclosure covers compared to established aerobic waste treatment procedures?"[5,6]

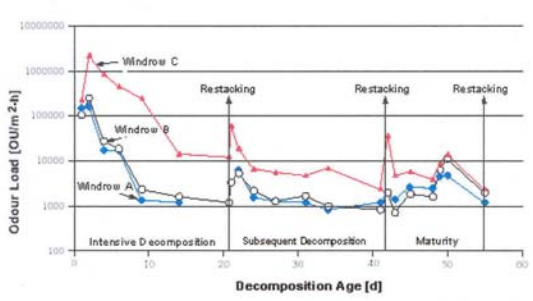
[4] Refer to GIRL – odor exposure guideline (OEG) 3.1, immission values, dated 21.09.2004

[5] Refer to DBU 2000: Composting under semipermeable enclosure covering as a low-emission "Low-Tech" and "Low-Cost" process, final report of the research project AZ 08776, Osnarbrück, unpublished report;

[6] Organic waste Composting, New developments and solutions for the reduction of odour emissions, HLUG, 2001

The comparison with other waste treatment procedures (container composting + biofilter, enclosed pile + biofilter) as described in the study shows that the procedure of enclosed cover composting shows excellent results as far as odor reduction is concerned. The study also illustrates that a two-week container composting with subsequent unventilated curing may lead to an absolutely disadvantageous emission situation even when compared to open windrow composting.
This study also explains that the entire waste treatment system must be always taken into consideration when forming an emission balance; considering only a part of the system, such as only the high rate composting in an enclosed structure is not sufficient.

This DBU research project revealed that the use of an enclosure cover with ventilation (heap A+B) in high rate composting as compared to open windrow composting (windrow C) leads to a 90% reduction in the odor emissions. If this enclosure cover is also used in the curing phase, the odor flux can be lowered to up to 98%.



Windrow C: Open windrow composting
Heap A+B: Composting with membrane covers
Re-stacking: Re-stacking a heap
Intensive decomposting: Phase I of intensive rot (high rate composting)
Subsequent decomposition: Phase II of intensive rot (stabilization)
Maturity: curing (Phase III)
Decomposition age [d]: Number of composting days
Odor load [OU/m²h]: Odor flux [OU/m²h]

Meanwhile, after implementing more than 170 systems equipped with the GORE® Cover system across the world with a total throughput of 2.7 million tons per year, a lot of data from odor measurements is available from systems operated for years. They prove that odor emissions have decreased by more than 90% with the GORE® Cover procedure[7].

[7] Cost-effective composting by using textile heap enclosures, pg. 181-190, M.Kühner, 1997; also refer to odor measurements in test heaps at the composting plant in Mannheim for the assessment of odor reduction using GORE-TEX® functional enclosures for heap composting, Stuttgart; unpublished report

Based on these odor measurements, officially taken control measurements as well as on the aforementioned study, a comparative report about the odor immissions was prepared in 2006 by a qualified expert in accordance with the guidelines of the German Environmental Law (TA Luft, GIRL). This sample study confirms that the GORE™ Cover System is at least equivalent to the established composting systems, and the GORE® Cover System achieves less odor immissions (odor perception frequencies) when compared with established tunnel or container composting systems.
The minimum distances up to the nearest residential area as required by the German Approval Law can be reduced in system approval with the use of GORE® Cover system.

To sum up, one may say that the GORE® Cover system has an odor reduction rate of up to 97%. Averaged over the entire composting period using the GORE® Cover enclosure (intensive rot), residual emissions less than 500 OU/m³ can be achieved.

RETENTION OF AEROSOLS AND MICROORGANISMS

Biotechnical procedures use and optimize biological decomposition processes that are then accelerated and optimized spatially. With these processes, bioaerosols (simplified in the following as “Germs”), i.e. air-borne bacteria (e.g. actinomycetes), fungi or their spores (aspergilla), as well as dead particles can be found in addition to the normal emissions such as dust, odor or noise.
In order to prevent danger to or negative effects on system personnel and residents, extensive retention of these bioaerosols is essential from the point of view of immission control.

Different types of germs have different sizes[8]:

- Bacteria and spores: 0.5 – 10 µm
- Fungus spores: 1 – 30 µm
- Viruses: 0.02 – 0.26 µm

Gore microporous ePTFE membranes are capable of effectively retaining germs of these sizes.
This retention effect is supported by the fact that microorganisms do not normally appear as individual particles, but exist in the form of the described aerosols of microcolonies and aggregates linked to dust particles or water droplets [9]; thus, they have cross sections that are considerably larger than the pore sizes of the Gore ePTFE membrane and can be therefore filtered more effectively.

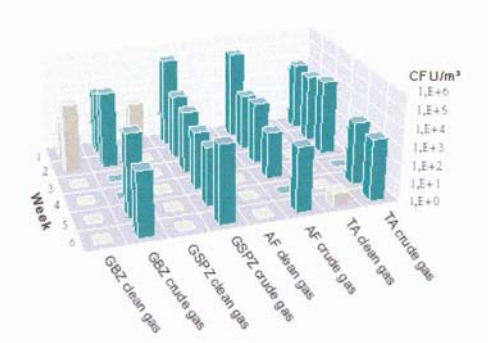
[8] Organic waste Composting – New developments and solutions for the reduction of odour emissions, page 7, HLUG, 2001

[9] Organic waste Composting – New developments and solutions for the reduction of odour emissions, page 13, HLUG, 2001

Since the cost factors in the industrial waste management require the decomposition and stabilization of the organic material to be as fast as possible, even the microbial activity in the composting system should be increased. This also includes high germ concentrations within active composting systems[10].

Structurally enclosed systems retain aerosols by collecting waste air and by treating waste air loaded with germs using a two-stage or multi-stage functional unit (e.g.´scrubber-filter combination).

Comparative measurements[11,12] within and outside the GORE® Cover membrane enclosures show an almost 100% retention capacity as regards air-borne germs for the total number of bacteria (GBZ), the total number of molds (GSPZ) as well as for both the primary germs of these categories, namely Aspergillus Fumigatus (AF) and Thermophile Actinomycetes (TA). Refer to the following figure for composting under semipermeable laminate enclosures[13].



AF: Aspergillus Fumigatus
TA: Thermophile Actinomycetes
GBZ: total number of bacteria
GSPZ: total number of molds

The almost complete retention of every sort of germ is also confirmed by certificates [14] of independent testing institutes, which could prove the impermeability of the heap enclosure used in the GORE® Cover system with the help of enhanced testing devices.

[10] Microorganisms in the environment of waste treatment systems, Hessian State Office for Environment and Geology, Department of Waste Management, Volker Kummer, Pg. 37-38

[11] Microorganisms in the environment of waste treatment systems, Hessian State Office for Environment and Geology, Volker Kummer, Pg. 34

[12] Refer to Fischer, K.& Kühner: Cost-effective composting by using textile pit lids, pg. 191-209

[13] Refer to Organic waste Composting – New developments and solutions for the reduction of odour emissions, HLUG

[14] ANAWA BIOSERVICE Scientific Laboratories GmbH, Report 951282

Measurements for the residual germ flux above the GORE® Cover membrane enclosure show that emissions even during the high rate composting phase are reduced to germ-figures below the limit of detection[15].

DUST

Dust is a natural element of air and thus exists virtually everywhere. Among other things, dust is formed by the release of biological materials (spores, seeds), and rises from the ground. Dust can be differentiated as coarse dust (> 10 µm) and fine dust. Dust with a particle size between 1 and 10 µm is termed as fine dust[16]. This fine dust is ubiquitous, can be inhaled and may affect the health.
In the technical instructions for keeping the air clean (TA Luft), a limiting value of 10 mg/m³ is determined for dust-forming emissions in waste air (TA Luft 5.4.8.5: total dust).
The GORE® Cover membrane has an average pore size of 0.3 µm. Empirical values prove that the GORE® Cover enclosure retains at least 99% of the fine dust.

HYGIENE

From the point of view of quality, “Hygienic safety” is an important criterion for the compost assessment. As per the requirements of the EU Law, waste treatment procedures must prove their epidemic and phytohygienic safety and their hygienic effectiveness, especially when waste of animal origin is being treated. For composting, this means that plant germs as well as germs that may be in the feedstock used for creating compost are definitely killed during the composting procedure used and during which high temperatures are generated. Moreover, a system must be designed such that re-contamination of the hygienized product is ruled out. This is achieved by encapsulating the heaps and a controlled collection of leachate, among other things.

Type approval

The hygiene type approval system is based on the principle of testing certain composting and fermentation procedures thoroughly for their efficacy to kill germs/effectiveness in killing germs. As one of the pioneers, the German Federal Community for Quality has created an extensive set of rules to determine the composting and fermentation procedures as hygienically tested prototypes[17].

[15] Refer to DBU 2000, pg. 142

[16] Refer to www. Umweltlexikon: fine dust

[17] Refer to hygiene prototype test, 3rd revised edition of the Bundesgütegemeinschaft Kompost e.V.

Then, Salmonella senftenberg W775 (H2S negative), tomato seeds, Tobacco-Mosaic virus and Plasmodiophora brassicae must be removed from the biological waste, so as not to let the compost become a medium for spreading germs. This must be safely and reliably carried out in every single batch.

In Germany, all composting systems must undergo a direct process inspection, i.e. the so-called hygiene type approval as per § 3 section 4 and annex 2 of the biological waste decree (BioAbfV) among other things[18]. The GORE® Cover system (three layer laminate with ePTFE membrane and manipulator, forced air ventilation and oxygen-temperature-control) sold by W. L. Gore & Associates GmbH is one such approved type: In the "Heap encapsulated"[19] category, this technology has an independent type which proves that certain primary germs are reliably killed within two weeks even though they are, thermodynamically, at the most unfavorable positions in the heap body.
The continuous monitoring and documentation of temperatures and oxygen concentrations in the individual pit batches using the operating software, the so-called indirect process inspection, ensures a cost-effective and permanent check of the composting process. By striking a balance with the necessary minimum requirements (correlation of time, temperature and particle size), the operation of the composting system as regards process hygiene can be achieved for each batch in conformity with the law.

The type approval ensures that hygienic safety of the composting process is achieved with membrane-covered, forced air ventilated systems (GORE®Cover system) just as in structurally enclosed systems. Also as far as hygienic safety is concerned, the GORE® Cover system is state-of-the-art.

Similar testing criteria are also applied in the same or a similar form in other countries for the determination of hygienic suitability of composting systems. Even Hungary has implemented a similar certification procedure. The GORE® Cover system has been acknowledged as a closed system in Hungary as well.[20]

European Animal By-products Regulation (ABPR; 1774/2002/EC)

Implementation of the European ABPR guideline is very different as per the national law. There are still uncertainties in the implementation of the guideline; a uniform European procedure is lacking. Existing type approved systems are taken as a basis to test for the conformity to ABPR to a certain extent. In some cases, single and repeat tests must be conducted for systems. In any case, apart from fulfilling the technical

[18] Refer to the decree on the assessment of biological waste on soil used for agriculture, forest and gardening (biological waste decree – BioAbfV) dated 21.09.98 in BGBI I, pg. 2955ff

[19] see annex 1: HB certificate, technical data sheet

[20] Confirmation about the fulfillment of criteria of an "enclosed compost system", Szent Istvan University, Gödöllö, 2002

requirements, organizational measures have to be taken to rule out the re-contamination of the hygienized product.

An example could be the London Waste Composting Center in London's Edmonton EcoPark that was approved in 2005, since Great Britain applies the most stringent standards in the whole of Europe as regards reactions to the BSE and foot-and-mouth disease. 30,000 t/a of kitchen, green and garden waste (140 t/day) from the seven London districts is treated there in 16 composting modules from BIODEGMA®: in order to fulfill the stringent ABPR requirements, these composting modules are always loaded from one side and emptied from the other. This is achieved by a proper separation of the necessary front-end loaders. The "Two-Barrier-System" can be thus implemented to rule out the risk of re-contamination of the hygienized product: The material to be treated undergoes a three-week closed high rate composting and then a similar three-week enclosed stabilization; thus, hygienization is ensured twice. The fresh compost subsequently matures for another 4-6 weeks in unventilated windrows (turned with a side turner), before it is finally marketed as high-quality ready compost.

Composting systems with GORE® Cover enclosures have been approved in many countries (Ireland, Hungary, Great Britain, Spain, and Germany) since the national ABPR laws have come into force.

SUMMARY:

The requirement for enclosed or in-vessel models of composting systems is justified for the protection of the health of humans, animals, plants and environmental assets, namely water, soil and air from emissions such as odor, aerosols and dust.

The term “enclosed system” for composting systems of all kinds is only partially applicable as they are unexceptionally in contact with the environment as far as materials and energy are concerned. Irrespective of the waste air treatment system, purified waste air is always released in the environment.

Composting systems with GORE® Cover enclosures have been internationally recognized as enclosed or in-vessel systems (e.g. in Hungary, USA, UK, Spain, Sweden, Italy, Ireland, Finland, Estonia, Germany and Canada).

The GORE® Cover laminate is water-proof and reduces odor. As against open systems, it prevents convection. It is thermally insulating and germ-proof.

The GORE® Cover system can be considered as a single-stage functional unit. At the same time, this system meets all requirements that are met by two or multi-stage functional units (retention of dust, odor and aerosols). It also meets the requirements of the hygiene type approval system and produces compost of the highest quality.

The parity of the membrane-covered, forced ventilated GORE® Cover composting system as regards emission control led to the approval of more than 170 systems in 27 countries across the world.

Annex 1: Certificate of the hygiene type approval conducted at the Cyriaxweimar composting plant



GÜTEZEICHEN KOMPOST RAL

CERTIFICATE

After examination of the submitted documentation acc. to digit 5 hygiene design survey system the Bundesgütegemeinschaft Kompost e.V. (German federal organisation concerned with the quality of compost)

certifies
the Hygiene Design

GORE™ Cover System 14 days

Enclosed System (Membrane Cover)

Hygiene Design 7.2

of

W. L. GORE & ASSOCIATES

as an audited composting system
in the sense of the hygiene design survey (HBPS).

The guideline of the performance and audit provision of the RAL quality mark for indirect process provision has to be observed

Bundesgütegemeinschaft Kompost e. V.

Bundesgütegemeinschaft

Postfach 92 01 64 • D-51151 Köln
Telefon: 02203/3 58 37- 0
Telefax: 02203/3 58 37-12
www.Kompost.de • info@BGKeV.de

Cologne, April 28th 2003

Date/Stamp

Annex 3: Hungarian certificate for “enclosed system”

SZENT ISTVÁN EGYETEM GÖDÖLLŐI TERÜLETI IRODA
TALAJTANI ÉS AGROKÉMIAI TANSZÉK

DR. ALEXA LÁSZLÓ PhD.

2103 GÖDÖLLŐ
PÁTER KÁROLY U. 1
TEL: 28/410-200/1811
FAX: 28/410-804

C O N F I R M A T I O N

About the fulfillment of the criteria of an “enclosed composting system”

According to the Hungarian environmental protection guidelines and legal norms (biological waste decree, 2002), a composting technique is recognized as an enclosed system, if *“during the composting process, the raw materials are separately treated in a closed area, without letting the untreated solid, liquid or gaseous particles enter the environment.” “In closed systems, the composting process is accelerated by forced-ventilation, optimization of the water content and temperature.”*

In accordance with the aforementioned features, the GORE® Cover system, comprising the GORE® Cover, a ventilation unit and a control unit is recognized as an “enclosed composting system”.

E X P L A N A T I O N

The conformity with the environmental protection guidelines has been confirmed as per the logs of the laboratory tests conducted at W.L. GORE & ASSOCIATES GmbH, Pasteur Institute and Anawa Bioservice, and as per the practically oriented logs of test composting (see annex 1 and 2 of the claimant).

The raw materials are spatially separated and treated by covering the heaps with GORE™ cover, and by fastening the cover. This helps in preventing dust emissions and the scattering of different larger particles due to wind.

The GORE™ Cover System also helps in separating the accumulation and the backflow of leachate of endogenous origin during the composting process. In the claimant's composting system, ground water contamination is prevented by collecting this leachate in the leachate channels installed below the heaps first, and then in the tanks.

The spreading of odorous substances and the molecules responsible for the odor emission is ascertained with the help of olfactometeric measurements and computer modeling. On the basis of these tests, it was proved that only a minimal quantity of odorous substances reach the environment with this technology, which is safe from the point of view of environmental protection as well as industrial safety.

Gödöllő, 15 April 2002.
Dr. Alexa László

Appendix B

Well Construction Permit
Commission on Water Resource Management,
Department of Land & Natural Resources
Letter dated November 4, 2010

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON

WILLIAM D. BALFOUR, JR.
SUMNER ERDMAN
NEAL S. FUJIWARA
CHIYOME L. FUKINO, M.D.
DONNA FAY K. KIYOSAKI, P.E.
LAWRENCE H. MIIKE, M.D., J.D.

LENORE N. OHYE
ACTING DEPUTY DIRECTOR

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

November 4, 2010

Ref: 3104-02.wcp

Ms. Tracie Sober
Valley Well Drilling, LLC
91-458 Komohana Street
Kapolei, HI 96707

Dear Ms. Sober:

Well Construction Permit
HEP-1 Well (Well No. 3104-02)

Enclosed are two (2) copies of your approved Well Construction Permit for the captioned well(s) that authorize well construction activities but excludes installation work for a permanent pump. As part of the Chairperson's approval, the following special conditions were added and are part of your permit under Permit Condition 17:

Special Conditions

1. **Attached for your information are copies of the Department of Health's (DOH) review comments. Please note DOH's requirements related to discharge of effluent from well drilling and testing activities. Also, please contact the Noise Radiation and Indoor Air Quality Branch at 586-4700 to check compliance with construction noise permit requirements for this project.**

Please refer to the Permit Processes Worksheet (transmitted with your acknowledgement letter) for further information regarding the process of drilling a well and installing a pump.

No withdrawal of water shall be made other than for testing purposes until a certificate of pump installation completion has been issued by the Commission.

Please sign both permit originals and return **one** copy to the Commission office for our files. For copies of the aquifer pump test worksheet, please call staff or visit www.state.hi.us/dlnr/cwrm/forms.htm.

IMPORTANT - Drilling work shall not commence until a fully signed permit is returned to the Commission. The permit shall be prominently displayed or made available at the construction site during construction. Be advised that you may be subject to fines of up to $5,000 per day for any violations of your permit conditions starting from the permit approval date.

If you have any questions, please call Charley Ice of the Commission staff at 587-0218.

Sincerely,

for LAURA H. THIELEN
Chairperson

Enclosures

c: Hawaiian Earth Products (with applicable comments – DOH CWB)
Cedar Grove, Hawaii, LLC

WELL CONSTRUCTION PERMIT

HEP-1 Well, Well No. 3104-02

Note: This permit shall be prominently displayed at the construction site until the work is completed

In accordance with Department of Land and Natural Resources, Commission on Water Resource Management's Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", this document permits the construction and testing of **HEP-1 Well** (Well No. **3104-02**) at TMK **(1) 6-5-002:026, Oahu**, subject to the Hawaii Well Construction & Pump Installation Standards (HWCPIS - February 2004) which include but are not limited to the following conditions:

1. The Chairperson of the Commission on Water Resource Management (Commission), P.O. Box 621, Honolulu, HI 96809, shall be notified, in writing, at least two (2) weeks before any work authorized by this permit commences and staff shall be allowed to inspect installation activities in accordance with §13-168-15, Hawaii Administrative Rules (HAR).
2. This permit shall be prominently displayed, or made available, at the site of construction work until work is completed.
3. The well construction permit shall be for construction and testing of the well only. The permittee shall coordinate with the Chairperson and conduct a pumping test in accordance with the HWCPIS (the latest pump test worksheet can be obtained by contacting Commission staff or at **www.hawaii.gov/dlnr/cwrm/resources_permits.htm**). The permittee shall submit to the Chairperson the test results as a basis for supporting an application to install a permanent pump. No permanent pump may be installed until a pump installation permit is approved and issued by the Chairperson. No withdrawal of water shall be made for purposes other than testing without a Certificate of Pump Installation Completion. The permitted pump capacity described on the pump installation permit **may be reduced** in the event that the pump test does not support the capacity.
4. In basal ground water, the depth of the well may not exceed one-fourth (1/4) of the theoretical thickness (41 times initial head) of the basal ground water unless otherwise authorized by the Chairperson. If it can be shown that the well does not tap basal ground water then this condition may be waived after consultation with and acceptance by Commission staff. However, in no instance can the well be drilled deeper than one-half (1/2) of the theoretical thickness without Commission approval.
5. The permittee shall incorporate mitigation measures to prevent construction debris from entering the aquatic environment, to schedule work to avoid periods of high rainfall, and to revegetate any cleared areas as soon as possible.
6. In the event that historically significant remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee shall stop work and immediately contact the Department of Land and Natural Resources' State Historic Preservation Division. Work may recommence only after written concurrence by the State Historic Preservation Division.
7. The proposed well construction shall not adversely affect existing or future legal uses of water in the area, including any surface water or established instream flow standards. This permit or the authorization to construct the well shall not constitute a determination of correlative water rights.
8. The Well Completion Report Part I shall be submitted to the Chairperson within sixty (60) days after completion of work (please contact staff or visit **www.hawaii.gov/dlnr/cwrm/resources _permits.htm** for current form).
9. The permittee shall comply with all applicable laws, rules, and ordinances; non-compliance may be grounds for revocation of this permit.
10. The well construction permit application and, if relevant, any related staff submittal approved by the Commission are incorporated into this permit by reference.
11. If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.
12. Any variances from the HWCPIS shall be approved by the Chairperson prior to invoking the variance.
13. The work proposed in the well construction permit application shall be completed within two (2) years from the date of permit approval, unless otherwise specified. The permit may be extended by the Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than the date the permit expires.
14. If the well is not to be used it must be properly capped. If the well is to be abandoned during the course of the project then the permittee must apply for a well abandonment permit in accordance with §13-168-12(f), HAR, prior to any well sealing or plugging work.
15. The permittee, its successors, and assigns shall indemnify, defend, and hold the State of Hawaii harmless from and against any loss, liability, claim, or demand for property damage, personal injury, or death arising out of any act or omission of the applicant, assigns, officers, employees, contractors, and agents under this permit or relating to or connected with the granting of this permit.
16. This permit shall apply to the location shown on the application only. If the well is to be relocated, the permittee shall apply for a new well construction/pump installation permit in accordance with §13-168-12(f), HAR.
17. Special conditions in the attached cover transmittal letter are incorporated herein by reference.

Date of Approval: **February 17, 2010**
Expiration Date: **February 17, 2012**

Laura H. Thielen

LAURA H. THIELEN, Chairperson
Commission on Water Resource Management

I have read the conditions and terms of this permit and understand them. I accept and agree to meet these conditions as a prerequisite and underlying condition of my ability to proceed and understand that I shall not commence work until I have signed, dated, and returned the permit to the Commission. I understand that this permit is not to be transferred to any other entity. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $5,000 per day starting from the permit date of approval.

Driller's Signature: _____ COPY C-57 License #: **C-24947** Date: _____

Printed Name: Tracie Sober Firm or Title: Valley Well Drilling, LLC

Please sign both copies of this permit, return one copy to the Commission office, and retain the other for your records.

Attachment

FAX TRANSMITTAL
State of Hawaii Department of Health
Environmental Management Division
Clean Water Branch - Engineering Section
Phone No.: (808) 586-4309
Fax No.: (808) 586-4352

Fax to: Mr. Ryan Imata / Mr. Charley Ice / Ms. Denise Mills
Company: Commission On Water Resource Management
Department of Land and Natural Resources
Fax No.: 587-0219

Date: 10.9.09
Fax from: Joanna L. Seto
Total Pages, incl. cover: 2+ 1

Subject: Well Construction/Pump Installation Permit Application(s)
Well No(s). 3104-02-

The Department of Health, Clean Water Branch (CWB) has the following comments:

1. For Well-Drilling Activities

Any discharge to State waters of treated process wastewater effluent associated with well drilling activities is regulated by Hawaii Administrative Rules (HAR), Title 11, Chapter 55, Appendix I, effective October 22, 2007, and compiled June 15, 2009. Treated process wastewater effluent covered by this general permit includes well drilling slurries, lubricating fluids wastewater, and well purge wastewater. This general permit does not cover well pump testing. The applicable Notice of Intent (NOI) Forms and filing fee shall be submitted at least 30 calendar days before the start of discharge to the:

Department of Health
Clean Water Branch
919 Ala Moana Boulevard, Room 301
Honolulu, Hawaii 96814-4920

The CWB-NOI Forms are available online at
http://www.hawaii.gov/health/environmental/water/cleanwater/forms/genl-index.html.
Inquiries may be directed to the CWB at (808) 586-4309 or by fax (808) 586-4352.

2. For Well Pump Testing

The discharger shall take all measures necessary to prevent the discharge of pollutants from entering State waters. Such measures shall include, if necessary, containment of initial discharge until the discharge is essentially free of pollutants. If the discharge is entering a stream or river bed, best management practices shall be implemented to prevent the discharge from disturbing the clarity of the receiving water. If the discharge is entering a storm drain, the discharger must obtain written permission from the owner of the storm drain prior to discharge. Furthermore, best management practices shall be implemented to prevent the discharge from collecting sediments and other pollutants prior to entering the storm drain.

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON

WILLIAM D. BALFOUR, JR.
SUMNER ERDMAN
NEAL S. FUJIWARA
CHIYOME L. FUKINO, M.D.
DONNA FAY K. KIYOSAKI, P.E.
LAWRENCE H. MIIKE, M.D., J.D.

KEN C. KAWAHARA, P.E.
DEPUTY DIRECTOR

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

2009 OCT 2 8:45 AM

October 1, 2009

TO: Honorable Chiyome L. Fukino, M.D., Director
Department of Health
Attention: Tomas See, Chief, Wastewater Branch
Stuart Yamada, Chief, Safe Drinking Water Branch
Alec Wong, Chief, Clean Water Branch
Dr. Keith Kawaoka, Office of Hazard Evaluation and Emergency Response

FROM: Laura H. Thielen, Chairperson
Commission on Water Resource Management

SUBJECT: Well Construction/Pump Installation Permit Application
HEP-1 Well (Well No. 3104-02)

Transmitted for your review and comment is a copy of the captioned Well Construction/Pump Installation permit application.

We would appreciate your comments on the captioned application for any conflicts or inconsistencies with the programs, plans, and objectives specific to your department. **Please respond by returning this cover memo form by November 2, 2009**. If we do not receive comments or a request for additional review time by this date, we will assume that you have no comments.

Please find the attached maps to locate the proposed well. If you have any questions about this permit application, request additional information, or request additional review time, please contact Ryan Imata of the Commission staff at 587-0255.

RI:ss
Attachment(s)

RESPONSE:

[ ] This well qualifies as a source which will serve as a source of potable water to a public water system (defined as serving 25 or more people at least 60 days per year or has 15 or more service connections) and must receive Director of Health approval prior to its use to comply with Hawaii Administrative Rules (HAR), Title 11, Chapter 20, Rules Relating to Potable Water Systems, §11-20-29.

[ ] This well does not qualify as a source serving a public water system (serves less than 25 people or more people at least 60 days per year or 15 service connections) and if the well water is used for drinking, the private owner should test for bacteriological and chemical presence before initiating such use and routinely monitor the water quality thereafter. However, if future planned use from this source increases to meet the public water system definition then Director of Health approval is required prior to implementation.

[ ] If the well is used to supply both potable and non-potable purposes in a single system, the user shall eliminate cross-connections and backflow connections by physically separating potable and non-potable systems by an air gap or an approved backflow preventer, and by clearly labeling all non-potable spigots with warning signs to prevent inadvertent consumption of non-potable water. Backflow prevention devices should be routinely inspected and tested.

[ ] It does not appear that this well will be used for consumptive purposes and is not subject to Safe Drinking Water Regulations.

[ ] For the applicant's information, a source of possible wastewater contamination [ ]is [ ] is not located near the proposed well site (information attached).

[ ] An NPDES permit is required.

[✓] Other relevant DOH rules/regulations, information, or recommendations are attached.

[ ] In the event that the location of the well changes but is still within the parcel described on this application, our division considers the comments to still be applicable, and we do not need to review the new location.

[ ] No comments/objections

Contact Person: Joanna L. Seto Phone: 586-4309

Signed: Joanna Seto Date: 10-9-09

090788

Appendix C

Biological Survey for the In-Vessel Composting Site,
Rana Biological Consulting, Inc. and AECOS Consultants
February 2011

Biological Surveys Conducted on the In Vessel Composting Site, TMK: 6-5-02:026, Waialua District, Island of O'ahu

Prepared by:

Reginald E. David
Rana Biological Consulting, Inc.
P.O. Box 1371
Kailua-Kona, Hawai'i 96745

&

Eric Guinther
AECOS Consultants
45-309 Akimala Pl.
Kāne'ohe, Hawai'i 96744

Prepared for:

Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

February, 2011

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Introduction

Hawaiian Earth Recycling LLC (HER) is proposing to construct an in-vessel composting facility in Waialua on the island of O'ahu (Figure 1). The proposed site is located on Tax Map Key: 6-5-002: 0x 26, owned by Cedar Grove Hawaii LLC and encompasses approximately 112 acres (Figure 1). The proposed project site has been cleared and is zoned, AG-2, surrounded by similar zoned agricultural lands to the north, south, east and west. Schofield Barracks is located approximately 800 meters south of the proposed project site (Figure 1).

This report describes the methods used and the results of, botanical, avian and mammalian surveys conducted on the subject property as part of the environmental disclosure process associated with the proposed project.

The primary purpose of the surveys was to determine if there are any botanical, avian or mammalian species currently listed, or proposed for listing under either federal or State of Hawai'i endangered species statutes within or adjacent to the study area.

The federal and State of Hawai'i listed species status follows species identified in the following referenced documents, (Department of Land and Natural Resources (DLNR) 1998; U. S. Fish & Wildlife Service (USFWS) 2005a, 2005b, 2011). Fieldwork was conducted on February 15, 2011.

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.

Project Description

Currently, the City and County of Honolulu's (C&C) Curbside Green Waste Collection Program; individual homeowners; commercial tree trimmers and landscape maintenance contractors, and governmental property maintenance agencies deliver green wastes to one of two Hawaiian Earth Products' (HEP is an affiliated company of HER) DOH-permitted composting/transfer locations, located at Campbell Industrial Park and Kapa'a Quarry, respectively. HEP recycles over 85,000 tons of green waste per year from both facilities. By recycling and reusing organic materials, this waste which once was dumped at O'ahu landfills is being turned into a beneficial product, such as, soil enrichment, fertilizer replacement/enhancement, gardening and landscaping products. HEP has moved its existing open window composting operations at Campbell Industrial Park to the facility (Department of Health (DOH) Permit No. CO-0091-08), at Waialua. This project will allow the existing DOH-permitted operation to include in-vessel composting.

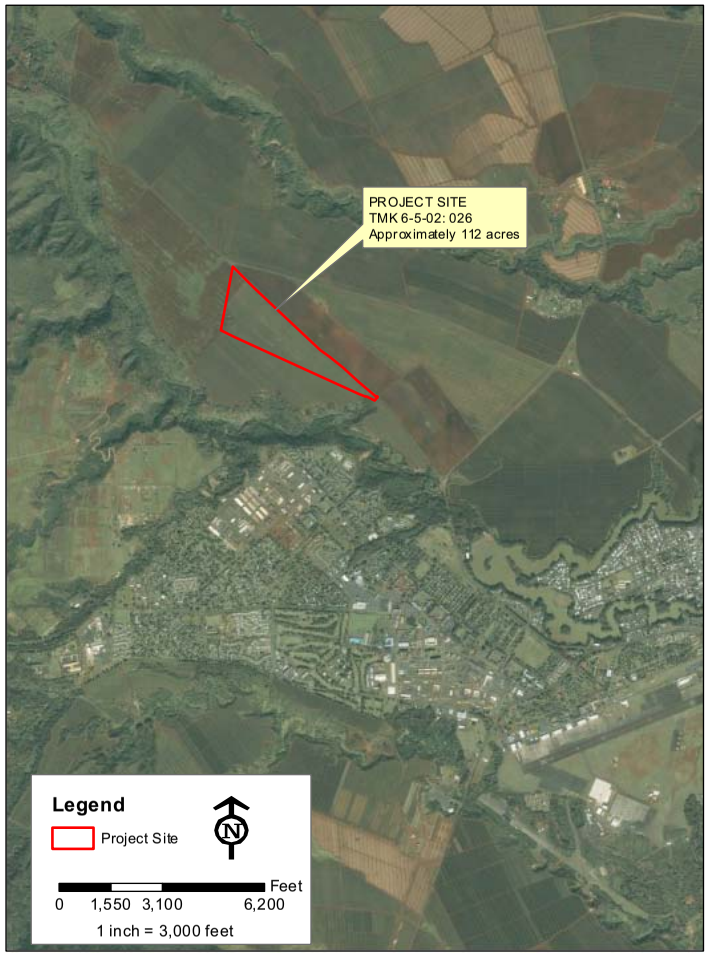


Figure 1. In-vessel Composting Location Map

The in-vessel composting facility will process up to 100,000 tons per year of green waste, food waste, and sewage sludge and produce marketable compost products, such as, soil amendments, and potting soil. By weight, this total amount is estimated to consist of approximately 70 to 80 percent green waste, 5 to 10 percent food waste and 15 to 20 percent dewatered sewage sludge. Food waste will be delivered from an as yet to be developed C&C food waste collection program and the sewage sludge will come from the C&C's Honouliuli and Kailua Regional Wastewater Treatment Facilities. It should be noted that the facility may be expanded in the future, through mutual agreement between the C&C and HER, to handle up to 150,000 tons per year.

The proposed facility will consist of the following: truck weighing scale; enclosed tipping and preparation building; processing area where the Gore system will be installed; stormwater retention ponds; leachate storage tank; and, open product storage area (see Figures 3 and 4). These facilities will encompass approximately 38 acres of the 112-acre parcel. The remainder is used for the existing open windrow composting operating and demonstration field using compost to assist crop production.

Site Description

The triangular site is bordered on the northeast by Wilikina Drive, and by fallow agricultural fields to the north, south and west (Figure 1, 2, & 3). The site slopes away gently from a high point near the middle towards the west, south, and east, with the lowest point in the southeast corner adjacent to a dry gulch. The elevation is 280 meters (940 feet) above sea level. The proposed project site has been plowed and cleared of all vegetation with the exception of a narrow soil berm on the order of 6 feet in height constructed around the entire perimeter (except at two highway access points; see Figure 4).



Figure 2 – Typical plowed habitat on the site, showing Mt. Ka'ala to the west-south-west



Figure 3 – Northern portion of site looking west-south-west towards ponded storm water



Figure 4. A portion of the berm surrounding the parcel, in foreground just constructed, in background with grass and forbs starting to take hold.

Methods

Plant names follow *Manual of the Flowering Plants of Hawai'i* (Wagner *et al*., 1990, 1999) for native and naturalized flowering plants, and Mushrooms of Hawai'i (Hemmes and Desjardin, 2002) for fungi. The avian phylogenetic order and nomenclature used in this report follows the *AOU Check-List of North American Birds* (American Ornithologists' Union, 1998), and the 42nd through the 51st supplements to the Check-List (American Ornithologists' Union 2000; Banks et al., 2002, 2003, 2004, 2005, 2006, 2007, 2008; Chesser *et al*., 2009, 2010). Mammal scientific names follow (Tomich, 1986). Place names follow (Pukui *et al*., 1974). Place names follow *Place Names of Hawaii* (Pukui *et al.,* 1974).

Botanical Survey

The botanical survey was undertaken on February 15, 2011 utilizing a pedestrian transect that traversed much of the site, but particularly the margins. The survey was conducted in the wet season and plants typical of this area, especially annuals, were readily observed and identified. For a few species not immediately recognized in the field, photographs were taken and/or material collected for identification in the laboratory.

Avian Survey

Five avian count stations were evenly spaced along a linear transect running the length of the project site. A single 8-minute avian point count was made at each count station. Field observations were made with the aid of Leica 10 X 42 binoculars and by listening for vocalizations. The count and subsequent search of the remainder of the site was conducted between 8:00 am and 11:00 am. Time not spent counting the point count stations was used to search the rest of the site for species and habitats not detected during the point count. Weather conditions were ideal, with no rain, unlimited visibility and winds of between 1 and 5 kilometers an hour.

Mammalian Survey

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 sign. A running tally was kept of all terrestrial vertebrate mammalian species detected within the project area.

Results

Botanical Survey

A plant checklist (Table 1) was compiled from field observations, with entries arranged alphabetically under plant family names (standard practice). Included in the list are scientific name, common name, and status (whether native or non-native) for each species observed on the property. Species status given in **bold** indicates a plant of some interest to the Hawaiian Islands flora (indigenous, endemic, or Polynesian introduction). 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 1 and apply to observations made during the present survey. For some species, a two-level system of abundance is used: the letter-number codes indicating species that have a clustered distribution (that is, a species infrequently encountered, but numerous where located). For example, an abundance rating of "R" indicates a plant encountered only once or twice during the entire survey. An "R2" indicates a plant encountered in just one or two places, but with several to many individuals present where encountered. An "R3" would be a plant seldom encountered (i.e., rare), but locally abundant in one or two of the locations where it was encountered.

The project area presently supports only weedy growth on the margins of a plowed field. The plowed area is dominated by fungal mushrooms (predominantly *Coprinus curtus*), a result of admixing of compost into the soil. A few seedlings were evident in the field and stored compost, but these are recently germinated. A slightly different mix of ruderal herbs occur along the verge of the highway, which is regularly mowed. However, most of the plants that occur here were observed as well on the soil berms surrounding the parcel .

A total of 41 species of flowering plants were identified during the survey. With the exception of three indigenous species (7%), all the rest are naturalized species. *Pōpolo* (*Solanum americanum*) and *ʻuhaloa* (*Waltheria indica*) are common and very widespread natives in Hawaiʻi. *Kou* (*Cordia subcordata*), a common indigenous tree, was seen here only as a seedling germinating in a compost pile.

Table 1 - Checklist of Plant Species Observed at the Proposed In-Vessel Composting Site.

Species listed by family	*Common name*	*Status*	*Occurrence*	*Notes*
	FLOWERING PLANTS			
	DICOTYLEDONES			
ACANTHACEAE				
Justicia betonica L.	white shrimp plant	Nat	R3	
AMARANTHACEAE				
Amaranthus viridis L.	slender amaranth	Nat	U	<1>
ARALIACEAE				
Schefflera actinophylla (Endl.) Harms	octopus tree	Nat	--	<2>
ASTERACEAE (COMPOSITAE)				
Ageratum conyzoides L.	*maile hohono*	Nat	U	
Bidens alba (L.) DC	---	Nat	AA	
Crassocephalum crepidioides (Benth.) S. Moore	---	Nat	U1	
Emilia fosbergii Nicolson	Flora's paintbrush	Nat	U	
Sonchus oleraceus L.	sow thistle	Nat	C	
BIGNONIACEAE				
Spathodea campanulata P. Beauv.	African-tulip tree	Nat	R	<3>
BORAGINACEAE				
Cordia subcordata Lam.	*kou*	**Ind**	R	<3>
BRASSICACEAE				
Coronopus didymus (L.) Sm.	swinecress	Nat	R	
Lepidium virginicum L.	pepperwort	Nat	O2	
CONVOLVULACEAE				
Ipomoea obscura (L.) Ker-Gawl.	---	Nat	C3	
Ipomoea triloba L.	little bell	Nat	U	
CUCURBITACEAE				
Momordica charantia L.	balsam pear	Nat	O	
EUPHORBIACEAE				
Euphorbia heterophylla L.	*kaliko*	Nat	U2	<1>
FABACEAE				
Canavalia sp.	white flwr	Nat	R	
Crotalaria juncea L.	sunn hemp	Orn	R	
Leucaena leucocephala (Lam.) deWit	*koa haole*	Nat	--	<3>
Medicago polymorpha L.	bur clover	Nat	R	
FABACEAE (cont.)				
Samanea saman (Jacq.) Merr.	monkeypod	Nat	R	<3,4>
LAMIACEAE				
Leonotis nepetifolia (L.) R. Br.	lion's ear	Nat	R	<4>
MALVACEAE				

Table 1 (continued).

Species listed by family	*Common name*	*Status*	*Occurrence*	*Notes*
Malva parviflora L.	cheese weed	Nat	U	
Malvastrum coromandelianum (L.) Garcke	false mallow	Nat	R	
Sida rhombifolia L.	--	Nat	R	
Sida spinosa L.	prickly sida	Nat	R	
MYRTACEAE				
Eucalyptus robusta Sm.	swamp mahogany	Nat	R	<2>
NYCTAGINACEAE				
Boerhavia coccinea Mill.	false *alena*	Nat	R	
PLANTAGINACEAE				
Plantago lanceolata L.	nrw-lvd. plantain	Nat	--	<1>
SOLANACEAE				
Nicandra physalodes (L.) Gaertn.	apple of Peru	Nat	R	
Solanum americanum Mill.	*pōpolo*	**Ind**	U1	
Solanum lycopersicum var. cerasiforme (Dunal) Spooner	cherry tomato	Nat	R	
STERCULIACEAE				
Waltheria indica L.	*'uhaloa*	**Ind**	R	
MONOCOTYLEDONES				
CYPERACEAE				
Cypreus rotundus (L.) Merr.	nut grass	Nat	R	
POACEAE				
Chloris sp.	fingergrass	Nat	U	
Digitaria insularis (L.) Mez ex Ekman	sourgrass	Nat	C3	
Digiteria sp.	crabgrass	Nat	R	
Eleusine indica (L.) Gaertn.	wiregrass	Nat	U	
Melinus repens (Willd.) Zizka	Natal redtop	Nat	O2	
Seteria verticillata (L.) P. Beauv.	bristly foxtail	Nat	U	
Urochloa maxima (Jacq.) Webster	Guinea grass	Nat	AA	

Legend to Table 1

STATUS = distributional status for the Hawaiian Islands:

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.

Om = Ornamental or agricultural; not known to be naturalized on O'ahu.

OCCURRENCE = abundance ratings for plants in survey 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:

Table 1 (continued).

1 – several plants present
2 - many plants present
3 – locally abundant

NOTES: <1> – A species associated almost exclusively with the highway verge.
<2> - Seen in gulch just outside south end of site (if abundance given, also on site) .
<3> – Seedlings only; in field or compost piles.
<4> - plant lacking flowers or fruit; identification uncertain.

Avian Survey

A total of 250 individual birds of 17 species, representing 13 separate families, were recorded during station counts. An additional two species, Mallard x Hawaiian Duck hybrid (*Anas platyrhynchos x A. wyvilliana*), and Ruddy Turnstone (*Arenaria interpres*) were recorded as incidental observations while transiting between count stations (Table 2). Three of the species detected, Mallard x Hawaiian Duck hybrid, Pacific Golden-Plover (*Pluvialis fulva*), and Ruddy Turnstone are native species. Of the 19 species recorded during both station counts and as incidental observations, 16 are considered to be alien to the Hawaiian Islands (Table 2).

One avian species detected, Mallard x Hawaiian Duck hybrid is currently listed as an endangered species under both federal and State of Hawaii endangered species statutes (DLNR, 1998; USFWS, 2011). Two birds were seen flying over the site in a south to north direction. No other avian species detected during the course of this survey are protected or proposed for protection under either the federal or State of Hawai'i endangered species statutes.

Avian diversity and densities were in keeping with the highly disturbed nature of the habitat present on the site, and the site's location. Four species, Red Avadavat (*Amandava amandava*), Pacific Golden-Plover, Common Waxbill (*Estrilda astrild*) and Sky Lark (*Alauda arvensis*) accounted for 53 percent of all birds recorded during station counts. The most commonly recorded species was Red Avadavat, which accounted for 16 percent of the total number of individual birds recorded. An average of 50 individual birds was recorded per station count.

Table 2 – Avian Species Detected Within the Proposed In-Vessel Composting Project Site

Common Name	*Scientific Name*	*ST*	*RA*
	ANSERIFORMES		
	ANATIDAE – Ducks, Geese & Swans		
	Anatinae – Ducks		
Mallard x Hawaiian Duck	*Anas platyrhynchos x Anas wyvilliana*	**EE**	**I-2**
	GALLIFORMES		
	PHASIANIDAE – Pheasants & Partridges		
	Phasianinae – Pheasants & Allies		
Gray Francolin	*Francolinus pondicerianus*	A	1.60
Black Francolin	*Francolinus francolinus*	A	0.80
Ring-necked Pheasant	*Phasianus colchicus*	A	0.60
	CHARADRIIFORMES		
	CHARADRIIDAE – Lapwings & Plovers		
	Charadriinae – Plovers		
Pacific Golden-Plover	*Pluvialis fulva*	IM	6.20
	SCOLOPACIDAE – Sandpipers, Phalaropes & Allies		
	Scolopacinae – Sandpipers & Allies		
Ruddy Turnstone	*Arenaria interpres*	IM	**I-1**
	COLUMBIFORMES		
	COLUMBIDAE – Pigeons & Doves		
Spotted Dove	*Streptopelia chinensis*	A	1.00
Zebra Dove	*Geopelia striata*	A	4.60
	PASSERIFORMES		
	ALAUDIDAE – Larks		
Sky Lark	*Alauda arvensis*	A	6.00
	PYCNONOTIDAE – Bulbuls		
Red-vented Bulbul	*Pycnonotus cafer*	A	2.80
	CETTIIDAE – Cettia Warblers & Allies		
Japanese Bush-Warbler	*Cettia diphone*	A	1.20
	ZOSTEROPIDAE – White-eyes		
Japanese White-eye	*Zosterops japonicus*	A	0.60
	STURNIDAE – Starlings		
Common Myna	*Acridotheres tristis*	A	3.80
	EMBERIZIDAE – Emberizids		
Red-crested Cardinal	*Paroaria coronata*		0.80
	CARDINALIDAE – Cardinals Saltators & Allies		
Northern Cardinal	*Cardinalis cardinalis*	A	0.60

Table 2 (continued).

Common Name	*Scientific Name*	*ST*	*RA*
	FRINGILLIDAE – Fringilline and Carduleline Finches & Allies		
	Carduelinae – Carduline Finches		
House Finch	*Carpodacus mexicanus*	A	4.80
	ESTRILDIDAE – Estrildid Finches		
	Estrildinae – Estrildine Finches		
Common Waxbill	*Estrilda astrild*	A	6.20
Red Avadavat	*Amandava amandava*	A	8.00
Chestnut Munia	*Lonchura atricapilla*	A	0.40

Key to table 2

ST	Status
EE	Endangered Endemic – Native and unique to Hawaii, also listed as endangered under the ESA
I-	Incidental Observation – Seen while transiting the site, followed by number detected
A	Alien – Introduced to the Hawaiian Islands by humans
IM	Indigenous Migrant – Native migratory species, does not breed in Hawai'i
RA	Relative Abundance - Number of birds detected divided by the number of count stations (5)

Mammalian Survey

The only terrestrial mammalian species detected on site during the course of this survey was dog (*Canis f. familiaris*). Tracks of one animal were encountered along the dirt road immediately abutting the grass verge between the plowed field and Wilikina Drive.

No mammalian species currently protected or proposed for protection under either the federal or State of Hawai'i endangered species programs were detected during the course of this survey, nor were any expected (DLNR, 1998; USFWS; 2005a, 2005b, 2011).

Discussion

Botanical Resources

The vegetation present on the site is limited to weedy species growing on soil berms surrounding the parcel. The land has been recently plowed, and few weeds have yet ventured forth. The dominant "vegetation" over a majority of the site in its present state are fungi feeding on recently added wood chips and compost (Figure 6). Surrounding parcels, presently fallow, give a good indication of the flora on the project site (or potentially invading if left fallow). In general, Guinea grass (*Urochloa mutica*) dominates these fallow fields, although beggartick (*Bidens alba*), golden crown-beard (*Verbesina encellioides*), fuzzy rattlepod (*Crotalaria incana*), and *'uhaloa* could all be seen as common to abundant on the adjacent land.

The vegetation in this area is almost completely alien as demonstrated by the fact that only three native plant species were recorded during the course of this survey. From a botanical perspective there are no resources that are special or unique present on this site. No plant species currently listed, or proposed for listing under either the federal or the State of Hawai'i endangered species programs were detected during the course of this survey.



Figure 5. Fungal fruiting structures (mushrooms) covering parts of the field where compost has been plowed in. Dark green band in background is grass-covered berm.

Avian Resources

The findings of the avian survey are consistent with the location of the property, and the highly disturbed habitat present on the site. Three avian species detected during the course of this survey are native species. A total of 31 Pacific Golden-Plover were recorded during station counts. One Ruddy Turnstone was recorded as an incidental observation flying over the site. Both of these species are indigenous migratory shorebird species that nest in the high Arctic during the late spring and summer months, returning to Hawai'i and the Tropical Pacific to spend the fall and winter months each year. They usually leave Hawai'i for their trip back to the Arctic in late April or the very early part of May. Two Mallard x Hawaiian Duck hybrids were seen flying over the site as we arrived at 8:00 am. The habitat on the site did not represent typical habitat used by this endangered species.

Although no seabirds were detected during the course of this survey, several seabird species potentially overfly the site on occasion. The primary cause of mortality in resident seabirds is thought to be predation by alien mammalian species at the nesting colonies (USFWS 1983; Simons and Hodges 1998; Ainley *et al.,* 2001). Collision with man-made structures is considered to be the second most significant cause of mortality in locally nesting seabird species in Hawai'i. Nocturnally flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting. When disoriented, seabirds often collide with manmade structures, and if they are not killed outright, the dazed or injured birds are easy targets of opportunity for feral mammals (Hadley 1961; Telfer 1979; Sincock 1981; Reed *et al.*, 1985; Telfer *et al.*, 1987; Cooper and Day, 1998; Podolsky *et al.* 1998; Ainley *et al.,* 2001; Hue *et al.,* 2001; Day *et al* 2003).

There are no known nesting colonies of any of the resident seabird species present on O'ahu on, or within close proximity of the project site.

Mammalian Resources

The findings of the mammalian survey are consistent with the location of the property and the habitat currently present on the site. Although no rodents were detected during the course of this survey, it is likely that the four established alien *muridae* fund on O'ahu, roof rat (*Rattus r. rattus*), Norway rat (*Rattus norvegicus*), European house mouse (*Mus musculus domesticus*) and possibly Polynesian rats (*Rattus exulans hawaiiensis*) use various resources found within the general project area on a seasonal basis. All of these introduced rodents are deleterious to native ecosystems and the native faunal species dependant on them.

No Hawaiian hoary bats were detected during the course of this survey. Given the paucity of documented records of this species on O'ahu and the complete lack of suitable roosting vegetation on the site the chance that any use resources on the subject property are extremely low (USFWS, 1998; David, 2010).

Potential Impacts to Protected Species

Botanical Resources

No plants of any concern or having protective status were observed and none is to be expected on the site.

Waterbirds

The principal potential impact that the operation of the proposed in-vessel composting facility poses to listed waterbird species is disturbance to any nests that could potentially occur on the site if birds are attracted to the storm-water retention basins.

Seabirds

The principal potential impact that construction and operation of the proposed in-vessel composting facility poses to protected seabirds is the increased threat that birds will be downed after becoming disoriented by lights associated with the project during the nesting season. The two main areas that outdoor lighting could pose a threat to these nocturnally flying seabirds is if, 1) during construction it is deemed expedient, or necessary to conduct nighttime construction activities, 2) following build-out, the potential operation of facility security lighting during the seabird nesting season.

Recommendations

- To minimize the potential that protected waterbird species that may be attracted to the storm-water retension basin could be disturbed by facility operations, it is recommended that the project develop and implement an Endangered Waterbird Management plan (EWMP).

- The EWMP should include a training module, which should be given to all employees on an annual basis that educates them about the protected waterbird species, details any restrictions and best management practices that will be followed when, and if, birds are present on the site.

- The EWMP should include standard BMP's and restrictions that the project will follow when, and if, protected waterbirds are on the property, as well as an emergency response and reporting process that will be followed in the unlikely event that anything untoward happens to a protected waterbird species on the property.

- If nighttime construction activity or equipment maintenance is proposed during the construction phases of the project, all associated lights should be shielded, and when large flood/work lights are used, they should be placed on poles that are high enough to allow the lights to be pointed directly at the ground.

- If facility or security lighting is installed in conjunction with the project, it is recommended that the lights be shielded to reduce the potential for interactions of

nocturnally flying seabirds with external lights and man-made structures (Reed *et al.*, 1985; Telfer *et al.*, 1987).

Critical Habitat

There is no federally delineated Critical Habitat present on or adjacent to the property. Thus the development and operation of proposed in-vessel composting Facility will not result in impacts to federally designated Critical Habitat. There is no equivalent statute under State law.

Glossary

Alien – Introduced to Hawai'i by humans
Commensal – Animals that share human food and lodgings, such as rats, mice cats and dogs.
Endangered – Listed and protected under the Endangered Species Act of 1973, as amended (ESA) as an endangered species
Endemic – Native to the Hawaiian Islands and unique to Hawai'i
Indigenous – Native to the Hawaiian Islands, but also found elsewhere naturally
Mauka – Upslope, towards the mountains
Muridae – Rodents, including rats, mice and voles, one of the most diverse family of mammals
Naturalized – A plant or animal that has become established in an area that it is not indigenous to
Nocturnal – Night-time, after dark
'Ōpe'ape'a – Endemic endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*)
Pelagic – An animal that spends its life at sea – in this case seabirds that only return to land to nest and rear their young
Phylogenetic – The evolutionary order that organisms are arranged by
Ruderal – Disturbed, rocky, rubbishy areas, such as old agricultural fields and rock piles
Sign – Biological term referring tracks, scat, rubbing, odor, marks, nests, and other signs created by animals by which their presence may be detected
Taxa – a taxonomic group of any rank, such as a species, family, or class
Threatened – Listed and protected under the ESA as a threatened species

C&C - City and County of Honolulu's (C&C)
DLNR – Hawai'i State Department of Land & Natural Resources
DOFAW – Division of Forestry and Wildlife
DOH - Department of Health
ESA – Endangered Species Act of 1973, as amended
HEP – Hawaiian Earth Products
HER - Hawaiian Earth Recycling LLC
USFWS – United State Fish & Wildlife Service

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Appendix D

Air Quality Impact Assessment,
B.D. Neal & Associates
March 9, 2011

B.D. NEAL & ASSOCIATES

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March 9, 2011

Ms. Tracy Fukuda
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, HI 96826

Subject: Waialua In-Vessel Composting Facility Project
Air Quality Impact Assessment

Dear Ms. Fukuda:

In response to your request, we have examined the potential air quality impacts related to the proposed In-Vessel Composting Facility Project located at Waialua, Oahu. The results of this examination along with background information related to this issue and recommended mitigation measures are summarized below.

Project Description

Hawaiian Earth Recycling, LLC (HER) is proposing to develop an in-vessel composting facility at a location adjacent to Wilikina Drive in Waialua on the island of Oahu. The proposed facility will be designed to process up to 150,000 tons per year of green and food waste as well as dewatered sludge from the City and County of Honolulu's Honouliuli and Kailua Regional Wastewater Treatment Facilities. The proposed facility will include a truck weighing scale, enclosed receiving building, open composting area, storm water retention pond, leachate storage tank, open product storage area and crop production and demonstration field. Access to the proposed facility will be provided via a new driveway off Wilikina Drive. It is expected that the proposed project would be completed during the year 2012 and operational in the year 2013.

Ambient Air Quality Standards

Both federal and state standards have been established to maintain ambient air quality. At the present time, seven parameters are regulated including: particulate matter, sulfur dioxide, hydrogen

sulfide, nitrogen dioxide, carbon monoxide, ozone and lead. The federal and state standards pertain to most of the same parameters, although at present, for several of the parameters regulated, the federal standards are more stringent than the Hawaii standards.

Regional and Local Climatology

Regional and local climate together with the amount and type of human activity generally dictate the air quality of a given location. Winds in the project area are predominantly trade winds which are probably deviated somewhat from the northeast toward the north or northwest by the local terrain. During winter, occasional storms may generate strong winds from the south (kona winds) for brief periods. When the trade winds or kona winds are weak or absent, local landbreeze-seabreeze circulations or mountain drainage winds may develop. Although published wind data for this area of Oahu is limited, wind speeds are likely often lower compared to coastal locations more directly exposed to the trade winds, but the trade winds can still be expected to provide relatively good ventilation much of the time. Temperatures in the Waialua area are generally very moderate with average daily temperatures ranging from about 65°F to 81°F. Extreme temperatures range from about 47°F to about 99°F. Rainfall is relatively low to moderate with an average of about 28 inches per year.

Existing Air Quality Conditions

Air quality in the vicinity of the project presently is mostly affected by emissions from vehicular sources which emit carbon monoxide, nitrogen oxides, hydrocarbons and other air pollutants. Air quality data from the nearest monitoring stations operated by the Hawaii Department of Health suggest that all state and national air quality standards are currently being met in the downtown Honolulu area.

Air Quality Impacts of Project

Short-term direct and indirect impacts on air quality could potentially occur during 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 soil

excavation, aggregate processing and vehicle movement; and (2) exhaust emissions from on-site construction equipment. Indirectly, there also could be short-term air quality impacts from the disruption of traffic on nearby roadways, from slow-moving construction equipment traveling to and from the project site, and from a temporary increase in local traffic caused by commuting construction workers.

Fugitive dust emissions from construction activities are difficult to estimate accurately because of their elusive nature of emission and because the potential for dust 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 U.S. 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 from project construction would likely be somewhere near this level. In any case, State of Hawaii Air Pollution Control Regulations prohibit visible emissions of fugitive dust from construction activities at the project property line. Thus, an effective dust control plan for the project construction phase should be prepared.

Adequate fugitive dust control can usually be accomplished by the establishment of a frequent watering program to keep bare-dirt surfaces in active construction areas from becoming significant sources of dust. On days without rainfall, construction areas should be watered at least twice during the workday to help keep dust to a minimum. Control regulations further stipulate that open-bodied trucks be covered at all times when in motion if they are transporting materials likely to give rise to airborne dust. Haul trucks tracking dirt onto paved streets from unpaved areas are oftentimes a significant source of dust in construction areas. Some means to alleviate this problem, such as tire washing or road cleaning, may be appropriate. Dust monitoring could be considered as a means to quantitatively evaluate 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 annual standard for nitrogen dioxide is not likely to be violated by short-term construction equipment emissions. Also, the new short-term (1-hour) standard for nitrogen dioxide is based on a three-year average; thus it is unlikely that relatively short-term construction emissions occurring over a period of a few months would exceed the standard. Carbon monoxide emissions from diesel engines, on the other hand, are low and should be relatively insignificant compared to vehicular emissions on nearby roadways. Indirectly, slow-moving construction vehicles on roadways leading to and from the project site could obstruct the normal flow of traffic to such an extent that overall vehicular emissions increase. This impact can be mitigated by moving heavy construction equipment during periods of low traffic volume. Likewise, the schedules of commuting construction workers can be adjusted to avoid peak hours in the project vicinity.

After the period of construction, long-term impacts on air quality from motor vehicle exhausts can potentially occur at or near any project that attracts large volumes of motor vehicle traffic. Carbon monoxide emissions are usually the primary issue, and public areas near traffic-congested intersections are the main concern. The proposed facility will be accessed from a new driveway off Wilikina Drive. The project traffic study examined two existing nearby roadway intersections along Wilikina Drive that may be affected by project traffic. These included Wilikina Drive at Kaukonahua Road and Wilikina Drive at Kamananui Road. The traffic study indicates that the existing traffic level-of-service at these intersections is reasonably good, and that with or without the project in the year 2013, the level-of-service conditions would remain unchanged. The project traffic study also indicates that with the project, peak-hour traffic volumes at these intersections would likely increase by about 3 percent or less.

Based on extensive experience in assessing traffic-related air quality impacts, traffic volume increases of less than about 5 percent or less than about 100 vehicles per hour and traffic approach volumes of less than about 1,000 vehicles per hour do not cause any significant impacts on air quality if adequate traffic level-of-service is provided. The project traffic study indicates that existing and future (2013) traffic conditions in the project area with or without the project generally meet these criteria. Considering the small project-related traffic volumes that are expected, traffic from the proposed project should have no measurable long-term impacts on air pollution levels in the

project area. Although a detailed air quality modeling study could be performed to quantitatively predict project impacts on air quality due to project traffic, such an analysis is probably unwarranted.

Trucks unloading dry bulk materials in an uncontrolled manner can potentially generate significant dust emissions. Trucks unloading at the proposed facility will do so within an enclosed receiving building. The receiving building will thus serve to contain any related dust emissions, but it is probable that much of the material will have a high moisture content and thus will probably not generate much dust.

In summary, short-term impacts from fugitive dust during project construction may potentially occur. Because of this, an effective dust control plan for the period of construction should be prepared and implemented. After construction, any long-term impacts on air quality from motor vehicle traffic or from truck unloading activities related to this project will likely be negligible.

Please call me if you have any questions concerning the information presented herein or if you wish to discuss this matter further.

Very truly yours,

Barry D. Neal

Barry D. Neal
Certified Consulting
Meteorologist

Appendix E

An Investigation of Potential Odors from
A Composting Facility in Hawaii,
ENVIRON International Corporation
May 2011



An Investigation of Potential Odors from A Composting Facility in Hawaii

Hawaiian Earth Recycling, LLC
Proposed Hawaiian Earth Recycling Facility
Wahiawa, Hawaii

PREPARED FOR:
HAWAIIAN EARTH RECYCLING, LLC

Prepared by:
Kirk Winges
ENVIRON International Corporation
Lynnwood, Washington



ENVIRON PROJECT NO. 29-27150A
MAY, 2011

ENVIRON

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Hawaiian Earth Recycling, LLC
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APPENDIX A

Resume for Kirk D. Winges

Abbreviations/Acronyms

AERMOD.....EPA's current regulatory air quality model
EPA.....Environmental Protection Agency (federal)

Units and Measures

D/T.....dilutions to threshold (see Section 2.3)
H_2S.....Hydrogen sulfide
Int.....Intensity (see Section 2.2)
OU.....Odor Units (see Section 2.3)
OU/m^3.....Odor Units per cubic meter of air, equivalent to D/T
ppb.....Parts per billion by volume in air

Hawaiian Earth Recycling, LLC
Odor Investigation

SECTION 1

INTRODUCTION

I am a Principal Consultant with Environ International Corporation in Lynnwood, Washington. I was asked by Hawaiian Earth Recycling, LLC to provide an odor analysis related to a proposed composting operation to be located on the island of Oahu near the town of Wahiawa. The subject of this report is the potential for odors from the proposed composting operation to impact the surrounding community, specifically a US Army facility known as the Schofield Barracks. This report provides analysis and illustrates that although the composting operation will produce odors, they will not significantly impact the surrounding community.

1.1 Background for Kirk Winges

I am an atmospheric scientist and have been practicing in the field of air quality consulting for over 32 years. A complete copy of my resume is provided as Appendix A. My primary area of expertise is air quality modeling, the application of computer programs to simulate the transport and dispersion of airborne pollutants. I have conducted several hundred air quality investigations in my career for many different types of emission sources in many different environmental settings. I have modeled emissions from power plants, smelters, pulp/paper mills, oil refineries, coal mines, livestock facilities, aluminum reductions plants, coal gasification plants, food processing plants, sewage plants, painting operations, rendering plants and many others. I have modeled facilities located in a wide variety of meteorological and topographic settings including the Arctic Ocean, in tropical settings, in desert settings, in mountainous settings and many others.

In 1985 I began using my experience in air quality to investigate odor issues. During the last 25 years I have conducted dozens of odor investigations for facilities such as wastewater treatment plants, landfills, transfer stations, composting operations, livestock facilities, asphalt plants, wood products facilities, food product facilities and others. In many of these projects, computer models were used to estimate odor impacts. Also, many of these projects involved odor measurement and sampling programs. I have used instruments that measure hydrogen sulfide as part of odor characterization programs and measured ammonia concentrations in the atmosphere. I have used an olfactometer to quantify odor measurements, conducted hundreds of field odor observations, and designed odor sampling programs. In addition to training field odor observers, I have managed and analyzed measured odor data. I have been qualified as an expert on numerous occasions and given expert testimony in federal and state courts on both air quality and odor. I have offered expert opinions on topics related to odor measurement, odor modeling, odor threshold determination and other topics related to odor characterization.

1.2 Central Issues

The Proposed Hawaiian Earth Recycling, LLC facility will receive organic waste material, green waste, food waste and dewatered sewage solids (biosolids). Although these materials will naturally degrade

through microbial activity, by processing the waste and placing it in controlled aerobic environments, the composting operation accelerates the natural biological degradation process and produces an organically-rich soil-like product, which is sold and put to productive uses in horticulture and agriculture.

Any microbial degradation process produces off-gases. For the proposed facility, the primary gases given off are carbon dioxide and water vapor, but there are small quantities of other gases, including some that have distinct odors. Some of the notable gases produced by green-waste composting include the family of compounds known as “terpenes” that have a woody character.

Odorous gases, when released by composting operations, mix with the surrounding air and can be carried by the wind to surrounding areas. Any odorous gas, when mixed with odor-free air has a concentration called the threshold of detection where the concentrations of the odorous gas are just high enough in the mixture to be detectable by 50% of the human population. If concentrations are above this threshold at the initial point of release, then an odor has been created in that body of air. As the mixture of odorous gases and air is carried downwind it continues to mix with surrounding air and the concentration of these odorous compounds decreases. In addition, the odorous compounds may chemically react or deposit out on various surfaces as they travel downwind, further reducing the odorous compound concentration. Eventually, the level of odorous compounds in the air will drop below the detection threshold and the odor can no longer be perceived. Ideally, this would occur before the air mass reaches any community members, but that is not always the case.

Figure 1-1 shows the general location of the proposed Hawaiian Earth Recycling, LLC facility. Figure 1-2 shows a closer view that gives the specific location of the proposed facility along with the neighboring Army facility, the Schofield Barracks. The purpose of the current investigation is to determine the nature and degree of any odor impacts from the composting facility on the Schofield Barracks and surrounding agricultural areas.



Figure 1-1. General Location of the Proposed Facility

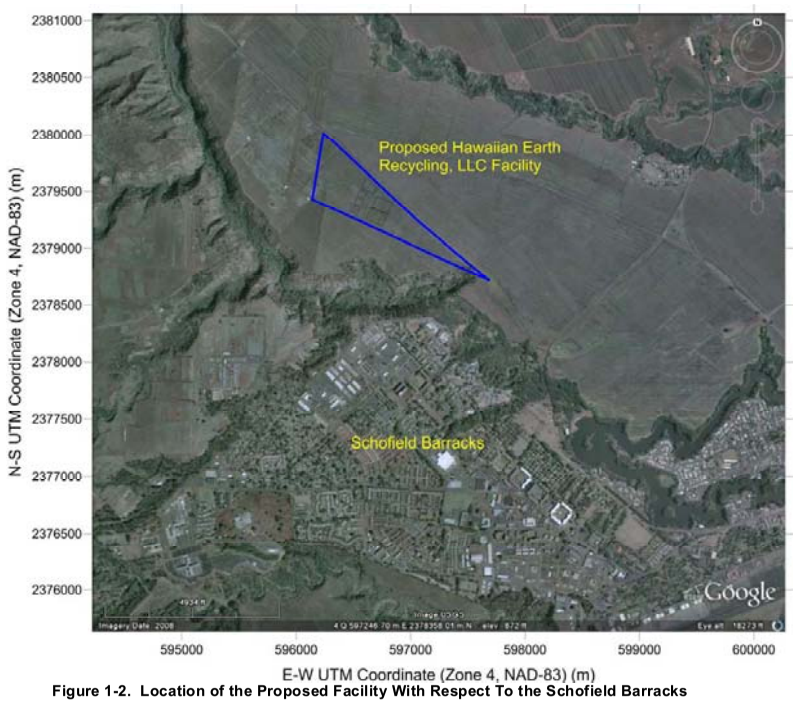


Figure 1-2. Location of the Proposed Facility With Respect To the Schofield Barracks

1.3 Methodology

The fundamental method used in the current odor analysis is a computer program, called an air quality model. Air quality models have been in wide use for odor and other types of air quality investigations for 40 years or more. The utility of air quality models in such investigations stems from their ability to examine situations which do not yet exist. In an ideal world there would be an exactly identical facility in an identical setting elsewhere in the world, and an odor investigation could be based on data collection in the vicinity of that facility. Unfortunately, there are too many factors that vary to allow an odor investigation to be based solely on an existing facility. While there are other composting facilities and we do use what has been learned from them in an odor modeling study, the facilities differ in terms of their design, size, orientation and waste stream. Also, the environmental setting is very different from one facility to the next. Factors such as wind speeds and directions are unique to each setting.

As a result complex computer programs, called air quality models, have been developed that allow a picture to be painted of the future air quality conditions that will exist if a proposed facility is established. These programs rely on input information of three types in conducting the analysis:

1. Source data – information about the locations, configurations, and emission release rates of the proposed facility.

2. Meteorological data – information on the wind speeds, wind directions, temperatures, atmospheric mixing conditions and other meteorological parameters that are present in the proposed location.

3. Receptor data – receptors are the locations at which concentrations are to be calculated and coordinate locations as well as terrain elevations are needed.

The information used in each of these categories is described briefly below, followed by the results of the air quality modeling investigation. First, however, since I will be using technical concepts, I will present a brief introduction on odor concepts to enable the reader to understand the modeling analysis and results that follow.

Hawaiian Earth Recycling, LLC
Odor Investigation

SECTION 2

ODOR CONCEPTS

Odor is a commonly experienced human sensation. We all understand that odor is a human perception that results from certain chemicals in the air we breathe. These chemicals cause nerve endings in the nose and mouth area to send signals to the brain that we interpret as an odor, both pleasant odors and unpleasant odors. There must be a certain quantity of these chemicals present before humans can detect an odor, which will vary from person to person. The concentration of a substance needed to detect an odor varies greatly from chemical to chemical.

From these "common knowledge" concepts, the science of odor has been developed. As with many areas of science, the concepts are simple, in many cases intuitive, but scientists have developed terminology, equivalent to a "shorthand" for discussing these concepts. This shorthand can often times become a barrier for the lay person when attempting to follow a scientific discussion. It can also be a source of confusion, even for scientists.

The purpose of this section is not to provide a formal education on odor science, but rather to provide simple explanations for the odor concepts.

2.1 How to Quantify an Odor

The first question one might ask is, "Why would you need to quantify an odor?" Isn't it just a simple question of whether odors exist or don't exist? The answer is no. We all experience odors all the time. If every project was stopped due to potential odors there would be no cars, no buses, no trucks, no roads paved, no livestock facilities, no restaurants, etc. A good example is the paving or repair of a roadway. New roads are being paved all the time and old roads are being patched with new pavement or potholes are being filled. The process usually involves the application of the highly odorous material, liquid asphalt to the roadway. Areas in the vicinity of a paving operation experience odor impacts, but the odors are not typically an issue in the community. Why? There are many answers that might be given to this question. For example, a person does not typically experience such odors frequently and if exposed, it would be for a short time, or the nature of the smell was not offensive, or the odor did not impact many people.

By considering this example, it immediately becomes apparent that there are characteristics of an odor that determine the nature and extent of the impact of that odor. Without some attempt at quantifying these characteristics, we have no way of distinguishing minor or insignificant odors from more significant odor exposures. Although there are no "bright line" standards for odor as there are with many other air contaminants, I will discuss how common sense can be used to interpret the quantified odor impacts.

Quantifying an odor creates the need to introduce some of the "shorthand" terminology discussed above. This terminology stems from the properties that an odor can have. While the terms may be new, the concepts are all simple and easily understood by all.

1. **Nature of the odor**. The first thing we think about when considering an odor is what does it smell like, and perhaps more importantly, is it pleasant or unpleasant? Scientists have created a scale for the pleasantness or unpleasantness of the nature of odor called the *hedonic tone*. It is a simple scale that is very subjective from one person to the next. In odor investigations of this nature, the hedonic tone is not typically used given its subjectivity.

2. **Strength of the Odor**. The second thing we think about when we discuss odor is its strength. There are numerous ways of quantifying the strength of an odor. Although we understand that odors stem from chemical concentrations in the air, it is the exception, rather than the rule, when chemical measurements can be used to define the strength of an odor. This is because most real odors we experience are complex mixtures of chemicals in the air. We can measure those concentrations in the air, but interpretation of those results is very difficult because we are not sure which chemicals, or more precisely which mixture of these chemicals is responsible for the odor we observe. Consequently, most odor measurements rely on controlled human observations. The simplest way to quantify the strength of an odor is to create a simple 5 or 10 point scale that a person can use to make an odor observation, where zero on the scale is no odor and the top level of the scale is an odor so strong that the observer can no longer tolerate the observation and must leave. While these data can be very useful, they suffer from the problem of being highly subjective. There are two primary methods of attempting to take the subjectivity out of this odor strength measure: *intensity* and *dilution to threshold*. For completeness I will discuss each of these concepts briefly below, although only the dilution to threshold method is used in this investigation.

3. **Duration of the Odor**. The paving example above illustrates that people have the ability to tolerate even strong odors for a short period of time, far more than long exposures. The duration of the odor is simply the length of time that an odor persisted at a particular location.

4. **Frequency of the Odor**. Related to, but different from duration, frequency refers to how often an odor was present at a particular location. The purpose here is to distinguish an odor that might have a duration of one hour, but then not be repeated for days or months from an odor that has a duration of one hour but happens 3 times a day, every day. They both have the same duration, but very different frequencies.

2.2 Odor Intensity

As mentioned above, odor intensity is one of two common ways to quantify odor strength. Odor intensity is very similar to the simple method discussed above, where an odor observer characterizes odor in a

simple scale. The difference in odor intensity measurements is that instead of using a highly subjective scale, intensity is determined by concentrations of a reference odorant, usually butyl alcohol (butanol) in air. The odor observer is effectively "trained" using a series of 8 reference concentrations of butanol in air. When making odor observations at a location then, the observer classifies the odor in the air as being closest in strength to one of the butanol reference odors. This method has been shown to remove some of the subjectivity in the simple scale measurements described above, and is much better when multiple odor observers are involved. However, the method does not lend itself readily to computer modeling, thus it has not been used in the current investigation.

2.3 Dilutions to Threshold (D/T)

An alternative method for odor strength quantification that is also widely used is the dilution to threshold commonly abbreviated as D over T or D/T. The D/T is a somewhat more mathematical quantification of odors than the intensity measurement. It does not use a reference scale. Rather, the D/T is based on the concept that all odors can be diluted by mixing with a certain amount of odor-free air to the point where the odor can just barely be detected by 50% of the population. This point where 50% of the population can detect a particular odor is called "threshold of detection" and varies from chemical to chemical and is even less defined for mixtures of chemicals. Nonetheless, even with complex mixtures of chemicals that produce odors (for example, diesel exhaust), mixture with odor-free air eventually drops the mixture to the point where it can just barely be detected. The D/T is then the amount of dilution that is necessary to get to this point.

In practice, D/T is measured by presenting people with samples of the original odor diluted to different levels to see at what level of dilution they can detect the odor. This method can be done objectively by subjecting a panel of people to different dilutions of the odorant. Of particular use in the current analysis, D/T lends itself very well to computer modeling, because even if the mixture of chemicals that produce an odor is not known, the computer model can predict the dilution that will occur to the odor as it passes from the facility into the community. If an accurate assessment can be made of the odors at the facility, the diluted odors in the community can be predicted. In this way, the extent and degree of an odor impact can be defined by the model.

The D/T is typically used to quantify and evaluate odors. The threshold of detection is 1.0 D/T, and while it reflects the level in a laboratory where a person could just barely detect an odor, it typically takes a somewhat higher odor before the average person will notice it in the environment. As a result, many researchers use a somewhat higher odor level called the "threshold of annoyance" when it is assumed that the average person would notice the odor and assuming the odor was unpleasant, would find the odor objectionable. A value of 4 D/T is commonly used for this purpose. This is not to suggest that 4 D/T is a strong odor, but rather that at a level of 4 D/T most people would notice it and if prolonged or continuous exposure were present, would find it objectionable. We all occasionally experience 4 D/T odors from environmental sources, such as the road paving example above, but if a person were continuously or frequently exposed to it, they may find it a significant impact.

2.4 Odor Units (OU)

One related technical concept must be introduced here because it is used later in the investigation. The concept is called "Odor Units" abbreviated as OU. Odor Units are essentially a non-dimensional mass. One odor unit is the quantity of odorous material needed to be added to one cubic meter of air to bring the odor level in the mixture to one D/T. Accordingly, one D/T is equivalent to one OU per cubic meter (OU/m^3). The concept is useful because in an odor investigation, while the chemical or mixture of chemicals may not be known, we can use the OU as the equivalent of a mass. So, in a typical air quality investigation the emission rate from a source might be defined as the pounds per hour that are emitted of some air pollutant, such as sulfur dioxide, but in an odor investigation, the emission rate is instead defined as the quantity of Odor Units that are emitted per hour.

It is worth noting that some people, even some well-known scientists, have misused this term and have referred to Odor Units the same as D/T. This is incorrect. D/T and OU/m^3 are the same. This points out one other oddity about this concept. Although D/T is truly dimensionless, Odor Units are not entirely dimensionless since they are tied to cubic meters.

In practice (as will be seen here) Odor Units are measured quantities at a facility used to characterize a source of odor emissions. In the simplest case, consider two common emission stacks at a facility, one that releases 1000 cubic meters per second (m^3/sec) of odorous air and one that releases ten times less, or 100 m^3/sec of odorous air. A sample of air is taken from each stack and analyzed for odors. The larger stack has an odor level of 10 D/T, while the smaller stack has odors that are 10 times stronger, or 100 D/T. But since D/T is equivalent to OU/m^3, we can multiply the D/T (the OU/m^3) by the m^3/sec to determine the OU/sec, and in each case the number is 10,000 OU/sec. The point here is that these two stacks have an equivalent emission rate, even though one is large and dilute and the other is small and concentrated. The OU concept is a shorthand for allowing an emission rate to be specified from a source where the actual chemicals are not known.

SECTION 3

EMISSION INFORMTION

The proposed facility will accept a variety of compostable materials. Table 1 shows the types of composting materials at both the proposed facility and under the facility's existing compost permit, and maximum annual quantities of each type:

Table 3-1. Maximum Annual Receiving Rates for Compostable Materials

Material Type	*Maximum Annual Receiving Rate (ton/yr)*
Municipal Green Waste	80,000
Commercial Green Waste	30,000
Bulking material – (Commercial and Municipal)	40,000
Food Waste (Mostly Municipal)	10,000
Biosolids	20,000

As in all composting facilities, received materials are mixed, in some cases ground, and allowed to decompose via natural bacterial processes until a finished product is obtained. The finish product is screened, stored and sold. There are numerous potential sources of odor in all such facilities:

- Receiving – the material may enter the facility with an odor and the initial handling of the material can release odorous gases to the atmosphere.
- Mixing/Grinding – the mechanical disturbance of the material can generate odors.
- Decomposing phase – the traditional method of windrowing involved placing the composting materials in long piles called windrows in the open air where the natural air movement would provide the oxygen necessary for aerobic bacteria to flourish and decompose the waste. The piles were periodically turned to mix and allow fresh air to get to the interior of the pile. In recent years alternate techniques have been used to facilitate the process such as placement on large "air tables" where air is pressure fed into the piles from below, or alternatively sucked through the piles from below. Still other methods involve completely enclosed facilities where oxygen is deprived and anaerobic bacteria are used to decompose the compost. In all cases the

decomposition process releases odors. It is this decomposing phase that has the greatest potential for creating odors that may be released into the surrounding environment.

- Product Handling and storage – Although the bacterial level is greatly reduced in the final product, these materials do still have an odor and when handled and stored can be a minor source of odor release.

The proposed Hawaiian Earth Recycling, LLC facility will utilize modern techniques to eliminate odors from the facility where possible. The key elements of the facility's odor management program include the following:

1. Receiving – the receiving area will be completely enclosed in a building. In addition the building will include a negative air system that will draw air in through the receiving doors and capture any odors generated by the receiving operation. The captured air will be sent to a biofilter for treatment prior to release to the atmosphere. Biofiltration is a process whereby odorous air is passed through a bed of completed compost. The active bacteria in the biofilter consume any odors in the air. These systems have been widely used throughout the world for odor control and are effective at reducing odors from many types of facilities including composting facilities, transfer stations, waste water treatment plants and others.

2. Mixing/Grinding – Similar to the receiving operation, the mixing/grinding will be done within the enclosed receiving building with any odors captured and treated with a biofilter prior to release to the atmosphere.

3. Decomposition – The main composting area will use GORE™ cover system technology. The GORE™ cover system involves placing the composting material in windrows with a forced positive air system underneath the windrow. But instead of having the windrows in the open air, the windrows are completely covered by a GORE™ fabric that acts as a barrier to formed odors. The mesh size of the GORE™ material is such that air can escape, but a moisture layer develops on the interior of the fabric that acts as a barrier to much of the odor in the air. The moisture barrier forms and reforms over time as drops of moisture, containing the odorous chemicals, fall back on the pile inside the GORE™ enclosure. Although not blocking all odors, the GORE™ system has been demonstrated to block much of the odor from escaping the composting process.

The W. L. Gore & Associates Company, manufacturers of the GORE™ cover system, sponsored and paid for a comprehensive odor investigation of their system by Barth & Bitter, a German Company specializing in odor investigations.[1] The investigation provides a basis for estimating the odor emissions from the proposed facility here. The facility studied in the Barth and Bitter study used the same basic

[1] Certifying Position statement on Comparison of odor Emissions and Immissions of Various Composting Systems. , Narth & Bitter, An der Feldmark 16 31515 Wunstor, Germany. September 22, 2006.

system, although the waste receiving and grinding operations were not in enclosed spaces in the Barth and Bitter study. But the decomposition phase was exactly the same.

After grinding and mixing, the composting materials are placed under the first set of GORE™ covers for a period of 4 weeks, called Phase 1. At the conclusion of this period, the covers are opened and the material is moved to a new GORE™ covered pad where it remains for the next two weeks, a period called Phase 2. After two weeks the process is repeated as the material is moved to the final phase, called Phase 3 where it remains for an additional 2 weeks. At the conclusion of this 8 week decomposition period, the material is now ready for screening and placement in a final product storage, awaiting sale to market.

At the proposed Hawaiian Earth Recycling, LLC facility the receiving, sorting, mixing and grinding areas have been assumed to be an insignificant source of odor given they are completely enclosed and the ventilation air treated with a biofilter. The odor investigation has therefore focused mainly on the active composting areas and the product storage areas. There are two main pads used for composting. Pad 1 will use a GORE™ system to compost a mixture of green waste and food waste. Pad 2 will also use a GORE™ system to compost a mixture of the Biosolids and the commercial green bulking agent waste. Finally, a small pad to the north will compost organic green waste in open windrows. Product storage will be in an area northwest of the GORE™ composting area.

Table 3-2 shows the emission calculations following methods outlined in the Barth & Bitter paper of odor emission sources at the facility.

Table 3-2. Calculation of Odor Emissions from Proposed Composting Facility

Source	Emission Factor	Units	Size	Units	Fraction of Time	Odor Emissions (OU/s)
Pad 1						
Week 1 non-ventilated	4	$OU/m^2/s$	1050	m^2	0.800	3360
Week 1 Ventilated	5.56	$OU/m^2/s$	1050	m^2	0.200	1168
Week 2 non-ventilated	0.33	$OU/m^2/s$	1050	m^2	0.750	260
Week 2 Ventilated	0.56	$OU/m^2/s$	1050	m^2	0.250	147
Week 3 non-ventilated	0.22	$OU/m^2/s$	1050	m^2	0.750	173
Week 3 Ventilated	0.42	$OU/m^2/s$	1050	m^2	0.250	110
Week 4 non-ventilated	0.22	$OU/m^2/s$	1050	m^2	0.800	185
Week 4 Ventilated	0.42	$OU/m^2/s$	1050	m^2	0.200	88
Turning to Phase 2	2.33	$OU/m^3/s$	1598	m^3	0.071	265
Week 5 non-ventilated	0.28	$OU/m^2/s$	1050	m^2	0.830	244
Week 5 Ventilated	0.49	$OU/m^2/s$	1050	m^2	0.170	87
Week 6 non-ventilated	0.17	$OU/m^2/s$	1050	m^2	0.920	164
Week 6 Ventilated	0.35	$OU/m^2/s$	1050	m^2	0.080	29
Turning to Phase 3	0.58	$OU/m^3/s$	1598	m^3	0.071	66
Week 7 non-ventilated	0.17	$OU/m^2/s$	1050	m^2	0.960	171
Week 7 Ventilated	0.21	$OU/m^2/s$	1050	m^2	0.040	9
Week 8 non-ventilated	0.17	$OU/m^2/s$	1050	m^2	0.960	171
Week 8 Ventilated	0.21	$OU/m^2/s$	1050	m^2	0.040	9
Turning to finished storage	0.42	$OU/m^3/s$	1598	m^3	0.071	48
Pad 2						
Week 1 non-ventilated	4	$OU/m^2/s$	1050	m^2	0.800	3360
Week 1 Ventilated	5.56	$OU/m^2/s$	1050	m^2	0.200	1168
Week 2 non-ventilated	0.33	$OU/m^2/s$	1050	m^2	0.750	260
Week 2 Ventilated	0.56	$OU/m^2/s$	1050	m^2	0.250	147
Week 3 non-ventilated	0.22	$OU/m^2/s$	1050	m^2	0.750	173
Week 3 Ventilated	0.42	$OU/m^2/s$	1050	m^2	0.250	110
Week 4 non-ventilated	0.22	$OU/m^2/s$	1050	m^2	0.800	185
Week 4 Ventilated	0.42	$OU/m^2/s$	1050	m^2	0.200	88
Turning to Phase 2	2.33	$OU/m^3/s$	1598	m^3	0.071	265
Week 5 non-ventilated	0.28	$OU/m^2/s$	1050	m^2	0.830	244
Week 5 Ventilated	0.49	$OU/m^2/s$	1050	m^2	0.170	87
Week 6 non-ventilated	0.17	$OU/m^2/s$	1050	m^2	0.920	164
Week 6 Ventilated	0.35	$OU/m^2/s$	1050	m^2	0.080	29
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Week 7 non-ventilated	0.17	$OU/m^2/s$	1050	m^2	0.960	171
Week 7 Ventilated	0.21	$OU/m^2/s$	1050	m^2	0.040	9
Week 8 non-ventilated	0.17	$OU/m^2/s$	1050	m^2	0.960	171
Week 8 Ventilated	0.21	$OU/m^2/s$	1050	m^2	0.040	9

Turning to finished storage	0.42	OU/m^3/s	1598	m^3	0.071	48
Organic Compost Area						
Week 1	5.56	OU/m^2/s	262.5	m^2	1.000	1460
Week 2	0.56	OU/m^2/s	262.5	m^2	1.000	147
Week 3	0.42	OU/m^2/s	262.5	m^2	1.000	110
Week 4	0.42	OU/m^2/s	262.5	m^2	1.000	110
Turning to Phase 2	2.33	OU/m^3/s	399.5	m^3	0.018	17
Week 5	0.49	OU/m^2/s	262.5	m^2	1.000	129
Week 6	0.35	OU/m^2/s	262.5	m^2	1.000	92
Turning to Phase 3	0.58	OU/m^3/s	399.5	m^3	0.018	4
Week 7	0.21	OU/m^2/s	262.5	m^2	1.000	55
Week 8	0.21	OU/m^2/s	262.5	m^2	1.000	55
Turning to finished storage	0.42	OU/m^3/s	399.5	m^3	0.018	3
Storage	0.15	OU/m^2/s	525	m^2	1.000	79
Packaging/delivery	1	OU/m^3/s	399.5	m^3	0.018	7
Product Storage Area						
Storage	0.15	OU/m^2/s	4200	m^2	1.000	630
Packaging/delivery	1	OU/m^3/s	3196	m^3	0.018	57
TOTAL						**16,465**

Hawaiian Earth Recycling, LLC
Odor Investigation

SECTION 4

METEOROLOGICAL DATA

The second category of data needed by the air quality model is meteorological data. For the current project a total of 5 years of meteorological data were used. The data were taken from the nearby Wheeler Army Airfield meteorological station. The Wheeler station collects high quality National Weather Service data less than 3 miles from the facility. It is judged to be very representative of the area. The years selected for analysis were the most recent available 2005 – 2009. A total of 43,828 hourly observations of wind speed, wind direction, temperature and other meteorological data were used. These data are best represented in a pictorial representation called a "wind rose". The wind rose shows the relative frequency of winds from different directions and different speeds. Note that winds in a wind rose are always presented as the direction from which the wind is coming.

Figure 4-1 is a wind rose depiction of the 5 year data set from Wheeler Army Airfield. The figure shows predominant winds are from the east-northeast, which would carry any odors to the west-southwest.

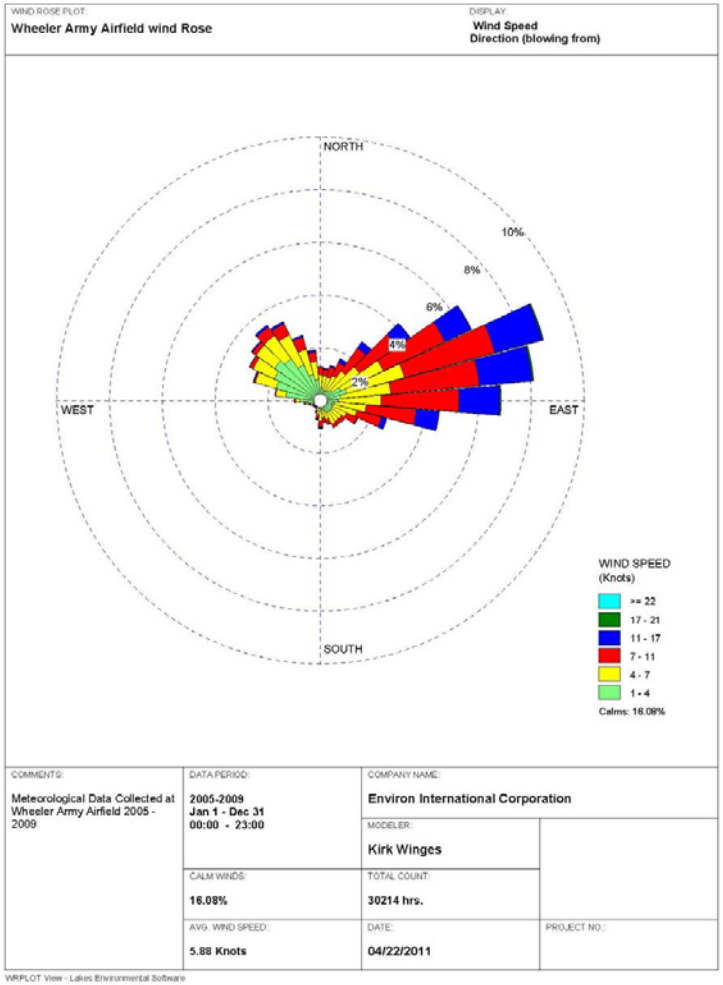


Figure 4-2. Wind Rose for Wheeler Army Airfield 2005 - 2009

SECTION 5

RECEPTOR LOCATIONS

The final category of information needed by the model is the location at which concentrations are to be calculated. These locations are called receptors. A total of 2,856 locations were specified as receptors. For each location a topographic elevation was established from data provided by the US Geological Survey in the form of a "geo-tiff" file. Topographic data were obtained from the USGS' Seamless Server website.[2]

Figure 5-1 shows the locations of the receptors used in the current evaluation.

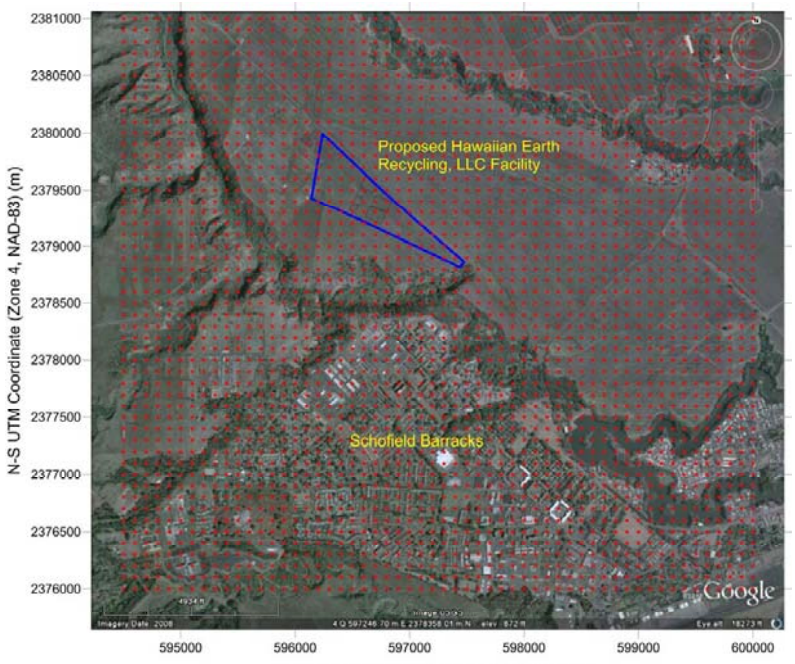


Figure 5-1. Location of Receptors Used in the Modeling Analysis

[2] http://seamless.usgs.gov/website/seamless/viewer.htm

SECTION 6

MODEL RESULTS

The air quality model used in the current application is the EPA current recommended model for regulatory applications called AERMOD. The AERMOD model reflects the latest developments in analytical air quality models and is recommended by EPA for modeling industrial facilities.

The emissions from Table 3-2 were entered into the model as a series of AREAPOLY sources. The model was run and odor concentrations in D/T (OU/m^3) were calculated for each of the 43,828 hours at each of the 2,856 receptors. In each case where an odor above 1 D/T was calculated, a record was written and stored for later post-processing.

The post processing steps involved the following:

1. Sort the records by receptor to find the number of hours at each receptor where the odor concentrations were above 1.0 D/T and 4.0 D/T

2. Average the number of hours over the 5 years to find the average number of hours per year at each receptor that the odors exceed 1.0 D/T and 4.0 D/T

3. Divide by 8760 and multiply by 100 to find the percentage of the time at each receptor that the odor exceeds the two thresholds of 1.0 D/T and 4.0 D/T.

The results of the odor investigation are depicted in Figures 6-1 and 6-2 for the two threshold values of 1.0 D/T and 4.0 D/T, respectively. Both figures show that odors would be very infrequent in the Schofield Barracks. Odors may reach the threshold of detection, but less than 1% of the time, and would not reach the threshold of annoyance even 0.1% of the time in the Barracks.

What this means in common sense terms is that if a person concentrated on observing odors in the community, they might be able to detect an odor of a compost nature as much as 1% of the time, but if not otherwise looking for an odor, the typical person would detect an odor from the compost operation less than one tenth of one percent of the time.

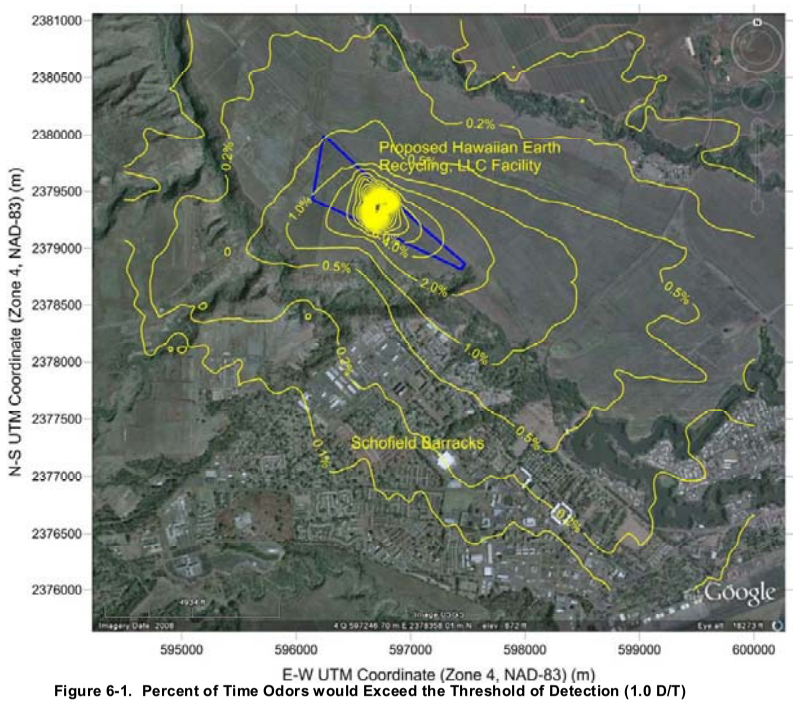


Figure 6-1. Percent of Time Odors would Exceed the Threshold of Detection (1.0 D/T)

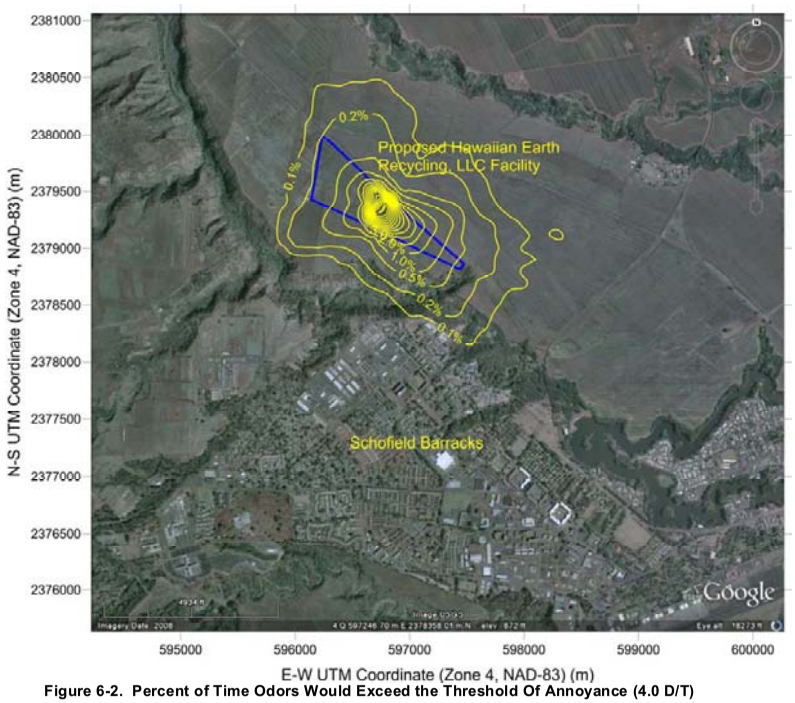


Figure 6-2. Percent of Time Odors Would Exceed the Threshold Of Annoyance (4.0 D/T)

SECTION 7

CONCLUSIONS

The results of the investigation into potential odors from the proposed Hawaiian Earth Recycling, LLC facility are as follows:

- While the process of composting organic matter, including biosolids, does create odorous gases, the enclosure of the operation both within the receiving building, controlled with a biofiler, and the main composting area, controlled by GORE™ cover system technology, will substantially block, and control these odorous gases.
- Based on a scientific investigation conducted at a composting facility in Europe using the GORE™ cover system, residual odors that escape the covers have been quantified and modeled in a state-of-the-art dispersion program for computing off-site concentrations of odorous gases.
- The results of the air quality modeling analysis indicate that than any off-site odors would be very infrequent and unlikely to cause or contribute to any odor complaints in the surrounding community, including the Schofield Barracks.

Hawaiian Earth Recycling, LLC
Odor Investigation

APPENDIX A

Resume for Kirk D. Winges

Hawaiian Earth Recycling, LLC
Odor Investigation

KIRK D. WINGES

EDUCATION

1973	MS, Chemical Engineering, University of California, Berkeley, Berkeley, CA
1971	BS, Earth and Planetary Science, Massachusetts Institute of Technology, Cambridge, MA

EXPERIENCE

Mr. Winges has extensive experience in the conduct of odor investigations. He has testified as an expert witness on the topic of odor in a Court of Law and well as in administrative proceedings. He has been deposed as an expert witness on odor on numerous occasions. He has published papers, participated in technical conferences and provided expertise to regulatory agencies on the topic of odor. He has conducted odor studies of 8 different wastewater treatment plants and associated facilities. He has conducted odor studies of 7 different solid waste landfills. He has conducted odor investigations for a variety of other industrial facilities, including rendering plants, asphalt paving facilities, asphalt shingle production plants, automobile assembly plants, and composting facilities. His expertise in odor concerns all aspects of odor, including the measurement and quantification of odor, the transport and dispersion of odor, techniques used to control odor and structure and design of odor complaint management and response programs. Examples of the type of work Mr. Winges has performed in his career are listed as follows:

- Conducted several air quality studies for a large operating landfill in eastern Washington. The studies involved investigations of flare systems, fugitive dust and all air quality permits for a related gas-to-energy plant constructed at the landfill. Complex air quality modeling involving the CALPUFF system was included in the analysis. Prepared a Title V permit application for the same facility.

- Conducted environmental audits of several asphalt shingle and related facilities in Arkansas and Louisiana. The studies involved complete review of all sources of air quality emissions at the plants, all applicable air quality regulations and a comprehensive review of the air quality permits for the facilities.

- Conducted air quality investigations for a closed landfill in Everett, Washington in support of a brownfields development project for the landfill. Efforts included an air quality and meteorological measurement program, and a comprehensive air quality modeling investigation of the landfill.

- Provided expert witness support for litigation involving alleged odor impacts at a wastewater treatment facility in eastern Washington.

- Provided expert witness testimony for litigation involving alleged odor from a solid waste landfill in Thurston County, Washington.

- Conducted air quality modeling and odor investigations for a proposed hot mix asphalt plant in Thurston County, Washington. Included in this effort was presentation of analysis results in a public hearing.

- Evaluated odor impacts from a polystyrene manufacturing facility in Southern California.

- Designed and installed air monitoring equipment at the Salton Sea to measure concentrations of PM10 in the air during experimental testing of water treatment equipment at the Sea. Also managed a major odor measurement program for the Salton Sea.

- Provided the air quality portions of an Environmental Impact Statement for the City of Seattle=s Comprehensive Solid Waste Management Plan. The study involved evaluation of the complex odor issues surrounding the handling, and processing of solid waste.

- Prepared a Title V permit application for a solid waste incinerator in Oregon.

- **Conducted six different investigations of air quality impacts associated with wastewater treatment facilities in the northwest including odor evaluations.**

- Evaluated air quality and odor impacts from a cattle feeding operation in eastern Washington State.

- Managed a major odor investigation for Seattle Metro of all off-site wastewater handling systems.

- Managed two separate odor investigations for a yard-waste composting operation in the Seattle area.

- Conducted odor investigations for a number of solid waste projects, including landfills, transfer stations and transport facilities.

Mr. Winges areas of expertise:

- Air Quality Model Development and Application
- Airborne Deposition of Particulate and Gaseous Compounds from Dry and Wet Processes
- Odor Science, Modeling and Measurement
- Design and Implementation of Ambient Air Measurement Programs
- Air Quality Permit Application Preparation
- Expert Witness Testimony on Air Quality Issues

Prior to joining ENVIRON Mr. Winges experience includes:

2008	Geomatrix Consultants, Inc., Principal Scientist
2004	MFG, Inc., Lynnwood, WA, Senior Atmospheric Scientist
1993	TRC Environmental Corporation, Mountlake Terrace, WA, Vice President
1985	The Earth Technology Corporation, Seattle, WA, Manager, Air Quality
1981	Environmental Research and Technology, Westlake Village, CA, Section Manager
1977	United States Air Force, Captain, Dayton, OH

PROFESSIONAL AFFILIATIONS & ACTIVITIES

Air Pollution Control Association

Air and Waste Management Association - AWMA

Technical Association of the Pulp and Paper Industry

CERTIFICATION

40-hour Hazardous Material Training Course (29CFR 1910.120)

PUBLICATIONS & PRESENTATIONS

"Aerial Deposition of Dioxins and Furans from a Dissolving Sulfite Pulp Mill in Southeast Alaska." W.J. Shields, J.M. Maloy, K.D. Winges, K.J. Richmond, L.P. Yost, and D. Peek, 1999 TAPPI International Environmental Conference and Exhibit, April, 1999.

"Odorous Gas Permeation through Plastic Membranes." K.D. Winges and M.E. Hrachovec. Presented at the Annual Meeting of the Pacific Northwest International Section of the Air and Waste Management Association. November, 1995.

"Odors and the Pulp and Paper Industry." K.D. Winges. Presented at the Annual Environmental Meeting of the Technical Association of the Pulp and Paper Industry. April, 1990.

"Particulate Dispersion at Surface Coal Mines." K.D. Winges and C.F. Cole. Presented at the APCA annual meeting, Minneapolis, Minnesota. June, 1986.

"Air Pollution Experiments in a Highway Tunnel." K.D. Winges. Presented at the APCA Annual Meeting, San Francisco, California. June, 1984.

"24 Hour TSP Analysis for Fugitive Dust Sources." K.D. Winges. Presented at the APCA Annual Meeting, San Francisco, California. June, 1984.

"An Air Quality Model for Calculation of Carbon Monoxide Concentrations in Two Way Tunnels." K.D. Winges. Presented at the Annual General Meeting of the Pacific Northwest International Section of APCA. November, 1983.

"Development of an Air Quality Model for Mining Fugitive Dust." K.D. Winges. Presented at the APCA Annual Meeting, New Orleans, Louisiana. June, 1982.

"An Analysis of Air Quality and Visibility Effects from an 11 Million Ton Per Year Coal Mine Near Bryce Canyon National Park." K.D. Winges. Proceedings of the 1981 APCA Convention, Philadelphia, Pennsylvania. June, 1981.

"Assessing Mining Operations with Air Quality Models." K.D. Winges. Proceedings of the 1979 APCA Convention, Cincinnati, Ohio. June, 1979.

"Community Exposure Associated with Releases of Plutonium Contaminated Soil from the 903 Drum Storage Pad at the Rocky Flats Nuclear Weapons Plant." T.R. Mongan, S.R. Ripple, K.D. Winges and R.M. Quillan. Health Physics, fall 1994.

"Improved Methods for Wet Deposition Modeling for Waste Combustion Risk Assessments." S.A. Campbell, K.H. Jones, E. Liebsch, K.D. Winges and K.J. Richmond, Proceedings of the 1992 Air and Waste Management Association Annual Meeting, Kansas City, Missouri. June 21-26, 1992.

REPRESENTATIVE PROJECTS

Air Quality Model Development and Application

Air Deposition Expert Witness Testimony, Reichhold Chemical v. USMR, Carterette, New Jersey. Lead air quality scientist for USMR in litigation involving allegations of deposition of lead and other metals from the historical operations of a large secondary copper smelter on neighboring industrial property. The project involved evaluation of air quality deposition analyses conducted by opposing experts and providing expert witness testimony on the subject of airborne deposition.

Airborne Mercury Deposition Expert Witness Testimony, Solvent Chemical v. Olin Chemical, Niagara Falls, New York. Lead air quality scientist for Olin Chemical in litigation that historical operations of their

chloralkali plant in Niagara Falls resulted in mercury contamination of a neighboring property as a result of airborne deposition. The project involved examination of soils data combined with detailed deposition modeling results to determine if the pattern of incidence of mercury in the soils was indicative of airborne deposition. Expert witness testimony was given in deposition and in a court of law.

Finley Butte BioEnergy Air Permit and Modeling, Finley BioEnergy, LLC, Boardman, OR. Project manager and lead analyst. Conducted air quality modeling and prepared air permit application for a proposed facility to generate electricity from landfill gas produced at the Finley Buttes Landfill. The proposed project would allow recovery of energy from landfill gas that is presently lost to the atmosphere, and waste heat from the facility could potentially be used to further offset emissions from fossil fuel combustion. Conducted air quality modeling to estimate ambient air quality changes resulting from proposed changes in emission rates and prepared air emissions permit for submittal to the Oregon Department of Environmental Quality.

Proposed Hot Mix Asphalt Plant Air Quality Modeling and Odor Investigations, Lakeside Industries, Thurston County, WA. Impact analysis specialist. Conducted air quality modeling and odor investigations for a proposed hot-mix asphalt plant. Presented results of the analysis at a public hearing.

Alumina Production Plant Air Quality Modeling Investigation and Permit Application, Alcoa, Port Lavaca, TX. Project manager. Conducted an extensive air quality modeling investigation for a major alumina production plant. Project involved application of the Industrial Source Complex Model for over 300 separate sources of emission and 50 different pollutants. Prepared a comprehensive air quality permit application for the entire facility.

Alumina Production Plant Air Quality Investigation, Alcoa, East St. Louis, IL. Project manager. Conducted an air quality modeling investigation for a historical alumina production plant inside the city limits of East St. Louis, Illinois. Project involved characterization of historical and recent emissions from dust and materials moving activities. Principal issue was the potential deposition of lead contained in some of the materials remaining on the facility site.

Solid Waste Incinerator Air Quality Modeling, City of Spokane, Spokane, WA. Project manager. Conducted air quality modeling for a major solid waste incinerator in eastern Washington, including evaluation of wet and dry deposition of particulate matter and individual air toxic pollutants. Established the emission rate of dioxins and other pollutants from the facility, and established the phase of dioxin emissions, whether attached to solid particles or released as gases. Ultimately computed ambient concentrations for the entire area surrounding the facility, and determined both wet and dry deposition rates were for the dioxins and other pollutants emitted from the facility. Modeling provided the concentration and deposition rates for a human health risk assessment conducted for the facility.

Electricity Generation Facility Plume Analysis, Bakersfield, CA. Project manager. Evaluated visible plumes analysis for a large combined-cycle electricity generation facility near Bakersfield. Effort included application of the SACTI cooling tower model for the visual plumes from a system of 24 separate cooling towers at the plant, as well as development of a combustion stack visible plume model for evaluation of the visible plume dimensions for the turbine and heat recovery steam generator (HRSG) exhaust plumes.

Parking Garage Air Quality Modeling Analysis, University Village Shopping Center, Seattle, WA. Project manager. Conducted an air quality modeling analysis of air quality impacts from a parking garage in support of an environmental impact statement (EIS) for the facility.

Pulp and Paper Plant Air Quality Modeling, Simpson Tacoma Kraft, Western WA. Project manager. Conducted air quality modeling of proposed temporary generators to be located at a large pulp and paper plant.

Comprehensive Solid Waste Management Plan Environmental Impact Report (EIR) Air Quality Study, City of Seattle, Seattle, WA. Project manager. Provided the air quality portions of an EIS for the City of Seattle's

Comprehensive Solid Waste Management Plan. Study involved evaluation of the complex odor issues surrounding the handling and processing of solid waste.

Strandley/Manning Superfund Site Air Quality Monitoring, City of Seattle, Seattle, WA. Project manager. Managed an air quality monitoring program for the Superfund site.

Coal-Fired Generating Station Air Quality Investigation, Pacific Power, Chehalis, WA. Project manager. Conducted a major air quality investigation of a coal-fired generating station in Washington state. Modeling conducted with the CALPUFF system for use in a human health risk assessment for the power plant. Provided expert witness testimony in defense of the power company against an appeal to the air quality permit issued for the plant.

Roosevelt Regional Landfill Air Quality Investigation Studies, Regional Disposal Company, Klickitat County, WA. Project manager. Conducted several air quality studies for the Roosevelt Landfill, a large, municipal solid waste landfill in Klickitat County, Washington. Provided air quality services through all phases of landfill development, from site selection, screening, permitting, and construction in 1989-1990, through operation and expansion phases. Studies involved investigations of flare systems, fugitive dust, and all air quality permits for a related gas-to-energy plant constructed at the landfill. Analysis included complex air quality modeling involving the CALPUFF system. Managed and conducted air quality evaluations for several different environmental impact statements prepared over the course of the project. Prepared air quality permit applications for the landfill, including the Notice of Construction permits for flares and other systems, and the Title 5 permit application for the landfill. Designed, constructed, and installed air quality and meteorological monitoring networks at the landfill that Geomatrix continues to maintain, and assisted in other efforts involving air quality issues surrounding the landfill. Managed studies to estimate emissions for the landfill and used computer models to estimate air quality impacts resulting from those emission sources, including long-range transport modeling using 3-dimensional grid modeling techniques (CALPUFF). Managed and directed various air quality and meteorological measurement programs on site, including one study involving a first-time measurement and estimation of ground retention of hydrogen sulfide in fugitive releases. Ongoing work at the landfill includes continuing air quality and meteorological monitoring and preparation of air permits for the landfill gas collection and cogeneration system.

Asphalt Shingle and Related Facilities Environmental Audits, CertainTeed, AR and LA. Project manager. Conducted environmental audits of several asphalt shingle and related facilities in Arkansas and Louisiana. Studies involved comprehensive review of all sources of air quality emissions at the plants, all applicable air quality regulations, and air quality permits for the facilities.

Steel Manufacturing Facilities Air Quality Permit Applications, Pioneer Industries, Western WA. Project manager. Prepared air quality permit application for two separate steel manufacturing facilities.

Closed Landfill Air Quality Investigation, City of Everett, Everett, WA. Project manager. Conducted air quality investigations for a closed landfill in support of a brownfields development project for the landfill. Efforts included an air quality and meteorological measurement program and a comprehensive air quality modeling investigation of the landfill.

Pulp and Paper Mill Air Quality Investigation, Louisiana Pacific, Ketchikan, AK. Project manager. Conducted a major air quality investigation of a pulp and paper mill. Project involved development of a complete emission history for the facility and air quality modeling to determine long-term deposition impacts. Principal issue was the deposition of metals and dioxins in the drinking water supply for local residents.

Gold Mine and Mill Air Quality Studies, Battle Mountain Gold, Chesaw, WA. Project manager. Performed all air quality studies for a gold mining and milling operation in Washington state.

Commercial Seafood Processing Plant Air Quality Investigations, Trident Seafoods, Akutan, AK. Project manager. Directed all air quality investigations for several large commercial seafood processing plants in Alaska, including preparation of Title V air quality operating permits for the facilities.

Wastewater Treatment Facilities Air Quality Investigations, Northwestern States. Project manager. Conducted six different investigations of air quality impacts associated with wastewater treatment facilities in the northwest.

St. Helens Mill Air Quality Services, Boise Cascade, St. Helens, OR. Project manager. Provided air quality consulting for the St. Helens mill including air quality modeling to support a new air permit for the facility. Also managed a meteorological monitoring program for the mill.

Rocky Flats Nuclear Arsenal Air Quality Evaluation, Department of Energy, Boulder, CO. Project manager. Prepared an evaluation of airborne contaminants released from the arsenal, including a significant release of plutonium as a result of spillage and subsequent wind erosion. Principal issue was the airborne transport and deposition of plutonium from this release.

Cogeneration Facility Air Quality Evaluation, City of Hanford, Hanford, CA. Project manager. Conducted an air quality evaluation of emissions from a petroleum-coke fired fluidized bed cogeneration facility in California.

Cattle Feeding Operation Air Quality Evaluation, El Oro Cattle Feeders, Eastern WA. Project manager. Evaluated air quality impacts from a cattle feeding operation.

Sand and Gravel Mining/Processing Air Quality Investigations and Evaluations, WA State. Project manager. Conducted three separate air quality evaluations of sand and gravel mining/processing operations, including evaluation of asphalt plant emissions. Also investigated and evaluated asphalt plant odors.

Vehicular Air Quality Evaluations. Project manager. Conducted several air quality evaluations where the major sources of emission were vehicular emissions. Developed a computer system for directly interfacing transportation models with air quality models.

Odor Science, Modeling and Measurement

Polystyrene Manufacturing Facility Odor Impact Evaluation, Jacuzzi, Southern CA. Project manager. Evaluated odor impacts from a polystyrene manufacturing facility.

Proposed Hot Mix Asphalt Plant Air Quality Modeling and Odor Investigations, Lakeside Industries, Thurston County, WA. Project manager. Conducted air quality modeling and odor investigations for a proposed hot mix asphalt plant. Included in this effort was presentation of analysis results in a public hearing.

Seattle Metro Off-Site Wastewater Odor Investigation, Seattle Metro, Seattle, WA. Project manager. Managed a major odor investigation for Seattle Metro of all off-site wastewater handling systems.

Composting Operation Odor Investigation, Cedar Grove Compost Co., Seattle, WA. Project manager. Managed two separate odor investigations for a yard-waste composting operation in the Seattle area.

Solid Waste Odor Investigations. Project manager. Conducted odor investigations for a number of solid waste projects, including landfills, transfer stations, and transport facilities.

Design and Implementation of Ambient Air Measurement Programs

Combined Cycle Electricity Generation Facility, NESCO, Sumas, WA. Project manager. Conducted a measurement program to evaluate the emission of rust particles from a combined-cycle electricity generation facility.

Salton Sea Wastewater Treatment Air Monitoring, Bureau of Reclamation, Salton Sea, CA. Project manager. Designed and installed air monitoring equipment at the Salton Sea to measure concentrations of particulate matter of less than 10 micrometers (PM10) in the air during experimental testing of water treatment equipment at the Sea.

Air Quality Permit Application Preparation

ARCO Black Thunder Mine Air Quality Permit Application, ARCO Coal, Gillette, WY. Project manager. Prepared an air quality permit application for the largest operating surface coal mine in the Western Hemisphere.

Commercial Seafood Processing Plant Air Quality Investigations, Trident Seafoods, Akutan, AK. Project manager. Directed all air quality investigations for several large commercial seafood processing plants in Alaska, including preparation of Title V air quality operating permits for the facilities.

Solid Waste Incinerator Title V Permit Application, Coos County, Coos Bay, OR. Project manager. Prepared a Title V permit application for a solid waste incinerator.

Cathcart & Proposed Regional Landfill Air Quality Analyses, Snohomish County, Washington. Project manager. Managed proposed project to construct a new regional landfill adjacent to the Cathcart landfill in Snohomish County. Conducted air quality studies of both the existing and the proposed new landfills. Conducted air quality modeling of the flare emissions from the active gas collection system proposed for the new regional landfill. Managed and conducted an assessment of potential odor impacts from the active face and leachate lagoon areas of the proposed landfill. Managed assessment of potential fugitive dust impacts from the movement of men and equipment on the unpaved surfaces of the landfill. Project included preparation of the air quality sections of the EIS, and air quality and meteorological monitoring. Also trained county personnel in methods of measuring odors and in particular in the conduct of community odor surveys. Managed sampling of the passive gas flares for unburned landfill gas compositions, and the post combustion flare gas to determine the destruction and removal efficiency of the existing passive flare system. Presented results in a report to Snohomish County.

St. Helens Mill Air Quality Services, Boise Cascade, St. Helens, OR. Project manager. Provided air quality consulting for the St. Helens mill including air quality modeling to support a new air permit for the facility. Also managed a meteorological monitoring program for the mill.

Steel Manufacturing Facilities Air Quality Permit Applications, Pioneer Industries, Western WA. Project manager. Prepared air quality permit application for two separate steel manufacturing facilities.

Alumina Production Plant Air Quality Modeling Investigation and Permit Application, Alcoa, Port Lavaca, TX. Project manager. Conducted an extensive air quality modeling investigation for a major alumina production plant. Involved application of the Industrial Source Complex Model for over 300 separate sources of emission and 50 different pollutants. Prepared a comprehensive air quality permit application for the entire facility. Expert Witness Testimony on Air Quality Issues

Expert Witness Testimony for Wastewater Treatment Facility Odor Impacts, City of Yakima, Yakima, Eastern WA. Project manager. Provided expert witness support for litigation involving alleged odor impacts at a wastewater treatment facility in eastern Washington.

Expert Witness Testimony for Hawks Prairie Solid Waste Landfill Odor Impacts, Thurston County, WA. Project manager. Provided expert witness testimony for litigation involving alleged odor from a solid waste landfill. Assisted Thurston County in defending the County against a class-action lawsuit alleging that hydrogen sulfide and other odorous gases were escaping the landfill gas management system at the Hawks Prairie Landfill and causing odor impacts over a wide area. Testified as an expert witness on behalf of the County to illustrate that claims of odors and impacts alleged by the opposing side were not supported by facts, including the County's odor survey data collected over numerous years. Also testified that air quality modeling techniques used by the opposing side to support the allegations of hydrogen sulfide impacts were not representative of true dispersion. Case was ultimately settled before trial.

Expert Witness Testimony for Railcar Explosion, LA. Project manager. Provided expert witness testimony for a large insurance case involving the explosion of a railcar filled with nitrogen tetroxide in Louisiana.

Expert Witness Testimony for Coal-fired Generating Station, Pacific Power, Chehalis, WA. Project manager. Conducted a major air quality investigation of a coal-fired generating station in Washington State. Modeling conducted with the CALPUFF system for use in a human health risk assessment for the power plant. Provided expert witness testimony in defense of the power company against an appeal to the air quality permit issued for the plant.

Expert Witness Testimony for Wyoming Mining Industry, Wyoming Mining Association, Cheyenne, WY. Acted as the chief air quality consultant to the Wyoming mining industry regarding EPA's actions under Section 234 of the Clean Air Act, and provided air quality expert witness testimony.

Expert Witness Testimony for Copper Smelting Company, US Metals and Refining, Carteret, NJ. Project manager. Acted as the chief air quality expert for attorneys in defense of US Metals and Refining, operators of the Carteret Copper Smelter in New Jersey, against allegations of lead and other metal deposition on neighboring properties. Conducted air quality modeling investigations of the historical operation of the large smelter as part of litigation support. Gave oral deposition by opposing attorneys.

Expert Witness Testimony for Chemical Company, Olin Chemical, Niagara Falls, NY. Acted as chief air quality expert for attorneys in defense of Olin Chemical, operators of a mercury-cell chlor-alkali (CAP) facility in Niagara Falls, New York, against allegations of mercury and other metals deposition. Conducted investigations into air quality modeling conducted by opponents as part of litigation support. Gave oral deposition by opposing attorneys.

Technical Expert

Air Quality and Greenhouse Gas Assessment of Solid Waste Planning Options, City of Seattle, WA. Project manager. Manage Geomatrix's subcontract with R.W. Beck and perform air quality analyses to assist King County in future planning for long-range solid waste disposition options, including considering air quality impact of various alternative management options. Alternatives include long haul of waste and ultimate landfill, as well as various conversion alternatives including mass burn and modified combustion. Analysis focuses on evaluation of greenhouse gas emissions, particularly comparing and contrasting landfilling options with conversion options in terms of greenhouse gas emissions and consequences.

Technical Expert for Downtown Portland Transportation Projects, City of Portland, Portland, OR. Project manager. Conducted several investigations of transportation-related projects including an air quality evaluation of the entire street network for downtown Portland, Oregon. Provided special expertise in evaluating the impact from diesel bus operation and the air quality impacts related to vehicular tunnels, including the development of an air quality model to simulate impacts within a major freeway tunnel.

Technical Expert for Various Mining Groups. Retained as a technical expert on air quality issues by organizations such as the National Coal Association, the American Mining Congress and the American Petroleum Institute. Retained by the EPA to incorporate his own theories on the retention of dust within mining pits into existing EPA models.

Appendix F

Acoustic Study for the In-Vessel Composting Facility,
Y.Ebisu & Associates
March 2011

ACOUSTIC STUDY FOR THE IN-VESSEL COMPOSTING FACILITY WAIALUA, OAHU

Prepared for:

WILSON OKAMOTO CORPORATION

Prepared by:

Y. EBISU & ASSOCIATES
1126 12th Avenue, Room 305
Honolulu, Hawaii 96816

MARCH 2011

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CHAPTER I. SUMMARY

The future noise levels associated with the proposed In-Vessel Composting Facility in Waialua on the island of Oahu were evaluated for their potential impact on noise sensitive receptors in the project environs. Future noise levels and potential impacts associated with In-Vessel Composting Facility operations and refuse vehicles were evaluated using available forecast data.

Along the In-Vessel Composting Facility Entrance Road which is expected to service the project traffic, noise levels are expected to be less than 65 DNL (Day-Night Average Sound Level) at 50 foot distance from the roadway centerline as a result of project traffic, which are expected to be primarily heavy trucks. In areas removed from the In-Vessel Composting Facility site, noise levels from the heavy equipment operations, grinding equipment, and materials handling equipment operating at the In-Vessel Composting Facility are expected to be less than 55 DNL at 2,400 feet distance.

Because of the relatively remote location of the proposed In-Vessel Composting Facility site (approximately 2,400 feet from the closest residences), the noise associated with the In-Vessel Composting Facility operations should be inaudible or barely audible at the closest residences, and should be well below present standards for environmental noise. Along the primary access roadway (Wilikina Drive) to the In-Vessel Composting Facility site, where concentrations of refuse vehicle traffic are expected to be highest, adverse noise impacts are not expected due to the undeveloped nature of the lands along Wilikina Drive. Along the existing roadway south of the In-Vessel Composting Facility's Entrance Road, increases in future traffic noise levels between 2011 and 2014 are expected to be less than 1.0 DNL. This level of increase will be difficult to measure, and adverse traffic noise impacts are not expected to result from the project.

Noise from on site activities at the In-Vessel Composting Facility may be audible at the closest residences if adequate noise mitigation measures are not incorporated into the planned facility. Due to the large setback distances (2,400 to 6,400 feet) between the facility and its closest neighbors, only the equipment with very high noise levels (such as a large, diesel engine driven grinder) should be concern. The addition of a noise quieting kit to the diesel engine driven grinder or the use of a fully enclosed, electric motor driven grinder are planned for the proposed facility to address this concern. The other equipment operating on the project site (refuse trucks, bulldozers, front end loaders, portable generators, etc.) are similar in noise levels to farm and agricultural equipment, and are not expected to cause adverse noise impacts.

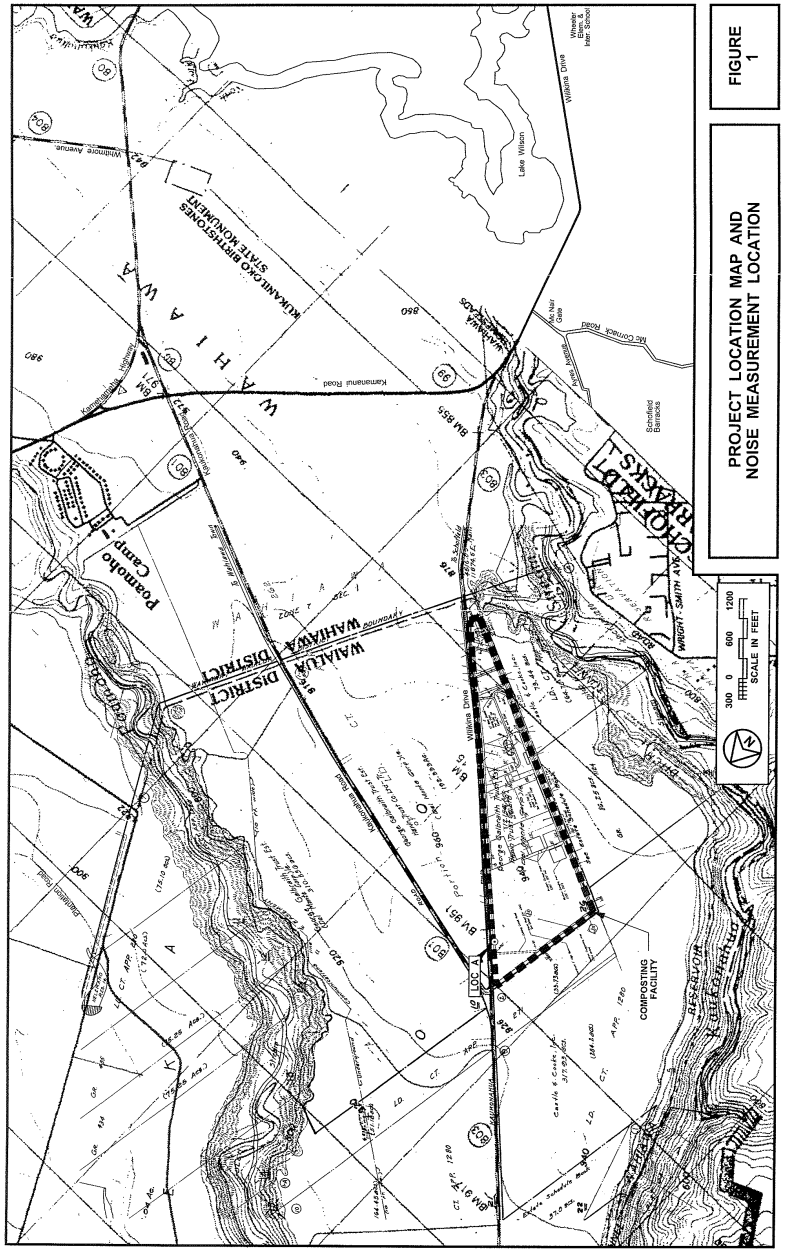
Adverse noise impacts are not anticipated during the construction of the proposed project. Large buffer distances of approximately 2,400 feet to the nearest noise sensitive building exist around the proposed In-Vessel Composting Facility site. Adverse impacts from construction noise are not expected to be in the "public health and welfare" category due to the temporary nature of the work and due to the administrative controls available for its regulation. Instead, these impacts will probably be limited to the temporary degradation of the quality of the acoustic environment in the immediate vicinity of the construction work sites.

CHAPTER II. PURPOSE

The primary objective of this study was to describe the future noise levels and potential noise impacts associated with the proposed In-Vessel Composting Facility in Waialua on the island of Oahu. The location of the project site is shown in Figure 1. The project site is located on former agricultural lands along Wilikina Drive north of Schofield Barracks and west of Poamoho Camp.

Roadway traffic noise levels and impacts associated with the proposed project were to be determined along the primary access roadways which are expected to service the project traffic. Traffic forecasts for 2014 with and without the project were used. A specific objective was to determine future traffic noise levels associated with project traffic, and the potential noise impacts associated with project traffic. Recommendations for minimizing traffic noise impacts were to be provided as required.

Assessments of possible noise impacts from on-site activities and as well as from short term construction noise were also included in the noise study objectives. Recommendations for minimizing these noise impacts were to be provided as required.



CHAPTER III. NOISE DESCRIPTORS AND THEIR RELATIONSHIP TO LAND USE COMPATIBILITY

The noise descriptor currently used by federal agencies to assess environmental noise is the Day-Night Average Sound Level (DNL or Ldn). This descriptor incorporates a 24-hour average of instantaneous A-Weighted sound levels as read on a standard Sound Level Meter. The maximum A-Weighted sound level occurring while a noise source such as a heavy truck or aircraft is moving past a listener (i.e., the maximum sound level from a "single event") is referred to as the "Lmax value". The mathematical product (or integral) of the instantaneous sound level times the duration of the event is known as the "Sound Exposure Level", or Lse, which is analogous to the energy of the time-varying sound levels associated with a single event.

The DNL values represent the average noise during a typical day of the year. DNL exposure levels of 55 or less are typical of quiet rural or suburban areas. DNL exposure levels of 55 to 65 are typical of urbanized areas with medium to high levels of activity and street traffic. DNL exposure levels above 65 are representative of densely developed urban areas and areas fronting high volume roadways.

By definition, the minimum averaging period for the DNL descriptor is 24 hours. Additionally, sound levels which occur during the nighttime hours of 10:00 PM to 7:00 AM are increased by 10 decibels (dB) prior to computing the 24-hour average by the DNL descriptor. Because of the averaging used, DNL values in urbanized areas typically range between 50 and 75 DNL. In comparison, the typical range of intermittent noise events may have maximum Sound Level Meter readings between 75 and 105 dBA. A more complete list of noise descriptors is provided in Appendix B to this report. In Appendix B, the Ldn descriptor symbol is used in place of the DNL descriptor symbol.

Table 1, extracted from Reference 1, categorizes the various DNL levels of outdoor noise exposure with severity classifications. Table 2, also extracted from Reference 1, presents the general effects of noise on people in residential use situations. Figure 2, extracted from Reference 2, presents suggested land use compatibility guidelines for residential and nonresidential land uses. A general consensus among federal agencies has developed whereby residential housing development is considered acceptable in areas where exterior noise does not exceed 65 DNL. This value of 65 DNL is used as a federal regulatory threshold for determining the necessity for special noise abatement measures when applications for federal funding assistance are made.

As a general rule, noise levels of 55 DNL or less occur in rural areas, or in areas which are removed from high volume roadways. In urbanized areas which are shielded from high volume streets, DNL levels generally range from 55 to 65 DNL, and are

TABLE 1

EXTERIOR NOISE EXPOSURE CLASSIFICATION (RESIDENTIAL LAND USE)

NOISE EXPOSURE CLASS	DAY–NIGHT SOUND LEVEL	EQUIVALENT SOUND LEVEL	FEDERAL (1) STANDARD
Minimal Exposure	Not Exceeding 55 DNL	Not Exceeding 55 Leq	Unconditionally Acceptable
Moderate Exposure	Above 55 DNL But Not Above 65 DNL	Above 55 Leq But Not Above 65 Leq	Acceptable(2)
Significant Exposure	Above 65 DNL But Not Above 75 DNL	Above 65 Leq But Not Above 75 Leq	Normally Unacceptable
Severe Exposure	Above 75 DNL	Above 75 Leq	Unacceptable

Notes: (1) Federal Housing Administration, Veterans Administration, Department of Defense, and Department of Transportation.

(2) FHWA uses the Leq instead of the Ldn descriptor. For planning purposes, both are equivalent if: (a) heavy trucks do not exceed 10 percent of total traffic flow in vehicles per 24 hours, and (b) traffic between 10:00 PM and 7:00 AM does not exceed 15 percent of average daily traffic flow in vehicles per 24 hours. The noise mitigation threshold used by FHWA for residences is 67 Leq.

TABLE 2

EFFECTS OF NOISE ON PEOPLE
(Residential Land Uses Only)

EFFECTS[1] / DAY-NIGHT AVERAGE SOUND LEVEL IN DECIBELS	Hearing Loss	Speech Interference		Annoyance[2]	Average Community Reaction[4]	General Community Attitude Towards Area
		Indoor	Outdoor			
	Qualitative Description	%Sentence Intelligibility	Distance in Meters for 95% Sentence Intelligibility	% of Population Highly Annoyed[3]		
75 and above	May Begin to Occur	98%	0.5	37%	Very Severe	Noise is likely to be the most important of all adverse aspects of the community environment.
70	Will Not Likely Occur	99%	0.9	25%	Severe	Noise is one of the most important adverse aspects of the community environment.
65	Will Not Occur	100%	1.5	15%	Significant	Noise is one of the important adverse aspects of the community environment.
60	Will Not Occur	100%	2.0	9%	Moderate to Slight	Noise may be considered an adverse aspect of the community environment.
55 and below	Will Not Occur	100%	3.5	4%		Noise considered no more important than various other environmental factors.

1. "Speech Interference" data are drawn from the following tables in EPA's "Levels Document": Table 3, Fig. D-1, Fig. D-2, Fig. D-3. All other data from National Academy of Science 1977 report "Guidelines for Preparing Environmental Impact Statements on Noise, Report of Working Group 69 on Evaluation of Environmental Impact of Noise."

2. Depends on attitudes and other factors.

3. The percentages of people reporting annoyance to lesser extents are higher in each case. An unknown small percentage of people will report being "highly annoyed" even in the quietest surroundings. One reason is the difficulty all people have in integrating annoyance over a very long time.

4. Attitudes or other non-acoustic factors can modify this. Noise at low levels can still be an important problem, particularly when it intrudes into a quiet environment.

NOTE: Research implicates noise as a factor producing stress-related health effects such as heart disease, high-blood pressure and stroke, ulcers and other digestive disorders. The relationships between noise and these effects, however, have not as yet been quantified.

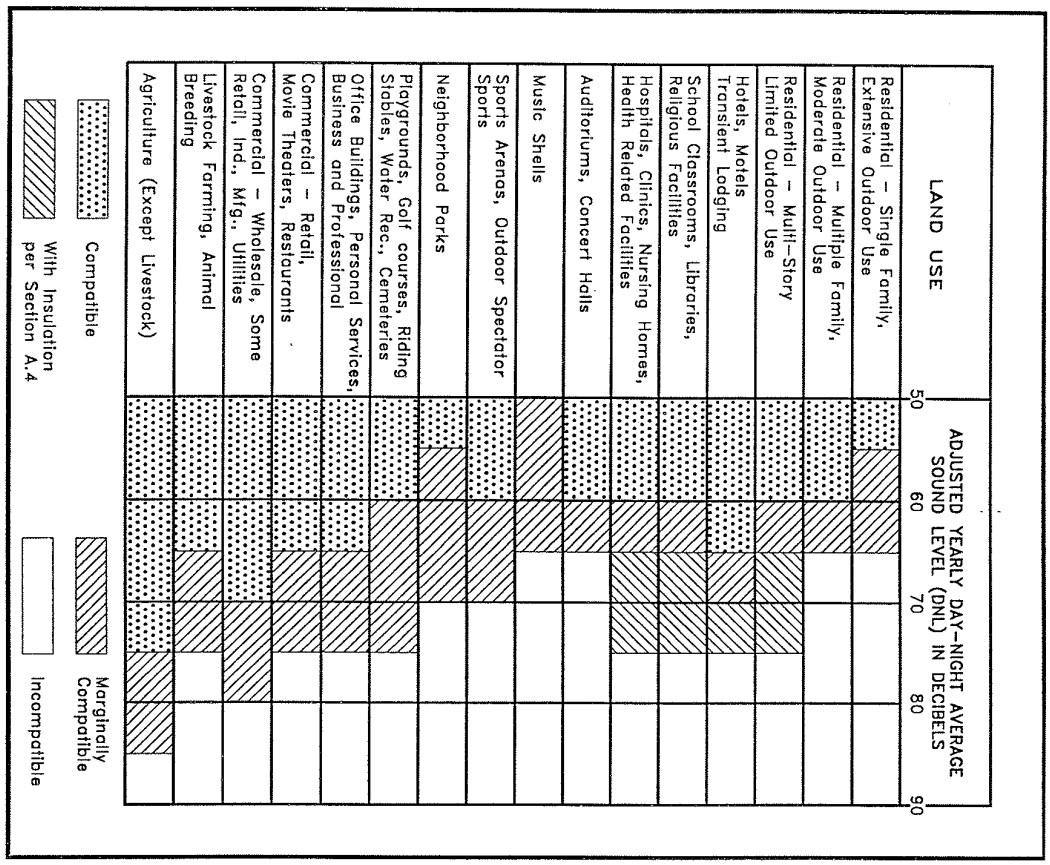


FIGURE 2

LAND USE COMPATIBILITY WITH YEARLY AVERAGE DAY-NIGHT AVERAGE SOUND LEVEL (DNL) AT A SITE FOR BUILDINGS AS COMMONLY CONSTRUCTED.
(Source: American National Standards Institute S12.9-1998/Part 5)

usually controlled by motor vehicle traffic noise. Residences which front major roadways can be exposed to levels of 65 DNL. Due to noise shielding effects from intervening structures, interior lots are usually exposed to 3 to 10 DNL lower noise levels than the front lots which are not shielded from the traffic noise.

For the purposes of determining an acceptable level of exterior noise for residences, federal agencies have determined that an exterior noise level of 65 DNL or lower is considered acceptable. These federal agencies include the Federal Aviation Administration (FAA), Department of Defense (DOD); Federal Housing Administration, Housing and Urban Development (FHA/HUD), and Veterans Administration (VA). This standard is applied nationally (see Reference 3).

For office, commercial, industrial, and other non-noise sensitive land uses, exterior noise levels as high as 70 to 75 DNL are generally considered acceptable. Exceptions to this occur when naturally ventilated office and other commercial establishments are exposed to exterior levels which exceed 65 DNL. The State Department of Health (DOH) regulates the noise levels from fixed machinery by imposing maximum allowable sound levels at the property boundaries for various zoning categories (see Reference 4). Because of the Agricultural Zoning of the project site, the allowable noise levels from fixed machinery on the project site is 70 dBA during the daytime and nighttime periods. The noise levels of portable or movable equipment (such as trucks, front end loaders, bulldozers, etc.) are not subject to the 70 dBA limit under DOH noise regulations.

Due to the large buffer distances between the In-Vessel Composting Facility site and noise sensitive receptors, regulation of the noise levels during construction of the In-Vessel Composting Facility is not as critical as it would be within an urban area. Construction noise levels are regulated by the State DOH using a curfew system (Reference 4) whereby noisy construction activities are not normally permitted during the nighttime periods, on Sundays, and on holidays. Construction activities are normally allowed during the normal daytime work hours on weekdays and on Saturdays using a system involving the issuance of construction noise permits.

CHAPTER IV. GENERAL STUDY METHODOLOGY

General. Computer noise modeling was used to describe future noise levels in the project environs. The noise levels of refuse vehicles and of a diesel engine driven grinder were measured at a similar composting facility in Kapolei, and were used to form a basis for modeling the noise levels from the proposed facility. The noise from grinders and heavy equipment operations at the Kapolei composting facility and from refuse vehicle traffic noise along the primary access roads servicing the proposed In-Vessel Composting Facility were evaluated. Risks of adverse noise impacts from In-Vessel Composting Facility operations, traffic, and short term construction noise were determined, and possible noise mitigation measures were provided as applicable.

Noise Measurements. Traffic noise measurements at Location A along Wilikina Drive (see Figure 1) were performed in January and February of 2011 to validate the traffic noise model. The U.S. Federal Highway Administration Traffic Noise Model (TNM) Version 2.5 (Reference 5) was used to calculate existing and future traffic noise levels, with the traffic noise measurements used to validate the reasonableness of the traffic noise predictions provided by the TNM. The results of these traffic noise measurements and their comparison with TNM predictions are shown in Table 3.

Measurements of refuse vehicles and on-site equipment at the Kapolei composting facility were performed in November 2010 to provide a basis for estimating the future noise levels associated with on-site equipment at the proposed facility. The results of these measurements are shown in Table 4. The results of the measurements for the large diesel engine driven grinder were used to predict if the grinder's noise levels would be less or greater than the DOH 70 dBA limit at the facility's property boundaries.

In-Vessel Composting Facility Noise Levels. Existing background ambient noise levels are expected to be very low because the proposed In-Vessel Composting Facility site is located on presently undeveloped lands which were previously in agricultural use. Existing noise levels are probably less than 55 DNL at locations removed from the major roadways, and are probably controlled by the natural sounds of birds and vegetation moving with the wind, with occasional sounds of aircraft. Future noise levels associated with the In-Vessel Composting Facility operations were assumed to include the noise from front end loader or excavator operations at the In-Vessel Composting Facility site, with anticipated noise levels of 79 dBA at 100 feet from an operating front end loader or excavator. In addition, the noise from grinders and on site heavy refuse vehicles were also expected to contribute to the total noise levels at the In-Vessel Composting Facility. The noise modeling was performed using inverse square law for hemispherical spreading of a sound from a source at or near the ground, with inclusion of molecular absorption and anomalous excess attenuation effects. The modeling equation used to predict sound levels at any given distance from an on-site noise source was:

$$L_p = L_w - 20 \times \text{Log}(d) - [d \times a(f)] / 100 - 8$$

TABLE 3

TRAFFIC AND BACKGROUND NOISE MEASUREMENT RESULTS

LOCATION	Time of Day (HRS)	Ave. Speed (MPH)	Hourly Traffic Volume AUTO	M.TRUCK	H.TRUCK	Measured Leq (dB)	Predicted Leq (dB)
A. 50 FT from the center-line of Willikina Drive (1/25/11)	1600 TO 1700	62	727	4	3	69.0 *	69.5
A. 50 FT from the center-line of Willikina Drive (1/26/11)	0700 TO 0800	60	585	2	2	69.0 *	68.6
A. 50 FT from the center-line of Willikina Drive (2/1/11)	1600 TO 1700	62	749	4	3	69.5	69.6
A. 50 FT from the center-line of Willikina Drive (2/2/11)	0700 TO 0800	60	575	2	2	68.6	68.5

NOTES:

* Measurement data was saturated and, therefore, not reliable, but are included for information only.

TABLE 4

RANGES OF A-WEIGHTED SOUND LEVELS OF ON-SITE EQUIPMENT AT 50 & 2,400 FOOT DISTANCES (IN-VESSEL COMPOSTING FACILITY)

EQUIPMENT	SOUND LEVELS (dBA) (Minimum / Maximum) 50 FEET	2,400 FEET
Hopto, Loader, Excavator	72 / 85	23 / 44 (1)
Tractor Trailer Truck On Site	65 / 75	16 / 35 (1)
Tractor Trailer Truck Unloading	85 / 90	36 / 52 (2)
Large Diesel Engine Grinder	100 / 103	51 / 62 (3)

Notes:

(1) Probably not audible.
(2) Barely audible sometimes.
(3) Probably audible.

where:

L_p = Sound pressure level in decibels (re $2x10^{-5}$ Pa) at distance d (in meters),
L_w = Sound power level of noise source in decibels (re picowatt), and
a(f) = Molecular absorption plus anomalous excess attenuation in decibels per 100 meters. For the 9 standard Octave Bands from 31.5 Hz to 8,000 Hz, the a(f) values used were 0.1, 0.16, 0.27, 0.39, 0.66, 1.08, 1.9, 3.47, and 5.2.

Traffic Noise Levels. Traffic noise predictions for the future conditions (2014) were performed using the Federal Highway Administration (FHWA) Traffic Noise Model (Reference 5). Traffic data entered into the noise prediction model were: roadway and receiver locations; hourly traffic volumes, average vehicle speeds; estimates of traffic mix; and "Loose Soil" propagation loss factor. The traffic data and forecasts for the project (Reference 6) were the primary sources of data inputs to the model. The peak hour traffic volumes for 2014, which were used to model future traffic noise along the primary access roadways in the project environs were obtained from Reference 6 and are shown in Appendix C. For existing and future traffic along the roadways servicing the project site, it was assumed that the average noise levels, or Leq(h), during the peak traffic hour were approximately 0.6 dB less than the 24-hour DNL along those roadways. The relationships between the hourly noise levels along Wilikina Drive at 100 feet from the centerline and the resulting DNL values are shown in Figures 3 and 4. The figures were developed using traffic counts provided by the Hawaii State Department of Transportation (Reference 7) and Wilson Okamoto Corporation (Reference 8), respectively.

Traffic noise calculations for the future conditions in the project environs were developed for ground level receptors without the benefit of shielding from natural or man made obstructions. Non-project and project related traffic noise levels for future conditions in 2014 were calculated along Wilikina Drive on both sides of the project's entrance road.

Construction Noise. Evaluations of potential construction noise impacts at noise sensitive properties closest to the In-Vessel Composting Facility site were also provided. Because of the large buffer distances to the nearest residential areas, expected construction noise levels were not significant at the nearest noise sensitive receptors.

FIGURE 3

HOURLY VARIATIONS OF TRAFFIC NOISE AT 100 FT SETBACK DISTANCE FROM THE CENTERLINE OF WILIKINA DRIVE BETWEEN KAMANANUI RD. AND KAUKONAHUA RD. (STA. B7208030000; FEBRUARY 14, 2008)

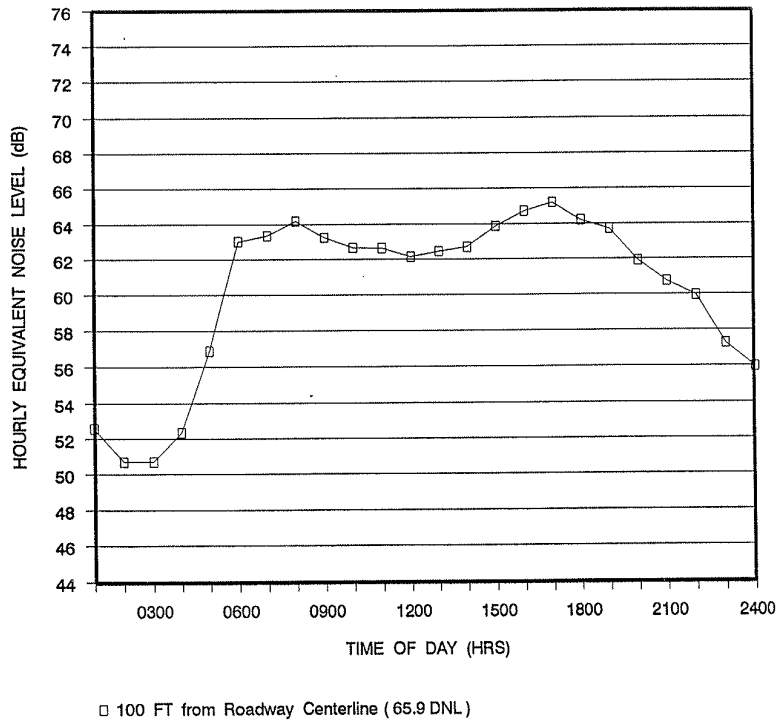
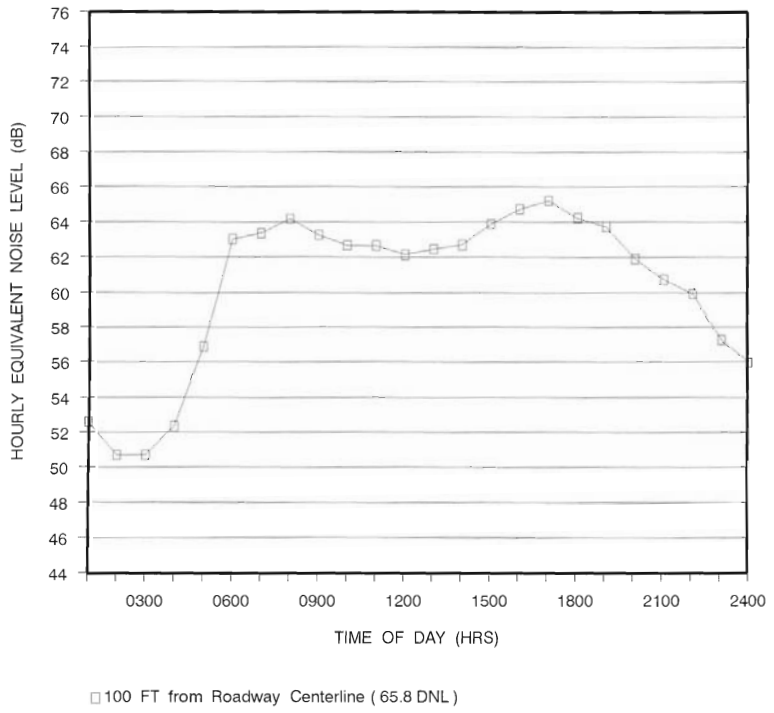


FIGURE 4

HOURLY VARIATIONS OF TRAFFIC NOISE AT 100 FT SETBACK DISTANCE FROM THE CENTERLINE OF WILIKINA DRIVE BETWEEN KAMANANUI RD. AND KAUKONAHUA RD. (WILSON OKAMOTO CORP., 2 / 1 / 11)



CHAPTER V. EXISTING NOISE LEVELS

Existing background ambient noise levels in the project environs are relatively low in areas removed from the major roadways because the area is presently undeveloped, former agricultural land. In these undeveloped areas removed from the existing roadways, existing noise levels are probably less than 55 DNL, and are probably controlled by the natural sounds of birds and vegetation moving with the wind, with occasional sounds of motor vehicles and aircraft. In residential areas such as Poamoho Camp and the military housing areas in Schofield Barracks, existing background noise levels are probably 55 DNL if they are removed from major roadways, and greater than 55 DNL if the housing areas front a major roadway.

Along existing roadways such as Wilikina Drive, which are expected to service the proposed In-Vessel Composting Facility site, existing traffic noise levels are relatively high and greater than 70 DNL at 50 foot setback distance from the roadway's centerline. These levels of traffic noise are relatively high due to the relatively high speeds of the motor vehicles using this roadway.

Table 5 presents the existing traffic volumes, speeds, vehicle types, and noise levels at 50, 100, and 200 feet from the centerline of Wilikina Drive. The noise levels shown in Table 5 are the average noise levels [or Leq(h)] during the pm peak traffic hour. Table 6 presents the calculated setback distances to the 65, 70, and 75 DNL traffic noise contours along Wilikina Drive. It should be noted that approximately 100 foot setback distance from the centerline of Wilikina Drive is required in order for traffic noise levels to decrease to 65 DNL.

TABLE 5

EXISTING (CY 2011) TRAFFIC VOLUMES AND NOISE LEVELS ALONG ROADWAYS IN PROJECT AREA (WEEKDAY PM PEAK HOUR)

LOCATION	SPEED (MPH)	TOTAL VPH	******* VOLUMES (VPH) ********* AUTOS	M TRUCKS	H TRUCKS	50' Leq	100' Leq	200' Leq
Wilikina Dr. North of Kaukonahua Rd.	62	931	922	5	4	70.8	64.2	57.4
Wilikina Dr. South of Kaukonahua Rd.	62	792	785	4	3	70.1	63.5	56.6
Wilikina Dr. North of Kamananui Rd.	62	792	785	4	3	70.1	63.5	56.6
Wilikina Dr. South of Kamananui Rd.	62	1,305	1,293	7	5	72.3	65.7	58.8

Notes:

1. Traffic noise levels calculated for ground level receptors.
2. "Loose Soil" ground conditions assumed along all roadway sections.

TABLE 6
EXISTING AND CY 2014 DISTANCES TO 65, 70, AND 75 DNL CONTOURS (WEEKDAY)

STREET SECTION	65 DNL SETBACK (FT) EXISTING	65 DNL SETBACK (FT) CY 2014	70 DNL SETBACK (FT) EXISTING	70 DNL SETBACK (FT) CY 2014	75 DNL SETBACK (FT) EXISTING	75 DNL SETBACK (FT) CY 2014
Wilikina Dr. North of Kaukonahua Rd.	98	99	58	62	35	35
Wilikina Dr. South of Kaukonahua Rd.	92	91	54	57	32	33
Wilikina Dr. North of Kamananui Rd.	92	103	54	60	32	35
Wilikina Dr. South of Kamananui Rd.	113	124	66	74	40	43

Notes:

(1) All setback distances are from the roadways' centerlines.
(2) See Tables 3A, 3B, 5A, and 5B for traffic volume, speed, and mix assumptions.
(3) Setback distances are for ground level receptors with unobstructed fields-of-view.
(4) "Loose Soil" ground conditions assumed along all roadway sections.

CHAPTER VI. FUTURE NOISE ENVIRONMENT

In-Vessel Composting Facility Operations. Predictions of the noise levels associated with future In-Vessel Composting Facility operations were based on the measured and predicted noise levels shown in Table 4. Spherical spreading plus molecular absorption and excess ground attenuation were used to calculate the sound levels at the large distance (2,400 feet to Schofield Barracks) from the In-Vessel Composting Facility. A worst case estimate of the DNL value associated with the noisiest grinder operations at the In-Vessel Composting Facility were based on the outdoor grinder operating 8 hours per day 6 days per week, and 52 weeks per year. The net result of these worst case noise modeling assumptions was that In-Vessel Composting Facility noise levels associated with on-site equipment operations would not exceed 55 DNL at 2,400 feet distance from the perimeter of the In-Vessel Composting Facility. Since 55 DNL is the most stringent published criteria for acceptable environmental noise exposure levels for noise sensitive land uses, and since the closest residences are at least 2,400 feet away from the In-Vessel Composting Facility, noise associated with In-Vessel Composting Facility operations should not exceed or approach levels which are considered to be unacceptable or incompatible for noise sensitive land uses. At 2,400 feet from the In-Vessel Composting Facility, the noise from other on-site equipment should be inaudible or barely audible as indicated in Table 4.

Refuse Vehicle Traffic. Table 7 presents the results of calculations of future traffic noise levels along Wilikina Drive following completion of the project in 2014. Predictions of future traffic noise levels were made using the traffic volume assignments of Reference 6 for CY 2014 with and without the proposed project. Table 6 presents the changes in the setback distances to the 65, 70, and 75 DNL contours along Wilikina Drive following completion of the project. Without the proposed In-Vessel Composting Facility project, future traffic noise levels along Wilikina Drive are predicted to increase very slightly by 0.0 to 0.1 DNL units between 2011 and 2014. Future traffic noise levels along Wilikina Drive are predicted to be approximately 65 DNL at 91 to 125 feet setback distances from the roadway's centerline.

The increases in future traffic noise levels along Wilikina Drive due to project traffic were calculated to be 0.8 DNL, which will be difficult to perceive and which are considered to be insignificant. The increases in traffic noise levels associated with the project are anticipated to occur only on the sections of Wilikina Drive south of the proposed project's Entrance Road (toward Honolulu). Therefore, with or without the proposed In-Vessel Composting Facility project, future traffic noise levels along the Wilikina Drive should not increase significantly.

Along the future In-Vessel Composting Facility Entrance Road, project traffic noise levels are predicted to be 60 DNL and 62 DNL at posted speed limits of 25 or 35 miles per hour, respectively, at 50 feet setback distance from the entrance roadway's centerline. These noise levels are relatively low, and well below current traffic noise impact criteria for commercial, industrial, or agricultural land uses.

TABLE 7

FUTURE (CY 2014) TRAFFIC VOLUMES AND NOISE LEVELS
ALONG ROADWAYS IN PROJECT AREA
(WEEKDAY PM PEAK HOUR, BUILD)

LOCATION	SPEED (MPH)	TOTAL VPH	******* VOLUMES (VPH) ********* AUTOS	M TRUCKS	H TRUCKS	50' Leq	100' Leq	200' Leq
Wilikina Dr. North of Kaukonahua Rd.	62	945	936	5	4	70.9	64.3	57.4
Wilikina Dr. South of Kaukonahua Rd.	62	804	797	4	3	70.2	63.5	56.7
Wilikina Dr. North of Kamananui Rd.	62	813	780	4	29	71.0	64.7	58.4
Wilikina Dr. South of Kamananui Rd.	62	1,334	1,296	7	31	72.9	66.5	60.0

Notes:

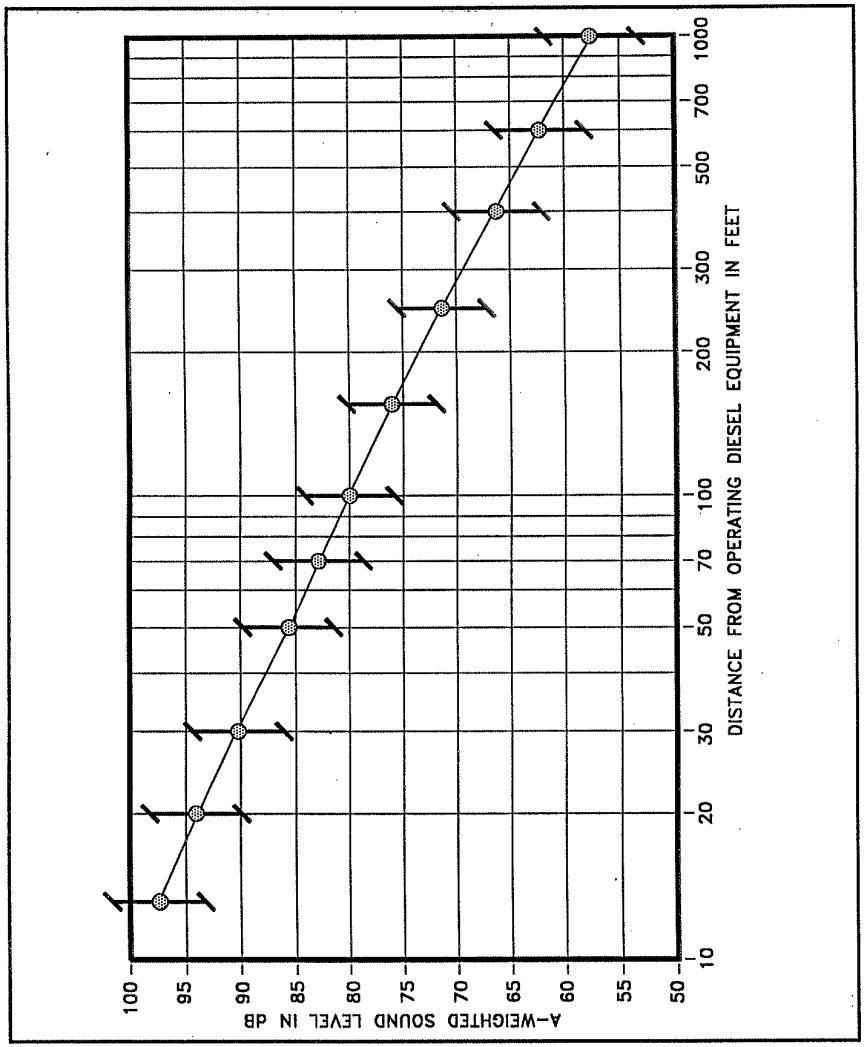
1. Traffic noise levels calculated for ground level receptors.
2. "Loose Soil" ground conditions assumed along all roadway sections.

CHAPTER VII. POTENTIAL NOISE IMPACTS ASSOCIATED WITH THE PROPOSED PROJECT AND POSSIBLE MITIGATION MEASURES

In-Vessel Composting Facility Noise Impacts. Potential noise impacts resulting from the noise of diesel engine driven grinder operations or other activities at the proposed In-Vessel Composting Facility are not expected to exceed 55 DNL at the nearest military housing area at Schofield Barracks. However, if the large diesel engine driven grinder is located and operated near the center of the proposed facility as originally planned, its noise level is predicted to exceed the State DOH 70 dBA limit by approximately 8 dBA at the closest property boundaries. For this reason, mitigation of the high noise level from the diesel engine driven grinder is recommended, either through the addition of a noise quieting kit or through the alternate use of an enclosed, electric motor driven grinder. The adoption of one of these two noise mitigation options for the grinder is presently being included in the on-site equipment plans for the In-Vessel Composting Facility.

Traffic Noise Impacts. The increases in noise levels attributable to project traffic in CY 2014 are predicted to be difficult to perceive and not significant along the south section of Wilikina Drive, which would service the proposed In-Vessel Composting Facility. Because of the remoteness of the In-Vessel Composting Facility site, project related traffic noise levels along the future In-Vessel Composting Facility Entrance Road should not cause traffic noise levels to exceed the 65 DNL FHA/HUD criteria at existing noise sensitive buildings in the project environs. Risks of potential noise impacts from project traffic are considered to be very low at existing noise sensitive receptors because of the large buffer distances between the noise sensitive buildings and the In-Vessel Composting Facility Entrance Road, and because of the very small increases in traffic noise expected from project traffic along Wilikina Drive. For these reasons, existing noise sensitive buildings in the project area should not require sound attenuation measures as a result of the proposed project.

Construction Noise Impacts. Construction noise levels are anticipated to range between 45 to 55 dBA at the closest residences during the entire project construction period. Typical levels of noise from construction activity (excluding pile driving activity) are shown in Figure 5. Adverse impacts from construction noise are not expected to occur due to the large buffer distances (at least 2,400 feet) from the project site to the closest residences, and construction noise mitigation measures should not be required. The implementation of State DOH construction noise permit procedures (see Reference 4) will require that noisy construction activities do not occur during the nighttime, Sundays, and holidays (see Figure 6). Therefore, adverse noise impacts are not expected to occur from construction activities on the project site.



ANTICIPATED RANGE OF CONSTRUCTION NOISE LEVELS VS. DISTANCE

FIGURE 9

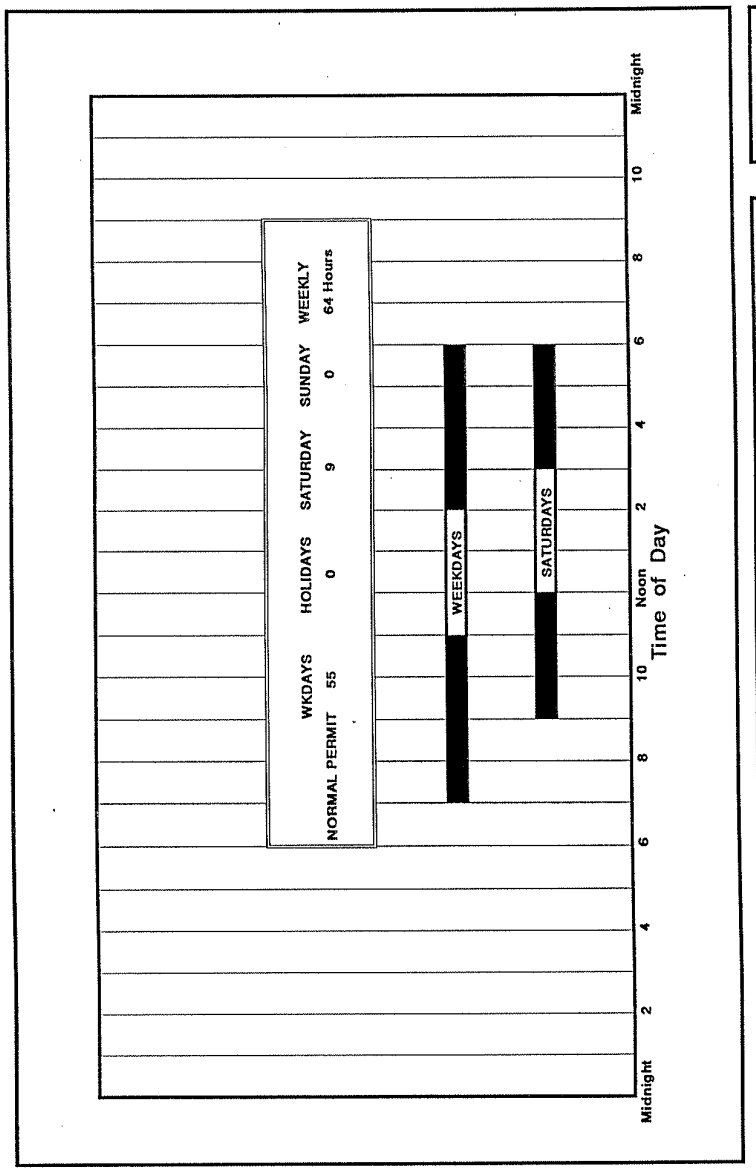


FIGURE 10

AVAILABLE WORK HOURS UNDER DOH PERMIT PROCEDURES FOR CONSTRUCTION NOISE

APPENDIX A. REFERENCES

(1) "Guidelines for Considering Noise in Land Use Planning and Control;" Federal Interagency Committee on Urban Noise; June 1980.

(2) American National Standard, "Sound Level Descriptors for Determination of Compatible Land Use," ANSI S12.9-1998/ Part 5; Acoustical Society of America.

(3) "Environmental Criteria and Standards, Noise Abatement and Control, 24 CFR, Part 51, Subpart B;" U.S. Department of Housing and Urban Development; July 12, 1979.

(4) "Title 11, Administrative Rules, Chapter 46, Community Noise Control;" Hawaii State Department of Health; September 23, 1996.

(5) "FHWA Highway Traffic Noise Model User's Guide;" FHWA-PD-96-009, Federal Highway Administration; Washington, D.C.; January 1998 and Version 2.5 Upgrade (April 14, 2004).

(6) Traffic Turning Movements for In-Vessel Composting Facility; Wilson Okamoto Corporation; February 21, 2011.

(7) Traffic Counts for Station B7208030000; Wilikina Drive Between Kamananui Road and Kaukonahua Road; Hawaii State Department of Transportation, Highways Division; February 14, 2008.

(8) Traffic Counts On Wilikina Drive Between Kamananui Road and Kaukonahua Road; Wilson Okamoto Corporation; February 1, 2011.

APPENDIX B

EXCERPTS FROM EPA'S ACOUSTIC TERMINOLOGY GUIDE

Descriptor Symbol Usage

The recommended symbols for the commonly used acoustic descriptors based on A-weighting are contained in Table I. As most acoustic criteria and standards used by EPA are derived from the A-weighted sound level, almost all descriptor symbol usage guidance is contained in Table I.

Since acoustic nomenclature includes weighting networks other than "A" and measurements other than pressure, an expansion of Table I was developed (Table II). The group adopted the ANSI descriptor-symbol scheme which is structured into three stages. The first stege indicates that the descriptor is a level (i.e., based upon the logarithm of a ratio), the second stage indicates the type of quantity (power, pressure, or sound exposure), and the third stage indicates the weighting network (A, B, C, D, E.....). If no weighting network is specified, "A" weighting is understood. Exceptions are the A-weighted sound level and the A-weighted peak sound level which require that the "A" be specified. For convenience in those situations in which an A-weighted descriptor is being compared to that of another weighting, the alternative column in Table II permits the inclusion of the "A". For example, a report on blast noise might wish to contrast the LCdn with the LAdn.

Although not included in the tables, it is also recommended that "Lpn" and "LepN" be used as symbols for perceived noise levels and effective perceived noise levels, respectively.

It is recommended that in their initial use within a report, such terms be written in full, rather than abbreviated. An example of preferred usage is as follows:

The A-weighted sound level (LA) was measured before and after the installation of acoustical treatment. The measured LA values were 85 and 75 dB respectively.

Descriptor Nomenclature

With regard to energy averaging over time, the term "average" should be discouraged in favor of the term "equivalent". Hence, Leq, is designated the "equivalent sound level". For Ld, Ln, and Ldn, "equivalent" need not be stated since the concept of day, night, or day-night averaging is by definition understood. Therefore, the designations are "day sound level", "night sound level", and "day-night sound level", respectively.

The peak sound level is the logarithmic ratio of peak sound pressure to a reference pressure and not the maximum root mean square pressure. While the latter is the maximum sound pressure level, it is often incorrectly labelled peak. In that sound level meters have "peak" settings, this distinction is most important.

"Background ambient" should be used in lieu of "background", "ambient", "residual", or "indigenous" to describe the level characteristics of the general background noise due to the contribution of many unidentifiable noise sources near and far.

With regard to units, it is recommended that the unit decibel (abbreviated dB) be used without modification. Hence, DBA, PNdB, and EPNdB are not to be used. Examples of this preferred usage are: the Perceived Noise Level (Lpn was found to be 75 dB. Lpn = 75 dB). This decision was based upon the recommendation of the National Bureau of Standards, and the policies of ANSI and the Acoustical Society of America, all of which disallow any modification of bel except for prefixes indicating its multiples or submultiples (e.g., deci).

Noise Impact

In discussing noise impact, it is recommended that "Level Weighted Population" (LWP) replace "Equivalent Noise Impact" (ENI). The term "Relative Change of Impact" (RCI) shall be used for comparing the relative differences in LWP between two alternatives.

Further, when appropriate, "Noise Impact Index" (NII) and "Population Weighed Loss of Hearing" (PHL) shall be used consistent with CHABA Working Group 69 Report Guidelines for Preparing Environmental Impact Statements (1977).

APPENDIX B (CONTINUED)

TABLE II

RECOMMENDED DESCRIPTOR LIST

TERM	A-WEIGHTING	ALTERNATIVE[1] A-WEIGHTING	OTHER[2] WEIGHTING	UNWEIGHTED
1. Sound (Pressure)[3] Level	L_A	L_{pA}	L_B, L_{pB}	L_p
2. Sound Power Level	L_{WA}		L_{WB}	L_W
3. Max. Sound Level	L_{max}	L_{Amax}	L_{Bmax}	L_{pmax}
4. Peak Sound (Pressure) Level	L_{Apk}		L_{Bpk}	L_{pk}
5. Level Exceeded x% of the Time	L_x	L_{Ax}	L_{Bx}	L_{px}
6. Equivalent Sound Level	L_{eq}	L_{Aeq}	L_{Beq}	L_{peq}
7. Equivalent Sound Level[4] Over Time(T)	$L_{eq(T)}$	$L_{Aeq(T)}$	$L_{Beq(T)}$	$L_{peq(T)}$
8. Day Sound Level	L_d	L_{Ad}	L_{Bd}	L_{pd}
9. Night Sound Level	L_n	L_{An}	L_{Bn}	L_{pn}
10. Day-Night Sound Level	L_{dn}	L_{Adn}	L_{Bdn}	L_{pdn}
11. Yearly Day-Night Sound Level	$L_{dn(Y)}$	$L_{Adn(Y)}$	$L_{Bdn(Y)}$	$L_{pdn(Y)}$
12. Sound Exposure Level	L_S	L_{SA}	L_{SB}	L_{Sp}
13. Energy Average Value Over (Non-Time Domain) Set of Observations	$L_{eq(e)}$	$L_{Aeq(e)}$	$L_{Beq(e)}$	$L_{peq(e)}$
14. Level Exceeded x% of the Total Set of (Non-Time Domain) Observations	$L_{x(e)}$	$L_{Ax(e)}$	$L_{Bx(e)}$	$L_{px(e)}$
15. Average L_x Value	L_x	L_{Ax}	L_{Bx}	L_{px}

(1) "Alternative" symbols may be used to assure clarity or consistency.

(2) Only B-weighting shown. Applies also to C,D,E,.....weighting.

(3) The term "pressure" is used only for the unweighted level.

(4) Unless otherwise specified, time is in hours (e.g., the hourly equivalent level is Leq(1). Time may be specified in non-quantitative terms (e.g., could be specified as Leq(WASH) to mean the washing cycle noise for a washing machine.

APPENDIX B (CONTINUED)

TABLE I

A-WEIGHTED RECOMMENDED DESCRIPTOR LIST

TERM	SYMBOL
1. A-Weighted Sound Level	L_A
2. A-Weighted Sound Power Level	L_{WA}
3. Maximum A-Weighted Sound Level	L_{max}
4. Peak A-Weighted Sound Level	L_{Apk}
5. Level Exceeded x% of the Time	L_x
6. Equivalent Sound Level	L_{eq}
7. Equivalent Sound Level over Time (T) (1)	$L_{eq(T)}$
8. Day Sound Level	L_d
9. Night Sound Level	L_n
10. Day-Night Sound Level	L_{dn}
11. Yearly Day-Night Sound Level	$L_{dn(Y)}$
12. Sound Exposure Level	L_{SE}

(1) Unless otherwise specified, time is in hours (e.g. the hourly equivalent level is $L_{eq(1)}$). Time may be specified in non-quantitative terms (e.g., could be specified a $L_{eq(WASH)}$ to mean the washing cycle noise for a washing machine).

SOURCE: EPA ACOUSTIC TERMINOLOGY GUIDE, BNA 8-14-78,

APPENDIX C

SUMMARY OF BASE YEAR AND YEAR 2014 TRAFFIC VOLUMES

ROADWAY LANES	**** CY 2011 ***** AM VPH	PM VPH	CY 2014 (NO BUILD) AM VPH	PM VPH	CY 2014 (BUILD) AM VPH	PM VPH
Wilikina Dr. N. of Kaukonahua Rd. (NB)	245	617	249	626	249	626
Wilikina Dr. N. of Kaukonahua Rd. (SB)	447	314	453	319	453	319
Two-Way	692	931	702	945	702	945
Wilikina Dr. S. of Kaukonahua Rd. (NB)	193	540	196	548	196	548
Wilikina Dr. S. of Kaukonahua Rd. (SB)	367	252	372	256	372	256
Two-Way	560	792	568	804	568	804
Wilikina Dr. N. of Kamananui Rd. (NB)	193	540	196	548	218	554
Wilikina Dr. N. of Kamananui Rd. (SB)	367	252	371	256	376	259
Two-Way	560	792	567	804	594	813
Wilikina Dr. S. of Kamananui Rd. (NB)	192	539	195	547	217	553
Wilikina Dr. S. of Kamananui Rd. (SB)	642	766	650	778	655	781
Two-Way	834	1,305	845	1,325	872	1,334
Kaukonahua Rd. At Wilikina Drive (WB)	57	86	58	87	58	87
Kaukonahua Rd. At Wilikina Drive (EB)	85	71	86	72	86	72
Two-Way	142	157	144	159	144	159
Kamananui Rd. At Wilikina Dr. (WB)	277	516	281	524	281	524
Kamananui Rd. At Wilikina Dr. (EB)	1	1	1	1	1	1
Two-Way	278	517	282	525	282	525

Appendix G

Archaeological Assessment for an Approximately 112-Acre Proposed Composting Facility, Cultural Surveys Hawaii, Inc. December 2010

Archaeological Assessment for an Approximately 112-Acre Proposed Composting Facility, *Mauka* Kamananui Ahupua‘a, Waialua District, O‘ahu TMK: [1] 6-5-002:026

Prepared for

Wilson Okamoto Corporation

Prepared by

Hallett H. Hammatt, Ph.D.

and

David W. Shideler, M.A.

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Reference	Archaeological Assessment for an Approximately 112-Acre Proposed Composting Facility, *Mauka* Kamananui Ahupua‘a, Waialua District, O‘ahu, TMK: [1] 6-5-002:026
Date	December 2010
Project Number (s)	Cultural Surveys Hawai‘i (CSH) Job Code Kamananui 1
Investigation Permit Number	The fieldwork component was carried out under archaeological permit number 1010, issued to Cultural Surveys Hawai‘i, Inc. (CSH) by the Hawai‘i State Historic Preservation Division/ Department of Land and Natural Resources (SHPD/DLNR), per Hawai‘i Administrative Rules (HAR) Chapter 13-282.
Project Location	The project area is in the *mauka* (inland) portion of the Waialua District and consists of TMK: [1] 6-5-002:026; its northeastern boundary is Wilikina Drive. The project area is depicted on the U.S. Geological Survey 7.5- minute series topographic map, Haleiwa (1999) and Schofield Barracks (1998) quadrangles
Land Jurisdiction	Private
Agencies	Hawai‘i State Historic Preservation Division/ Department of Land and Natural Resources (SHPD/DLNR)
Project Description	Hawaiian Earth Recycling LLC (HER) proposes to construct an in-vessel composting facility (composting of organics that occurs in enclosed reactors with controlled air flow) in the present Waialua study area. The in-vessel composting of the proposed facility will process up to 100,000 tons per year of green waste, food waste, and sewage sludge, and produce marketable compost products, such as soil amendments and potting soil. The facility may also be expanded in the future, through mutual agreement between the City & County of Honolulu and HER, to handle up to 150,000 tons per year. The in-vessel composting of the proposed facility will utilize the GORE™ Cover System for the composting process, which is highly effective in managing and controlling odors and emissions. The proposed facility will consist of two truck weighing scales, an enclosed tipping and preparation building, and open processing area where the GORE™ system will be installed, storm water retention ponds, a sewered leachate storage tank, and an open product storage area. These facilities will encompass approximately 38 acres of the 112-acre project area. The remainder will continue to be used for the existing open windrow composting operating (green waste and pre-consumer food waste) and will be utilized to demonstrate using compost to assist crop production.
Project Acreage	Approximately 112 acres

Area of Potential Effect (APE) and Survey Acreage	Based on available information, the proposed project will not have visual, auditory or other environmental impacts to any known archaeological historic properties located either inside or outside the project area. Therefore, the area of potential effect is the same as the project area. The survey area for the current investigation includes the entire approximately 112-acre APE.
Historic Preservation Regulatory Context	CSH conducted an archaeological inventory survey investigation for the proposed composting facility project. Per the requirements of Hawai‘i Administrative Rules (HAR) Chapter 13-13-276, the study was conducted to identify, document, and make Hawai‘i Register of Historic Places (Hawai‘i Register) eligibility recommendations for the survey area’s historic properties. Because no historic properties were identified in the survey area, this investigation is termed an archaeological assessment per HAR Chapter 13-13-275-5. This archaeological assessment report was prepared to support the proposed project’s historic preservation review under Hawai‘i Revised Statutes (HRS) Chapter 6E-8 and HAR Chapter 13-13-275. This archaeological assessment report was prepared to support the proposed project’s historic preservation review and any other project-related historic preservation consultation.
Fieldwork Effort	A field inspection was conducted on November 5, 2010 by Rosanna Runyon, B.A., and David Shideler, M.A., under the overall supervision of Hallett H. Hammatt, Ph. D. (principal investigator), and required approximately 12 person-hours to complete.
Number of Historic Properties Identified	None
Effect Recommendation	CSH’s effect recommendation for the proposed development is “no historic properties affected.” The project area was observed to have undergone extensive land modification during previous agricultural cultivation.
Mitigation Recommendation	No further archaeological work is recommended for the proposed composting facility in *mauka* Kamananui Ahupua‘a. If in the unlikely event that intact cultural resources, including but not limited to human remains or other significant cultural deposits, are encountered during the course of development activities, all work in the immediate area should stop and the State Historic Preservation Division should be promptly notified.

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Section 1 Introduction

1.1 Project Background

At the request of Wilson Okamoto Corporation, Cultural Surveys Hawai‘i, Inc. (CSH) completed an archaeological assessment for a proposed composting facility in *mauka* (inland) Kamananui Ahupua‘a, Waialua District, O‘ahu (TMK: [1] 6-5-002:026). Wilikina Drive forms the project area’s northeastern boundary. The project area is depicted on the U.S. Geological Survey 7.5- minute series topographic map, Haleiwa (1999) and Schofield Barracks (1998) quadrangles (Figure 1), a Tax Map Key (Figure 2) and an aerial photograph (Figure 3).

CSH conducted an archaeological inventory survey investigation for the approximately 112 acres proposed composting facility. Per the requirements of Hawai‘i Administrative Rules (HAR) Chapter 13-13-276, the study was conducted to identify, document, and make Hawai‘i Register of Historic Places (Hawai‘i Register) eligibility recommendations for the project area’s historic properties. Because no historic properties were identified in the project area, this investigation is termed an archaeological assessment per HAR Chapter 13-13-284-5. This archaeological assessment report was prepared to support the proposed project’s historic preservation review under Hawai‘i Revised Statutes (HRS) Chapter 6E-8 and HAR Chapter 13-13-275. This archaeological assessment report was also prepared to support the proposed project’s historic preservation review and any other project-related historic preservation consultation.

Currently, the City and County (C&C) of Honolulu’s Curbside Green Waste Collection Program, individual homeowners, commercial tree trimmers and landscape maintenance contractors, and governmental property maintenance agencies deliver green wastes to one of two Hawaiian Earth Products’ (HEP) Department of Health-permitted composting/transfer locations, located at Campbell Industrial Park and Kapa‘a Quarry, respectively. HEP recycles over 85,000 tons of green waste per year from both facilities into beneficial products, such as soil enrichment, fertilizer replacement/enhancement, and gardening and landscaping products. HEP has a DOH permitted open windrow composting operations (long, low mounds of shredded green waste that are turned every few days to provide air for the microbes digesting the organics) at both Campbell Industrial Park and the Waialua facility.

Hawaiian Earth Recycling LLC (HER) (an affiliated company of HEP) proposes to construct an in-vessel composting facility (composting of organics that occurs in enclosed flexible vessels with controlled air flow) in Waialua (present project area). The in-vessel composting of the proposed facility will process up to 100,000 tons per year of green waste, food waste, and sewage sludge, and produce marketable compost products, such as soil amendments and potting soil. Food waste will be delivered from a developed C&C food waste collection program and the sewage sludge will come from the C&C’s Honouliuli and Kailua Regional Wastewater Treatment Facilities. The C & C portion of the facility may also be expanded in the future, through mutual agreement between the C&C and HER, to handle up to 150,000 tons per year.

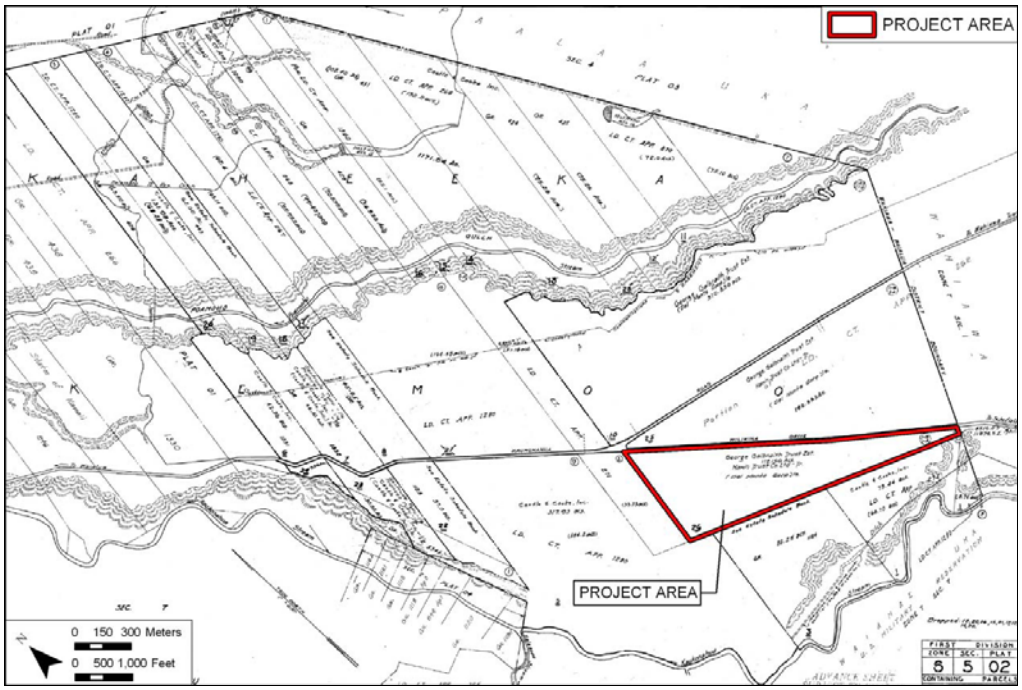


Figure 2. Tax Map Key (TMK) plat [1] 6-5-02 showing the project area

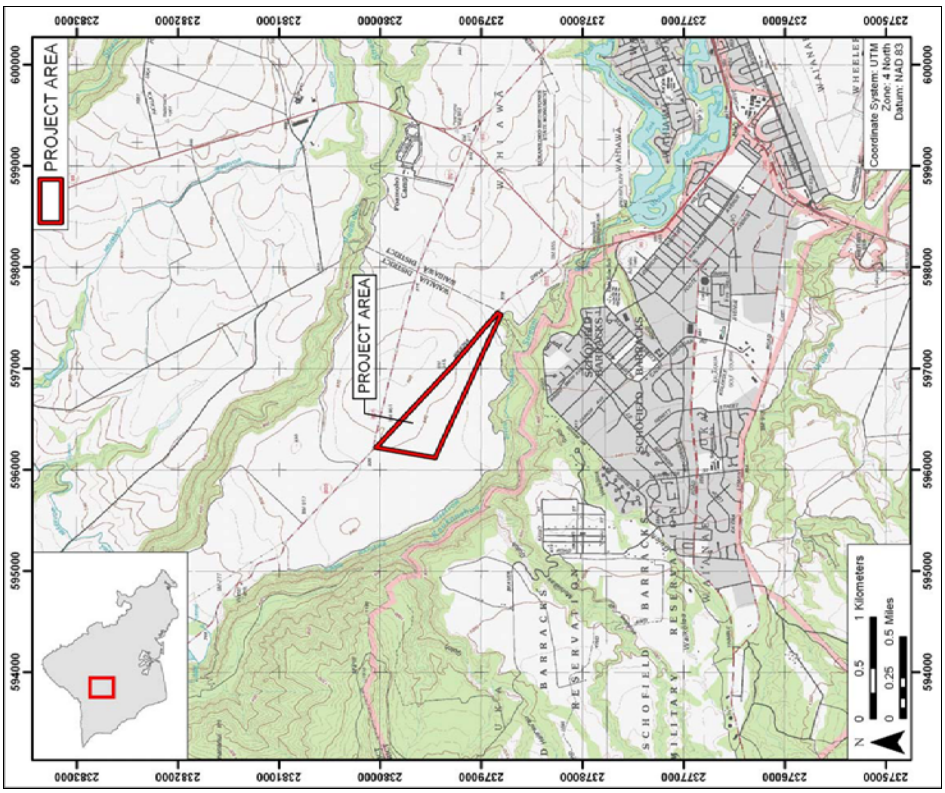


Figure 1. Portion of the U. S. Geological Survey 7.5-minute series topographic map, Haleiwa (1999) and Schofield Barracks (1998) quadrangles, showing the project area

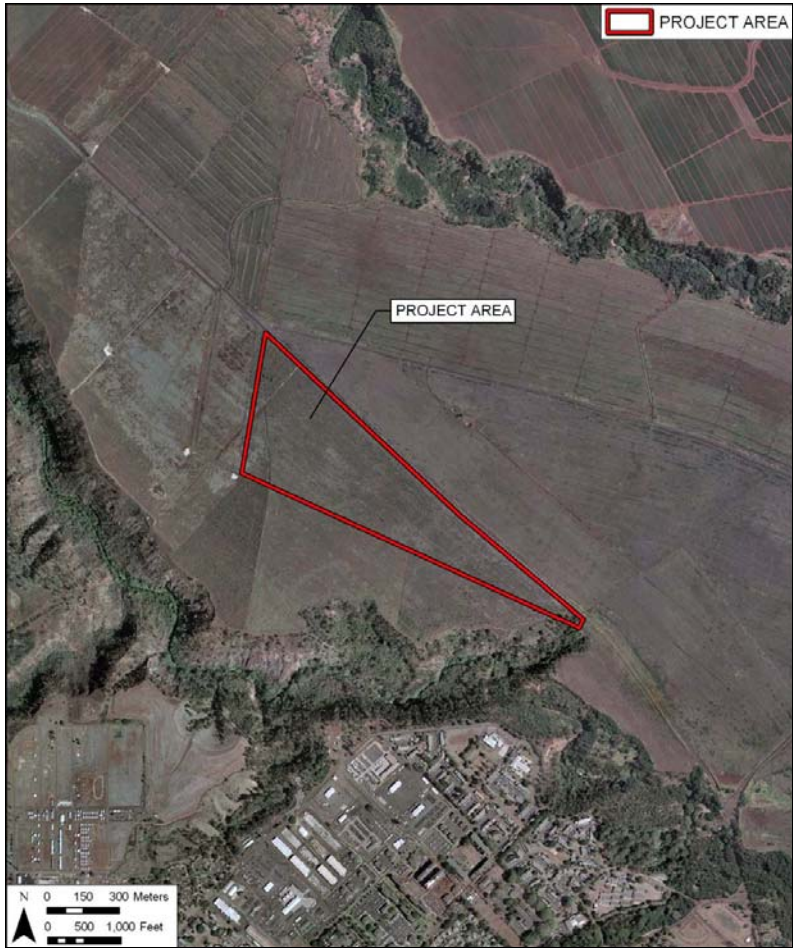


Figure 3. Aerial photograph (source: Google Earth 2008) showing the project area (note extensive agricultural development)

The in-vessel composting of the proposed facility will utilize the GORE™ Cover System for the composting process, which is highly effective in managing and controlling odors and emissions. The proposed facility will consist of two truck weighing scales, an enclosed tipping and preparation building, and open processing area where the GORE™ system will be installed, 3 storm water retention ponds, sewered leachate storage tanks, and an open product storage area (see Figure 4, site plan, and Figure 5, conceptual plan). These facilities will encompass approximately 38 acres of the 112-acre Project area. The remainder will be used for the existing open windrow composting operating (green waste only) and will be utilized to demonstrate using compost to assist crop production.

Currently, mulch that consists of ground up green waste is in piles and spread out over the project area.

1.2 Scope of Work

The scope of work for this investigation includes:

1. Historical research to include study of archival sources, historic maps, Land Commission Awards and previous archaeological reports to construct a history of land use and to determine if archaeological sites have been recorded on or near this property.
2. Field inspection of the project area to identify any surface archaeological features and to investigate and assess the potential for impact to such sites. This assessment was to identify any sensitive areas that may require further investigation or mitigation before the project proceeds.
3. Preparation of a report to include the results of the historical research and the fieldwork with an assessment of archaeological potential based on that research, with recommendations for further archaeological work, if appropriate. It was also to provide mitigation recommendations if there are archaeologically sensitive areas that need to be taken into consideration.

1.3 Environmental Setting

1.3.1 Natural Environment

The approximately 112-acre project area (TMK [1] 6-5-002:026) is within fairly level lands that range in elevation from 880 to 955 feet above mean sea level. There is a steep gulch in the project area's extreme east corner. Annual rainfall in the project area vicinity is between 800 and 1,000 mm (31-39 inches) (Giambelluca et al. 1986)

Project area sediments primarily consist of Wahiawa silty clay (a mixture of WaA, 0 to 3 Percent Slope and WaB, 3 to 8 Percent Slope). The eastern-most portion of the project area contains Helemano Silty Clay, 30 to 90 percent slope (Figure 6).

The Wahiawa series consists of well-drained silty clay soils developed in residuum and old alluvium derived from basic igneous rocks. They are on nearly level to moderately steep lands. Wahiawa soils are used for pineapple, sugarcane, pasture, truck crops, orchard, and home sites.

Natural vegetation consists of bermudagrass, guava, *koa haole*, *honohono*, and *lantana* (Foote et al. 1972:124).

The Helemano series consists of well-drained soils on alluvial fans and colluvial slopes on the sides of gulches. These soils developed in alluvium and colluviums derived from basic igneous rock and are steep to extremely steep. These soils are used for pasture, wildlife habitat, and woodland. Natural vegetation consists of Christmas berry, Formosa *koa*, eucalyptus, guava, Japanese tea, *koa haole*, and Java plum (Foote et al. 1972:40).

The only vegetation currently within the flat plateau lands of the project area consists of exotic grasses and weeds along its perimeter. Within the small gulch area in the extreme southeast portion of the project area are a variety of exotic trees and shrubs including haole koa (*Leucaena glauca*) banyan (*Ficus* sp.), octopus tree (*Schefflera actinophylla*) Christmasberry (*Schinus terebinthifolius*) and Java plum (*Syzygium cumini*).

1.3.2 Built Environment

There are no structures or buildings within the project area. Wilikina Drive forms the project area's northeastern boundary.

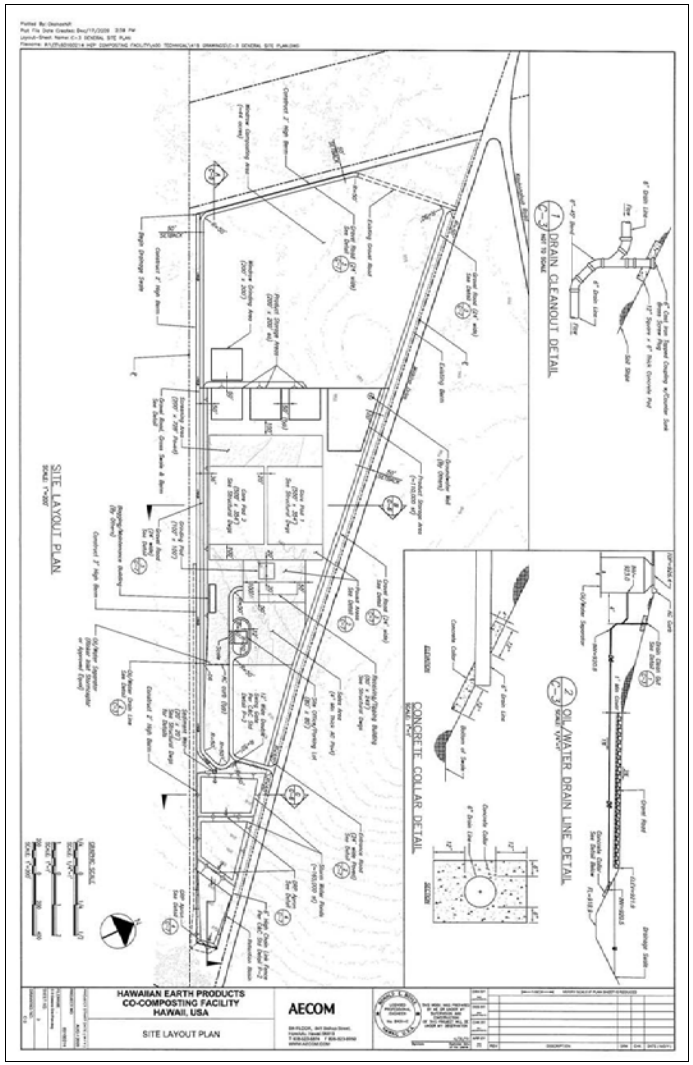


Figure 4. Co-Composting Facility Project plans (provided by client)

Figure 6. U.S. Geological Survey 7.5-Minute Series Topographic map, 'Haleiwa (1999) and Schofield Barracks (1998) quadrangles, with overlay of the U.S. Department of Agriculture soil survey data (Foote et al. 1972), indicating sediment types within the project area

Figure 5. Conceptual plan: Aerial view of similar composting facility (outside of Hawai'i) to that presently proposed

Section 2 Methods

2.1 Field Methods

The fieldwork component of this archaeological assessment was conducted on November 5, 2010 by two CSH archaeologists, Rosanna Runyon, BA, and David Shideler, M.A., under the overall supervision of Hallett H. Hammatt, Ph. D. (principal investigator), and required approximately 12 person-hours to complete. The fieldwork consisted of a complete pedestrian inspection of the proposed composting facility project area.

No historic properties were encountered and the pedestrian inspection was documented with field notes, maps, and photographs.

2.2 Document Review

Background research included: a review of previous archaeological studies on file at SHPD/DLNR; review of documents at Hamilton Library of the University of Hawai‘i, the Hawai‘i State Archives, the Mission Houses Museum Library, the Hawai‘i Public Library, and the Archives of the Bishop Museum; study of historic photographs at the Hawai‘i State Archives and the Archives of the Bishop Museum; and study of historic maps at the Survey Office of the Department of Land and Natural Resources. Historic maps and photographs from the CSH library were also consulted. In addition, Māhele records were examined from the Waihona ‘Aina database (www.waihona.com).

This research provided the environmental, cultural, historic, and archaeological background for the project area. The sources studied were used to formulate a predictive model regarding the expected types and locations of historic properties in the project area.

Section 3 Background Research

The proposed composting facility, lies within the traditional Hawaiian land division of Kamananui Ahupua‘a in Waialua District (Figure 7). Pukui et al. (1974:80) translate the name as “the large branch” presumably a reference to Ki‘iki‘i Stream (also known as Kaukonahua Stream) that joins Paukauila Stream at the head of Kaiaka Bay. Kirch and Sahlins (1992:20) relate that Kaiaka Bay “is more commonly called Waialua Bay in historic accounts,” since it is within Kamananui, “the political center of the *moku* [district] of Waialua.”

There is another Kamananui in Waialua District that is a tributary to the Waimea River.

3.1 Mythological and Traditional Accounts

There are few mythological accounts specific to Kamananui, O‘ahu. Thrum’s (1907:252-253) account of “Kaneaukai A Legend of Waialua” makes a passing reference to Kamananui Stream. Two *kahuna* of Waimea are told by the god Kāneaukai to go to Mokulē‘ia to fetch a certain image of the god. The *kahuna* baulk at going “as it was a dark night and there were usually quicksands after a freshet in the Kamananui River.” It is agreed they will send their sons who were aided “…when a meteor (*hoku kaolele*) appeared and went before them, showing them how to escape the quicksands.”

3.2 Early Historic Period

Waialua enters the historic record in 1794 when Ka-‘eo-kū-lani recruited the “warriors of Waialua and Wai‘anae” to make war on his nephew Kalanikūpule, then ruler of O‘ahu (Kamakau 1992:168); by December 1794 Ka‘eo had been killed and his forces were defeated. Kalanikūpule was deposed the following year when the invading Hawai‘i Island forces of Kamehameha prevailed at the Battle of Nu‘uanu in April 1795. Apparently the Waialua District was spared direct involvement in the battles associated with Kamehameha’s conquest. However, Kamehameha’s hegemony on O‘ahu would have immediate consequences for the district — including Kamananui Ahupua‘a — during the first decades of the 19th century.

Handy (1940:85) relates that Kamananui formerly had:

> …… large terrace areas along the flatlands between the junction of Helemano and Poamoho Streams and the flatland west of Poamoho. There were also small terrace areas up in the lower flats of Poamoho and Kaukonahua Valleys. There were small flats in the bottom of Kaukonahua Canyon for several miles above its junction with Manawai Stream. Poamoho is probably too narrow for taro terraces. It is likely that in these gulches, as at Waimea, sweet potatoes and bananas were planted around home sites along the ridge and near taro patches at the bottom of the gulch. Wild taro and bananas grow in Manawai Valley and presumably also in the other five valleys that run up toward Puu Kane. At Kamananui are the remains of what McAllister describes as “the longest irrigation ditch of which there is any memory: among modern Hawaiians.

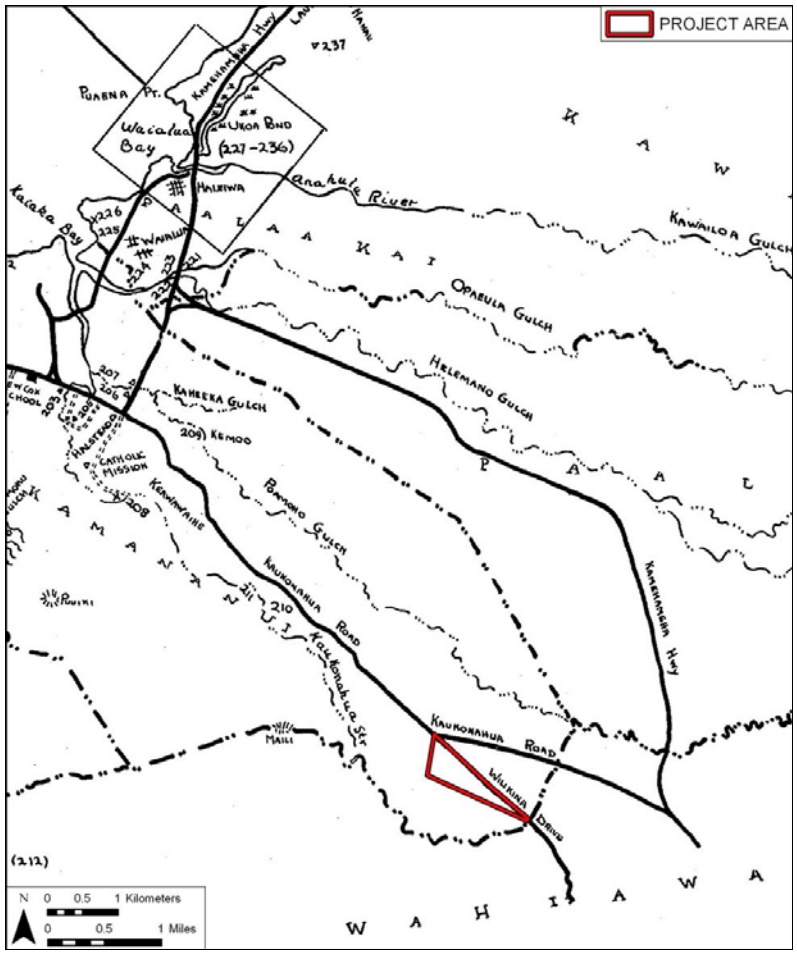


Figure 7. Map of Kamananui Ahupua‘a (adapted from Sterling and Summers 1978) showing location of McAllister sites and present project area

The project area is between Kaukonahua Gulch (to the west) and Poamoho Gulch (to the east).

3.3 Early to Mid-1800s

The Hawaiian Islands began exporting sandalwood to the Orient shortly after 1800 and the commerce flourished until the supply dwindled in the mid-1830s. Trade in sandalwood was the strict monopoly of the *ali‘i* beginning with Kamehameha. At the height of the sandalwood boom, Kamehameha was buying foreign ships, including six vessels between 1816 and 1818, to transport his own wood to the Orient (Kuykendall 1965:87). When Kamehameha bought the schooner *Columbia* in 1817, it was paid for with sandalwood from Kauai and from the districts of Waimea and Wai‘anae on O‘ahu (Kuykendall 1965:88).

After Kamehameha’s death in 1819, Liholiho (Kamehameha II) allowed his chiefs to share in the trade, resulting in an unrestrained demand on stocks of the wood and upon the energies of the *maka‘āinana* (commoners) who harvested the sandalwood. In October 1817, a Russian visitor on O‘ahu noted: “There are now many fields left uncultivated, since the natives are obliged to be cutting sandalwood” (Barratt 1988:218).

“Traders records from Kamehameha’s last years show several important *ali‘i* trafficking in sandalwood on their own, including...Kalaimoku, Cox, Boki, Ka‘ahumanu, and some others” (Kirch and Sahlins 1992:59). Among these *ali‘i*, Ke‘eaumoku Cox was the Hawai‘i Island chief who had been given control of Waialua by Kamehameha. Diaries and journals of the western entrepreneurs on O‘ahu record the early 19th-century sandalwood-based trade that intruded upon the established mores and customs of the Waialua population. Stephen Reynolds, a clerk for the Honolulu merchant William French, noted in his journal on April 30, 1824:

> Very hot sun — many of the residents [of Honolulu] preparing to go to Wairua [Waialua], some for wood — some to buy hogs, some for pleasure — All the Kanakas of Wairua belonging to Cox who lately died, came up to day — bringing cows, Pigs, Dogs, Fowls & other things, produce of the Country to give to Krymakoo [Kalaimoku, the Regent], Kahumana [Ka‘ahumanu], & other principal chiefs — according to the custom of the country. (King 1989:27)

During the same decades that commercial ventures were forcing changes upon the Hawaiian landscape, western missionaries were gaining a foothold in the islands. The American Board of Commissioners for Foreign Missions, headquartered in Boston, sent its first company of missionaries to the Hawaiian Islands in 1819, leaving Boston on October 23rd aboard the brig Thaddeus.

Accounts by missionary visitors present some of the first documentation of the Kamananui landscape and inhabitants. By the 1820s, the Protestant missionaries had established close links with the *ali‘i.* From July to August 1826, Ka‘ahumanu and an entourage consisting of up to 300 people conducted a proselytizing tour around O‘ahu. Rev. Hiram Bingham’s account of the proceedings at Waialua suggests the extent of the missionaries’ inroads in the district:

> A very large concourse of people assembled on the Lord's day, for public worship in the open air. To the listening throngs I endeavored to proclaim the great salvation...
>
> After the Sabbath we examined and encouraged, and partially supplied with books, the incipient schools established there under the particular patronage of Lydia Namahana and Gideon Laanui, to whom the district belonged. There were found under Maiao and his assistant teachers, four hundred and ninety-five male and female pupils, and under Kaoo, one hundred and sixty-four, amounting together to six hundred and fifty-nine pupils, chiefly men and women. (Bingham 1847:295-296)

Lydia Pi'ia Namahana, sister of Ka'ahumanu, was involved in the Waialua sandalwood trade by 1826 and the following year, retained control of Kamananui and the Waialua District. Stephen Reynolds' journal entry of October 24, 1826 noted: "Convoy sailed for Wairua — to get 400 piculs of wood from Piia [Namahana] — Due from Cox's estate" (King 1989:155).

> Namahana's husband, Gideon La'anui, had been born on Hawai'i Island and grew up in the train of Kamehameha. Elizabeth Pratt, La'anui's daughter (by his second wife, Teresa Owana), records that it was Kamehameha himself who arranged La'anui's marriage to Namahana:
>
> Among the visitors to the royal court was Kekuwai-Piia [Namahana], who had just become a widow, coming as a guest of her sister, Queen Kaahumanu. Laanui was a boy growing to maturity. The king had not forgotten the great wish of his heart, coveting possession of Waimea and hoping to gain it, if not in battle, through a matrimonial alliance...[Now] he chose a new agent of his ambition by inviting Laanui to the court. The invitation was gladly accepted and the visit lasted for months. Kamehameha was loath to have Laanui depart while he was still slyly intriguing with Kaahumanu to negotiate a marriage between Piia and Laanui. Piia is described as being a person heavily built and not prepossessing in appearance like her sisters Kaahumanu and Kaheiheimalie. When at last the proposition was put squarely to Laanui, that it was the united wish of the king and queen that the marriage should take place, for a moment he was dejected. To wed a woman very many years his senior was not the desire of his heart. Yet realizing that it might be perilous to go contrary to the express desire of the powerful monarch he quietly consented "to take the bitter pill." (Pratt 1920:46)

La'anui's own words (given in testimony to the mid-nineteenth century Land Commission) reveal how he and his wife came to reside at Waialua and tell of his land interests in Kamananui:

> My wife Kuaipua [Lydia Namahana Kekuaipi'ia] is the foundation [*kumu*] of my claim here at Waialua, and I have truly become a *kamaaina* here, like the native children of the place [*a lilo maoli i kamaaina no o nei, me ke keiki papa la*]. After I had been living at Waialua for a little while with Kekuaipiia, the *ili* of Ukoa became hers — that is at Kamananui — along with Kalopa [Kalaopa], the two of them. Kaahumanu asked Keeaumoku [Cox] for Lokoea and he consented it be given to Piia and she gave me [*a haawi a Piia ia'u*] Ukoa, Lokoea and Kalopa in

> [the *ahupua'a* of] Kamananui. When Keeaumoku died in 1824, Ka'ahumanu gave Piia Waialua, from one point to the other, just for her support ['food', *kona ai io nae*], and Kawailoa from the sea inland to the mountain and one side to the other, excepting the *kus ['ili kūpono*]. Piia then said to me: Your land is Kawailoa, from upland to the sea and one side to the other, I retain no *ku* within it; I give it to you, together with the two *ili* at Paalaa and the six *ili* at Kamananui. Ukoa and Lokoea are to be joined with the *ahupua'a* of Kawailoa. Thus Piia spoke to me. (in Kirch and Sahlins 1992:95)

La'anui was living at Kawailoa, adjacent to Kamananui, in 1832 (Namahana had died in 1829) when the Rev. John S. Emerson (1800-1867) and his wife arrived at Waialua Bay to establish a mission station in the Waialua district; Emerson reported in a letter:

> The wind was against us as we entered the harbor at Waialua, and we were obliged to "beat in." As soon as we approached the land, La'anui, our chief, came alongside in a canoe to welcome us, presenting us with a good watermelon, of which we ate freely and were at once relieved of our seasickness. (Emerson 1928:55)

Emerson gave the name "Haleiwa" (home of the frigate bird) to their settlement. Emerson's son, Oliver Pomeroy Emerson, recounts an episode revealing the authority La'anui possessed within Waialua:

> The new [meeting] house [at Waialua] was opened for the first time for dedication and public worship on September 25th, 1833, and Dr. Judd, Mr. Bingham and Mr. Brinsmade, a merchant, came from Honolulu for the occasion. When they got to the meeting with my father, they found an immense crowd of natives filling every part of the house and others crowding around all the windows and doors, utterly unable to enter. "Truly the spirit of God is here working on the hearts of this people, who are hungering for instruction," thought my father. Dr. Judd, who had been in the country four years longer than he, began to ask questions, and found that La'anui had issued positive commands that everyone in the entire district of Waialua should attend this service under threat of severe penalty...When La'anui had filled the meeting-house with the crowd of people standing, he ordered them to sit down on the floor, packed together as close as possible, but a great many were still compelled to stand outside. After the services were over, Dr. Judd and my father kindly explained to La'anui that he should not force the people to attend church in that way... (Emerson 1928:88-89)

Protestant missionaries throughout the Hawaiian Islands began census taking in 1831, providing the earliest documentation of the size of the native population after the first decades of western contact. During the first census of O'ahu Island in 1831-1832, a total population of 2,640 was recorded in the Waialua District, comprising only 8.8% of the entire island population of 29,745 (Schmitt 1977:12). By the census of 1835-1836, the Waialua population had dropped to 2,415 comprising 8.6% of the O'ahu Island population of 27, 798 (Schmitt 1977:38). These early censuses do not record the specific Kamananui Ahupua'a population figures.

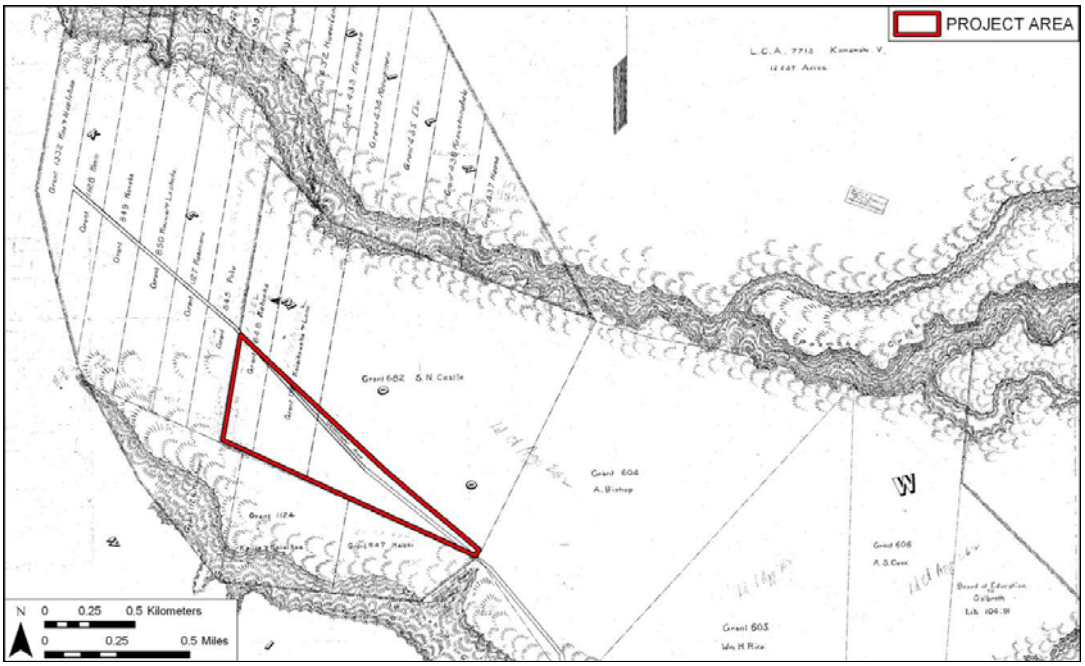


Figure 8. Portion of 1901 W. A. Wall map of the Waialua Agricultural Company Ltd. lands (Reg. Map 2056) showing project area, which was in the "Kemoo" section of the sugar plantation

By the time Protestant missionaries were establishing their presence in Waialua in the 1830s, the sandalwood trade that had driven commerce in the Hawaiian Islands had collapsed. However, new enterprises began emerging to fill the void and activity at Waialua would continue apace. In October of 1819, two whaling ships had anchored in the Hawaiian Islands. During the next decades, other whaling ships followed, as the islands became a victual and layover base in the mid-Pacific. Supplies of beef, fresh and salted, and produce were in demand; and a trade in hide and tallow was also developing. As had happened during the years of the sandalwood trade, authority to commandeer valued goods from the commoners of Waialua was vested in the chiefs.

> The variety as well as amount of things being appropriated from Waialua by the ruling chiefs is impressive. The [letters of Gideon La'anui] speak of ocean fish taken in sweeps as well as great quantities of fish shipped from the old royal ponds of 'Uko'a and Lokoea, of dry cooked taro (*pai'ai*) as well as poi, of sweet potato, breadfruit, shrimp, goats and pigs, timbers of different kinds, chickens, oranges and lemons — and often cash money. (Kirch and Sahlins 1992:145)

3.4 Māhele of 1848

In 1845, the Board of Commissioners to Quiet Land Titles, also called the Land Commission, was established "for the investigation and final ascertainment or rejection of all claims of private individuals, whether natives or foreigners, to any landed property" (Chinen 1985:8). This led to the Māhele, the division of lands between the king of Hawaii, the *ali'i*, and the common people, which introduced the concept of private property into the Hawaiian society. In 1848, Kamehameha III divided the land into four categories: certain lands to be reserved for himself and the royal house were known as Crown Lands; lands set aside to generate revenue for the government were known as Government Lands; lands claimed by *ali'i* and their *konohiki* (supervisors) were called Konohiki Lands; and habitation and agricultural plots claimed by the common people were called *kuleana* (Chinen 1985:8-15). Kamananui Ahupua'a was retained by the Kingdom as "government lands".

The Waihona 'Aina Māhele website shows nineteen land claims filed in Kamananui (Table 1) but none of them were awarded. This appears to have been the pattern in all the Waialua District lands other than in the *ahupua'a* of Pa'ala'a and Kawailoa. Apparently, the missionary in residence, Reverend John S. Emerson, concluded it was in the interest of the native Hawaiians to buy land outright as grants rather than to complete the Land Commission Award application process. "He himself wrote the deeds and had them recorded, issued the titles, and collected for the Government the amounts due…." (Emerson 1928:141). Reverend John Emerson would assert with some pride, "I have accepted an appointment to sell to the natives, at my discretion, about 10,000 acres of land in the district of Waialua" and further that "I have plotted out about 8,000 acres, mostly grazing land, into about 300 lots, and nearly all are bargained for by natives" (Emerson 1928:142). While this system may have been a service to his parish it makes it more difficult to reconstruct traditional Hawaiian patterns of land use at Kamananui from the historic record. All we know about the present project area is that by 1900 it was the southern portion of three former land grants including: Land Grant 682 to S. N. Castle (east end of the present project area), Land Grant 848 to Kahoeka (west end of the present project area), and Land Grant 1125 to Kaiakawaha (central portion of the present project area) as shown on the 1901 W. A.

Wall map of the Waialua Agricultural Company Ltd. lands (Figure 8). The project area was in the "Kemoo" section of the sugar plantation (see section 3.6 for a full discussion of Waialua Agricultural Company Ltd.), and a "Government Road" that is in the same location as the current Wilikini Drive forms the northeast boundary.

Table 1. Land Claims at Kamananui Ahupua'a (seemingly none of which was awarded)

LCA #	Claimant	*Ahupua'a*	*'Ili*
02683	Imaui	Kamananui	Paukauila, Puaae
02693	Wanahea	Kamananui	Kamahu
02719	Polu	Kamananui?	Manuaula
02742	Puu	Kamananui	Nonokihewa
02797	Kahakinaawa	Kamananui	-
02805	Keoa	Kamananui	-
02810	Kiekie	Kamananui	Paukauila
02899	Kioi	Kamananui	Kumupali
02902	Kauakahi	Kamananui	-
02908	Kuemanu	Kamananui	Muliwai
04313	Kuhi	Kamananui	-
04314	Kaaiohelohua	Kamananui	-
04315	Kahinapoo	Kamananui	-
04317	Keoahu	Kamananui	Keoneula
07342	Kuokoa, L.	Waialua, Kawailoa, Kamananui	Puaena, Lahuimoho, Honohikilua, Kalaopa, Kupalu, Kawaipuolo, Anahulu, Kalehunui, Kamahu, Lokoea, Kealia
07400	Koa	Kamananui	Paukauila
07405	Kahaimoana	Kamananui	-
07415	Kaelehiwa	Kamananui	-
07416	Kaamoku	Kamananui	-

The nature of the Land Grants in the immediate area including the western portion of the present project is long thin rectangles with parallel sides. This form is not at all typical for traditional Hawaiian land holdings that are more commonly in the shape of irregular polygons. This suggests that the present project area may not have been traditional, pre-contact Hawaiian land holdings – at least not in the form in which the grants were issued.

3.5 1850s to 1900

In 1850, the first road from Honolulu to Waialua was built. Economic changes also impacted life within Waialua District at this time.

Although the whaling industry in the Pacific Ocean reached its peak in 1859, prices for whale oil collapsed five years later. This price decline during the 1860s led to far fewer whaling ships taking long layovers in the islands. The paucity of whaling ships caused a decline in demand for provisions that adversely impacted the Hawaiian economy, which had been dependent on the heightened demands for goods and services by the whalers. Many residents of districts like

Waialua, whom had been dependent on cultivating crops for trade, migrated to Honolulu and other parts of O'ahu. Twenty-two percent of Hawai'i's population resided in Honolulu by 1860 (Juvik and Juvik 1998:174).

Government censuses during the second half of the 19th century document the diminishing population of the Waialua District and, presumably, Kamananui Ahupua'a. In 1853 a total of 1,126 persons was recorded in Waialua. Nineteen years later, in 1872, the total district population had dropped to 851 (Schmitt 1977: 12-13).

The diaries of Robert C. Perkins, an entomologist and ornithologist, who collected specimens in the Waialua District in 1892-1893, reveal aspects of life in the area near the end of the 19th century:

> The end of 1892 and early months of 1893 were not very favorable for collecting, the weather being generally wet in the mountains and there were three big spates of the mountain streams, these did very much damage to the system of flumes belonging to the Chinese of the district on more than one occasion during the winter months. (Perkins 1892-1893)

The "Chinese of the district" mentioned above were the rice growers who had settled in the area after fulfilling their sugar plantation contracts. In 1852, the first Chinese contract laborers arrived in the islands. Contracts were for five years, and pay was $3 a month plus room and board. Upon completion of their contracts, a number of the immigrants remained in the islands, many of whom became merchants or rice farmers. As was occurring in other locales in the 1880s, groups of Chinese began leasing and buying (from the Hawaiians of Waialua) former taro lands for conversion to rice farming. The taro lands' availability throughout the islands in the late 1800s reflected the declining demand for taro as the native Hawaiian population diminished.

The Hawaiian Islands were well positioned for rice cultivation. A market for rice in California developed as increasing numbers of Chinese laborers immigrated there beginning in the mid-nineteenth century. Similarly, as Chinese immigration to the islands also accelerated, a domestic market opened.

> By 1876 there was still a considerable amount of former taro land available for rice farming. The great demand for rice land brought disused taro patches into requisition — especially because water rights attached to them...
>
> As the demand for rice continued, it became profitable to bring into use land hitherto unused. The land most easily rendered fit for rice cultivation was swamp or marsh land of which there was a large amount in the islands...At Waialua on Oahu, about three hundred acres of swamp land were reclaimed for rice farming. (Coulter and Chun 1937: 11)

Additionally, as Chinese immigration to the islands increased, a domestic market for rice developed. The immigrant Chinese may account for the rise in the Waialua District population during the last quarter of the 19th century: Government censuses record populations of 939 in 1878, 1,265 in 1884 and 1,286 in 1890 (Schmitt 1977:13). In 1892, 180 acres of rice were under cultivation in the Waialua District; these rice fields were located in the *ahupua'a* of Mokulē'ia, Kamananui and Kawailoa (Coulter and Chun 1937:12, 21).

In addition to agricultural changes, western entrepreneurial interests would also alter the Kamananui landscape. The Oahu Railway and Land (OR&L) Company, organized by Benjamin Dillingham in 1889, connected outlying areas of O‘ahu to Honolulu. During the last decade of the 19th century, the railroad extended from Honolulu to Pearl City in 1890, to Waianae in 1895, to Waialua in 1898, and to Kahuku in 1899 (Kuykendall 1967:100).

In 1899, Dillingham recognized the economic advantage of providing additional services for the increasing numbers of visitors to the north shore of O‘ahu. The two-story Hale‘iwa Hotel at Waialua Bay in neighboring Pa‘ala‘a Ahupua‘a had its grand-opening in 1899. The hotel was built at a cost of more than $50,000 on land leased from the Bernice Pauahi Bishop Estate. The hotel’s name – Hale‘iwa - eventually became synonymous with the area above the bay and the “town” which comprised the hotel, a church, and a courthouse.

The development of a railroad system also spurred the development of large-scale sugar farming in Waialua. John Emerson, a missionary, cultivated the first sugarcane in Waialua earlier in the century. He constructed a small sugar mill that also produced molasses. During subsequent decades, other missionaries and western entrepreneurs continued expanding sugar cultivation in the district although still on a small-scale. Benjamin Dillingham, pursuing new business for his railroad, persuaded Castle & Cooke to lease Waialua land already under cultivation of sugar. In 1898, Castle & Cooke organized the Waialua Agricultural Company and soon began a program of land purchases and leases to increase the plantation’s capacity.

A description of the original state of the lands within the plantation at its inception is provided by William Warren Goodale, the Waialua Agriculture Company’s plantation manager:

> At the time Waialua Agricultural Co., Ltd., was organized in October, 1898, it took over the old Halstead Plantation with about 600 acres of cane, certain leases of large tracts of unimproved lands covered with lantana and stones, several hundred acres of rice and ranch land, a small mill, one five million gallon pumping station, no reservoirs or railroads, one small set of steam plows and other equipment of a small plantation. (Clark 2007:58)

3.6 1900s

Waialua Agricultural Company — later named Waialua Sugar Company — continued to expand during the first decades of the 20th century, eventually reaching more than 12,000 acres, including extensive portions of Kamananui and Pa‘ala‘a Ahupua‘a. The expansion of the sugar plantation is reflected in government censuses of the early 1900s. While in 1896 there were only 1,349 persons recorded in Waialua District, subsequent censuses recorded 3,285 persons in 1900; 6,083 in 1910; 7,641 in 1920; and 8,129 in 1930 (Schmitt 1977:13-14). The center of operations was the mill and mill village located north of Farrington Highway and 7.0 kilometers northwest of the present project area.

Into the 20th century, rice continued to be cultivated in well-watered areas of Kamananui, the Waialua District, and other areas within the Hawaiian Islands. However:

> Rice farming went into a steady decline for several decades before phasing out almost completely just before the beginning of World War II. In 1921, Hawai‘i exported seven hundred thousand pounds of rice as compared to the ten million pounds produced at its height in 1890. In 1929 there were only twenty-five hundred acres of rice grown in Hawai‘i by less than seven hundred laborers, nearly five thousand laborers less than in 1903 when there were 5,643 rice planters. (Chong 1998:53)

Kemoo Land Co., which is likely near or within the current project area, operated “tributary to the Waialua Agricultural Co.” (Thrum 1908:173).

On the North Shore, the Hale‘iwa Hotel continued to operate in the first decades of the 20th century. It was taken over by the U.S. Army in the 1930s, serving as a center for recreational activities by military personnel in Hale‘iwa during World War II.

3.7 Project Area and Vicinity Development

The uplands of Kamananui were divided into a large number of relatively large land grants by the Territory of Hawaii circa 1913. The 1913 Land Court Application No. 262 map (Figure 9) continues to show the project area within portions of three former land grants including: Land Grant 682 to S. N. Castle (east end of the present project area), Land Grant 848 to Kahoeka (west end of the present project area), and Land Grant 1125 to Kaiakawaha (central portion of the present project area). The Waianae Uka U.S. Military Reservation is shown south of the project area.

The Waianae Uka U.S. Military Reservation lands that became Schofield Barracks were ceded to the U.S. Government in 1899. Construction of the military post began in 1908 and by 1914, 6,000 men resided on the base (Tropic Lightning Museum 2005).

The 1913 Land Court Application No. 272 map (Figure 10) shows the eastern portion of the project area and the U.S. Military Reservation to the south.

The 1919 U.S. War Department map (Figure 11) shows some development northwest of the project area within a location that is shown as “Kemoo Farm” on the 1928-1929 U.S. Geological Survey map (Figure 12). Figure 12 also shows agricultural development within the project area. Kemoo Camp is northeast of the project area.

Kemo‘o Farms began as a pig farm in 1909 and expanded in 1919 to include a dairy operation with a milk depot. Subsequently, an ice cream parlor, coffee shop, and market were added. In 1934, the Rodby family left the farm to open a restaurant across the highway from Schofield Barracks. Kemo‘o Farms Bar & Grill has been serving food and libations since 1935 in the same location (Kemo‘o Farms Bar & Grill 2010).

By the 1920s it is likely that pineapple rather than sugar cane was under cultivation within the project area and its vicinity since the area was known as the “Pineapple Capitol of the World.” James Dole cultivated the first 60 acres of pineapple in Wahiawa District in 1901.

Kemoo Junction marks the intersection of Wilikina Drive and Kaukonahua Road on the 1943 U.S. War Department map (Figure 13), and Kemoo Camp is still present to the northeast. By 1953 (Figure 14), a water tank is in the former location of Kemoo Junction, and Kemoo Camp is no longer present. A 1977-1978 aerial photograph (Figure 16) shows agricultural cultivation surrounding the project area and in its northernmost portion, while the majority of the project area appears to either be recently harvested or fallow.

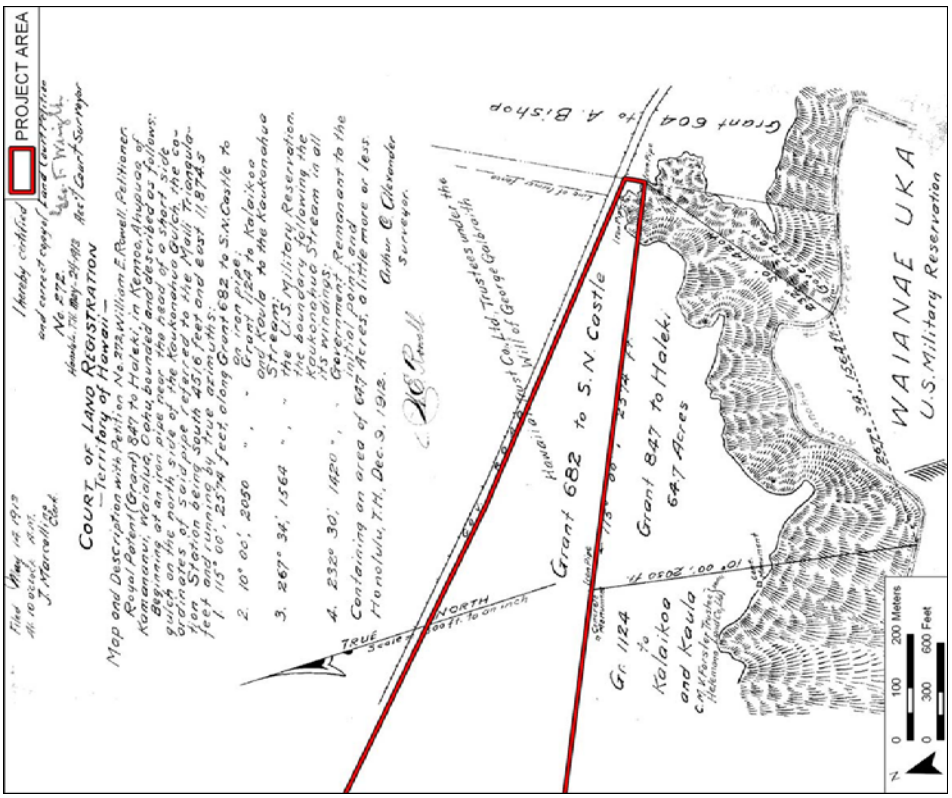


Figure 10. 1913 Land Court Application No. 272 showing east portion of project area

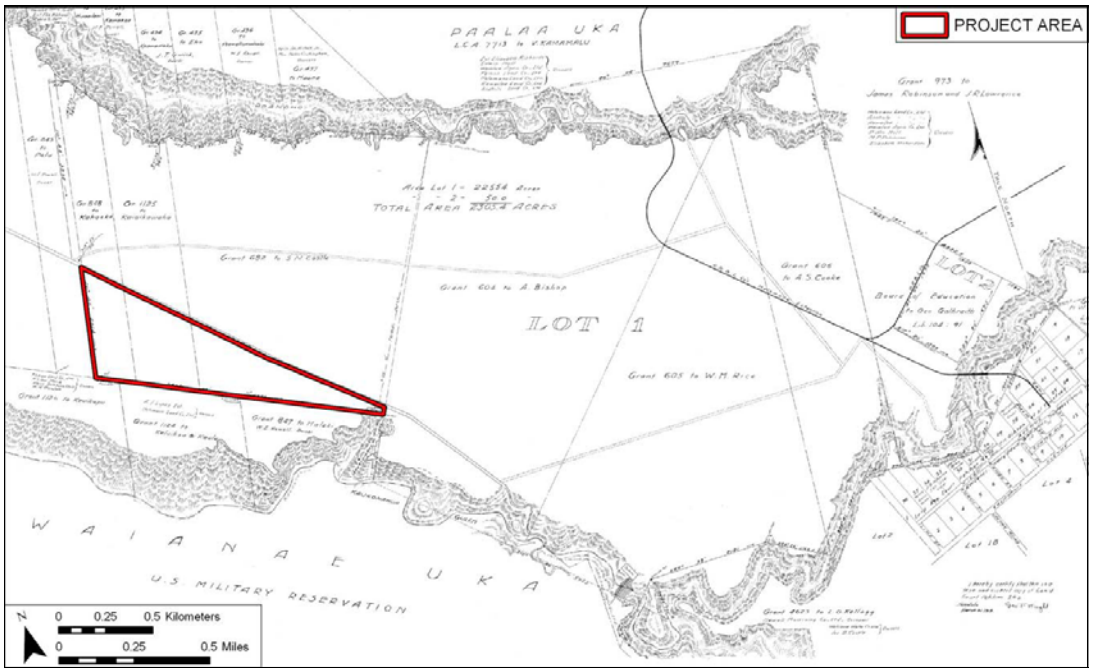


Figure 9. 1913 Land Court Application No. 262 showing project area

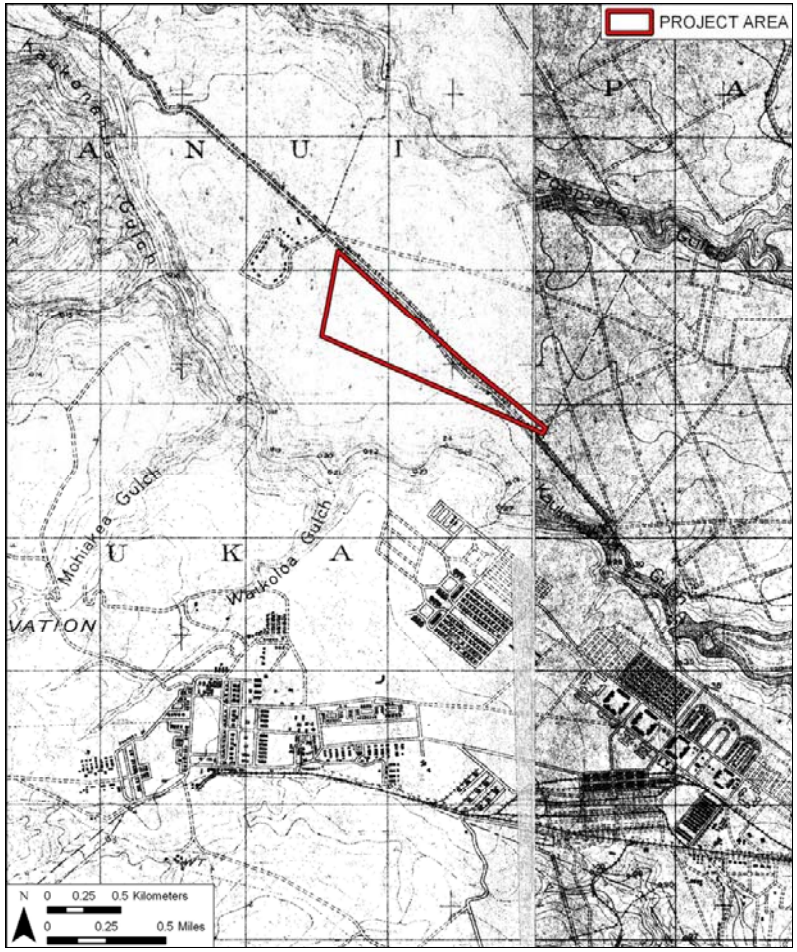


Figure 11. Portion of 1919 U.S. War Department map, Waianae and Wahiawa quadrangles, showing the project area

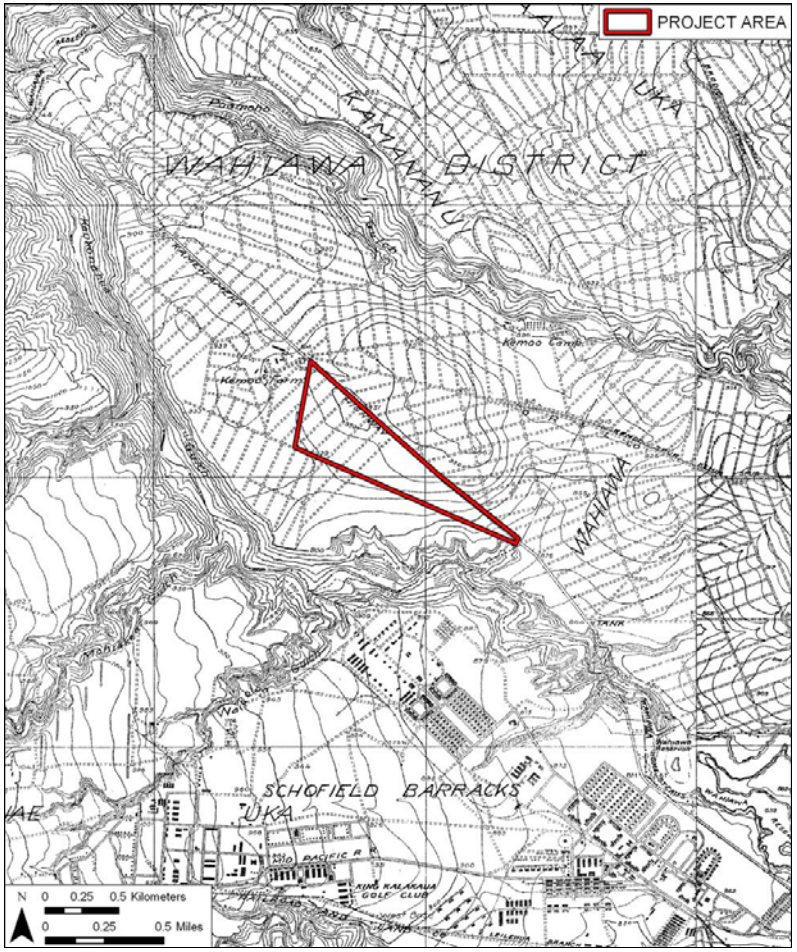


Figure 12. Portion of 1928-1929 U.S. Geological Survey map, Schofield and Wahiawa quadrangles, showing the project area

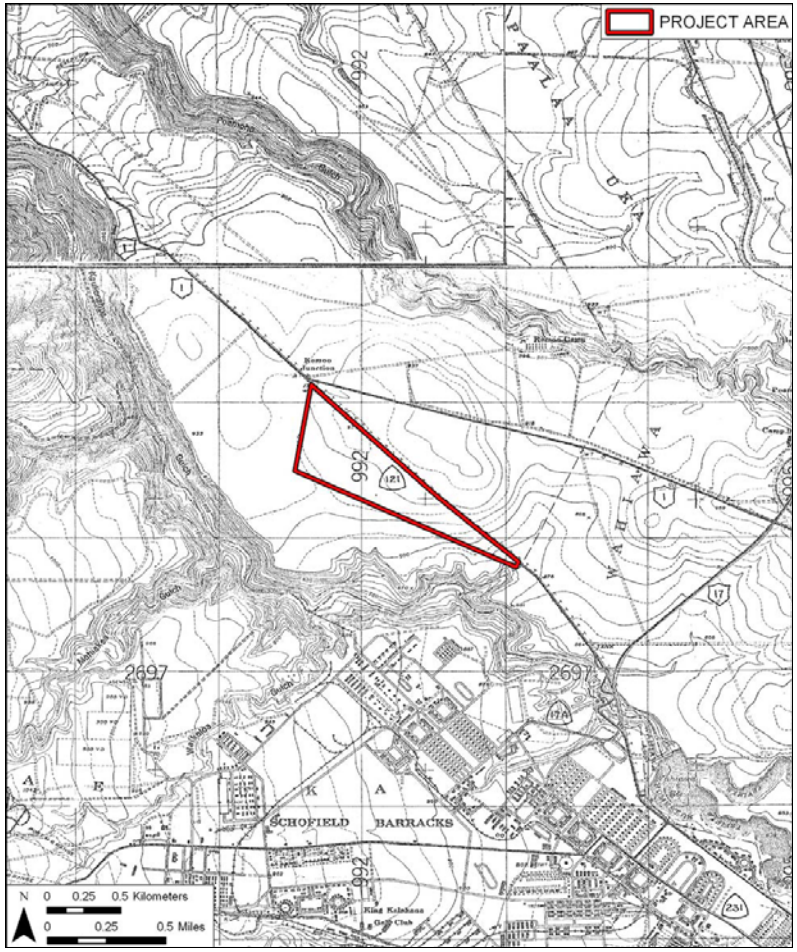


Figure 13. Portion of 1943 U.S. War Department map, Haleiwa, Paalaa, and Schofield Barracks quadrangles, showing the project area

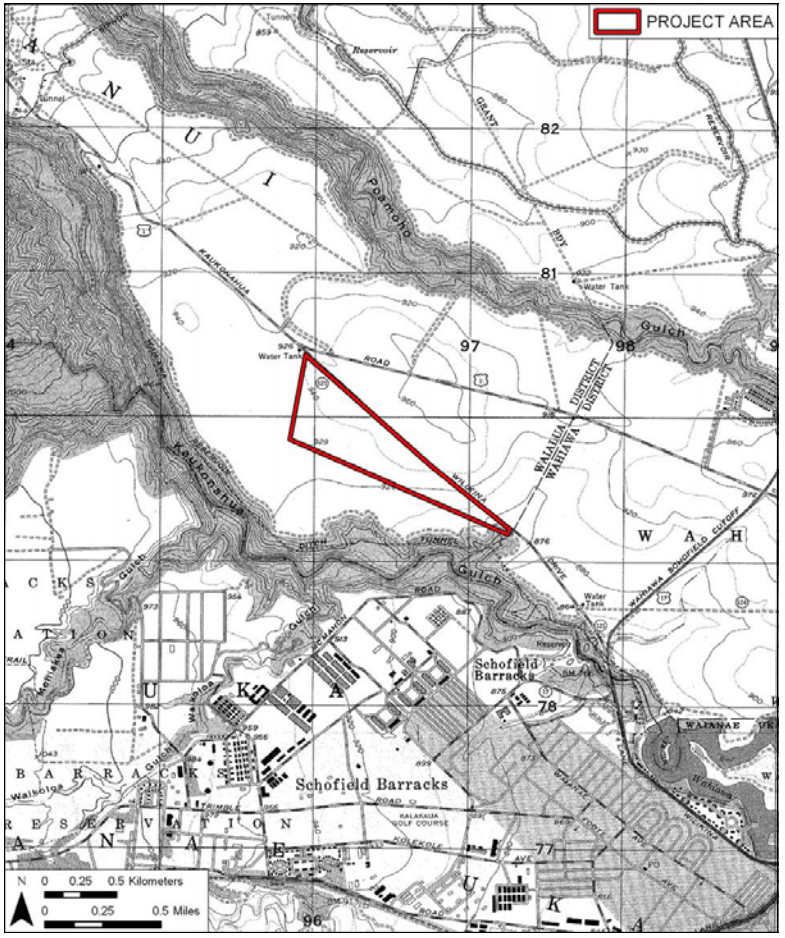


Figure 14. Portion of 1953 U.S. Army Mapping Service map, Haleiwa and Schofield quadrangles, showing the project area

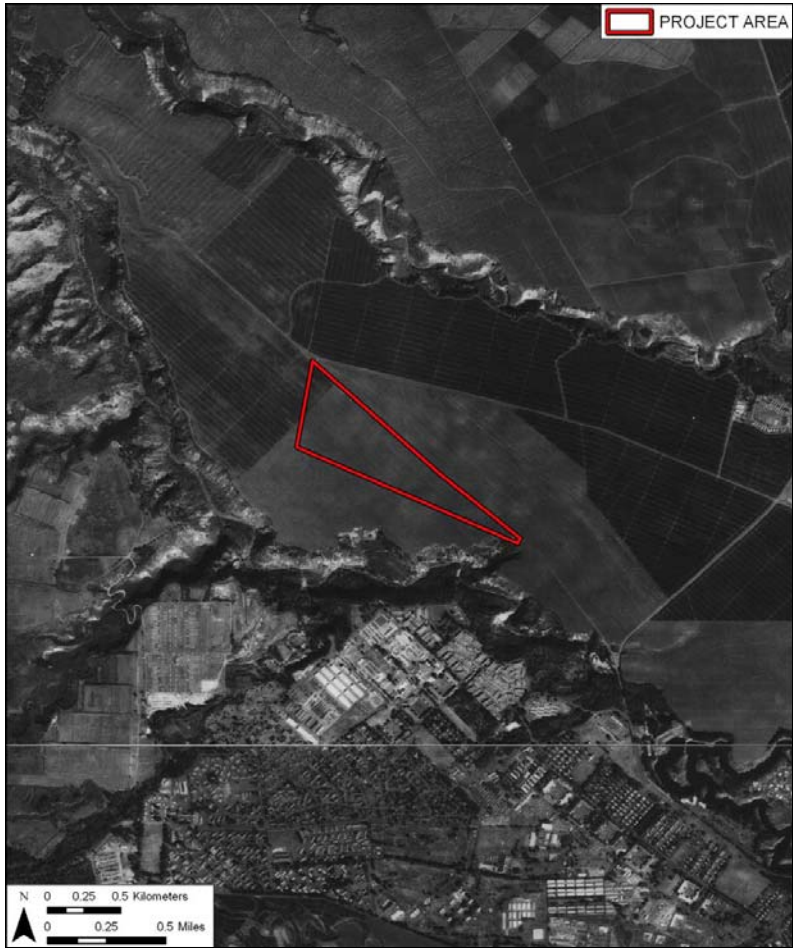


Figure 15. 1977-1978 aerial photograph showing the location of the project area (U.S. Geological Survey Orthoimagery 1977-1978)

Section 4 Previous Archaeological Research

4.1 McAllister’s Documentation of Sites at Kamananui

The first systematic archaeological study of Kamananui was conducted by J. Gilbert McAllister of the Bernice P. Bishop Museum in the 1930s. McAllister (1933) consulted with knowledgeable informants about both physical and legendary sites of each district during his island-wide survey of O‘ahu. McAllister identified 13 sites (see Figure 7) within Kamananui Ahupua‘a (sites 197-200, 202, 203 and 205-211) described as follows:

> Site 197. Kalakiki Heiau in Kamananui, on the slope back of the Waialua mill beneath Puu Kaupakuhale
>
> Located on the crest of the ridge, with a slope on all except the mountain side, a large front terrace is about all that remains of the structure, and only that portion which is rock-paved is visible. The remainder of the heiau is covered with a dense growth of *Lantana*. The mountain-ward portion has undoubtedly been covered by dirt washed down from the almost bare slope behind. The heiau was probably of two or more terraces, with several small divisions. The highest wall is 1.5 feet, but terrace facings are as much as 6 feet high.
>
> Thrum (79, 14) says: “it is deemed unwise to express an intent to go a-fishing abrest of Kalakiki unless in an indirect or figurative way, else Keanini, the shark-god deity of the heiau, which is a huge rock lying awash a few hundred feet from the shore, will cause the phosphorescent lights to so dog one’s efforts as to render the attempt futile. A still further superstition is, that a house built within the range from the temple to its deity must not have its doorway face the hills, else trouble, sickness and death to the household are sure to follow.” (McAllister 1933:129)

Site 197 Kalakiki Heiau is located approximately 7.5 kilometers northwest from the present project area.

> Site 198. Burial cave, Kaumoku Gulch, Waialua
>
> Powdered skeletal material was noticed on the side of a cliff beneath several very small caves. Upon examination portions of two skeletons were found in a lava tube whose entrance was so cleverly sealed that the material would not have been discovered had there not been a hole into a lower cave larger than a man’s head. From the inside, light was noticed through the cracks of the rocks, and the entrance then discovered. No mortar had been used, but sharp-edged rocks had been carefully fitted together. There were no artifacts with the burial. The bones had probably been bundled together, but had evidently been disturbed by animals, as several had been recently gnawed. There was one skull but no mandible, one humerus, one radius, two ulnas, four femurs, three tibiae, and many fragments. (McAllister 1933:130)

The Site 198 burial cave is located approximately 8.0 kilometers southwest from the present project area.

Site 199. Pile of stones, near the mouth of Kaumoku Gulch, Waialua.
Near the mountain side of the siphon put in 1930 by the Waialua Agricultural Company are many piles of stones which, as I was told by Mr. Low, who is of the opinion that they are old Hawaiian, were there 24 years ago when cane was first planted on this land. The larges pile is oval in shape, 28 by 15.5 feet by 7 feet high. There are six piles in a group averaging from 50 to 200 feet apart, evenly faced but with the top comparatively level. Just west of this group are a number of stone walls and one or two small inclosures [sic]. The whole site is in the mouth of the gulch. The stones may have been cleared away for agricultural purposes before the plantation took over the land. A large field on the mountain side and east of the Dillingham ranch which had also formerly been planted in cane has similar mounds of stone. I was also told that these stones were there in 1908 when the plantation took over the land. Hookala says they were pile in this manner to clear the land for agricultural purposes. (McAllister 1933:130-131)

The Site 199 pile of stones is located approximately 8.0 kilometers southwest from the present project area.

Site 200. Cave in Kaumoku Gulch, Kamananui, Waialua.

At present one can squirm about 200 feet into the interior but comes in contact with large stones which obstruct the passage. It is believed that in the construction of the water tunnel just above, the blasting dislocated these stones. Water also constantly drips from the roof making shallow pools in the passageway. Twenty years or more ago the cave is said to have contained skeletal material, though there is no evidence now of such remains, which undoubtedly would have decayed with so much moisture. (McAllister 1933:131)

The Site 200 cave is located approximately 8.0 kilometers southwest from the present project area.

Site 201 is understood as located within Mokulēi‘a Ahupua‘a.

Site 202. Skeletal remains, near Puuiki station, Waialua.
In the sands near the present station a number of skeletons have been uncovered at a depth of approximately 4 feet by plantation workers who were removing sand. The skeletons are said to have been in good condition. One skull which I saw was well preserved. (McAllister 1933:132)

The Site 202 skeletal remains are located near the coast, approximately 9.0 kilometer northwest from the present project area.

Site 203. Heiau, near Kaukonahua Stream, Waialua.
It is said that a small heiau once occupied the site where the Waialua Agricultural Company has installed their Pump Number 1. This is near the mountain side of the bridge which crosses Kaukonahua Stream near the plantation settlement. The name is not known. (McAllister 1933:132)

The Site 203 *Heiau* is located approximately 8.0 kilometers northwest from the present project area.

Site 204 is understood as located within Waianae-Uka Ahupua‘a.

Site 205. Akua stone, Poloa grove, Kamananui (pl. 11, *B*).
The grove, once sacred to Pele, has been left untouched in the midst of cane, and covers an area of approximately 80 by 170 feet. On the eastern side is a stone, triangular in cross section, standing 1.7 feet high, 0.6 foot thick, surrounded by eight small stones. The plantation placed a small iron fence about this stone many years ago and it is now almost completely rusted. The stone was believed by Oscar Cox to be called Kaneaukai, but his uncle Hookala does not remember that name applied to this stone. Hawaiians have been buried in the grove within the last 50 years, though there is nothing to indicate such graves, which are shaded by breadfruit, mango, kukui, and Pride of India trees. (McAllister 1933:132)

The Site 205 Akua stone and Pōloa grove are located approximately 8.2 kilometers northwest from the present project area.

Site 206. Kahakahuna heiau, Pala-kai, was once located on the sea side of the road and north of the old mill site. The stones have been removed and the slightly elevated ground upon which it was built it is used for agricultural purposes. (McAllister 1933:132)

The Site 206 Kahakahuna Heiau is located approximately 7.0 kilometers northwest from the present project area.

Site 207. Kawai heiau was located just below the junction of Poamoho and Kaheeka gulches, on the elevation below the Waialua Plantation manager’s house. It was one of the first heiaus to be destroyed. (McAllister 1933:132)

The Site 207 Kawai Heiau is located approximately 7.0 kilometers northwest from the present project area.

Site 208. Irrigation ditch, Kamananui, Waialua.

The longest irrigation ditch of which there is any memory. The intake was from the Kaukonahua Stream, just before it issues from the gulch, about 2 miles inland from the mill. According to Tom Low, the ditch could be traced as far as the intersection of the Mokuleia, Haleiwa, and Honolulu roads. The most distant land watered surrounded the site of the old mill one and one-third miles away. This ditch was for many years used by the plantation. The cemented intake and portion of the rebuilt walls are still to be seen. Along part of its course the ditch flowed along the side of a hill about 50 feet high. According to Low, the old ditch was made by piling stones on the lower side, with a rubble fill. Consequently there was much seepage and loss of water. Aside from following the old course, the plantation had practically to reconstruct the walls. (McAllister 1933:133)

The Site 208 irrigation ditch is located approximately 7.1 kilometers northwest from the present project area.

Site 209. Worked stones, found some years ago in Poamoho Gulch.

> When the shaft for the pump in Poamoho Gulch was being dug, a number of artificially worked stones were found at depths of 13 to 18 feet. Gravel and silt were found above the artifacts, according to G. L. Trist, who was in charge of the work. The stones are said to have resembled *ulumaika*. (McAllister 1933:133)

The Site 209 worked stones are located approximately 7.2 kilometers northwest from the present project area.

> Site 210. Indications of former habitations, Kaukonahua Gulch, Waialua.
>
> House sites on both sides of the stream and in the south bank a small cave with the decayed remnants of skeletal material. Four piles of large stones approximately 3 feet in height are built in a perfect line, with an interval of approximately 20 feet between each pile. It was at first thought that these were supports of a former flume, but there has never been a pipeline in this section, though cane is planted in this gulch on a small plain just above these stones. No explanation has been obtained. The Hawaiians say that the stone piles were built by Europeans. (McAllister 1933:133)

The Site 210 indications of former habitations are located approximately 3.0 kilometers northwest from the present project area.

> Site 211. Burial cave, immediate vicinity of the Waialua Agricultural Company pumping plant (known as K.P.P.).
>
> A small cave. The mouth had been walled up, but has since been broken into and the burials disturbed. Much of the skeletal material had evidently been removed. Bits of cloth and shoes indicate that it was post-European, though it may also have been used earlier. Just across the stream are indications that the narrow fertile plain was used for the cultivation of taro, and also the foundations of several frame houses. In the side of the bank is another burial cave, 10 feet wide and high and 15 feet deep, said to have been used by the Keloha family for many generations. When soldiers became troublesome the family built a doorway to the vault, which was locked. Later a party of soldiers destroyed the door, looted the coffins, scattered the remains, and took skulls and long bones for souvenirs.

The Site 211 burial cave is located approximately 3.1 kilometers northwest from the present project area.

4.2 Subsequent Archaeological Studies in the Vicinity

Subsequent archaeological studies in the vicinity are shown on Figure 16, summarized in Table 2, and are discussed below in chronological order. No studies have been previously conducted within the vicinity of the project area; the closest studies are more than 2.5 kilometers away.

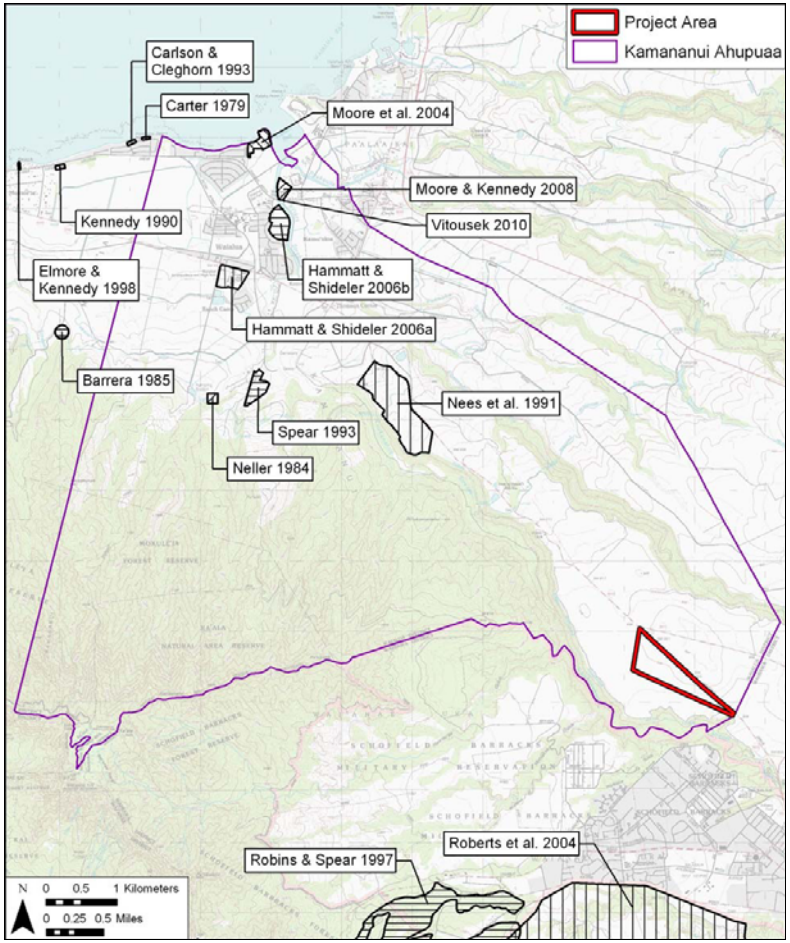


Figure 16. U.S. Geological Survey 7.5-minute series topographic map, Haleiwa (1999) and Schofield Barracks (1998) quadrangles, showing previous archaeological studies in Kamananui Ahupua'a and near the project area

Table 2: Archaeological Studies in Kamananui Ahupua‘a and Near the Project Area

Author(s)/ Date	Location	Nature of Work	Findings
McAllister 1933	Kamananui Ahupua‘a	Island-wide survey	Identified 13 sites at Kamananui Ahupua‘a : Site 197 Kalakiki Heiau, Site 198 Burial Cave, Kaumoku Gulch, Site 199 Piles of stones, near the mouth of Kamoku Gulch, Site 200 Cave in Kaumoku Gulch, Site 202 Skeletal remains near Puuiki Station, Site 203 Heiau near Kaukona Stream, Site 205 Akua stone Poloa Grove, Site 206 Kahakahuna Heiau, Site 207 Kawai Heiau, Site 208 Irrigation Ditch, Kamananui, Site 209 Worked stones Poamoho Gulch, Site 210 former habitations, Kaukonahua Gulch and Site 211 Burial Cave
Yent 1981	TMK 6-7-01:51 Across Kaiaka Bay from State Rec Area, coastal Kamananui	Archaeological inspection	An eroding cultural deposit circa 1900 was noted
Neller 1984	Mokuleia Exploratory Well Site	Archaeological Reconnaissance Survey	No finds in specific area but notes possible pre-contact burial platforms just to the north
Kennedy 1991	TMK: 6-7-02:por 27	Surface Examination	Found one rock structure that may be remains of the Kalakiki /Olohena Heiau described by McAllister (Site 50-80-04-197).
Nees et al. 1991	Proposed Kaukonahua Quarry (TMK 6-5-01)	Archaeological Survey and Literature and Document Search	No pre-contact sites found due to sugar cultivation; one pill box and cane irrigation systems were noted
Spear 1993	Hidden Valley Ranch TMK 6-7-03: por. 5 &. 9	Reconnaissance Survey	No significant finds

Author(s)/ Date	Location	Nature of Work	Findings
Moore et al. 2004	TMK 6-7-01:51 & 52	Archaeological Inventory Survey	51 backhoe trenches were excavated. Finds included a previously disturbed collection of osteological remains (SIHP 50-80-04-6532), Waialua Dairy structures (-6533), two WWII pillboxes (-6534), & a reinterment location
Hammatt and Shideler 2006a	Waialua High and Intermediate School, TMK [1] 6-7-02:9	Archaeological Literature Review and Field Check	Identified no concerns, recommended no further work
Hammatt and Shideler 2006b	Kupahu Subdivision, Waialua Town, TMK: [1] 6-7-009:003	Archaeological Field Check and Literature Review	Project area lands very disturbed by decades of agricultural use. The Waialua Sugar Company building was recommended for evaluation by an architectural historian prior to any significant modification of this structure.
Moore and Kennedy 2008	Property Located at TMK (1) 6-6-021:001	Archaeological Assessment Report	No historic properties identified
Vitousek 2010	Waialua Beach Road Guardrail Improvement Project, TMK [1] 6-6-022:004	Inadvertent Discovery of Human Skeletal Remains During Monitoring Activities, SHPD letter report	Addresses single human vertebra encountered in imported beach sand fill

Neller (1984) carried out an archaeological reconnaissance survey of the Mokuleia Exploratory Well Site in Kamananui. No finds were reported other than irregular rock structures found just to the north that were possible pre-contact burial platforms.

The most extensive and significant archaeology that has been conducted in the Waialua region was organized by Kirch and Sahlins (1992) in what was called the “Anahulu Valley Research Project”. In 1971, Marshal Sahlins and several staff members of the Bishop Museum began investigating local Hawaiian society and economy in the late prehistoric and early historic periods. Archaeological investigations in the Anahulu Valley were first undertaken in 1974 and 1976. In 1979, Kirch surveyed the Anahulu Valley archaeological remains and excavated two significant habitation sites and in 1974 and 1976, eight more archaeological sites were identified

and described, including two burial caves, five overhanging rock shelters, and a terraced habitation complex.

Kirch and Sahlins defined the proto-historic settlement pattern in Waialua District as follows:

> Four main zones of taro irrigation had been developed on these alluvial lands [of Waialua] Handy (1940:85) refers to “large terrace areas along the flatlands between the junction of Helemano and Poamoho Streams and the flatland west of Poamoho.” One of these zones has been totally obliterated by the Waialua Agriculture Company mill and town (Handy and Handy 1972:465). This was the pond field system water by site 208, described by McAllister as “the longest irrigation ditch of which there is any memory” (1933:133; see also Handy 1940:85-86). This ditch or canal, which evidently tapped Kaukonohua Stream about 3 km inland, was later cemented in and used for many years by the plantation. In addition to the main irrigation complexes shown in figure 1.7, there were smaller pond field systems adjacent to the streams as they followed their incised valley courses inland (Kirch and Sahlins, 1992 vol. 1:17)

Kennedy (1991) carried out a surface examination of TMK: 6-7-02:por 27 identifying one rock structure that may be the remains of the Kalakiki/Olohena Heiau described by McAllister as Site 197 (SIHP 50-80-04-197).

Spear (1993) carried out a reconnaissance survey of a 15-acre parcel (Hidden Valley Ranch) at 200 foot elevation. No historic properties or cultural material were found.

In 1999, Cathleen Dagher a Staff Archaeologist at the State Historic Preservation Division responded to the inadvertent discovery of isolated human skeletal remains on Bishop Estate Land in Hale‘iwa (Kamananui), approximately 7 km northwest of the current project area. The remains consisted of an isolated cranium that was found on the surface of a sand pile. The sand fill contained bits of rusted metal, coral, marine shell, and organic materials, although no other skeletal remains were present. There was no archaeological context for the deposit, however the cranium was identified to be “possible native Hawaiian” and of female gender, over fifty years at the time of death.

As part of an Inter-Island DOE Cesspool Project, CSH (Hammatt and Shideler 2006a) carried out an archaeological literature review and field check at Waialua High and Intermediate School but found no indications of archaeological deposits or burials and recommended no further work.

In 2006, CSH (Hammatt and Shideler 2006b) conducted an archaeological literature review and field inspection within a 26.525-acre project area (TMK [1] 6-7-009:003) on what appeared to be bottom lands of a flood plain on the west side of the Ki‘iki‘i Stream (also known as Kaukonahua Stream). Field observations concluded that the vast majority of the project area was highly disturbed by modern agricultural activities, and was almost entirely under cultivation for cacao (*Theobroma cacao*). No pre-contact cultural remains were identified, however, a number of historic features, largely agricultural features, were noted during the field inspection.

The two previous studies (see Figure 16) shown within Schofield Barracks (Roberts et al. 2004, Robins and Spear 1997) are in Wahiawa District. Of interest and pertaining to the current study is the fact that “historic and modern land use activities, predominately pineapple

production, have effectively obliterated the ground surface of a vast majority of the level plateau landform” (Roberts et al. 2004:85).

4.3 Background Summary and Predictive Model

Analysis of the historical record is ultimately inconclusive about use of the project lands prior to c. 1900. The focus on land grants urged on Hawaiians by the Reverend Emerson makes it difficult to reconstruct traditional Hawaiian patterns of land use at Kamananui from the historic record. All we know about the present project area is that by 1900 it was the southern portion of three former land grants including: Land Grant 682 to S. N. Castle, Land Grant 848 to Kahoeka, and Land Grant 1125 to Kaiakawaha (see Figure 8). The project area was in the “Kemoo” section of the Waialua Agricultural Company Ltd. sugar plantation at that time.

For the most part, the nature of the Land Grants in the immediate area including the western portion of the present project lands is long thin rectangles with parallel sides. This form is not at all typical for traditional Hawaiian land holdings that are more commonly in the shape of irregular polygons. This suggests that the present project area may not have been an area of traditional, pre-contact Hawaiian land holding – at least not in the form in which the grants were issued. The pattern of residences and burials appear to have been nearer the coast.

Although McAllister identified thirteen sites within Kamananui all of the sites are located some distance away. His Site 210, Indications of former habitations, Kaukonahua Gulch, is the closest and approximately 3 kilometers to the northwest, which suggests less cultural use of the specific project area environs. There have been few archaeological studies in the vicinity upon which to base inferences. Inland studies (Neller 1984, Spear 1993, Nees et al. 1991) have reported no finds other than the irregular rock structures noted by Neller far inland. The majority of documented burials within Kamananui seem to be specific to coastal Jaucas sand deposits.

Section 5 Results of Fieldwork

5.1 Field Inspection

Pedestrian inspection of the project area confirmed the findings of the background research. No pre-contact agricultural features, the most anticipated traditional Hawaiian archaeological remains in this area, were located during the field inspection.

Using a hand-held GPS unit and copies of an aerial photograph on which the project area was overlaid, a pedestrian inspection of the project area was made. Beginning from the north portion of the project area, pedestrian sweeps were undertaken in a general northwest to southeast and southeast to northwest direction (parallel to the long axis of the triangular-shaped project area). As the project area narrows to a point at the southeast, certain zigzag transects were used to improve coverage. The archaeologists typically walked 20 meters apart. Figure 17 shows the track log of one of the two archaeologists (half of the pedestrian traverse is depicted). Virtually the entire project area has been massively impacted by the present mulching operations (and decades of sugar and pineapple cultivation before that). Ground visibility is generally good in the sense that there is virtually no vegetation at all (only exotic grasses on the perimeter) (Figure 17 to Figure 29). On the other hand virtually the entire project area is overlain with 25 cm to 30 cm (10" to 12") of chipped green waste mulch that has been tilled into the soil (see particularly Figure 28). Thus while visibility was "excellent" only in perhaps 2% of the project area was the natural soil surface visible. Perhaps 10% of the project area is presently under linear piles of mulch 3.0 to 3.5 m high (see particularly Figure 23 & Figure 29). These piles of mulch were actively being "turned-over" by large earth moving equipment and it is thought that there is zero chance of significant cultural resources above the ground surface under these piles.

Particular attention was addressed to a steep-sided gulch in the extreme southeast corner of the project area (Figure 30 & Figure 31).

No historic properties, cultural deposits, or cultural material were found within the proposed 112-acre project area.

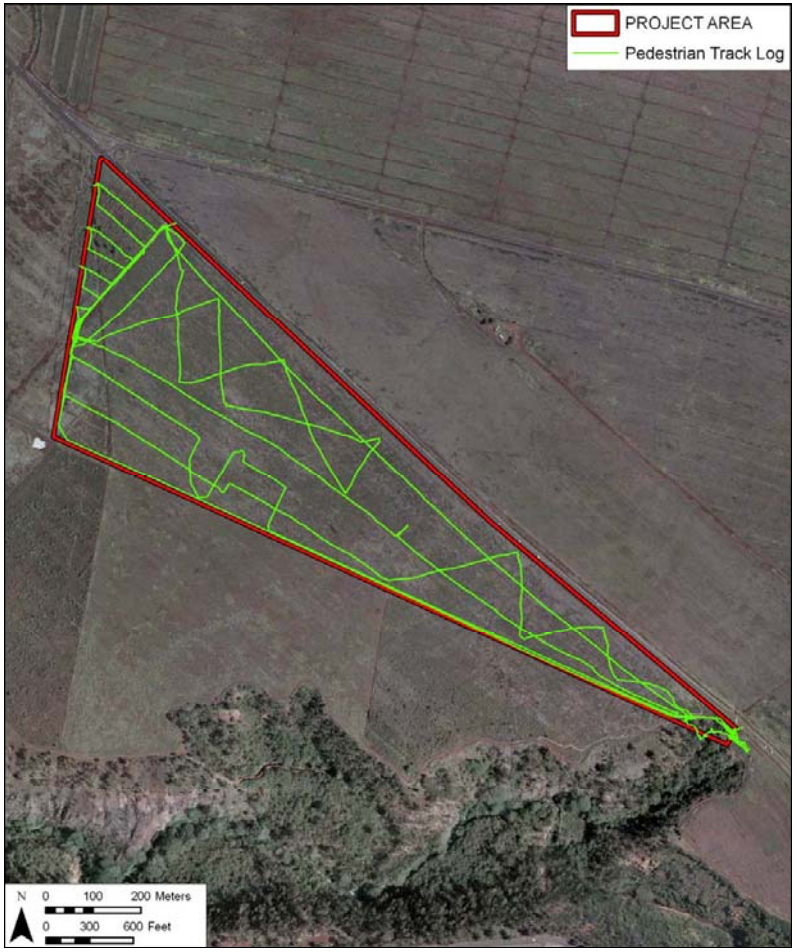


Figure 17. Track log of one of two archaeologists' pedestrian survey route of the project area (the second archaeologists traverse paralleled these transects typically at a distance of 20 m)



Figure 18. General view of northeast side of project area from north corner (Wilikina Drive at left), view to southeast



Figure 19. General view of west side of project area from north corner (linear berm defines west edge), view to south



Figure 20. General view of northeast side of project area from east corner (Wilikina Drive at right), view to northwest



Figure 21. General view of south side of project area from east corner (linear berm defines south edge), view to northwest



Figure 22. General view of south side of project area from southwest corner (linear berm at right side defines south edge), view to southeast



Figure 23. General view of southwest portion of project area from southwest corner (windrows of mulch in foreground), view to northeast



Figure 24. General view of southwest portion of project area from near center of project area, view to southwest



Figure 25. General view of northwest portion of project area from near center of project area, view to northwest



Figure 26. General view of northeast portion of project area from near center of project area, view to north



Figure 27. General view of southeast portion of project area from near center of project area, view to southeast



Figure 28. Close up view of typical ground surface (25 to 30 cm [10" to 12"] of mulch), clip board at right for scale)



Figure 29. General view of linear mounds of mulch in southwest portion of project area (3 m to 3.5 m high)



Figure 30. General view of steep gulch in extreme east corner of project area, view to northwest



Figure 31. General view of interior of steep gulch in extreme east corner of project area, view to north

Section 6 Summary and Recommendations

6.1 Summary

At the request of Wilson Okamoto Corporation, Cultural Surveys Hawai‘i, Inc. (CSH) completed an archaeological assessment for a proposed composting facility in *mauka* Kamananui Ahupua‘a, Waialua District, O‘ahu (TMK: [1] 6-5-002:026). Wilikina Drive forms the project area’s northeastern boundary.

CSH conducted an archaeological inventory survey investigation for the proposed composting facility project. Per the requirements of Hawai‘i Administrative Rules (HAR) Chapter 13-13-276, the study was conducted to identify, document, and make Hawai‘i Register of Historic Places (Hawai‘i Register) eligibility recommendations for the survey area’s historic properties. Because no historic properties were identified in the survey area, this investigation is termed an archaeological assessment per HAR Chapter 13-13-275-5. This archaeological assessment report was prepared to support the proposed project’s historic preservation review under Hawai‘i Revised Statutes (HRS) Chapter 6E-8 and HAR Chapter 13-13-275. This archaeological assessment report was prepared to support the proposed project’s historic preservation review and any other project-related historic preservation consultation.

As part of its archaeological assessment field effort, carried out on November 5, 2010, CSH conducted systematic pedestrian inspection of the project area. No historic properties were identified. These findings are largely in keeping with expectations for the project area, based on historical and previous archaeological research.

6.2 Recommendations

6.2.1 Project Effect

No historic properties, cultural deposits, or cultural material were identified within the 112-acre proposed project area. Land clearing for agricultural cultivation and agricultural activities themselves likely impacted or destroyed any possible surface or subsurface historic properties that may have existed within the project area. Consequently, CSH’s effect recommendation for the proposed t project is “no historic properties affected.”

6.2.2 Mitigation Recommendations

CSH recommends no additional archaeological work for the proposed 112-acre composting facility in *mauka* Kamananui Ahupua‘a.

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Appendix H

Cultural Impact Assessment for
Proposed In-Vessel Composting Facility,
Cultural Surveys Hawaii, Inc.
September 2011

Cultural Impact Assessment for the Proposed In-Vessel Composting Facility, Kamananui Ahupua'a, Waialua District, O'ahu Island

TMK: [1] 6-5-002:026

Prepared for

Wilson Okamoto Corporation

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Prefatory Remarks on Language and Style

A Note about Hawaiian and other non-English Words:

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

A Note about Plant and Animal Names:

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

Abbreviations

APE	Area of Potential Effect
C & C	City and County
CIA	Cultural Impact Assessment
CSH	Cultural Surveys Hawai'i
HAR	Hawai'i Administrative Rules
HEP	Hawaiian Earth Products
HER	Hawaiian Earth Recycling
HRS	Hawai'i Revised Statutes
LCA	Land Commission Award
OEQC	Office of Environmental Quality Control
OHA	Office of Hawaiian Affairs
OIBC	O'ahu Island Burial Council
SHPD	State Historic Preservation Division
TCP	Traditional Cultural Property
TMK	Tax Map Key
USGS	United States Geological Survey

Management Summary

Reference	Cultural Impact Assessment for the Proposed In-Vessel Composting Facility, Kamananui Ahupua'a, Waialua District, O'ahu Island (TMK: [1] 6-5-002:026) (Genz and Hammatt 2011)
Date	September 2011
Project Number	CSH Job Code: KAMANANUI 2
Agencies	State of Hawai'i Department of Health/Office of Environmental Quality Control (DOH/OEQC)
Project Location	The Project area is in the *mauka* (inland) portion of Waialua District, with Wilikina Drive as its northeastern boundary.
Land Jurisdiction	Private
Project Description	Hawaiian Earth Recycling LLC (HER) proposes to construct an in-vessel composting facility (composting of organics that occurs in enclosed reactors with controlled air flow). The in-vessel composting of the proposed facility will process up to 100,000 tons per year of green waste, food waste, and sewage sludge, and produce marketable compost products, such as soil amendments and potting soil. The facility may also be expanded in the future, through mutual agreement between the City and County of Honolulu and HER, to handle up to 150,000 tons per year. The in-vessel composting of the proposed facility will utilize the GORE™ Cover System for the composting process, which is highly effective in managing and controlling odors and emissions. The proposed facility will consist of a truck weighing scale, an enclosed tipping and preparation building, ans an open processing area where the GORE™ system will be installed. These facilities will encompass approximately 13 acres of the 112 acre parcel. The remainder will be used for storm water retention ponds, leachate storage tanks, open product storage areas, existing open windrow composting operations (green waste only), and an exhibition farm to demonstrate benefits of using compost for crop production and commercial farming operation.
Project Acreage	Approximately 112 acres
Area of Potential Effect (APE) and	For the purposes of this Cultural Impact Assessment (CIA), the Area of Potential Effect (APE) is defined as the approximately 112-acre

Survey Acreage	Project area. While this investigation focused on the Project APE, the study area included the entire *ahupua'a* (land division usually extending from the uplands to the sea) of Kamananui.
Document Purpose	The Project requires compliance with the State of Hawai'i environmental review process (Hawai'i Revised Statutes [HRS] Chapter 343), which requires consideration of a proposed project's effect on cultural practices and resources. Wilson Okamoto Corporation requested CSH conduct this CIA. Through document research and ongoing cultural consultation efforts, this report provides information pertinent to the assessment of the proposed Projects' impacts to cultural practices and resources (per the *Office of Environmental Quality Control's Guidelines for Assessing Cultural Impacts*) which may include Traditional Cultural Properties of ongoing cultural significance that may be eligible for inclusion on the State Register of Historic Places, in accordance with Hawai'i State Historic Preservation Statute (Chapter 6E) guidelines for significance criteria according to Hawai'i Administrative Rules (HAR) §13-284 under Criterion E. The document is intended to support the Project's environmental review and may also serve to support the Project's historic preservation review under HRS Chapter 6E and HAR Chapter 13-284.
Consultation Effort	Hawaiian organizations, agencies and community members were contacted in order to identify potentially knowledgeable individuals with cultural expertise and/or knowledge of the Project area and the vicinity. The organizations consulted included the State Historic Preservation Division, the Office of Hawaiian Affairs, the O'ahu Island Burial Council, Hui Mālama I Nā Kūpuna O Hawai'i Nei, the Hawaiian Civic Club of Wahiawā, the Waialua Hawaiian Civic Club, and community members of Kamananui Ahupua'a.
Results of Background Research	Background research for this Project yielded the following results (presented in approximate chronological order): 1. The Project area is located far from the sea in a high, level saddle region between the two mountain ranges of O'ahu. A network of trails traversed the region, connecting the *moku* (districts) of Waialua, Wai'anae, 'Ewa, and Kona ('Ī'ī 1959:99). These paths intersected at Kūkaniloko, a sacred ceremonial birthing place for the highest ranking chiefs and its associated *heiau* (place of worship, temple) located about one mile southeast of the Project area, an area that some people consider the *piko* (navel or center) of O'ahu (Becket and Singer 1999:64).

	2. Extensive cultivation took place in this saddle region, which suggests sizable populations of ancient Hawaiians (Handy and Handy 1972:464). The present town of Wahiawā, which is located about two miles southeast of the Project area in Wai'anae Uka Ahupua'a, was an area of extensive irrigated sweet potato and yam cultivation (Handy and Handy 1972:464–465). Closer to the Project area, numerous *lo'i kalo* (irrigated taro terraces) were maintained at a place called Kukui-o-Lono; *mo'olelo* (oral traditions) describe that an ancient high chief, Kūkaniloko, grew the first *lo'i* there (Handy and Handy 1972:465). Hawaiians most likely cultivated sweet potatoes and bananas in the *mauka* gulches of Kamananui Ahupua'a (Handy 1940:85), and there is evidence of former habitations on both sides of Kaukonahua Gulch about two miles northwest of the Project area (McAllister 1933:133). 3. Two caves with skeletal remains (Site 211) are located along Kaukonahua Gulch about three miles northwest of the Project area (McAllister 1933:133), but there is no documented evidence from archaeological surveys, historical records or oral traditions of *iliina* (burials) or *iwi kūpuna* (ancestral remains) within the Project area. 4. Kamananui Ahupua'a was the political and ritual center of Waialua Moku until the 1820s, when the ruling chief re-drew the *ahupua'a* boundaries with his shift in residence to Kawailoa Ahupua'a and when the Kawailoa-based Protestant mission of Waialua "usurped the ritual hegemony from the temples of human sacrifice [*po'okanaka*] that not long before had sanctified the landscape of Kamananui" (Sahlins 1992:21). 5. During the Māhele of 1848, the lands of the Project area were purchased by S. N. Castle (Land Grant 682), Kahoeka (Land Grant 848), and Kaiakawaha (Land Grant 1125). Claims for Land Commission Awards reveal that Hawaiians used the land in the *mauka* portions of Kamananui Ahupua'a primarily to cultivate taro and *wauke* (paper mulberry) (Waihona 'Aina 2000). 6. Rice cultivation, extension of the railroad system toward Waialua, and the development of commercial sugarcane cultivation with the rise of the Waialua Agricutlural Company (later named the Waialua Sugar Company) dramatically altered the landscape of Kamananui Ahupua'a during the last two decades of the nineteenth century. Then, the lands surrounding the Project area within the *'ili* (land division smaller than an

	ahupua'a) of Kemo'o were further modified during the early twentieth century through the development of a military post (Schofield Barracks), sugar cane cultivation (Kemoo Land Company), a piggery and dairy operation (Kemo'o Farms), and the pineapple industry with its plantation settlements (Kemoo Camp) further transformed the landscape surrounding the Project area.
Results of Community Consultation	CSH attempted to contact 12 community members and government agency and community organization representatives. Of the ten people that responded, two *kūpuna* (elders) and/or *kama'āina* (Native-born) participated in formal interviews for more in-depth contributions to the CIA. This community consultation indicates: 1. Drawing from the Kumulipo, a cosmological creation chant, and teachings from kūpuna, Mr. Tom Lenchanko articulates an expansive view of Kūkaniloko, the current State of Hawai'i five-acre Kūkaniloko Birthstones State Monument located about one mile southeast of the Project area. While the birth of *ali'i* (chiefs) at Kūkaniloko is well documented, Kūkaniloko extends back in time to the creation of the island of O'ahu and the descent of the first people from the gods, and expands geographically to encompass at least 36,000 acres of land within a network of *ka'anani'au* (boundary markers) that pre-dates the *moku* and *ahupua'a* territorial system. The *mana* (divine power) of Kūkaniloko, the most sacred site on O'ahu, endures today. As a result, any development within the *ka'anani'au*—including the nearby composting facility—will disjoint the *mana* of Kūkaniloko. 2. Mr. Lenchanko is concerned that the proposed Project will trespass upon the *'āina* (land) and *iwiawaloa* (ancestral burial places). Ms. Coochie Cayan and Ms. Velma Kekipi are also concerned that any ground disturbing activity may unearth burials or burial sites not known despite the intense agricultural use of the land. 3. From such a deep ancestral connection to the genesis of the land, Mr. Lenchanko questions how developers today claim land ownership. He politely queries whether Hawaiian Earth Recycling LLC can demonstrate and prove their clear unbroken chain of land ownership, or "exclusive territorial jurisdiction," for the Project area, as "nothing is older than Kūkaniloko and those who are buried in our land." 4. One of the long-term visions of the Hawaiian Civic Club of Wahiawā is to gain stewardship of approximately 500 acres of

	land surrounding the current Kūkaniloko Birthstones State Monument in order to integrate the cultural traditions of Kūkaniloko with a cultural learning center. This expanded region would extend close to the southern limit of the proposed Project area. 5. Mr. Shad Kāne acknowledges that the footprint of the Project is in previously disturbed agricultural land and that the likelihood of any cultural sites in this area would only be found within the adjacent valleys. To contexualize the cultural significance of the lands surrounding the Project area, Mr. Kāne describes historical events on a trail (now Kunia Road) in the region of Lihue in the *ahupua'a* of Honouliuli that once connected the West Loch of Pearl Harbor to Kūkaniloko, including warriors who "secured the sanctity and purity of the bloodline of the ruling chiefs and that of Kukaniloko."
Impacts and Recommendations	Based on the information gathered for the cultural and historic background and community consultation detailed in this CIA report, CSH does not foresee potential impacts of the proposed Project on Native Hawaiian or other ethnic groups' cultural practices customarily and traditionally exercised for subsistence, cultural or religious purposes. However, CSH does anticipate potential impacts of the proposed Project on cultural, historic, and natural resources, and makes the following recommendations: 1. Land-disturbing activities may uncover cultural resources, including burials or burial sites not known despite the intense agricultural use of the land. Should historic, cultural or burial sites or artifacts be identified during ground disturbance, the construction contractor should immediately cease all work and the appropriate agencies notified pursuant to applicable law. 2. HER should brief and consult with community members and organizations as the Project design progresses, especially Tom Lenchanko and the Hawaiian Civic Club of Wahiawā, the *kahu* (guardian) and curator of Kūkaniloko Birthstones State Monument, respectively. This on-going consultation should keep the community informed of any changes that could result in unanticipated adverse cultural impacts.

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Section 1 Introduction

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At the request of Wilson Okamoto Corporation, Cultural Surveys Hawai'i (CSH) is conducting a Cultural Impact Assessment (CIA) for the proposed In-Vessel Composting Facility, Kamananui Ahupua'a, Waialua District, O'ahu Island (TMK: [1] 6-5-002:026) (Figure 1 to Figure 3). The Project area is in the *mauka* (inland) portion of the *ahupua'a* (land division running from the mountains to the sea) of Kamananui within the *moku* (district) of Waialua, with Wilikina Drive as its northeastern boundary.

Currently, the City and County (C & C) of Honolulu's Curbside Green Waste Collection Program, individual homeowners, commercial contractors, and government maintenance agencies deliver green waste to one of two Hawaiian Earth Products' (HEP) Department of Health-permitted composting/transfer locations, located at Campbell Industrial Park and Kapaa Quarry, respectively. From both facilities, HEP recycles over 85,000 tons of green waste per year into products such as soil enrichment, fertilizer replacement/enhancement, and gardening and landscaping products. HEP has moved its existing open windrow composting operations (long, low mounds of shredded green waste that are turned every few days to provide air for the microbes digesting the organics) at Campbell Industrial Park to the Waialua facility.

Hawaiian Earth Recycling LLC (HER) (an affiliated company of HEP) proposes to construct an in-vessel composting facility (composting of organics that occurs in enclosed reactors with controlled air flow). The in-vessel composting of the proposed facility will process up to 100,000 tons per year of green waste, food waste, and sewage sludge, and produce marketable compost products such as soil amendments and potting soil. Food waste will be delivered from a yet to be developed C & C food waste collection program and the dewatered sewage sludge will come from the C & C's Honouliuli and Kailua Regional Wastewater Treatment Facilities. The facility may also be expanded in the future, through mutual agreement between the C & C and HER, to handle up to 150,000 tons per year.

The in-vessel composting of the proposed facility will utilize the GORE™ Cover System for the composting process, which is highly effective in managing and controlling odors and emissions. The proposed facility will consist of a truck weighing scale, an enclosed tipping and preparation building, ans an open processing area where the GORE™ system will be installed. These facilities will encompass approximately 13 acres of the 112 acre parcel. The remainder will be used for storm water retention ponds, leachate storage tanks, open product storage areas, existing open windrow composting operations (green waste only), and an exhibition farm to demonstrate benefits of using compost for crop production and commercial farming operation (Figure 4 and Figure 5).

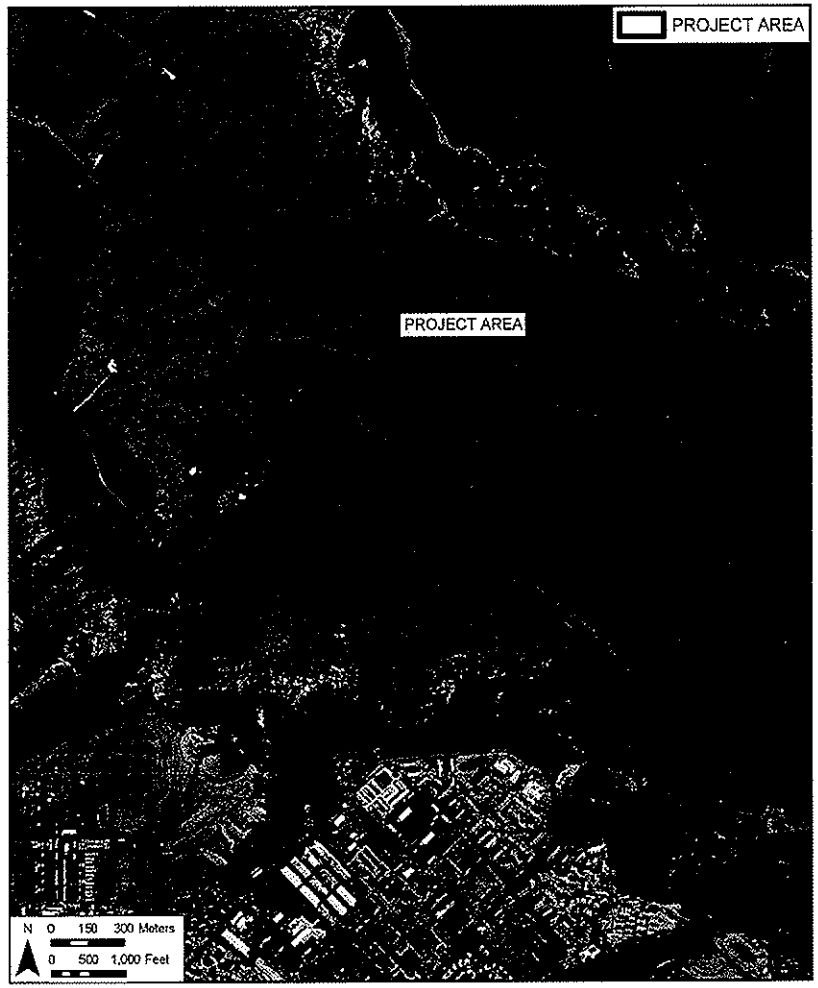


Figure 1. Aerial photograph (Google Earth 2008) showing the Project area

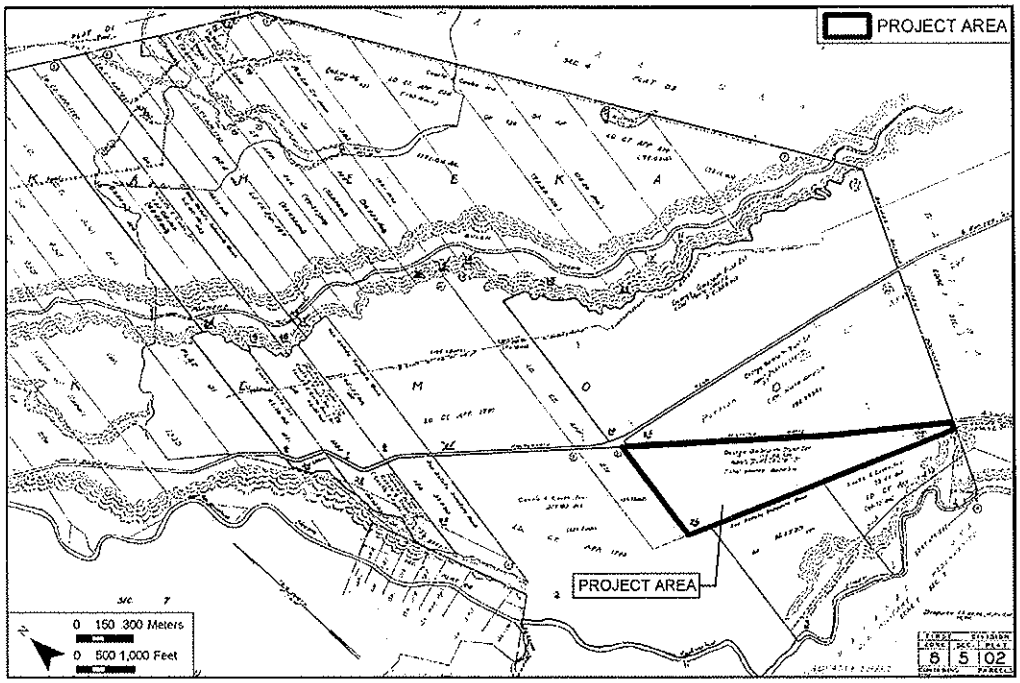


Figure 3. Tax Map Key (TMK): [1] 6-5-02 showing the Project area (Hawai'i TMK Service 2010)

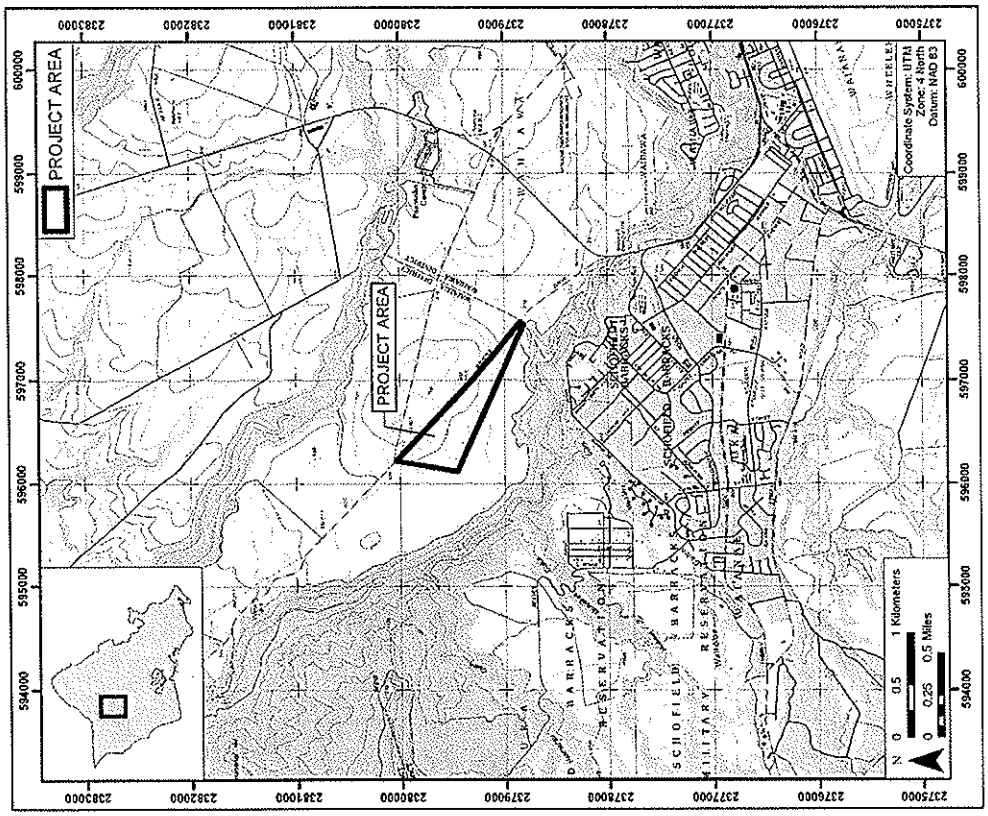


Figure 2. Portion of the U. S. Geological Survey 7.5-minute series topographic map, Hale'iwa (1999) and Schofield Barracks (1998) quadrangles, showing the Project area

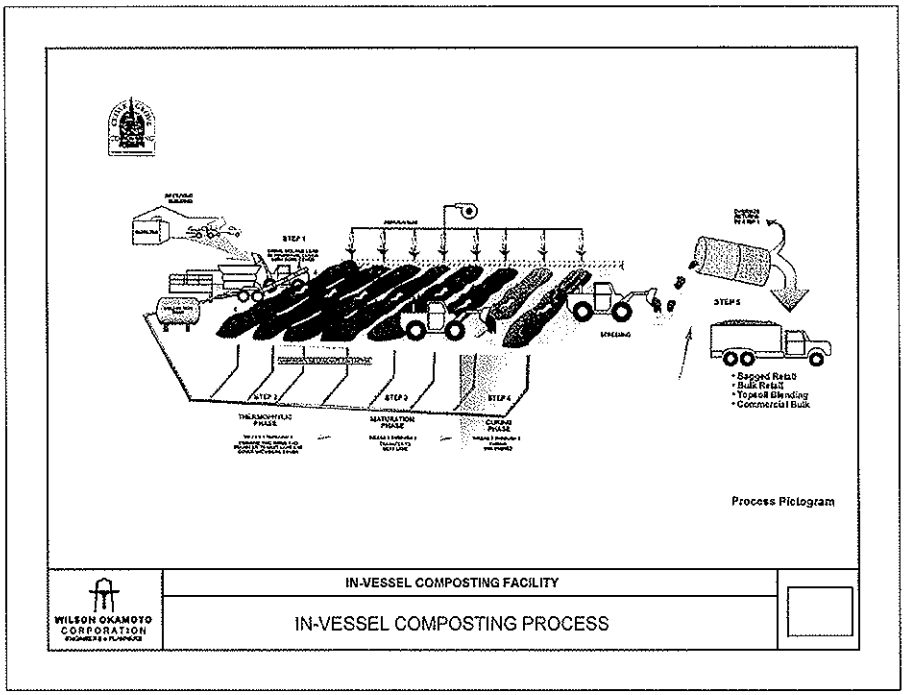


Figure 5. Conceptual plan for in-vessel composting process (Wilson Okamoto Corporation 2010b)

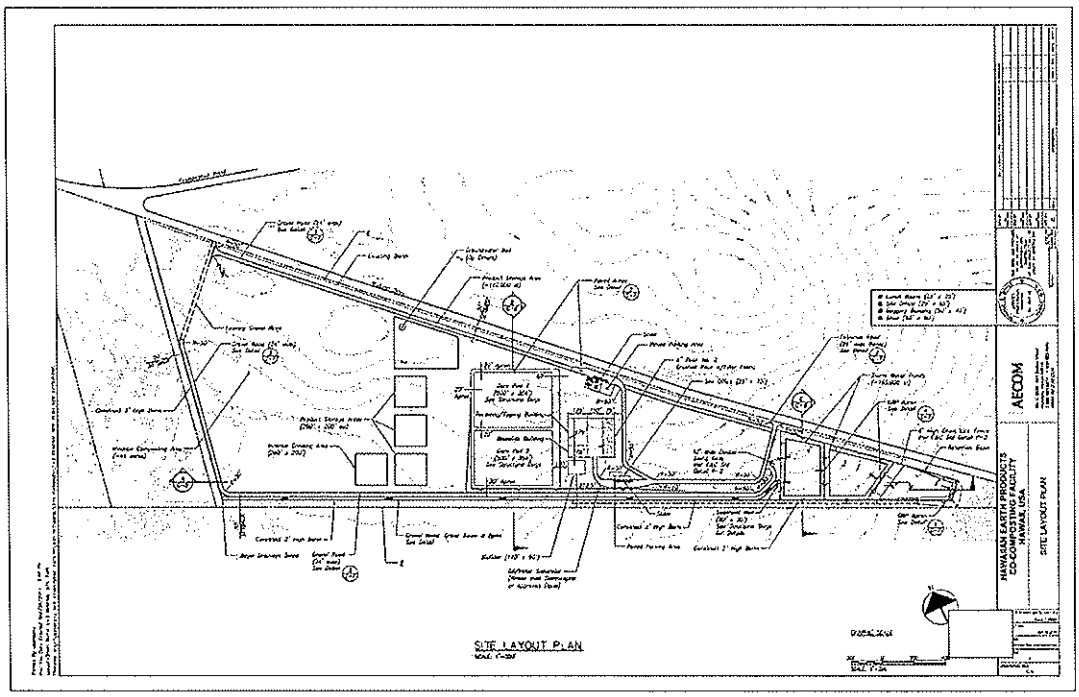


Figure 4. Site Plan (Wilson Okamoto Corporation 2010a)

1.2 Document Purpose

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

> Have an important value to the Native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group's history and cultural identity.

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

1.3 Scope of Work

The scope of work for this CIA includes:

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

1.4 Environmental Setting

1.4.1 Natural Setting

The Project is within fairly level lands that range in elevation from 880 to 940 feet above mean sea level, with a steep gulch in the Project area's extreme east corner. The *mauka* region of Kamananui Ahupua'a receives moderate rainfall annually (between 800 and 1,000 millimeters (31–39 inches) (Giambelluca et al. 1986). The Project area sediments primarily consist of a mixture of two types of Wahiawā silty clay that ranges from three to eight percent slopes, while the extreme eastern portion of the Project area contains Helemano Silty Clay, ranging from 30 to 90 percent slopes (Figure 6). The Wahiawā series consists of well-drained silty clay soils developed in residuum and old alluvium derived from basic igneous rocks (Foote et al. 1972:124–125). The Helemano series consists of well-drained soils on alluvial fans and colluvial slopes on the sides of gulches (Foote et al. 1972:40). Typical vegetation includes Bermuda grass, guava, *koa haole* (common shrub), *honohono* (dayflower), lantana, Christmas berry, Formosa *koa*, eucalyptus, guava, Japanese tea, and Java plum (Foote et al. 1972:40, 124).

1.4.2 Built Environment

There are no structures or buildings within the Project area. Wilikina Drive forms the Project area's northeastern boundary.

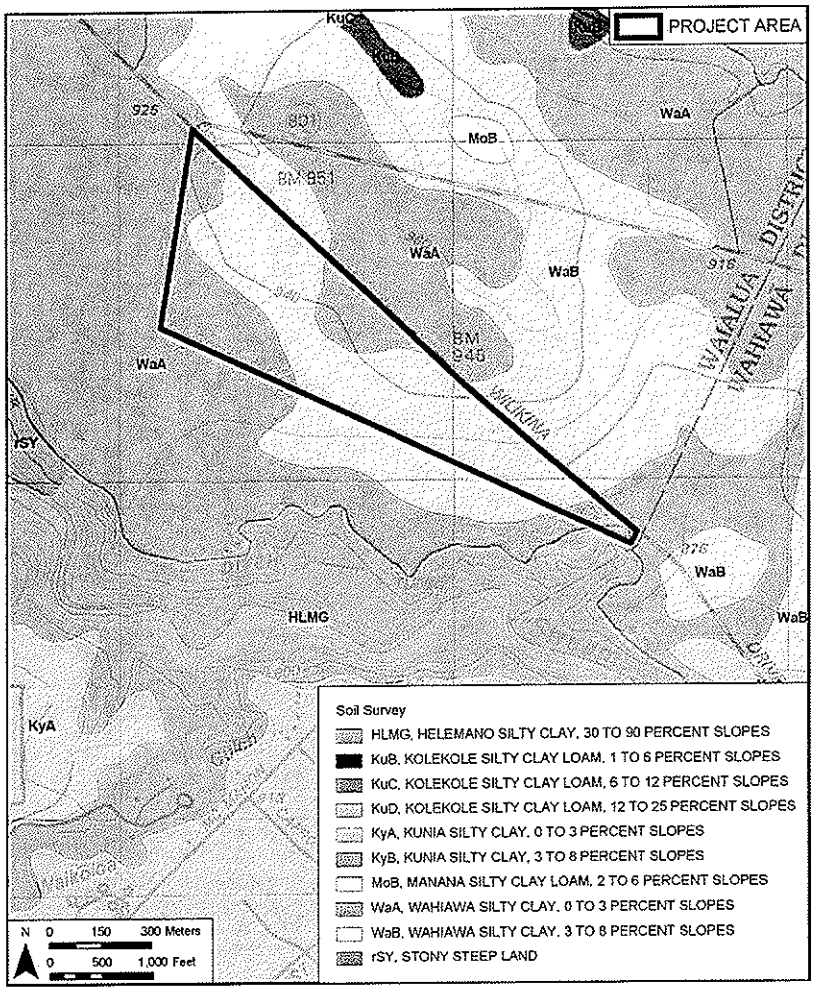


Figure 6. Portion of the U. S. Geological Survey 7.5-minute series topographic map, Haleiwa (1999) and Schofield Barracks (1998) quadrangles, showing the Project area with soil overlay (Foote el al. 1972)

Section 2 Methods

2.1 Archival Research

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

2.2 Community Consultation

2.2.1 Sampling and Recruitment

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

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

of people with recognized experience and expertise in a specific area (Bernard 2006:189–191). CSH maintains a database that draws on over two decades of established relationships with community consultants: cultural practitioners and specialists, community representatives and cultural and lineal descendants. The names of new potential contacts were also provided by colleagues at CSH and from the researchers' familiarity with people who live in or around the study area. Researchers often attend public forums (e.g., Neighborhood Board, Burial Council and Civic Club meetings) in (or near) the study area to scope for participants. Please refer to Table 1, Section 4, for a complete list of individuals and organizations contacted for this CIA.

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

2.2.2 Informed Consent Protocol

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

2.2.3 Interview Techniques

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

religious and spiritual beliefs and ceremonies were emphasized over other categories less salient to Project participants. These interviews and oral histories supplement and provide depth to consultations from government agencies and community organizations that may provide brief responses, reviews and/or referrals gathered via phone, email and occasionally face-to-face commentary.

2.2.3.1 In-depth Interviews and Oral Histories

Interviews were conducted initially at a place of the study participant's choosing (usually at the participant's home or at a public meeting place) and/or—whenever feasible—during site visits to the Project area. Generally, CSH's preference is to interview a participant individually or in small groups (two–four); occasionally participants are interviewed in focus groups (six–eight). Following the consent protocol outlined above, interviews may be recorded on tape and in handwritten notes, and the participant photographed. The interview typically lasts one to four hours, and records the—who, what, when and where of the interview. In addition to questions outlined above, the interviewee is asked to provide biographical information (e.g., connection to the study area, genealogy, professional and volunteer affiliations, etc.).

2.2.3.2 Field Interviews

Field interviews are conducted with individuals or in focus groups comprised of *kūpuna* (elder) and *kama'āina* (Native-born) who have a similar experience or background (e.g., the members of an area club, elders, fishermen, *hula* dancers) who are physically able and interested in visiting the Project area. In some cases, field visits are preceded with an off-site interview to gather basic biographical, affiliation and other information about the participant. Initially, CSH researchers usually visit the project area to become familiar with the land and recognized (or potential) cultural places and historic properties in preparation for field interviews. All field activities are performed in a manner so as to minimize impact to the natural and cultural environment in the project area. Where appropriate, Hawaiian protocol may be used before going on to the study area and may include the *ho'okupu* (offering) of *pule* (blessing), and *oli*. All participants on field visits are asked to respect the integrity of natural and cultural features of the landscape and not remove any cultural artifacts or other resources from the area.

2.3 Compensation and Contributions to Community

Many individuals and communities have generously worked with CSH over the years to identify and document the rich natural and cultural resources of these islands for cultural impact, ethno-historical and, more recently, TCP studies. CSH makes every effort to provide some form of compensation to individuals and communities who contribute to cultural studies. This is done in a variety of ways: individual interview participants are compensated for their time in the form of a small honorarium and/or other *makana* (gift); community organization representatives (who may not be allowed to receive a gift) are asked if they would like a donation to a Hawaiian charter school or nonprofit of their choice to be made anonymously or in the name of the individual or organization participating in the study; contributors are provided their transcripts, interview summaries, photographs and—when possible—a copy of the CIA report; CSH is working to identify a public repository for all cultural studies that will allow easy access to

current and past reports; CSH staff do volunteer work for community initiatives that serve to preserve and protect historic and cultural resources (for example in, Lāna'i and Kaho'olawe). Generally our goal is to provide educational opportunities to students through internships, share our knowledge of historic preservation and cultural resources and the State and Federal laws that guide the historic preservation process, and through involvement in an ongoing working group of public and private stakeholders collaborating to improve and strengthen the Chapter 343 environmental review process.

Section 3 Cultural and Historical Background

This section draws from archaeology, ethnography, and an archive of historic documents and images to present a portrait of Hawaiian culture and history as it relates to the specific Project area. Focusing in on geographic and temporal scales, this section first traces the exploration of the Pacific Ocean and the subsequent discovery, settlement, and expansion of the Hawaiian archipelago. This broad overview of Hawaiian history introduces key concepts and terms used throughout the report (e.g. *ahupua'a*) and leads to a focused history of Kamananui Ahupua'a with emphasis on the Project area, including the earliest known settlement and subsistence patterns, a compilation of *wahi pana* and associated *mo'olelo*, successions of chiefly rule, the introduction of private property, and contemporary land use.

3.1 Discovery, Settlement, and Expansion of the Hawaiian Islands

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

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

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

by a contraction of voyaging as populations grew and rival chiefdoms fought over land and power" (Finney 2007:145).

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

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

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

places the cessation of Hawaiian long-distance voyaging at about A.D. 1450 (Fornander 1878:168–169).

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

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

3.2 Waialua Moku

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

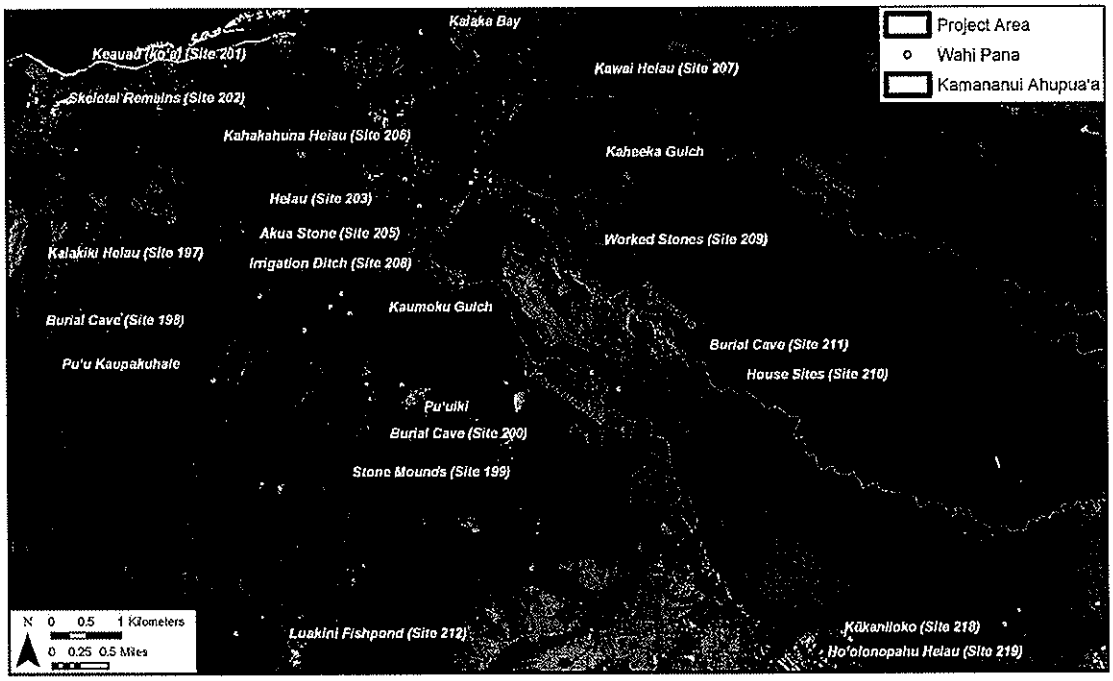


Figure 7. Archaeological sites indicative of ancient settlement and habitation and known locations of *wahi pana* of Kamananui Ahupua'a (base image, Google Earth 2008)

Mo 'olelo chronicle the rise of divine kingship in the uplands of Waialua (Kirch 2010). Located near what some people consider the *piko* (navel or center) of O'ahu (Becket and Singer 1999:64), Kūkaniloko was a sacred birthing place of *ali'i kapu* (sacred chiefs) (Kamakau 1991:53) (see Section 3.3.2.2).

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

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

The distant lands of the Project area, from the southwest mountainous peak of Ka'ala to the northeast coastal region of Kāpaeloa, were once connected culturally and politically. According to anthropologist Marshall Sahlins, Kamananui Ahupua'a was once the dominant political and ritual center of Waialua Moku that included detached, outlying lands, including the remote fishing community of Kāpaeloa at the eastern border of Waialua with its prime marine resources, that were controlled by stewards (*konohiki*) of Kamananui proper (Sahlins 1992:20-21). Then, in the 1820s, the ruling chief of Kamananui Ahupua'a moved to Anahulu Valley in the *ahupua'a* of Kawailoa, which resulted in a redrawing of *ahupua'a* boundaries. Kāpaeloa and other outlying sections of Kamananui were thus subsumed into the land of Kawailoa (See Section 3.3.4).

The cultural landscape of the entire *moku* of Waialua has been severely destroyed or obscured during the past two centuries, especially due to the clearing and plowing under of coastal land and sloping uplands between gulches for sugarcane cultivation with the Waialua Agricultural Company (Sahlins 1992:17). Yet, archaeological documentation of sites in the early to mid-twentieth century based in part on the recollections of old Hawaiian residents (McAllister 1933; Thrum 1906), combined with collected *mo 'olelo* and documented observations, illuminate the cultural landscape—patterns of ancient habitation, subsistence, and *wahi pana*—for the *ahupua'a* of Kamananui (Figure 7).

3.3 Kamananui Ahupua'a

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

Reconstructing patterns of ancient settlement draws heavily from *wahi pana*, a term not easily defined or described. A Hawaiian *wahi pana* "physically and poetically describes an area while revealing its historical or legendary significance" (Landgraf 1994:v). *Wahi pana* are sacred places that include such cultural properties as *heiau*, *loko i'a*, *ala hele* (trails), *ilina* and *iwi kūpuna* (ancestral bone remains), land divisions, and natural geographic locations (place names), such as streams, peaks, rock formations, ridges, and offshore islands and reefs that are associated with culturally significant beliefs or events. A *wahi pana* leaves an imprint on the landscape even if its tangible properties no longer exist, as the *mana* (divine power) of previous people and events associated with this space continues to manifest itself. For example, the stereotypical *heiau* is composed of terraces, enclosures, walls, mounds, or upright stones, but *heiau* can also be sacred places on a landscape that lack built structures, natural landscape features such as rock outrcoppings, and earthworks where *mana* is concentrated and transferred between the deities and worshippers (Becket and Singer 1999:xix-xx). Further, previously documented and ongoing *mo'olelo* of *wahi pana* that no longer have material traces are precisely the evidence of their enduring significance (Sahlins 1992:22). For clarity, the locations of *wahi pana* are bolded in the text and labeled (see Figure 7) if their locations are known; all *wahi pana* meanings are cited from Pukui et al. (1974) unless otherwise noted; and spelling and use of diacriticals follow Pukui et al. (1974).

3.3.1 Settlement Patterns

3.3.1.1 Place Names

Hawaiian place names convey a wide variety of information about the relationships between people, landscapes and other natural and cultural resources. Place names may also express cultural, historical and/or spiritual values and concepts important to Hawaiian world views. It is common for places and landscape features to have multiple names, some of which may only be known to certain *'ohana* (families) or even certain individuals within *'ohana*, and many of which have been lost, forgotten or kept secret through time. Place names may also convey *kaona* (hidden meanings) and *huna* (secret) information that may even have political or subversive undertones. Before the introduction of writing to the islands, when cultural information was exclusively preserved and perpetuated orally, Hawaiians gave names to literally everything in

their environment, including individual garden plots and *'auwai*, house sites, intangible phenomena such as meteorological and atmospheric effects, *pōhaku* (rocks), *pūnāwai* (fresh-water springs), and many others. Bolded text indicates the feature is included in Figure 7.

Several streams flow through gulches from the *mauka* lands of Wahiawā toward Kaiaka Bay (shadowed sea), including **Poamoho Stream** (and Gulch) and **Kaukonahua Stream** (and Gulch). Other gulches include **Kaheeka Gulch** and **Kaumoku Gulch**. A ridge called **Pu'u Kaupakuhale** (house ridgepole or roof) lines the extreme western side of the *ahupua'a*, and an isolated hill called **Pu'uiki** (small hill) (also the name of a coastal section fo land) is located in the central part of the *ahupua'a*. A slope called **Keawawaihe** along Kaukonahua Gulch overlooks the *moku* of Waialua. This place, also called the Valley of Spears, was a place where brigands accosted travelers by disjointing them through the practice of *lua* (hand-to-hand fighting) and sometimes killing them with spears (Honolulu Advertiser 1925, cited in Sterling and Summers 1978:107). The Project area is located with the *'ili* (land division smaller than an *ahupua'a*) of **Kemo'o.**

3.3.1.2 Subsistence and Habitation

The Project area is located far from the sea in a high, level saddle region between the two mountain ranges of O'ahu. A network of trails traversed the region, connecting the *moku* of Waialua, Wai'anae, 'Ewa, and Kona ('Ī'ī 1959:99), with a sacred ceremonial place (Kūkaniloko) (McAllister 1933: 134–137) at its center, located about one mile southeast of the Project area. Extensive cultivation took place in this saddle region, which suggests sizable populations of ancient Hawaiians (Handy and Handy 1972:464). The present town of Wahiawā, which is located about one mile southeast of the Project area, was an area of extensive irrigated sweet potato and yam cultivation (Handy and Handy 1972:464–465) on a plain called Lelehua (*lehua* lei). Closer to the Project area, numerous *lo'i kalo* were maintained at a place called Kukui-o-Lono; *mo'olelo* describe that an ancient high chief, Kūkaniloko, grew the first *lo'i* there (Handy and Handy 1972:465).

The fertile coastal plains of Waialua were watered from streams from the Ko'olau mountains, and dense settlements and large complexes of irrigated taro fields were located on the floodplains of these streams (Sahlins 1992:20). Large terraces once extended along the flatlands between the junction of Poamoho Stream and Helemano Stream (in adjacent Pa'ala'a Ahupuaa to the east) and west of Poamoho Stream in the *makai* section of the *ahupua'a* (Handy 1940:85). A rock-lined irrigation ditch extended about two miles from Kaukonahua Stream toward these flatlands (later modified by the Waialua sugar Plantation for the sugar mill) (Site 208; McAllister 1933:133), irrigating *lo'i kalo* (Handy and Handy 1972:466). Smaller terraces were also located in the lower flats of Poamoho and Kaukonahua Valleys, and Hawaiians most likely cultivated sweet potatoes and bananas in the *mauka* gulches (Handy 1940:85). On both sides of Kaukonahua Gulch farther *mauka* about two miles northwest of the Project area are four closely-spaced piles of large stones indicative of former habitations (Site 210; McAllister 1933:133). In the extreme western portion of the *ahupua'a*, several oval-shaped piles of stones are located at the mouth of Kaumoku Gulch and may have been cleared away for agricultural purposes prior to the plantation period in the early twentieth century (Site 199; McAllister 1933:130).

3.3.1.3 Heiau and other Ceremonial and Religious Structures

Kalakiki Heiau, located on the crest of a ridge below Pu'u Kaupakuhale in the western section of the *ahupua'a* about six miles northwest of the Project area, once contained at least two terraces, but only a large front terrace is not covered by dense foliage (Site 197; McAllister 1933:129). **Onehana Heiau**, of *po'okanaka* class (human sacrifice) formerly adjoined Kalakiki Heiau (Thrum 1906:47), but no physical features remain today (Sterling and Summers 1978:104).

A *heiau* of unknown name once occupied a site near Kaukonahua Stream in the *makai* section of the *ahupua'a* (Site 203; McAllister 1933:132). Nearby, an *akua* (spirit) stone once sacred to the goddess Pele is located in an area that remained untouched in the midst of sugar cane fields (Site 205; McAllister 1933:132). **Kahakahuna Heiau** and **Kawai Heiau** once flanked the nearby Poamoho Stream; the latter was one of the first *heiau* to be destroyed during the plantation era (Sites 206 and 207; McAllister 1933:132). Farther *makai*, a *ko'a* (fishing shrine) called **Keauau** was formerly located on the beach at Pu'uiki (Site 201; McAllister 1033:132).

About one mile southeast of the Project area in the modern *ahupua'a* of Wahiawā, which was formely part of Kamananui until 1913 (Sterling and Summers 1978:138) is the sacred site of **Kūkaniloko** (Site 218; McAllister 1933:134–137), one of two famous birthing places in the Hawaiian archipelago (the other is in Kaua'i) for the highest ranking chiefs, the *ali'i kapu* (sacred chiefs). Located near what some people consider the *piko* (navel or center) of O'ahu (Becket and Singer 1999:64), Kūkaniloko was a site of *mana*, which the gods recognized in the child born there (Mililani High School 2001), "an *ali'i*, an *akua*, a *wela*—a chief, a god, a blaze of heat" (Kamakau 1991:38). *Mo'olelo* describe that Kahihiokalani, the wife of the *ali'i* Nanakaoko, gave birth to their son, Kapawa, at a birthing stone called Kūkaniloko in the twelfth century, an event witnessed by 36 chiefs (Fornander 1919–1920, Vol. 6:247). With the beating of two special *pahu* (drums) to inform the commoners of the birth of a new *ali'i*, Kapawa and subsequent newborns were taken to nearby **Ho'olonopahu Heiau** (sounding the *pahu*) (Site 219; McAllister 1933:137), now destroyed, where 48 chiefs presided over the ceremonial cutting of the naval cord (Thrum 1911). *Kāhuna* prepared each pregnant noble woman for a painless birth through a strict diet and exercise regime, hence the meaning of Kūkaniloko, "to anchor the cry from within" (Mililani High School 2001). Although the ancient structure had deteriorated, in 1797 Kamehameha I arranged for the birth of his heir, Liholiho, to take place at Kūkaniloko, although his wife's illness prevented this from occurring (Fornander 1878, Vol.2:20). As the most sacred site on O'ahu, Kūkaniloko was protected by the Daughters of Hawaii in 1925 until stewardship was transferred to the Wahiawā Hawaiian Civic Club in the early 1960s, then listed on the National Registers of Historic Places in 1973 and the State Register of Historic Places in 1973, and finally placed under the jurisdiction of State Parks in 1992 (Omandam 1998). Today, as part of Kūkaniloko Birthstones State Monument, the naturally weathered stones of Kūkaniloko still receive offerings (Kirch and Babineau 1996:34–35).

Farther southeast of the Project area at the former division between 'Ewa and Waialua (prior to the establishment of Wahiawā) are a pair of stones named **O'ahu nui** (big), the shape of which resembles the outline of O'ahu (Site 204; McAllister 1933), and **O'ahu iki** (small). The mapped location of this *pōhaku* by Sterling and Summers (1978) in the *makai* section of Kamananui

appears inconsistent with the description and mapped location by John Papa 'Ī'ī (1959:96), as well as community participant Tom Lenchanko (see Section 5.2).



Figure 8. Kūkaniloko (Becket and Singer 1999:65)

3.3.1.4 Recreation

Artificially worked stones were discovered underground during the digging of the shaft for a pump in Poamoho Gulch. They are reported to have resembled *'ulu maika* (stones used to play a game similar to bowling) (Site 209; McAllister 1933:133).

3.3.1.5 Ala Hele

John Papa 'Ī'ī depicts and briefly describes a network of trails connecting the *moku* of Waialua, Wai'anae, 'Ewa, and Kona that passed through Kūkaniloko very near to the current Project area. This trail is depicted, albeit at a general resolution given the scale and detail of the map, as passing by the current Project area ('Ī'ī 1959:96)

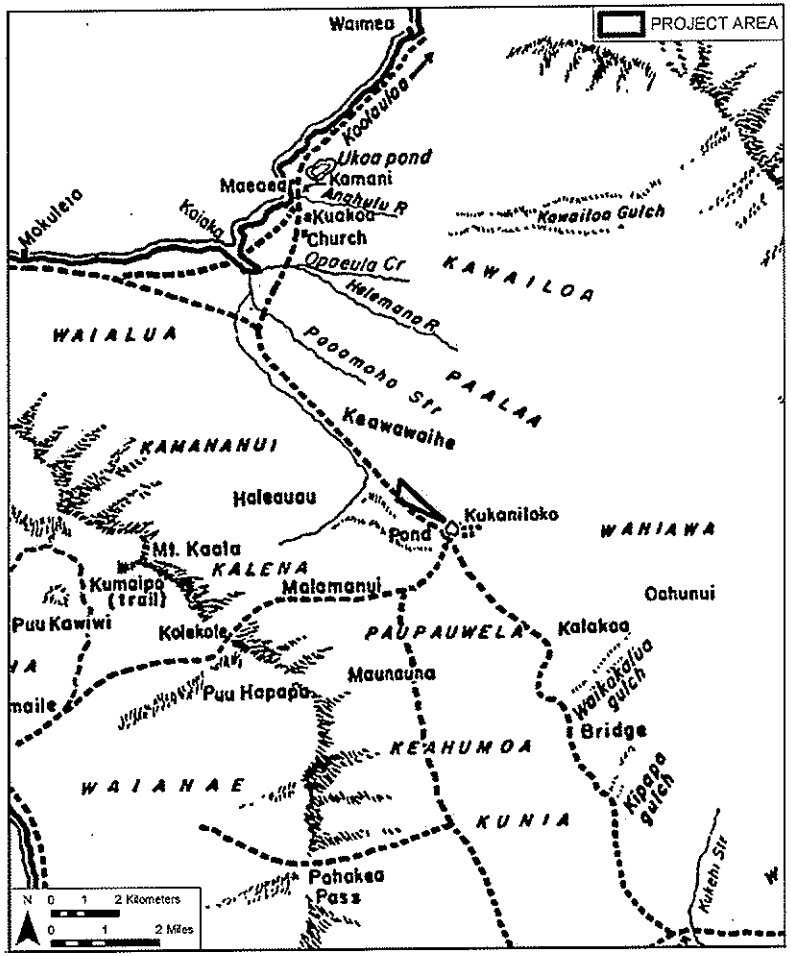


Figure 9. Network of leeward trails described by John Papa 'Ī'ī, map by Paul Rockwood, indicating the central site of Kūkaniloko one mile southeast of the Project area ('Ī'ī 1959:96)

3.3.1.6 Ilina

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

3.3.2 Mo'olelo of Wahi Pana

There are few documented *mo'olelo* associated with the *wahi pana* of Kamananui Ahupua'a. In one *mo'olelo* that references Kamananui Stream, two *kāhuna* (priests) of Waimea are told by the god Kāneaukai to go to Mokulē'ia to fetch a wooden image of him. The *kāhuna* baulked at going, as the dark night prevented them from sighting quicksands in the Kamananui River. They agreed to send their sons, who escaped the quicksands when a meteor (*hōkū kaolele*) illuminated their path (Thrum 1907:252--253).

3.3.3 Shift in Political and Ritual Center

Kamananui Ahupua'a was once the political and ritual center of Waialua. The following *'ōlelo no 'eau* is suggestive of such power:

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

According to anthropologist Marshall Sahlins, Kamananui was a dominant *ahupua'a* that included detached, outlying lands, including the remote fishing community of Kāpaeloa at the eastern border of Waialua with its prime marine resources, that were controlled by stewards (*konohiki*) of Kamananui proper (Sahlins 1992:20–21). Then, in the 1820s, the ruling chief of Kamananui Ahupua'a moved to Anahulu Valley in the *ahupua'a* of Kawailoa, which resulted in a redrawing of *ahupua'a* boundaries. Kāpaeloa and other outlying sections of Kamananui were thus subsumed into the land of Kawailoa. The historic shift in political domination from Kamananui to Kawailoa was paralleled by a relocation of the religious center of the *moku*. In the 1830s, the Kawailoa-based Protestant mission of Waialua "usurped the ritual hegemony from the temples of human sacrifice [*po'okanaka*] that not long before had sanctified the landscape of Kamananui" (Sahlins 1992:21).

3.3.4 The Māhele

The Organic Acts of 1845 and 1846 initiated the process of the Māhele—the division of Hawaiian lands—that introduced private property into Hawaiian society. In 1848, Kamehameha III divided the land into four categories: Certain lands to be reserved for himself and the royal house were known as Crown Lands; lands set aside to generate revenue for the government were

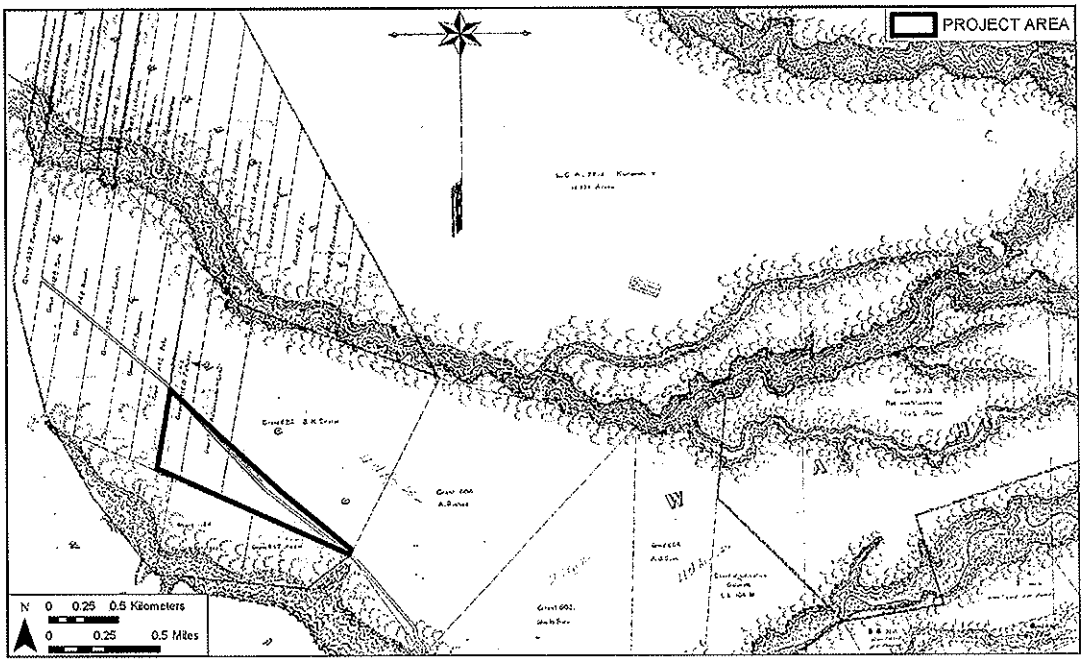


Figure 10. Portion of the map of the Waialua Agricultural Company Ltd. lands (W.A. Wall 1901), showing Land Grants within the *'ili* of Kemo'o and the Project area

known as Government Lands; lands claimed by *ali'i* and their *konohiki* were called Konohiki Lands; and habitation and agricultural plots claimed by the common people were called *kuleana* (Native land rights) (Chinen 1985:8-15).

To apply for fee-simple title to their lands, native tenants were required to file their claim with the Land Commission within the specified time period of February 1846 and February 14, 1848. The Kuleana Act of 1850 confirmed and protected the rights of native tenants. Under this act, the claimant was required to have two witnesses who could testify they knew the claimant and the boundaries of the land, knew that the claimant had lived on the land for a minimum of two years, and knew that no one had challenged the claim. The land also had to be surveyed. Not everyone who was eligible to apply for *kuleana* lands did so and, likewise, not all claims were awarded. Some claimants failed to follow through and come before the Land Commission, some did not produce two witnesses, and some did not get their land surveyed. Out of the potential 2,500,000 acres of Crown and Government lands, Chinen documents less than 30,000 acres of land were awarded to the Native-Hawaiian tenants (1958:31), although the actual acreage may have been more.

There were 23 LCA claims filed within Kamananui Ahupua'a, but no *kuleana* LCAs were awarded. Apparently, the missionary in residence, John S. Emerson, concluded it was in the interest of the native Hawaiians to buy land outright as grants rather than to complete the LCA application process (Emerson 1928:141). The lands of the Project area were purchased by S. N. Castle (Land Grant 682), Kahoeka (Land Grant 848), and Kaiakawaha (Land Grant 1125) (Figure 10). Yet, the claims that were completed reveal that Hawaiians used the land in the *mauka* portions of Kamananui Ahupua'a primarily to cultivate taro and *wauke* (paper mulberry) (Waihona 'Aina 2000).

3.3.5 Transforming Landscape

The landscape of Kamananui Ahupua'a transformed dramatically during the last two decades of the nineteenth century. In the 1880s, immigrant Chinese laborers began leasing and buying former taro lands from the Hawaiians of Waialua to convert to rice farming. By 1892, 180 acres of rice were under cultivation in Waialua, including rice fields in the *ahupua'a* of Kamananui (Coulter and Chun 1937:12, 21). In 1889, Benjamin Dilingham organized the Oahu Railway and Land Company. When this railroad system reached Waialua in 1898, Dillingham persuaded Castle & Cook to lease about 600 acres of Waialua land already under sugarcane cultivation, which led to the rise of the Waialua Agricultural Copmany (Kuykendall 1967). Later named the Waialua Sugar Company, it expanded during the first decades of the twentieth century to reach more than 12,000 acres, including extensive portions of Kamananui Ahupua'a. The sugar mill and associated village were located north of Farrington Highway about five miles northwest of the present Project area.

Residential, agricultural, and military development in the early twentieth century accelerated the transformation of the landscape surrounding the Project area (Figure 11 to Figure 15). The Waianae Uka military reservation was located on Crown Lands south of the Project area, which were taken over by the U.S. Territorial Government in 1899. Construction of a military post, which came to be known as Schofield Barracks, began in 1908 and by 1914, 6,000 men resided on the base (Tropic Lightning Museum 1999). In 1907, the Kemoo Land Company planned to cultivate sugarcane in Waialua (Thrum 1907:173). As the company's name is the same as the *'ili* within which the Project area is located, it is possible that its sugarcane operations took place within or in the immediate vicinity of the Project area. Kemo'o Farms, located immediately northwest of the Project area, began as a pig farm in 1909, expanded in 1919 to include a dairy operation with a milk depot, and was discontinued in 1934 (Kemo'o Farms Bar & Grill 2010). By the 1920s, it is likely that pineapple rather than sugar cane was under cultivation within the Project area. During this time period, a pineapple plantation settlement, Kemoo Camp, developed northeast of the Project area (Youn 2006).

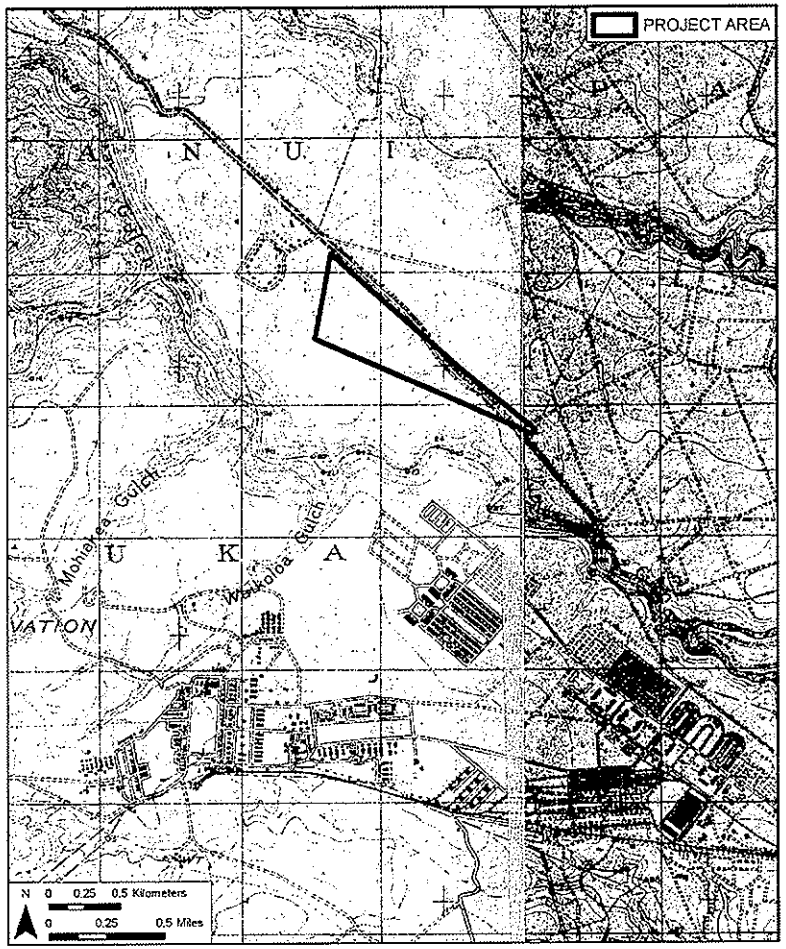


Figure 11. Portion of 1919 U.S. War Department map, Wai'anae and Wahiawā quadrangles, showing the Project area; note residential development northwest of Project area and Schofield Barracks south of the Project area

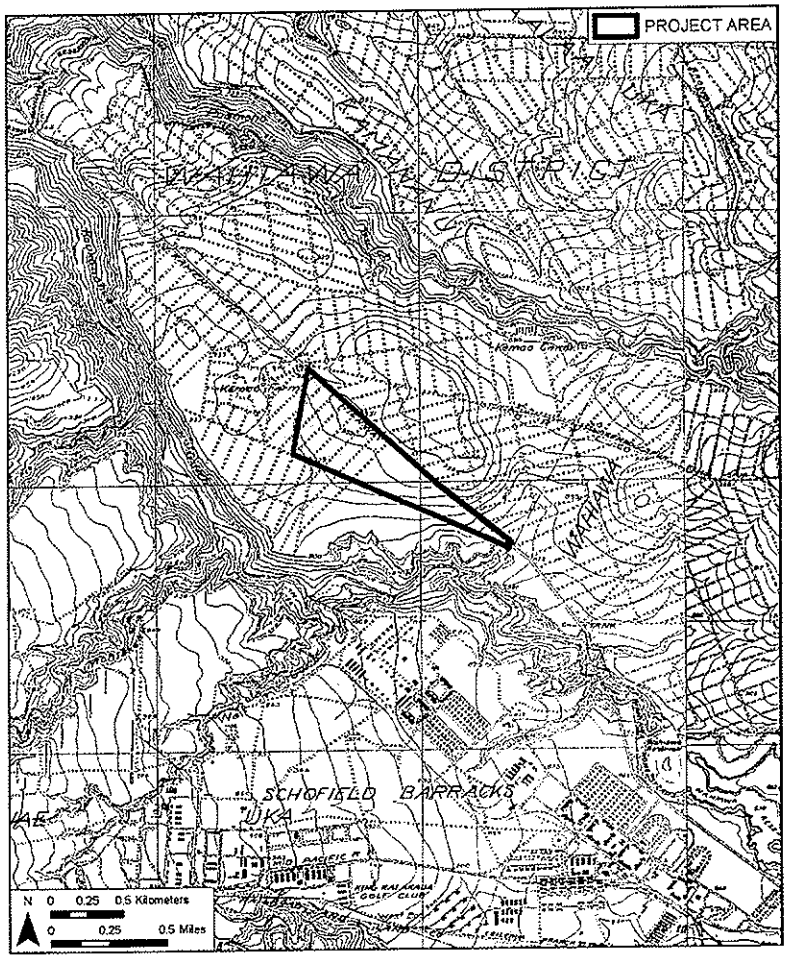


Figure 12. Portion of 1928–1929 USGS 7.5-minute topographic map, Schofield Baracks and Wahiawā quadrangles, showing the Project area; note Kemoo Farm northwest of the Project area and Kemoo Camp northeast of the Project area

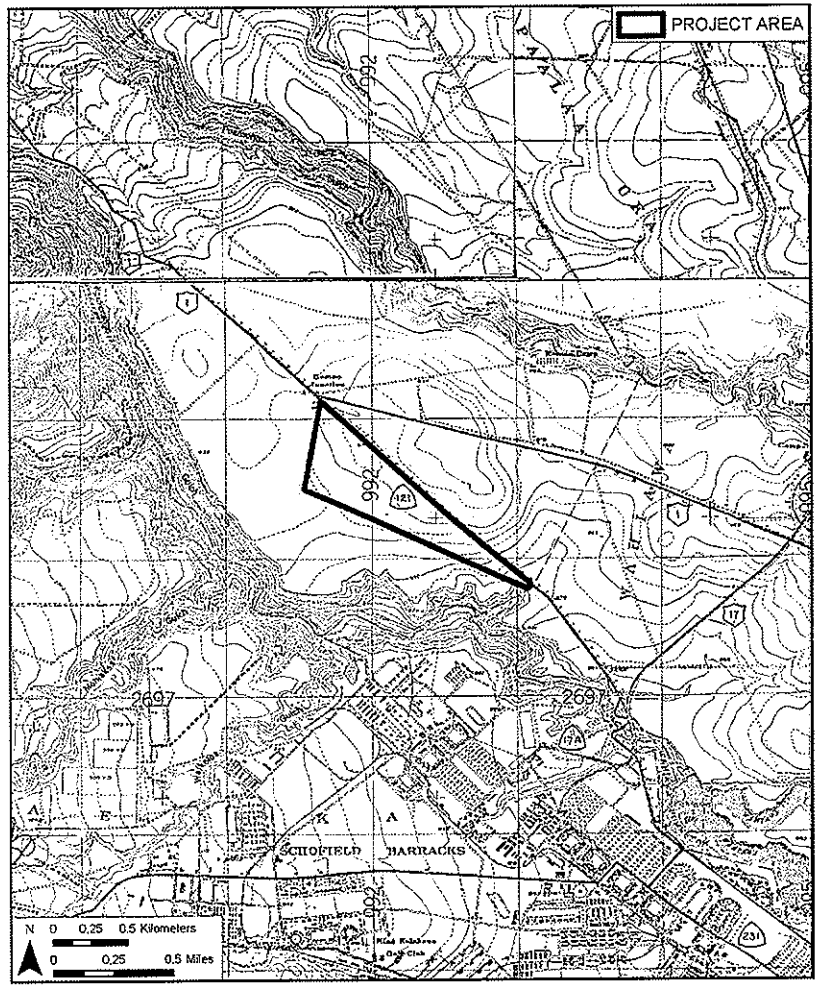


Figure 13. Portion of 1943 U.S. War Department map, Hale'iwa, Schofield Baracks, and Pa'ala'a quadrangles, showing the Project area; note that Kemoo Camp is still present

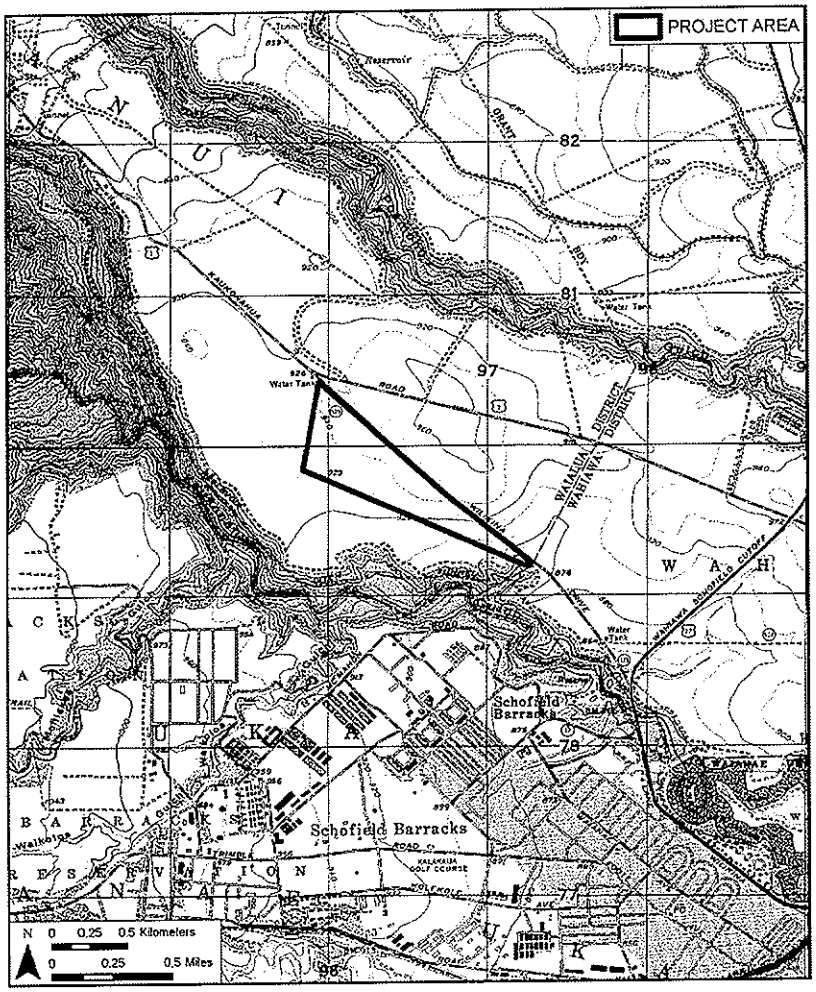


Figure 14. Portion of 1953 U.S. Army Mapping Service map, Hale'iwa and Schofield Barracks quadrangles, showing the Project area

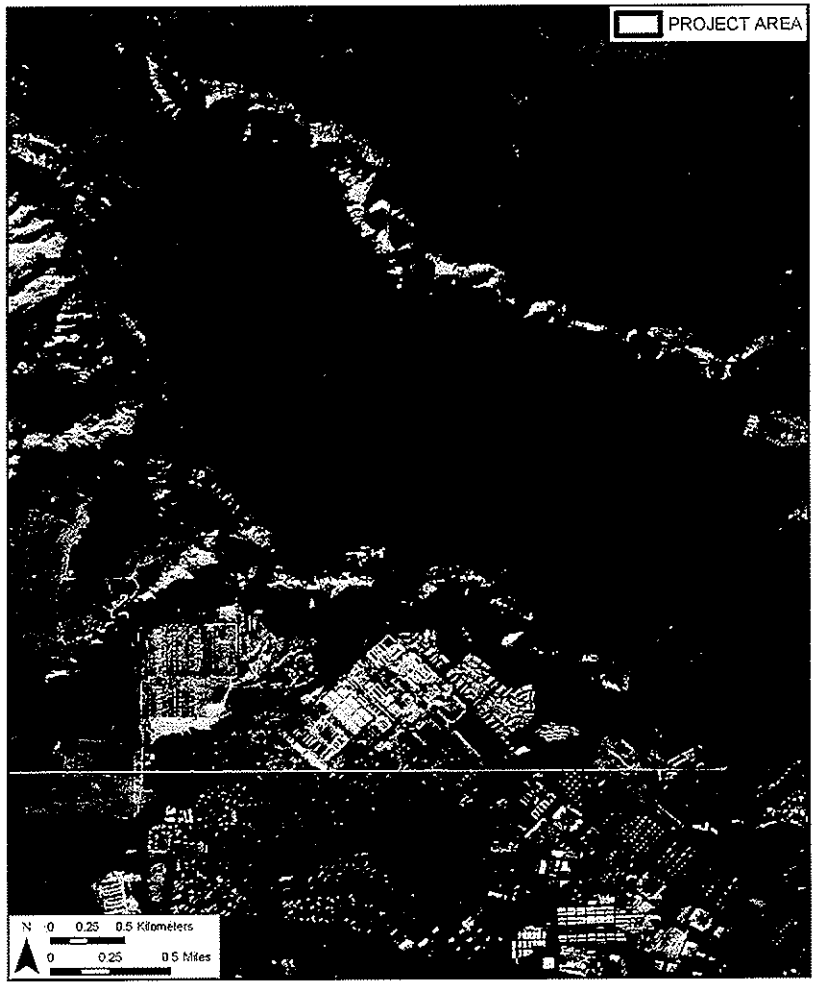


Figure 15. Portion of the orthoimagery of the 1977–1978 USGS 7.5-minute topographic map, Hale'iwa and Schofield Barracks quadrangles, showing the Project area

Section 4 Community Consultation

Throughout the course of this CIA, 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. This effort was made by letter, email, telephone and in-person contact. The initial outreach effort was started in December 2010 and community consultation was completed in March 2011. In the majority of cases, a letter (Appendix D), an aerial photograph (see Figure 1), and a map (see Figure 2) of the Project area were mailed.

In most cases, two to three attempts were made to contact individuals, organizations, and agencies apposite to the CIA for this Project. The results of the community consultation process are presented in Table 1. Excerpts from more extensive interviews specifically related to Kamananui Ahupua'a and the Project area are presented in Section 5 below.

Table 1. Results of Community Consultation

Name	Affiliation, Background	Comments
Ailā, William	Hui Mālama I Nā Kūpuna 'O Hawai'i Nei	December 10, 2010 CSH sent letter by email December 13, 2010 Mr. Ailā responded by email, referring the Wahiawā Hawaiian Civic Club, and is not aware of any specific cultural sites within the Project footprint
Au, Kawika	President, Waialua Hawaiian Civic Club	January 24, 2011 CSH sent letter February 14, 2011 CSH sent letter by email February 16, 2011 Mr. Au replied, stating that he has forwarded the Project information to the club's members.
Ayau, Halealoha	Hui Mālama I Nā Kūpuna 'O Hawai'i Nei	December 10, 2010 CSH sent letter by email January 3, 2011 CSH sent letter by email January 3, 2011 Mr. Ayau responded, and does not have knowledge of this particular area

Name	Affiliation, Background	Comments
Cayan, Phyllis "Coochie"	History and Culture Branch Chief, SHPD	December 10, 2010 CSH sent letter February 10, 2011 CSH sent letter February 23, 2011 Ms. Cayaan sent a response letter, referring Thomas Shirai, Leimaile Quiteves, Tom Lenchanko, and Rep. Gil Riviere (see Section 4.1)
Kāne, Shad	O'ahu Island Burial Council, Nākoa 'O Pālehua, Assocation of Hawaiian Civic Club's Historic Preservation Committee	December 10, 2010 CSH sent letter by email December 10, 2010 Mr. Kāne replied by email and referred CSH to his cultural preservation blogs (See Section 4.3)
Kekipi, Velma	President, Hawaiian Civic Club of Wahiawā	December 14, 2010 CSH sent letter by email January 3, 2011 CSH sent letter by email February 14, 2011 CSH sent letter by email February 23, 2011 CSH interviewed Ms. Kekipi (see Section 5.2) March 2, 2011 Ms. Kekipi approved interview summary
Lenchanko, Tom	Vice-President, Hawaiian Civic Club of Wahiawā	December 13, 2010 CSH sent letter by email December 14, 2010 Mr. Lenchanko replied by email, requesting a meeting at Oahunui (Launani Valley) on a Saturday January 18, 2011 CSH conducted interview (see Section 5.3) February 17, 2011 CSH met Mr. Lenchanko at Kūkaniloko, and approved the interview summary

Name	Affiliation, Background	Comments
Lyons, Michael	Chair, North Shore Neighborhood Board	January 6, 2011 CSH sent letter by email February 14, 2011 CSH sent letter by email
McKeague, Kawika	OIBC	December 10, 2010 CSH sent letter by email December 10, 2010 Mr. McKeague forwarded Project information to Leimaile Quitevis
Nāmu'o, Clyde	Administrator, OHA	December 10, 2010 CSH sent letter December 23, 2010 Mr. Nāmu'o sent a response letter, referring Thomas Shirai, Lemaile Quitevis, and those with connections to Kūkaniloko, as well as the North Shore Neighborhood Board
Riviere, Gil	State Representative	March 8, 2011 CSH sent letter by email
Shirai, Thomas	OHA Native Hawaiian Historic Preservation Council, Past Member Oahu Island Burial Council	December 13, 2010 CSH sent letter by email December 16, 2010 Mr. Shirai replied by email, stating that he will provide comments and get back to CSH January 6, 2010 CSH called Tom Shirai, who said he will try to get written comments back within a week January 11, 2011 CSH sent letter by email

4.1 State Historic Preservation Division

CSH contacted Phyllis "Coochie" Cayan, History and Culture Branch Chief of SHPD, on December 10, 2010. In a written response sent to CSH on February 23, 2011 (Figure 16), Ms. Cayan is concerned that any ground disturbing activity may unearth burials or burial sites not known despite the intense agricultural use of the land. Ms Cayan refers Thomas Shirai, Leimaile Quiteves, Rep. Gil Riviere, and Tom Lenchanko.

4.2 Office of Hawaiian Affairs

CSH contacted Clyde Nāmu'o, Administrator of OHA, on December 10, 2010. In a written response sent to CSH on December 23, 2010 (Figure 17), Mr. Nāmu'o refers Thomas Shirai, Leimaile Quitevis, people with connections to Kūkaniloko, and the North Shore Neighborhood Board.

4.3 Shad Kāne

CSH contacted Shad Kāne, member of the Assocation of Hawaiian Civic Clubs' Historic Preservation Committee, on December 10, 2010. In a written response sent to CSH on December 10, 2010, Mr. Kāne describes severe disturbance to the cultural landscape of the Project area:

> The footprint of the project however is in previously disburbed agricultural land. There are no cultural sites within the area of potential effects. The likelihood of any cultural sites in this area would only be found within the adjacent valleys. This area has also been compromised by the early grading practices of pushing soil over the rim of the valley to flatten the area for planting. Most of the cultural structures in this area would have been buried by pushed soil and erosion of the higher level soils to the base of the river system.

Mr. Kāne referred CSH to his cultural preservation blogs to contextualize the cultural significance of the lands of surrounding the Project area. One section of a blog describes historical events on a trail (now Kunia Road) in the region of Lihue in the *ahupua'a* of Honouliuli that connected the West Loch of Pearl Harbor to Kūkaniloko, located about one mile southeast of the Project area:

> There are several aspects that make Lihue an extremely interesting place. This significance appears to have grown out of a need to secure the sanctity and purity of the bloodline of the ruling chiefs and that of Kukaniloko. The road to Kukaniloko was by way of Kaihuopalaai (West Loch). That path to Kukaniloko is today's Kunia Road. The traditions associated with Lihue makes reference to it serving as a place of Nakoa (warrior) training. These warriors not only secured the road to Kukaniloko but also served to secure the northern gate into Waianae Moku at the Kolekole Pass. It was along the road to Kukaniloko at Lihue that Hawaii Island warriors entered Kaihuopalaai with 3,000 canoes in the 16th century in search of Mailikukahi's army stationed at Lihue. Led by Hawaii Island Chiefs Punalu'u and Hilo suffered a major defeat first at Waikakalaua, then on the Plains

of Punalu'u (now Mililani) which took the name of the fallen Hawaii Chief. Kipapa Gulch took the name of the many Hawaii Island warriors who died and "paved" the gulch with their bodies. Hilo was killed and decapitated, his head placed on a pole at the intersection today of Kunia Road and Farrington Highway. The area took the name of Po'ohilo (Head of Hilo) and appears in tax maps of the late 1800s. It served as a lesson to any other island chief with ambitions of leading any future assaults on O'ahu (Kāne 2010)

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DEPARTMENT OF LAND AND NATURAL RESOURCES
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

February 23, 2011

Mr. Joe Genz, Cultural Specialist
Cultural Surveys Hawaii Inc.
P.O. Box 1114
Kailua, Hawaii 96734

Log No. 2011.0464
Doc No.1102pc007

Dear Joe Genz:

SUBJECT: KAMANANUI 2: A Cultural Impact Assessment (CIA) for the proposed In-Vessel Composting Facility Project, Kamananui Ahupua'a, Waialua District, O'ahu Island. TMK: (1) 6-5-002:026.

The State Historic Preservation Division (SHPD) comments herein will be more of a strategic recommendation of folks and/or groups to consult with on the above subject proposed project. The CIA's focus for any cultural impacts is at the proposed project area that is approximately 112-acres of former agricultural lands as well as the entire ahupua'a of Kamananui. This is a huge chunk of land that truly needs to be brought to the community for comments and consultation with known organizations on the North Shore. Although this ahupua'a has been formerly used in heavy agriculture (i.e., sugar cane), there may still be core families (three generations or more) who reside there with mana'o of cultural usage.

The SHPD is concerned that any ground disturbing activity may unearth burials and/or burial sites not known despite the heavy agriculture history of the area. Also, the SHPD cautions that you research any traditional cultural access and gathering rights for native Hawaiians through the ahupua'a that may have existed prior to agricultural use.

Some folks and/or groups to contact include but not limited to the following:

- Thomas Shirai is a core 'ohana resident. kawaihapai@hawaii.rr.com #637-4690
- Leimaile Quiteves serves as the Waialua representative on the O'ahu Island Burials Council (OIBC) 84-265 Farrington Hwy. #410, Waianae, HI 96792 leimaile.q@gmail.com
- Rep. Gil Riviere repriviere@capitol.hawaii.gov #586-6380
- Tom Lenchanko 91-140 Olai Street, Kapolei, HI 96707 tlenchanko1@hawaii.rr.com

Lastly, you may want to contact senior citizen groups, any Hawaiian civic club, and other community groups who may have folks willing to talk story about possible cultural impacts at Kamananui ahupua'a. Mahalo for the opportunity to comment on this CIA.

Sincerely,

Phyllis Coochie Cayan

Phyllis Coochie Cayan
SHPD History & Culture Branch Chief

Figure 16. SHPD response 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

HRD10/5457

December 23, 2010

Joe Genz, Researcher
Cultural Surveys Hawai'i, Inc.
P.O. Box 1114
Kailua, Hawai'i 96734

Re: **Pre- Cultural Impact Assessment Consultation**
In-Vessel Composting Facility Project
Kamananui, Waialua District, Island of O'ahu

Aloha e Joe Genz,

The Office of Hawaiian Affairs (OHA) is in receipt of your December 10, 2010 request for comments ahead of a cultural impact assessment (CIA) for a proposed in-vessel composting facility project on 38 acres of land in Kamananui on the Island of O'ahu.

Hawaiian Earth Products is proposing to construct the facility which will process up to 100,000 tons of material for composting a year. Operations may be expanded in the future through agreements with the Honolulu City and County (C&C). The facility will take material from existing C&C facilities.

OHA recommends consultation with the following individuals who may be willing to share their thoughts with you: Thomas Shirai, Leimaile Quitevis and those with connections to Kukaniloko. The North Shore Neighborhood Board may also be an appropriate forum to seek input on the CIA. Please remember that this list is not all encompassing and we are sure additional individuals or organizations will be identified as you move forward with the consultation process.

Thank you for initiating consultation at this early stage and we look forward to reviewing the CIA and providing additional comments at that time. Should you have any questions, please contact Keola Lindsey at 594-0244 or keolal@oha.org.

'O wau iho nō me ka 'oia'i'o.

Clyde W. Nāmu'o
Chief Executive Officer

Figure 17. OHA response letter

Section 5 Interviews

Kama'āina and *kūpuna* with knowledge of the proposed Project and study area participated in semi-structured interviews from December 2010 to March 2011 for this CIA. CSH attempted to contact 12 individuals for this CIA report; of those, ten responded and two participated in formal interviews. CSH initiated the interviews with questions from the following five broad categories: *wahi pana* and *mo'olelo*, agriculture and gathering practices, freshwater and marine resources, cultural and historic properties, and burials. Participants' biographical backgrounds, comments, and concerns about the proposed development and Project area are presented below.

5.1 Acknowledgements

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

5.2 Thomas Lenchanko

Thomas Joseph Lenchanko, Spokesperson for 'Aha Kūkaniloko/Koa Mana, Hawaiian National Lineal Descendants, met with CSH on January 17, 2011 at the *ka'anani'au* (boundary markers that distinguish a beautiful period of time) O'ahu nui, ka lua a'a hu, Waikakalaua Stream, also known as Launani Valley, in Wahiawā, and on February 17, 2011 at Kūkaniloko to share his traditional comprehension, *mo'olelo*, and *mana'o* of the enduring cosmological, spiritual, and cultural significance of Kūkaniloko, since time eternal, time immemorial, the creation of the island of O'ahu, and the descent of the first people from the gods. Traditionally, Kūkaniloko extends geographically to encompass the island of O'ahu within (*iloko*) and without (*iwaho*) a network of *ka'anani'au* that are superimposed upon the six territorial *moku* land divisions of Kona, Ewa, Wai'anae, Waialua, Ko'olauloa and Ko'olaupoko. (Note: Mr. Lenchanko intentionally deviates from the use of diacritical markings for some Hawaiian terms and the capitalization of some place names to highlight their antiquity, and intentionally does not translate some Hawaiian terms because such translation would only be a superficial gloss of the layers of hidden meanings [*kaona*]).

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

The land of O'ahu is divided by a concentric alignment of *ka'ānani'au* that demarcates the area of Kūkaniloko. Mr. Lenchanko describes that these series of rock pilings conservatively

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

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

Mr. Lenchanko describes *ali'i* as managers of the people. The *ali'i* had divine status (*ikū pau*) and the highest genealogy (*hoa ali'i*), as they were descendant of Kāne, *akua* (gods, spirits), *ali'i*, *ho'āno* (peacefulness, sacredness), *kapu* (special privilege), *wela* (heat), *moe*, *ahi* (fire).... Those special privileges were issued at the birth for those of divine descent whom are known to be Lo-Ali'i. Kūkaniloko since time immemorial, time eternal, begins with ka lua a'a hu at *ka'ānani'au* O'ahu nui, then to be found within kapa ahu (unapproachable, child only one of whose parents are *ali'i*) at *ka'ānani'au* Halemano and to the contemporary site kapa ahu awa (prescribed birth rite, unapproachable, child only of whose parents are *ali'i*) Kūkaniloko, also known as Kūkaniloko Birthstones State Monument. It is taught that A.D.1060, *ali'i kapu* Nanakaoko, *kāne*, and *ali'i kapu* Kahihiokalani, *wahine*, made kapa ahu awa Kūkaniloko for the birth of their son, Kapawa. This hallowed place remained in ceremonial rite until the liloe kapu birth of Kakuhihewa, the last such practiced at Kūkaniloko. Keopuolani and Kamehameha I were hopeful for the birth of his heir, Liloliho (Kamehameha II), at Kūkaniloko; however, a fate that some attribute to Kamehameha's practice of human sacrifice disallowed this distinguished birth rite to continue within the Kamehameha lineage.

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

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

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

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

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

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

> chiefs and their land agents might change, but the burial rights of the families survived on their lands...

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

'a'e ku

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

ho'ohewahewa mauliauhonua malama o'pa 'oe

aloha pua pele pau mano

'oia ua 'ike a 'aia la

5.3 Velma Kekipi

CSH interviewed Ms. Velma Pāpahileialoha Kekipi in Kalihi on February 23, 2011 and previously in Nu'uanu on July 23, 2010. Ms. Kekipi was born in Kapahulu in 1942 to parents Mildred Nagata and Isaac John Kekipi and then moved with her family to Pālolo in 1946. In 1972, she moved to Wahiawā, where her husband operated a car towing service. She then lived in Nānākuli between 1984 and 1994, and finally relocated to Wahiawā. Now, she is the president of the Hawaiian Civic Club of Wahiawā.

Ms. Kekipi's mother, a second-generation Japanese immigrant, was a homemaker and her father was one of the first Native Hawaiian men to obtain a diesel engineering degree. His engineering services were in high demand in Hawai'i and he worked for some of the prominent construction and development companies as a diesel engineer and equipment operator. As a young child Ms. Kekipi recalls that her father emphasized the need to adopt Western culture:

> When I was growing up in Pālolo, my father encouraged us to learn the English language as well as the western ways because he felt it was vital to our future successes. We weren't allowed to speak Hawaiian or Japanese. He wouldn't even allow us to participate in Hawaiian cultural things such as *hula*. I remember one time when I was in a summer fun program, we learned the *Hukilau* song. I had to make sure he did not know I had learned that song or he would've been very upset. My father spoke Hawaiian and was what we called a "*kalua* pig man," referring to his expertise at cooking pigs in the *imu*.

Ms. Kekipi grew up in several different houses in Pālolo during her early years. The first house had no running water. The *'au'au hale* (bath house) as well as the *hale pau pilikia* (toilet) were both located outside the main house. There was a pipe outside the house to wash dishes and kerosene was used for the stove. The lights in the house used electricity and the light bulbs hung

from a wire hanging from the ceiling. The roof of their house was made of tin. It was also in their yard that her father had an *imu* to cook the pigs for various occasions. Ms. Kekipi shares a story about her father and his friends:

> I remember there was a huge mango tree in the yard and the *imu* was next to it. My father would make this drink called *kī kapu* juice, which is similar to fermented fruits like pineapple swipe [brew]. He and his friends would be drinking this juice hanging out under the mango tree. His friends would end up sleeping over under the tree in the yard. The next day they would tell my dad that they had seen a white lady ghost floating a few feet above the ground. They were really scared and many of them never came back to our house. It was my understanding that these ghosts would appear when they didn't want someone there. These spirits would travel throughout Pālolo Valley and they could be tracked by the howling and barking of the neighborhood dogs. My father always told me to not fear the *kepalō* [ghost, spirits] for they will always be helpful if they are asked.

Ms. Kekipi states that her father would make home remedy elixirs such as honey combined and heated with whiskey for sore throats. They would also use *pōpolo* (glossy nightshade) to help heal their bodies from infections or scrapes and would also eat the berries. The *honohono* (dayflower) grass was also used medicinally. This type of grass would be chewed and then applied to an injury to stop bleeding. These types of remedies were known to her as a child and taught to her by her elders. There was also a lot of *pū'ohe'ohe* (Job's tears), a plant they would use to string leis. Her family did not desire this plant to grow on their land as it was associated with perpetual hardship as written in the bible.

According to Ms. Kekipi, the rain in Pālolo is called *kilihune* (fine light rain) as opposed to the rain that falls in Mānoa known as *tuahine* or *kuahine* (misty rain). She further states that this *kilihune* rain will only fall in a certain area and would not pass what is now Pa'ale'a Street in mid-Pālolo Valley. The mountain side would be wet and the adjoining section of land (Wai'alae) would be dry.

Now in her late 60s, Ms. Kekipi is an expert *lau hala* (pandanus leaf) weaver. Her art of *lau hala* weaving includes body adornments as well as mats and rugs. She has contributed to the creation of a *lau hala* mat in the bookstore of the Queen Emma Summer Palace. She states that during recent renovations at the palace, there was a shortfall of budget for the carpet in the palace's library. So they found an old *lauhala* mat in storage at the palace, which was at least 50 years old, and Ms. Kekipi and others refurbished the old mat and it was used for years until the Queen Emma Summer Palace bookstore finally replaced the mat with carpet.

Ms. Kekipi acknowledges that the Hawaiian Civic Club of Wahiawā is the curator of Kūkaniloko Birthstones State Monument. While this official site of Kūkaniloko currently encompasses five acres, Ms. Kekipi describes a vast space from the mountains of Wai'anae across the plains past to Wahiawā that is also recognized among *kūpuna* as the area of Kūkaniloko. One of the long-term visions of the Hawaiian Civic Club of Wahiawā is to gain stewardship of approximately 500 acres of land surrounding the current Kūkaniloko Birthstones State Monument in order to integrate the cultural traditions of Kūkaniloko with a cultural

learning center. This expanded region would extend close to the southern limit of the proposed Project area.

Ms. Kekipi notes that many people have described Kūkaniloko as the *piko* of O'ahu. In her view, the significance of Kūkaniloko, located about one mile southeast of the Project area, extends even greater geographically and temporally than the cosmological creation of the island of O'ahu. She indicates that Kūkaniloko is also the *piko* of the entire world. From this perspective, she asserts that Kūkaniloko can heal people and the Earth.

While the land of the proposed Project was severely altered with pineapple cultivation, Ms. Kekipi cautions that it may contain burials. She suggests that the entire area and surrounding landscape was used for family burials. She notes that the military have unearthed *iwi* on in nearby Schofield Barracks, and similar findings will probably occur in the Project area. If *iwi* are discovered, Tom Lenchanko, the *kahu* (guardian) of Kūkaniloko, should be consulted in order to handle the bones properly (*pono*).

Section 6 Cultural Landscape

Discussions of specific aspects of traditional Hawaiian culture as they may relate to the Project area are presented below. This section integrates information from Sections 3–5 in order to examine cultural resources and practices identified within or in proximity to the Project area in the broader context of the encompassing landscape of Kamananui Ahupua'a.

6.1 Cosmological and Religious Significance

The Project area is located far from the sea in a high, level saddle region between the two mountain ranges of O'ahu. A network of trails traversed the region, connecting the *moku* of Waialua, Wai'anae, 'Ewa, and Kona ('Ī'ī 1959:99). These paths intersected at Kūkaniloko, a sacred ceremonial birthing place for the highest ranking chiefs, and its associated *heiau* located about one mile southeast of the Project area, an area that some people consider the *piko* of O'ahu (Becket and Singer 1999:64), including Mr. Tom Lenchanko and Ms. Velma Kekipi. Drawing from the Kumulipo, a cosmological creation chant, and teachings from kūpuna, Mr. Lenchanko articulates a view of Kūkaniloko that expands beyond the current State of Hawai'i five-acre Kūkaniloko Birthstones State Monument. Mr. Lenchanko explains that Kūkaniloko extends back in time to the creation of the island of O'ahu and the descent of the first people from the gods, and expands geographically to encompass at least 36,000 acres of land within a network of *ka'anani'au* that pre-dates the *moku* and *ahupua'a* territorial system. Thus, the Project area is part of Kūkaniloko, the most sacred site on O'ahu, and, according to Ms. Kekipi, possibly in the entire world.

6.2 Settlement and Habitation

The earliest settlements along the northern coastal areas of O'ahu have yet to be recovered archaeologically, but a settlement complex in Anahulu Valley, which was most likely a peripheral extension of the core Waialua production lands, dates to A.D. 1300. This complex includes numerous habitation sites, rock shelters, irrigation systems, and dryland agricultural remains (Kirch 1992). The *ahupua'a* system of territorial land units was established in approximately A.D. 1400 by Mā'ilikūkahi, an *ali'i kapu* who was born at Kūkaniloko in the uplands of Waialua, and who whose chiefly title was consecrated at the *heiau* of Kapukapuākea (Kirch 2010:84–90). Kamananui Ahupua'a was the political and ritual center of Waialua until the 1820s, when the ruling chief re-drew the *ahupua'a* boundaries with his shift in residence to Kawailoa Ahupua'a and when the Kawailoa-based Protestant mission of Waialua "usurped the ritual hegemony from the temples of human sacrifice [*po'okanaka*] that not long before had sanctified the landscape of Kamananui" (Sahlins 1992:21).

6.3 Cultivation

Extensive cultivation took place in this saddle region, which suggests sizable populations of ancient Hawaiians (Handy and Handy 1972:464). The present town of Wahiawā, which is located about two miles southeast of the Project area in Wai'anae Uka Ahupua'a, was an area of extensive irrigated sweet potato and yam cultivation (Handy and Handy 1972:464–465). Closer to the Project area, numerous *lo'i kalo* (irrigated taro terraces) were maintained at a place called

Kukui-o-Lono; *mo'olelo* (oral traditions) describe that an ancient high chief, Kūkaniloko, grew the first *lo'i* there (Handy and Handy 1972:465). Hawaiians most likely cultivated sweet potatoes and bananas in the *mauka* gulches of Kamananui Ahupua'a (Handy 1940:85), and there is evidence of former habitations on both sides of Kaukonahua Gulch about two miles northwest of the Project area (McAllister 1933:133). During the Māhele of 1848, the lands of the Project area were purchased by S.N. Castle (Land Grant 682), Kahoeka (Land Grant 848), and Kaiakawaha (Land Grant 1125). Claims for Land Commission Awards reveal that Hawaiians used the land in the *mauka* portions of Kamananui Ahupua'a primarily to cultivate taro and *wauke* (paper mulberry) (Waihona 'Aina 2000). Rice cultivation, extension of the railroad system toward Waialua, and the development of commercial sugarcane cultivation with the rise of the Waialua Agricutlural Company (later named the Waialua Sugar Company) dramatically altered the landscape of Kamananui Ahupua'a during the last two decades of the nineteenth century. Then, the lands surrounding the Project area within the *'ili* (land division smaller than an *ahupua'a*) of Kemo'o were further modified during the early twentieth century through the development of a military post (Schofield Barracks), sugar cane cultivation (Kemoo Land Company), a piggery and dairy operation (Kemo'o Farms), and the pineapple industry with its plantation settlements (Kemoo Camp) further re-shaped the landscape surrounding the Project area.

6.4 Storied Landscape

There are few documented *mo'olelo* associated with the *wahi pana* of Kamananui Ahupua'a. Mr. Kāne describes historical events on a trail (now Kunia Road) in the region of Lihue in the *ahupua'a* of Honouliuli that once connected the West Loch of Pearl Harbor to Kūkaniloko. He relates that warriors "secured the sanctity and purity of the bloodline of the ruling chiefs and that of Kukaniloko."

6.5 Burials

Two caves with skeletal remains (Site 211) are located along Kaukonahua Gulch about three miles northwest of the Project area (McAllister 1933:133), but there is no documented evidence from archaeological surveys, historical records or oral traditions of *ilina* (burials) or *iwi kūpuna* (ancestral remains) within the Project area.

Section 7 Summary and Recommendations

CSH undertook this CIA at the request of Wilson Okamoto Corporation. The cultural survey broadly included the entire *ahupua'a* of Kamananui and more specifically the approximately 112 acres of private land of the Project area, TMK: [1] 6-5-002:026. The Project involves the construction of an in-vessel composting facility.

7.1 Results of Background Research

Background research on the Project area and surrounding area of Kamananui Ahupua'a indicates (presented in approximate chronological order):

1. The Project area is located far from the sea in a high, level saddle region between the two mountain ranges of O'ahu. A network of trails traversed the region, connecting the *moku* (districts) of Waialua, Wai'anae, 'Ewa, and Kona ('Ī'ī 1959:99). These paths intersected at Kūkaniloko, a sacred ceremonial birthing place for the highest ranking chiefs and its associated *heiau* (place of worship, temple) located about one mile southeast of the Project area, an area that some people consider the *piko* (navel or center) of O'ahu (Becket and Singer 1999:64).

2. Extensive cultivation took place in this saddle region, which suggests sizable populations of ancient Hawaiians (Handy and Handy 1972:464). The present town of Wahiawā, which is located about two miles southeast of the Project area in Wai'anae Uka Ahupua'a, was an area of extensive irrigated sweet potato and yam cultivation (Handy and Handy 1972:464–465). Closer to the Project area, numerous *lo'i kalo* (irrigated taro terraces) were maintained at a place called Kukui-o-Lono; *mo'olelo* (oral traditions) describe that an ancient high chief, Kūkaniloko, grew the first *lo'i* there (Handy and Handy 1972:465). Hawaiians most likely cultivated sweet potatoes and bananas in the *mauka* gulches of Kamananui Ahupua'a (Handy 1940:85), and there is evidence of former habitations on both sides of Kaukonahua Gulch about two miles northwest of the Project area (McAllister 1933:133).

3. Two caves with skeletal remains (Site 211) are located along Kaukonahua Gulch about three miles northwest of the Project area (McAllister 1933:133), but there is no documented evidence from archaeological surveys, historical records or oral traditions of *ilina* (burials) or *iwi kūpuna* (ancestral remains) within the Project area.

4. Kamananui Ahupua'a was the political and ritual center of Waialua Moku until the 1820s, when the ruling chief re-drew the *ahupua'a* boundaries with his shift in residence to Kawailoa Ahupua'a and when the Kawailoa-based Protestant mission of Waialua "usurped the ritual hegemony from the temples of human sacrifice [*po'okanaka*] that not long before had sanctified the landscape of Kamananui" (Sahlins 1992:21).

5. During the Māhele of 1848, the lands of the Project area were purchased by S.N. Castle (Land Grant 682), Kahoeka (Land Grant 848), and Kaiakawaha (Land Grant 1125). Claims for Land Commission Awards reveal that Hawaiians used the land in the *mauka*

portions of Kamananui Ahupua'a primarily to cultivate taro and *wauke* (paper mulberry) (Waihona 'Aina 2000).

6. Rice cultivation, extension of the railroad system toward Waialua, and the development of commercial sugarcane cultivation with the rise of the Waialua Agricutlural Company (later named the Waialua Sugar Company) dramatically altered the landscape of Kamananui Ahupua'a during the last two decades of the nineteenth century. Then, the lands surrounding the Project area within the *'ili* (land division smaller than an *ahupua'a*) of Kemo'o were further modified during the early twentieth century through the development of a military post (Schofield Barracks), sugar cane cultivation (Kemoo Land Company), a piggery and dairy operation (Kemo'o Farms), and the pineapple industry with its plantation settlements (Kemoo Camp) further re-shaped the landscape surrounding the Project area.

7.2 Results of Community Consultation

CSH attempted to contact 12 community members and government agency and community organization representatives. Of the nine people that responded, two *kūpuna* (elders) and/or *kama'āina* (Native-born) participated in formal interviews for more in-depth contributions to the CIA. This community consultation indicates:

1. Drawing from the Kumulipo, a cosmological creation chant, and teachings from kūpuna, Mr. Tom Lenchanko articulates an expansive view of Kūkaniloko, the current State of Hawai'i five-acre Kūkaniloko Birthstones State Monument located about one mile southeast of the Project area. While the birth of *ali'i* (chiefs) at Kūkaniloko is well documented, Kūkaniloko extends back in time to the creation of the island of O'ahu and the descent of the first people from the gods, and expands geographically to encompass at least 36,000 acres of land within a network of *ka'anani'au* (boundary markers) that pre-dates the *moku* and *ahupua'a* territorial system. The *mana* (divine power) of Kūkaniloko, the most sacred site on O'ahu, endures today. As a result, any development within the *ka'anani'au*—including the nearby composting facility—will disjoint the *mana* of Kūkaniloko.
2. Mr. Lenchanko is concerned that the proposed Project will trespass upon the *'āina* (land) and *iwiawaloa* (ancestral burial places). Ms. Coochie Cayan and Ms. Velma Kekipi are also concerned that any ground disturbing activity may unearth burials or burial sites not known despite the intense agricultural use of the land.
3. From such a deep ancestral connection to the genesis of the land, Mr. Lenchanko questions how developers today claim land ownership. He politely queries whether Hawaiian Earth Recycling LLC can demonstrate and prove their clear unbroken chain of land ownership, or "exclusive territorial jurisdiction," for the Project area, as "nothing is older than Kūkaniloko and those who are buried in our land."
4. One of the long-term visions of the Hawaiian Civic Club of Wahiawā is to gain stewardship of approximately 500 acres of land surrounding the current Kūkaniloko Birthstones State Monument in order to integrate the cultural traditions of Kūkaniloko

with a cultural learning center. This expanded region would extend close to the southern limit of the proposed Project area.

5. Mr. Shad Kāne acknowledges that the footprint of the Project is in previously disburbed agricultural land and that the likelihood of any cultural sites in this area would only be found within the adjacent valleys. To contexualize the cultural significance of the lands surrounding the Project area, Mr. Kāne describes historical events on a trail (now Kunia Road) in the region of Lihue in the *ahupua'a* of Honouliuli that once connected the West Loch of Pearl Harbor to Kūkaniloko, including warriors who "secured the sanctity and purity of the bloodline of the ruling chiefs and that of Kukaniloko."

7.3 Impacts and Recommendation

Based on the information gathered for the cultural and historic background and community consultation detailed in this CIA report, CSH does not foresee potential impacts of the proposed Project on Native Hawaiian or other ethnic groups' cultural practices customarily and traditionally exercised for subsistence, cultural or religious purposes. However, CSH does anticipate potential impacts of the proposed Project on cultural, historic, and natural resources, and makes the following recommendations:

1. Land-disturbing activities may uncover cultural resources, including burials or burial sites not known despite the intense agricultural use of the land. Should historic, cultural or burial sites or artifacts be identified during ground disturbance, the construction contractor should immediately cease all work and the appropriate agencies notified pursuant to applicable law.
2. HER should brief and consult with community members and organizations as the Project design progresses, especially Tom Lenchanko and the Hawaiian Civic Club of Wahiawā, the *kahu* (guardian) and curator of Kūkaniloko Birthstones State Monument, respectively. This on-going consultation should keep the community informed of any changes that could result in unanticipated adverse cultural impacts.

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Appendix A Glossary

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

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

Hawaiian Word	English Translation
ahupua'a	Land division usually extending from the uplands to the sea, so called because the boundary was marked by a heap (*ahu*) of stones surmounted by an image of a pig (*pua'a*), or because a pig or other tribute was laid on the altar as tax to the chief.
akua	God, goddess, spirit, ghost, devil, image, idol, corpse.
ali'i	Chief, chiefess, officer, ruler, monarch, peer, headman, noble, aristocrat, king, queen, commander.
'auwai	Ditch, canal.
heiau	Pre-Christian place of worship, shrine; some *heiau* were elaborately constructed stone platforms, others simple earth terraces. Many are preserved today.
'ili	Land section, next in importance to an ahupua'a and usually a subdivision of an *ahupua'a*.
ilina	Grave, tomb, sepulcher, cemetery, mausoleum, plot in a cemetery.
iwiawaloa	Ancestral burial places (Tom Lenchanko)
iwi kūpuna	Ancestral bone remains (common).
ka'anani'au	Boundary markers (Tom Lenchanko)

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

Common Names		Possible Scientific Names		Source
Hawaiian	Other	Genus	Species	
honohono	dayflower	uncertain	uncertain	uncertain
pōpolo	glossy nightshade	*Solanum*	*americanum*	Wagner et al. 1999
pū 'ohe 'ohe	Job's tears	*Coix*	*lachryma-jobi*	Wagner et al. 1999

Hawaiian Word	English Translation
kahuna	Priest, sorcerer, magician, wizard, minister, expert in any profession. *Kāhuna*—plural of *kahuna*.
kama 'āina	Native-born, one born in a place, host; native plant; acquainted, familiar, Lit., land child.
kuleana	Native Hawaiian land rights (common). Right, privilege, concern, responsibility, title, business, property, estate, portion, jurisdiction, authority, liability, interest, claim, ownership, tenure, affair, province.
kupuna	Elders (common). Grandparent, ancestor, relative or close friend of the grandparent's generation, grandaunt, granduncle. *Kūpuna*—plural of *kupuna*.
lo 'i	Irrigated terrace, especially for taro, but also for rice; paddy.
loko i 'a	Fishpond (common).
makai	Seaward.
mauka	Inland.
moku	District, island, islet, section.
mo 'olelo	Story, tale, myth, history, tradition, literature, legend, journal, log, yarn, fable, essay, chronicle, record, article; minutes, as of a meeting. (From *mo 'o 'ōlelo*, succession of talk; all stories were oral, not written).
'ōlelo no 'eau	Proverb, wise saying, traditional saying.
oli	Chant that was not danced to, especially with prolonged phrases chanted in one breath, often with a trill at the end of each phrase; to chant thus.
wahi pana	Storied place (common). Legendary place.

Appendix C Authorization and Release Form

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

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

Job code: KAMANANUI 2 jgeno@culturalsurveys.com www.culturalsurveys.com

AUTHORIZATION AND RELEASE FORM

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

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

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

For your protection, we need your written confirmation that:

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

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

_____
(Signature)

_____
(Date)

Appendix D Community Consultation Letter

Cultural Surveys Hawai'i, Inc.
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December 10, 2010

Aloha e Kūa,

At the request of Wilson Okamoto Corporation, Cultural Surveys Hawai'i Inc. (CSH) is conducting a Cultural Impact Assessment (CIA) for the proposed In-Vessel Composting Facility Project, Kamananui Ahupua'a, Waialua District, O'ahu Island, TMK [1] 6-5-002:026. This CIA focuses on the approximately 112-acre Project area (see Figure 1, aerial image and Figure 2, USGS map) as well as the entire *ahupua'a* of Kamananui.

Currently, the City and County (C&C) of Honolulu's Curbside Green Waste Collection Program, individual homeowners, commercial tree trimmers and landscape maintenance contractors, and governmental property maintenance agencies deliver green wastes to one of two Hawaiian Earth Products' (HEP) Department of Health-permitted composting/transfer locations, located at Campbell Industrial Park and Kapaa Quarry, respectively. HEP recycles over 85,000 tons of green waste per year from both facilities into beneficial products, such as soil enrichment, fertilizer replacement/enhancement, and gardening and landscaping products. HEP has moved its existing open windrow composting operations (long, low mounds of shredded green waste that are turned every few days to provide air for the microbes digesting the organics) at Campbell Industrial Park to the facility.

Hawaiian Earth Recycling LLC (HER) (an affiliated company of HEP) proposes to construct an in-vessel composting facility (composting of organics that occurs in enclosed reactors with controlled air flow) in Waiahia. The in-vessel composting of the proposed facility will process up to 100,000 tons per year of green waste, food waste, and sewage sludge, and produce marketable compost products, such as soil amendments and potting soil. Food waste will be delivered from a soon to be developed C&C food waste collection program and the sewage sludge will come from the C&C's Honouliuli and Kailua Regional Wastewater Treatment Facilities. The facility may also be expanded in the future, through mutual agreement between the C&C and HER, to handle up to 150,000 tons per year.

The in-vessel composting of the proposed facility will utilize the GORE™ Cover System for the composting process, which is highly effective in managing and controlling odors and emissions. The proposed facility will consist of a truck weighing scale, an enclosed tipping and preparation building, and open processing area where the GORE™ system will be installed, a storm water retention pond, a leachate storage tank, and an open product storage area (see Figure 3, site plan, and Figure 4, conceptual plan). These facilities will encompass approximately 38 acres of the 112-acre Project area. The remainder will be used for the existing open windrow composting operating (green waste only) and will be utilized to demonstrate using compost to assist crop production.

1

The purpose of this CIA is to evaluate potential impacts to cultural practices and resources as a result of the proposed development in Kamananui Ahupua'a. We are seeking your *kōkua* and guidance regarding the following aspects of our study:

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

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

Mahalo nui,

Joe Genz, Ph.D.
Cultural Specialist

2

Appendix I

Traffic Impact Report for the
In-Vessel Composting Facility,
Wilson Okamoto Corporation
February 2011

TRAFFIC IMPACT REPORT

FOR THE

IN-VESSEL COMPOSTING FACILITY

Prepared for:

Hawaiian Earth Recycling LLC
91-400 Malakole Street
Kapolei, HI 96707

Prepared by:

Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826
WOC Ref: 8135-03

February 2011

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I. INTRODUCTION

A. Purpose of Study

The purpose of this study is to identify and assess the traffic impacts resulting from the proposed in-vessel composting facility in Waialua on the island of Oahu. The proposed facility will be able to process up to 150,000 tons per year of green and food waste, as well as, dewatered sewage sludge.

B. Scope of Study

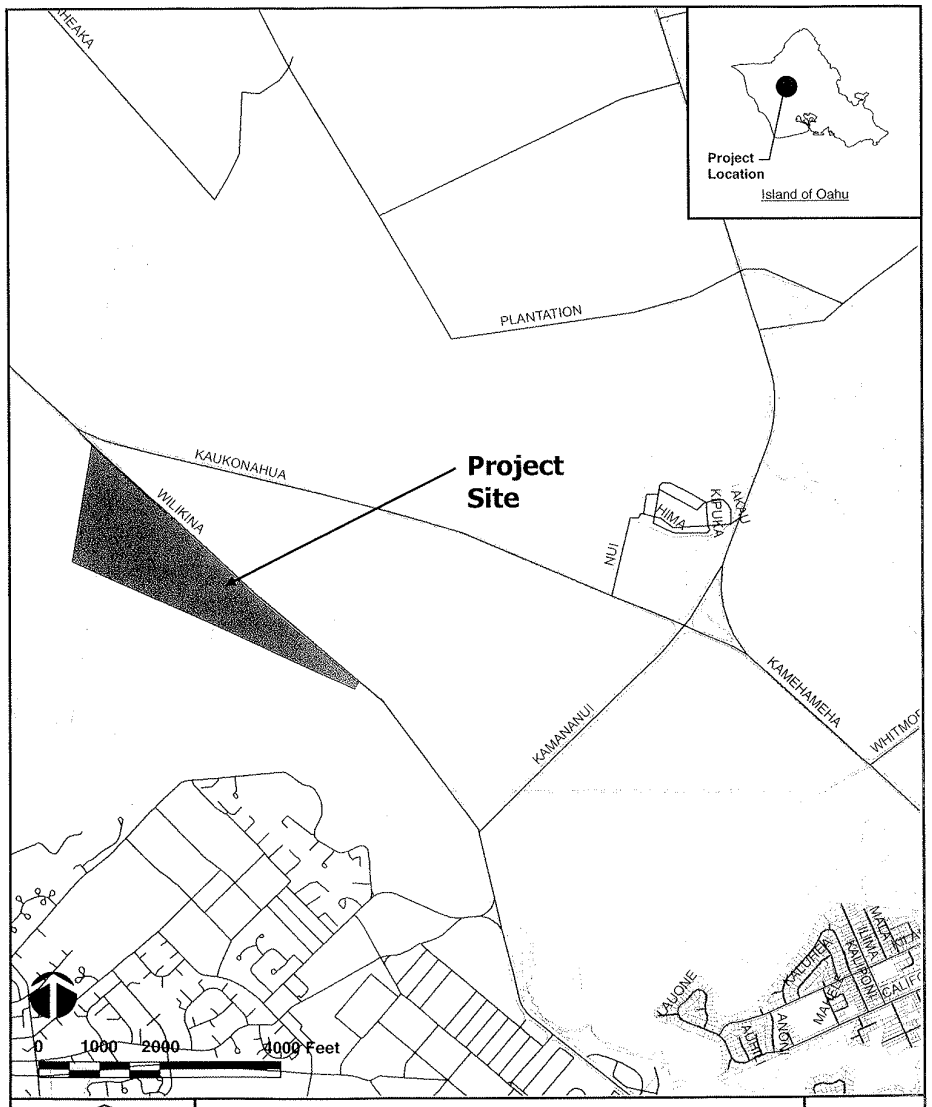
This report presents the findings and conclusions of the traffic study, the scope of which includes:

1. Description of the proposed project.
2. Evaluation of existing roadway and traffic operations in the vicinity.
3. Analysis of future roadway and traffic conditions without the proposed project.
4. Analysis and development of trip generation characteristics for the proposed project.
5. Superimposing site-generated traffic over future traffic conditions.
6. The identification and analysis of traffic impacts resulting from the proposed project.
7. Recommendations of improvements, if appropriate, that would mitigate the traffic impacts resulting from the proposed project.

II. PROJECT DESCRIPTION

A. Location

The proposed in-vessel composting facility will be located adjacent to Wilikina Drive in Waialua on the island of Oahu between Kamananui Road and Kaukonahua Road (see Figure 1). The project site is further identified as Tax Map Key 6-5-002: 026. The project site is bounded by Wilikina Drive to the north and agricultural lands to the east, south, and west. Access to the proposed facility will be provided via a new driveway off Wilikina Drive.



WILSON OKAMOTO CORPORATION ENGINEERS - PLANNERS	IN-VESSEL COMPOSTING FACILITY LOCATION AND VICINITY MAP	FIGURE 1

B. Project Characteristics

Hawaiian Earth Production (HEP) currently operates a transfer station at Kapaa Quarry and a 39-acre composting facility at Campbell Industrial Park in Kapolei. The existing facility at Campbell Industrial Park currently processes approximately 86,000 tons per year of green and food waste. HEP proposes to convert the Campbell Industrial Park facility to a transfer station and relocate their composting operations to a new facility on a 112-acre site in Waialua. The proposed in-vessel composting facility will be able to process up to 150,000 tons per year of green and food waste, as well as, dewatered sewage sludge from the City and County of Honolulu's Regional Wastewater Treatment Facilities. The proposed facility will include the following:

- Truck weighing scales
- Enclosed receiving building for sorting and processing
- Office, shop, and bagging facility
- Concrete composting area
- Stormwater retention ponds
- Leachate storage tanks
- Open product storage area
- Crop production and demonstration field

The proposed project is expected to begin operation in the Year 2013 with the facility approaching maximum capacity by the Year 2014 at the earliest. As such, for the purpose of this report, the completion year for the facility is conservatively assumed to occur by the Year 2014. Access provided via a new driveway off Wilikina Drive. Figure 2 shows the proposed site plan.

III. EXISTING TRAFFIC CONDITIONS

A. Area Roadway System

The proposed facility will be located adjacent to Wilikina Drive, a predominantly two-lane, two-way roadway that serves as a connector roadway between Kamehameha Highway and Kaukonahua Road. Southeast of the project site, Wilikina drive intersects Kamananui Road. At this signalized T-intersection, the northbound approach of Wilikina Drive has a shared through and right-turn lane while the southbound approach has an exclusive left-turn lane and one through lane.

Kamananui Road is a short two-way roadway that serves as a connector roadway between Wilikina Drive and Kamehameha Highway. At the intersection with Wilikina Drive, the Kamananui Road approach has exclusive left-turn and right-turn lanes.

Northwest of the intersection with Kamananui Road, Wilikina Drive intersects Kaukonahua Road. At this unsignalized T-intersection, the northbound approach of Wilikina Drive has a shared through and right-turn lane while the southbound approach has an exclusive left-turn lane and one through lane. Kaukonahua Road is a predominantly two-lane, two-way roadway that runs parallel to Kamehameha Highway providing access to Waialua and the north shore of Oahu. At the intersection with Wilikina Drive, the Kaukonahua Road approach has exclusive left-turn and right-turn lanes.

B. Traffic Volumes and Conditions

1. General

a. Field Investigation

Field investigations were conducted on January 19 and February 1, 2011, and consisted of manual turning movement count surveys at the intersections of Wilikina Drive with Kamananui Road and Kaukonahua Road. The manual turning movement count surveys were conducted during the morning peak hours of 6:00 AM and 9:00 AM, and afternoon peak hours of 3:00 PM and 6:00 PM. In addition, 24-hour mechanical count data was collected along Wilikina Drive in the vicinity of the project. Appendix A includes the existing traffic count data.

b. Capacity Analysis Methodology

The highway capacity analysis performed in this study is based upon procedures presented in the "Highway Capacity Manual", Transportation Research Board, 2000, and the "Synchro" software, developed by Trafficware. The analysis is based on the concept of Level of Service (LOS).

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IN-VESSEL COMPOSTING FACILITY

Project Site Plan

FIGURE 2

LOS is a quantitative and qualitative assessment of traffic operations. Levels of Service are defined by LOS "A" through "F"; LOS "A" representing ideal or free-flow traffic operating conditions and LOS "F" representing unacceptable or potentially congested traffic operating conditions.

"Volume-to-Capacity" (v/c) ratio is another measure indicating the relative traffic demand to the roadway carrying capacity. A v/c ratio of one (1.00) indicates that the roadway is operating at or near capacity. A v/c ratio of greater than 1.00 generally indicates that the traffic demand exceeds the road's carrying capacity. The LOS definitions are included in Appendix B.

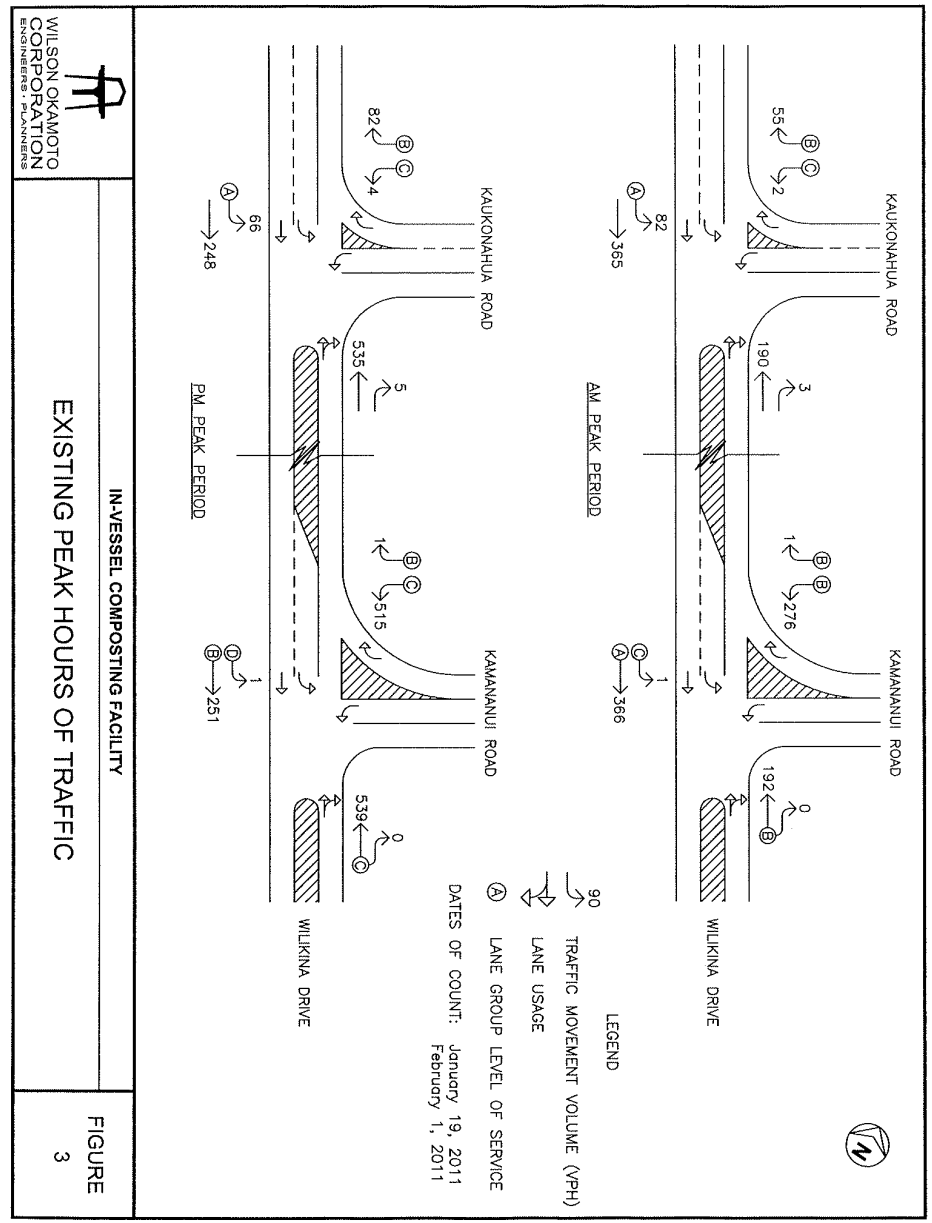
2. Existing Peak Hour Traffic

a. General

Figure 3 shows the existing AM and PM peak period traffic volumes and traffic operating conditions. The AM peak hour of traffic generally occurs between the hours of 7:15 AM and 8:15 AM while the PM peak hour of traffic generally occurs between the hours of 3:30 PM and 4:30 PM. The analysis is based on these peak hour time periods for each intersection. LOS calculations are included in Appendix C.

b. Wilikina Drive and Kamananui Road

At the intersection with Kamananui Road, Wilikina Drive carries 192 vehicles northbound and 367 vehicles southbound during the AM peak hour of traffic. During the PM peak hour of traffic, the overall traffic volume is higher with 539 vehicles traveling northbound and 252 vehicles traveling southbound. The critical movements on the Wilikina Drive approaches are the northbound approach and the southbound through traffic movement. The northbound approach operates at LOS "B" and LOS "C" during the AM and PM peak periods, respectively, while the southbound through traffic movement



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IN-VESSEL COMPOSTING FACILITY

EXISTING PEAK HOURS OF TRAFFIC

FIGURE 3

operates at LOS "A" and LOS "B" during the AM and PM peak periods, respectively. Traffic queues periodically formed on the Wilikina Drive approaches of the intersection with average queue lengths of 4-6 vehicles observed the approaches during both peak periods. These queues were observed to clear the intersection after each traffic signal cycle change.

The Kamananui Road approach of the intersection carries 277 vehicles and 516 vehicles westbound during the AM and PM peak periods, respectively. The critical movement on this approach is the left-turn traffic movement which operates at LOS "B" and LOS "C" during the AM and PM peak periods, respectively. Traffic queues periodically formed on this approach during both peak periods with average queue lengths of 8-10 vehicles observed during both peak periods. These queues were observed to clear the intersection after each traffic signal cycle change.

c. Wilikina Drive and Kaukonahua Road

At the intersection with Kaukonahua Road, Wilikina Drive carries 193 vehicles northbound and 447 vehicles southbound during the AM peak hour of traffic. During the PM peak hour of traffic, traffic volumes are higher with 540 vehicles traveling northbound and 314 vehicles traveling southbound. The critical movement on the Wilikina Drive approaches is the southbound left-turn traffic movement which operates at LOS "A" during both peak periods.

The Kaukonahua Road approach of the intersection carries 57 vehicles and 86 vehicles westbound during the AM and PM peak periods, respectively. The critical movement on this approach is the left-turn traffic movement which operates at LOS "C" during both peak periods. Traffic queues periodically formed on this approach during both peak periods with average queue lengths of 1-3 vehicles observed during both peak periods.

IV. PROJECTED TRAFFIC CONDITIONS

A. Site-Generated Traffic

1. Trip Generation Methodology

The trip generation methodology used in this study is based upon generally accepted techniques developed by the Institute of Transportation Engineers (ITE) and published in "Trip Generation, 8th Edition," 2008. A trip generation rate was derived for the proposed facility based on the highest monthly truck traffic data from the existing Campbell Industrial Park facility during 2010 provided by HEP (see Appendix D). This locally derived trip generation rate more accurately reflects the anticipated traffic growth as a result of the proposed facility. Table 1 summarizes the project site trip generation characteristics applied to the AM and PM peak periods of traffic.

Table 1: Peak Hour Trip Generation

Composting Facility INDEPENDENT VARIABLE: 1,000 Tons per year processed = 150		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	22
	EXIT	4
	TOTAL	26
PM PEAK	ENTER	6
	EXIT	3
	TOTAL	9

2. Trip Distribution

Figure 4 shows the distribution of site-generated vehicular trips at the study intersections during the AM and PM peak hours of traffic. Almost all of the trips generated by the facility during the peak periods are expected to be trucks or other heavy vehicles either delivering to or picking up material from the facility. According to HEP, most of these trucks will be traveling to/from their transfer stations and are expected to utilize the Interstate H-2 Freeway to reach Waialua. As such, all entering vehicles are expected to travel northbound along Wilikina Drive to access the project driveway while all

exiting vehicles are expected to turn right from the facility and travel southbound along Wilikina Drive.

B. Through Traffic Forecasting Methodology

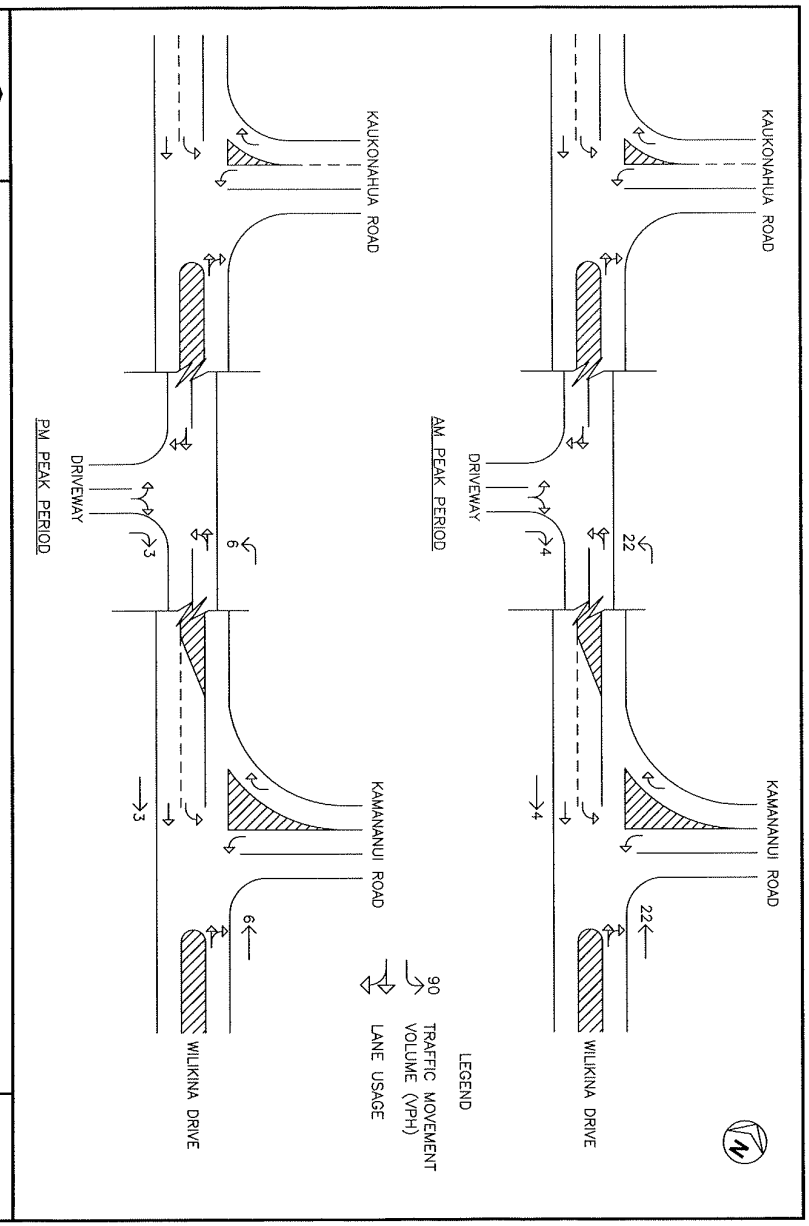
Typically, travel forecasts are developed based upon historical traffic count data obtained from the State Department of Transportation (SDOT), Highway Division survey stations. However, since the SDOT traffic survey data along Wilikina Drive in the vicinity of the project indicates relatively stable traffic volumes, use of the SDOT data is inappropriate to derive a reasonable level of accuracy or certainty in the traffic forecast. As such, the travel forecast developed for this study conservatively assumes the existing traffic volumes in the project vicinity will increase at a rate of 0.5% per year to the Year 2014. Using 2011 as the Base Year, a growth factor of 1.015 was applied to the existing traffic demands in the project vicinity to achieve the projected Year 2014 traffic demands.

C. Total Traffic Volumes Without Project

The projected year 2014 AM and PM peak period traffic volumes and operating conditions without the proposed in-vessel composting facility are shown in Figure 5, and summarized in Table 2. The existing levels of service are included for comparison purposes. LOS calculations are included in Appendix E.

Table 2: Existing and Projected (Without Project) LOS Traffic Operating Conditions

Intersection	Critical Traffic Movement		AM		PM	
			Exist	Year 2014 w/out Proj	Exist	Year 2014 w/out Proj
Wilikina Dr/ Kamananui Rd	Westbound	LT	B	B	C	C
	Northbound	TH-RT	B	B	C	C
	Southbound	TH	A	A	B	B
Wilikina Dr/ Kaukonahua Rd	Westbound	LT	C	C	C	C
	Southbound	LT	A	A	A	A



IN-VESSEL COMPOSTING FACILITY

DISTRIBUTION OF SITE-GENERATED VEHICLES

FIGURE 4

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Under Year 2014 without project conditions, traffic operations are expected to remain similar to existing conditions. The critical movements at the intersection of Wilikina Drive with Kamananui Road are expected to continue operating at LOS "B" or better during the AM peak period and LOS "C" or better during the PM peak period. At the intersection with Kaukonahua Road, the critical movements are expected to continue operating at LOS "C" or better during both peak periods.

D. Total Traffic Volumes With Project

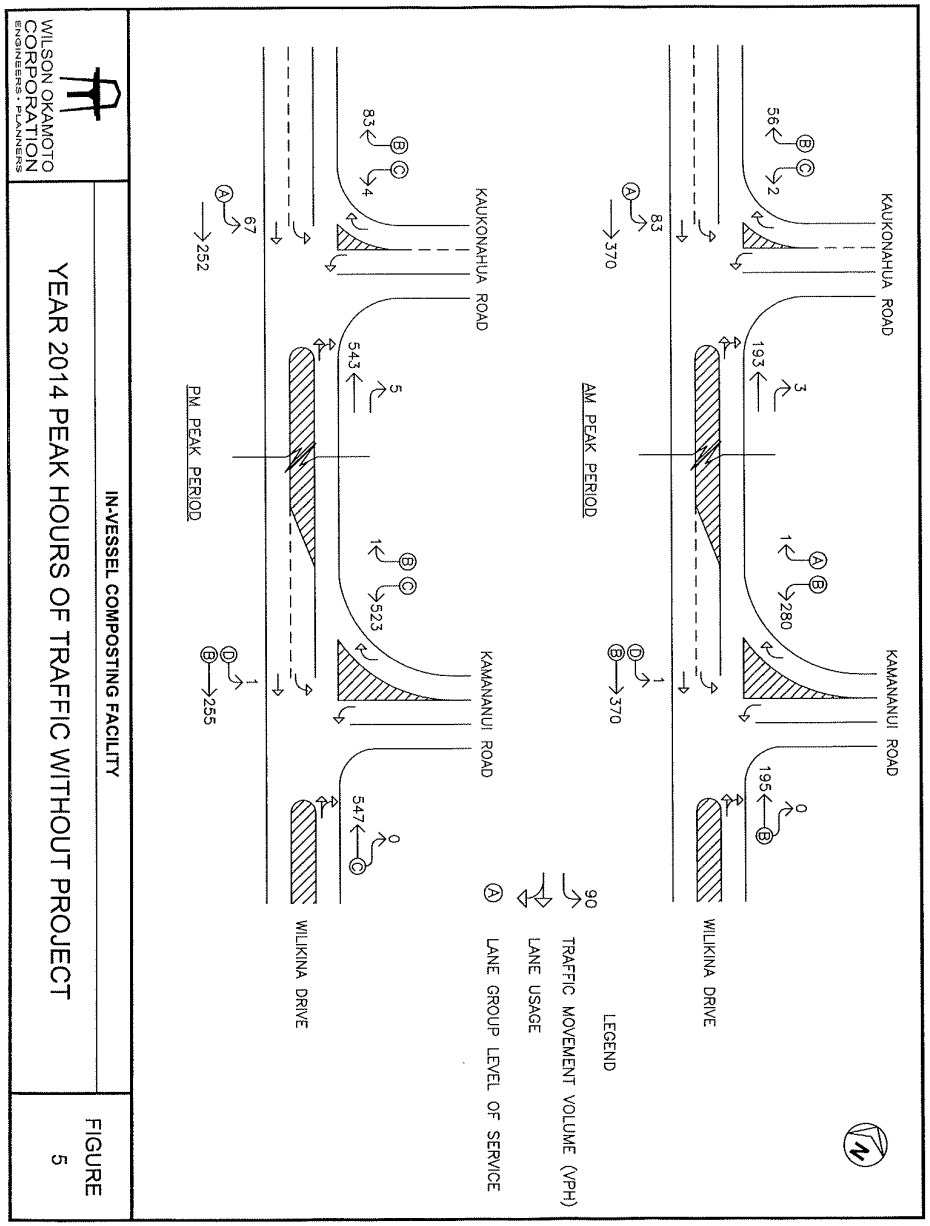
Figure 6 shows the Year 2014 cumulative AM and PM peak hour traffic conditions with the proposed in-vessel composting facility. The cumulative volumes consist of site- generated traffic superimposed over Year 2014 projected traffic demands. The traffic impacts resulting from the proposed project are addressed in the following section.

V. TRAFFIC IMPACT ANALYSIS

The Year 2014 cumulative AM and PM peak hour traffic conditions with the proposed in-vessel composting facility are summarized in Table 3. The existing and projected Year 2014 (Without Project) operating conditions are provided for comparison purposes. LOS calculations are included in Appendix F.

Table 3: Existing and Projected (Without and With Project) LOS Traffic Operating Conditions

Intersection	Critical Traffic Movement		AM			PM		
			Exist	Year 2014		Exist	Year 2014	
				w/out Proj	w/ Proj		w/out Proj	w/ Proj
Wilikina Dr/ Kamananui Rd	Westbound	LT	B	B	B	C	C	C
	Northbound	TH-RT	B	B	B	C	C	C
	Southbound	TH	A	A	A	B	B	B
Wilikina Dr/ Driveway	Eastbound	LT-RT	-	-	B	-	-	A
	Northbound	LT-TH	-	-	A	-	-	A
Wilikina Dr/ Kaukonahua Rd	Westbound	LT	C	C	C	C	C	C
	Southbound	LT	A	A	A	A	A	A



IN-VESSEL COMPOSTING FACILITY

YEAR 2014 PEAK HOURS OF TRAFFIC WITHOUT PROJECT

FIGURE 5

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Traffic operations under Year 2014 with project conditions are expected to remain similar to existing and Year 2014 without project conditions during both peak periods. The critical movements at the intersection of Wilikina Drive with Kamananui Road are expected to continue operating at LOS "B" or better during the AM peak period and LOS "C" or better during the PM peak period while those at the intersection with Kaukonahua Road are expected to continue operating at LOS "C" or better during both peak periods. At the intersection of the new project driveway with Wilikina Road, the driveway approach of the intersection is expected to operate at LOS "B" and LOS "A" during the AM and PM peak periods, respectively, while the northbound approach of Wilikina Drive is expected to operate at LOS "A" during both peak periods.

VI. RECOMMENDATIONS

Based on the analysis of the traffic data, the following are the recommendations associated with the proposed in-vessel composting facility:

1. Provide sufficient sight distance for motorists to safely enter and exit the project driveway.

2. Provide adequate on-site loading and off-loading service areas and prohibit off-site loading operations.

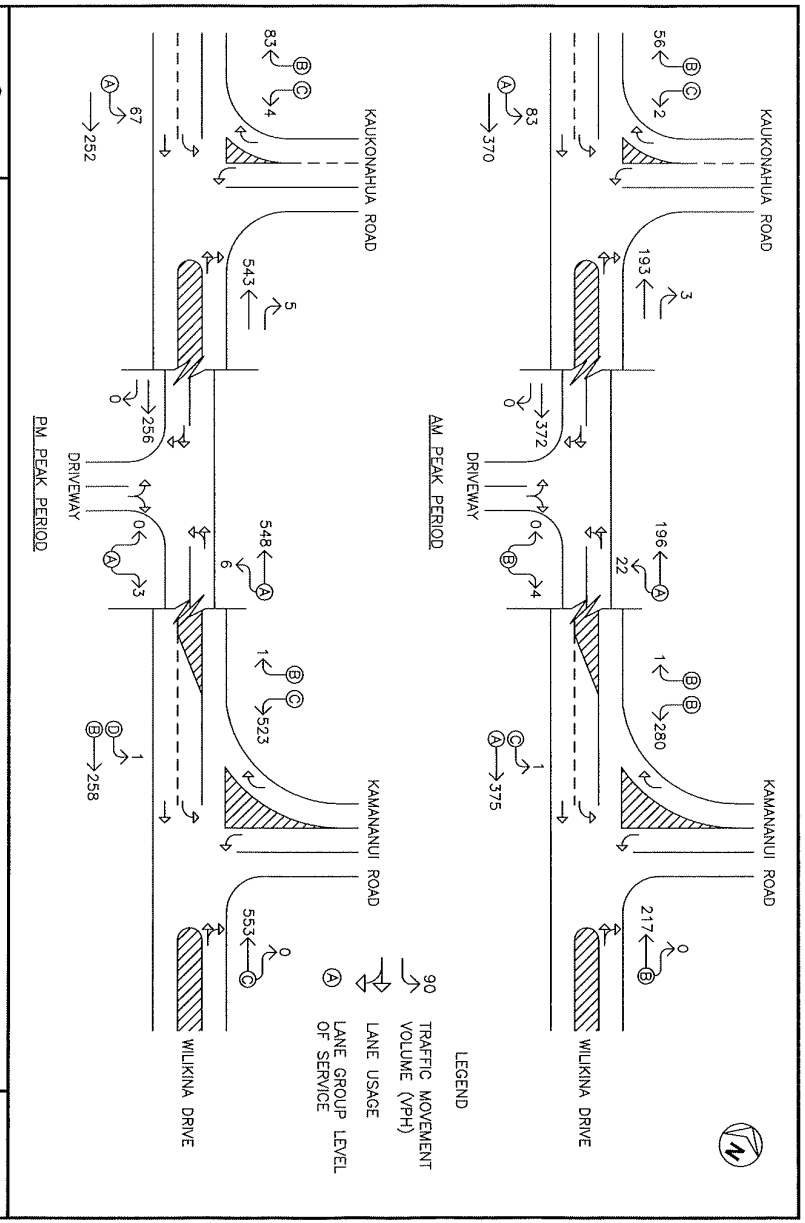
3. Provide adequate turn-around area for service, delivery, and refuse collection vehicles to maneuver on the project site to avoid vehicle-reversing maneuvers onto adjacent public roadways.

4. Provide sufficient turning radii at the project driveway to avoid or minimize vehicle encroachments to oncoming traffic lanes.

5. Ensure that the truck weighing scale is located a sufficient distance from the driveway to provide adequate queuing area for trucks waiting to be weighed and ensure that queues do not extend onto the adjacent public roadway.

VII. CONCLUSION

Hawaiian Earth Production (HEP) plans to develop a new in-vessel composting facility on a 112-acre site in Waialua with the ability to process up to 150,000 tons per year of green and food waste, as well as, dewatered sewage sludge from the City and County of Honolulu's Regional Wastewater Treatment Facilities. Traffic operations under Year 2014 with project conditions are expected to remain similar to existing and Year 2014 without



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IN-VESSEL COMPOSTING FACILITY

YEAR 2014 PEAK HOURS OF TRAFFIC WITH PROJECT

FIGURE 6

project conditions during both peak periods. The installation of a traffic signal system along Wilikina Drive at the project access driveway does not appear to be warranted and may instead adversely impact traffic flow along Wilikina Drive. In addition, the traffic signal system operations at the adjacent intersection of Wilikina Drive and Kamananui Road should create gaps in the through traffic stream along Wilikina Drive that would allow ingress and egress maneuvers at the project access driveway. These gaps would preserve through traffic flow along the roadway without the need of exclusive left-turn lanes, acceleration lanes, or other auxiliary lanes at the intersection of Wilikina Drive and the project access driveway.

With the implementation of the aforementioned recommendations, the proposed facility is not expected to have a significant impact on traffic operations in the project vicinity. The critical movements at the study intersections in the project vicinity are expected to continue operating at levels of service similar to existing and without project conditions. In addition, the total traffic volumes entering the study intersections along Wilikina Drive are expected to increase by 3% or less during both peak periods of traffic with the proposed facility. These increases in the total traffic volumes are in the range of daily volume fluctuations along this roadway and represent a minimal increase in overall traffic volumes.

APPENDIX A

EXISTING TRAFFIC COUNT DATA

Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, Hi 96826

Counter:D4-5676
Counted By:DY
Weather:Clear

File Name : KamWil AM
Site Code : 00000002
Start Date : 1/19/2011
Page No : 1

Groups Printed- Unshifted

	Kamananui Road Southbound				Wilikina Drive Westbound				Wahiawa Refuse Convenience Center Northbound				Wilikina Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
06:00 AM	89	0	0	89	1	19	36	56	0	0	1	1	1	84	0	85	231
06:15 AM	62	0	0	62	0	25	41	66	0	0	0	0	1	107	0	108	236
06:30 AM	73	0	0	73	0	36	43	79	0	0	3	3	0	98	0	98	253
06:45 AM	84	0	0	84	0	35	54	89	0	0	0	0	1	74	0	75	248
Total	308	0	0	308	1	115	174	290	0	0	4	4	3	363	0	366	968
07:00 AM	51	0	0	51	0	50	59	109	0	0	1	1	0	86	1	87	248
07:15 AM	73	0	0	73	1	47	57	105	0	0	1	1	0	115	2	117	296
07:30 AM	61	0	0	61	0	62	118	180	0	0	3	3	0	97	2	99	343
07:45 AM	71	0	0	71	1	47	106	154	1	0	0	1	1	94	0	95	321
Total	256	0	0	256	2	206	340	548	1	0	5	6	1	392	5	398	1208
08:00 AM	71	0	1	72	3	39	86	128	1	0	1	2	0	84	2	86	288
08:15 AM	71	0	0	71	3	42	62	107	2	0	4	6	0	82	2	84	268
08:30 AM	108	0	0	108	4	45	58	107	0	0	2	2	0	72	0	72	289
08:45 AM	131	0	0	131	3	46	75	124	0	0	4	4	1	81	1	83	342
Total	381	0	1	382	13	172	281	466	3	0	11	14	1	319	5	325	1187
Grand Total	945	0	1	946	16	493	795	1304	4	0	20	24	5	1074	10	1089	3363
Apprch %	99.9	0	0.1		1.2	37.8	61		16.7	0	83.3		0.5	98.6	0.9		
Total %	28.1	0	0	28.1	0.5	14.7	23.6	38.8	0.1	0	0.6	0.7	0.1	31.9	0.3	32.4	

	Kamananui Road Southbound				Wilikina Drive Westbound				Wahiawa Refuse Convenience Center Northbound				Wilikina Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**73**	0	0	**73**	1	47	57	105	0	0	1	1	0	**115**	**2**	**117**	296
07:30 AM	61	0	0	61	0	**62**	**118**	**180**	0	0	**3**	**3**	0	97	2	99	**343**
07:45 AM	71	0	0	71	1	47	106	154	**1**	0	0	1	**1**	94	0	95	321
08:00 AM	71	0	1	72	**3**	39	86	128	1	0	1	2	0	84	2	86	288
Total Volume	276	0	1	277	5	195	367	567	2	0	5	7	1	390	6	397	1248
% App. Total	99.6	0	0.4		0.9	34.4	64.7		28.6	0	71.4		0.3	98.2	1.5		
PHF	.945	.000	.250	.949	.417	.786	.778	.788	.500	.000	.417	.583	.250	.848	.750	.848	.910

Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, Hi 96826

Counter:D4-5676
Counted By:DY
Weather:Clear

File Name : KamWil PM
Site Code : 00000002
Start Date : 1/19/2011
Page No : 1

Groups Printed- Unshifted

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Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
03:00 PM	70	0	0	70	6	91	138	235	1	1	3	5	0	73	2	75	385
03:15 PM	111	0	1	112	3	92	110	205	0	4	5	9	2	66	1	69	395
03:30 PM	143	0	0	143	1	137	165	303	0	2	2	4	0	49	2	51	501
03:45 PM	141	0	1	142	3	147	155	305	1	0	3	4	0	75	3	78	529
Total	465	0	2	467	13	467	568	1048	2	7	13	22	2	263	8	273	1810
04:00 PM	110	0	0	110	6	131	136	273	1	2	4	7	0	59	0	59	449
04:15 PM	121	0	0	121	2	135	125	262	1	1	2	4	1	78	1	80	467
04:30 PM	137	0	1	138	2	96	141	239	0	1	2	3	0	52	2	54	434
04:45 PM	121	0	0	121	3	131	160	294	4	0	4	8	0	55	5	60	483
Total	489	0	1	490	13	493	562	1068	6	4	12	22	1	244	8	253	1833
05:00 PM	97	0	0	97	3	118	147	268	1	2	2	5	0	64	1	65	435
05:15 PM	112	0	0	112	3	105	176	284	1	1	5	7	0	96	3	99	502
05:30 PM	92	0	1	93	2	78	124	204	3	3	0	6	1	67	1	69	372
05:45 PM	118	0	1	119	0	81	117	198	1	1	1	3	0	64	0	64	384
Total	419	0	2	421	8	382	564	954	6	7	8	21	1	291	5	297	1693
Grand Total	1373	0	5	1378	34	1342	1694	3070	14	18	33	65	4	798	21	823	5336
Apprch %	99.6	0	0.4		1.1	43.7	55.2		21.5	27.7	50.8		0.5	97	2.6		
Total %	25.7	0	0.1	25.8	0.6	25.1	31.7	57.5	0.3	0.3	0.6	1.2	0.1	15	0.4	15.4	

	Kamananui Road Southbound				Wilikina Drive Westbound				Wahiawa Refuse Convenience Center Northbound				Wilikina Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:30 PM																	
03:30 PM	**143**	0	0	**143**	1	137	**165**	303	0	**2**	2	4	0	49	2	51	501
03:45 PM	141	0	**1**	142	3	**147**	155	**305**	**1**	0	3	4	0	75	**3**	78	**529**
04:00 PM	110	0	0	110	**6**	131	136	273	1	2	**4**	**7**	0	59	0	59	449
04:15 PM	121	0	0	121	2	135	125	262	1	1	2	4	**1**	**78**	1	**80**	467
Total Volume	515	0	1	516	12	550	581	1143	3	5	11	19	1	261	6	268	1946
% App. Total	99.8	0	0.2		1	48.1	50.8		15.8	26.3	57.9		0.4	97.4	2.2		
PHF	.900	.000	.250	.902	.500	.935	.880	.937	.750	.625	.688	.679	.250	.837	.500	.838	.920

Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, Hi 96826

Counter:
Counted By:
Weather:

File Name : KauwilA
Site Code : 00000001
Start Date : 2/1/2011
Page No : 1

Groups Printed- Unshifted

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06:00 AM	0	4	0	0	4	0	13	0	0	13	0	0	0	0	0	12	93	0	0	105	122
06:15 AM	0	8	0	0	8	0	20	0	0	20	0	0	0	0	0	11	115	0	0	126	154
06:30 AM	0	13	0	0	13	0	26	0	0	26	0	0	0	0	0	12	94	0	0	106	145
06:45 AM	0	7	0	0	7	0	27	0	0	27	0	0	0	0	0	17	74	0	0	91	125
Total	0	32	0	0	32	0	86	0	0	86	0	0	0	0	0	52	376	0	0	428	546
07:00 AM	0	11	0	0	11	0	31	0	0	31	0	0	0	0	0	8	77	0	0	85	127
07:15 AM	1	21	0	0	22	0	42	1	0	43	0	0	0	0	0	20	102	0	0	122	187
07:30 AM	0	16	0	0	16	0	60	1	0	61	0	0	0	0	0	23	71	0	0	94	171
07:45 AM	0	11	0	0	11	0	47	0	0	47	0	0	0	0	0	18	98	0	0	116	174
Total	1	59	0	0	60	0	180	2	0	182	0	0	0	0	0	69	348	0	0	417	659
08:00 AM	1	7	0	0	8	0	36	1	0	37	0	0	0	0	0	21	70	0	0	91	136
08:15 AM	0	13	0	0	13	0	39	1	0	40	0	0	0	0	0	15	79	0	0	94	147
08:30 AM	0	12	0	0	12	0	30	0	0	30	0	0	0	0	0	13	116	0	0	129	171
08:45 AM	0	6	0	0	6	0	24	0	0	24	0	0	0	0	0	13	65	0	0	78	108
Total	1	38	0	0	39	0	129	2	0	131	0	0	0	0	0	62	330	0	0	392	562
Grand Total	2	129	0	0	131	0	395	4	0	399	0	0	0	0	0	183	1054	0	0	1237	1767
Apprch %	1.5	98.5	0	0		0	99	1	0		0	0	0	0		14.8	85.2	0	0		
Total %	0.1	7.3	0	0	7.4	0	22.4	0.2	0	22.6	0	0	0	0	0	10.4	59.6	0	0	70	

	Kaukonahua Southbound				Wiikina Drive Westbound				Kaukonahua Northbound				Wiikina Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**1**	**21**	0	**22**	0	42	**1**	43	0	0	0	0	20	**102**	0	**122**	**187**
07:30 AM	0	16	0	16	0	**60**	1	**61**	0	0	0	0	**23**	71	0	94	171
07:45 AM	0	11	0	11	0	47	0	47	0	0	0	0	18	98	0	116	174
08:00 AM	1	7	0	8	0	36	1	37	0	0	0	0	21	70	0	91	136
Total Volume	2	55	0	57	0	185	3	188	0	0	0	0	82	341	0	423	668
% App. Total	3.5	96.5	0		0	98.4	1.6		0	0	0		19.4	80.6	0		
PHF	.500	.655	.000	.648	.000	.771	.750	.770	.000	.000	.000	.000	.891	.836	.000	.867	.893

Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, Hi 96826

Counter:D4-5675
Counted By:TO
Weather:Clear

File Name : KauWil PM
Site Code : 00000001
Start Date : 2/1/2011
Page No : 1

Groups Printed- Unshifted

	Kaukonahua Road Southbound					Wilikina Drive Westbound					Northboun d	Wilikina Drive Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:00 PM	0	15	0	0	15	0	83	1	0	84	0	22	65	0	0	87	186
03:15 PM	0	15	0	0	15	0	116	2	0	118	0	16	50	0	0	66	199
03:30 PM	2	18	0	0	20	0	108	1	0	109	0	12	66	0	0	78	207
03:45 PM	1	19	0	0	20	0	131	1	0	132	0	22	56	0	0	78	230
Total	3	67	0	0	70	0	438	5	0	443	0	72	237	0	0	309	822
04:00 PM	1	25	0	0	26	0	136	3	0	139	0	15	49	0	0	64	229
04:15 PM	0	20	0	0	20	0	148	0	0	148	0	17	68	0	0	85	253
04:30 PM	0	22	0	0	22	0	120	3	0	123	0	11	66	0	0	77	222
04:45 PM	2	15	0	0	17	0	106	1	0	107	0	8	57	0	0	65	189
Total	3	82	0	0	85	0	510	7	0	517	0	51	240	0	0	291	893
05:00 PM	0	12	0	0	12	0	129	0	0	129	0	15	59	0	0	74	215
05:15 PM	0	19	0	0	19	0	120	0	0	120	0	8	52	0	0	60	199
05:30 PM	0	14	0	0	14	0	99	0	0	99	0	11	56	0	0	67	180
05:45 PM	0	10	0	0	10	0	78	2	0	80	0	6	39	0	0	45	135
Total	0	55	0	0	55	0	426	2	0	428	0	40	206	0	0	246	729
Grand Total	6	204	0	0	210	0	1374	14	0	1388	0	163	683	0	0	846	2444
Apprch %	2.9	97.1	0	0		0	99	1	0			19.3	80.7	0	0		
Total %	0.2	8.3	0	0	8.6	0	56.2	0.6	0	56.8	0	6.7	27.9	0	0	34.6	

	Kaukonahua Road Southbound				Wilikina Drive Westbound				Northbound	Wilikina Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1														
Peak Hour for Entire Intersection Begins at 03:45 PM														
03:45 PM	**1**	19	0	20	0	131	1	132	0	**22**	56	0	78	230
04:00 PM	1	**25**	0	**26**	0	136	**3**	139	0	15	49	0	64	229
04:15 PM	0	20	0	20	0	**148**	0	**148**	0	17	**68**	0	**85**	**253**
04:30 PM	0	22	0	22	0	120	3	123	0	11	66	0	77	222
Total Volume	2	86	0	88	0	535	7	542	0	65	239	0	304	934
% App. Total	2.3	97.7	0		0	98.7	1.3			21.4	78.6	0		
PHF	.500	.860	.000	.846	.000	.904	.583	.916	.000	.739	.879	.000	.894	.923

Wilson Okamoto Corporation

1907 S. Beretania St., Suite 400
Honolulu, HI 96826

Wilikina Drive
Site Code:
Station ID:
Between Kamananui Rd. and Kaukonahua Rd.

Latitude: 0' 0.000 Undefined

Start Time	31-Jan-11 Mon	WB		Hour Totals		EB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		*	*			*	*				
12:15		*	*			*	*				
12:30		*	*			*	*				
12:45		*	*	0	0	*	*	0	0	0	0
01:00		*	*			*	*				
01:15		*	*			*	*				
01:30		*	*			*	*				
01:45		*	*	0	0	*	*	0	0	0	0
02:00		*	*			*	*				
02:15		*	*			*	*				
02:30		*	*			*	*				
02:45		*	*	0	0	*	*	0	0	0	0
03:00		*	81			*	67				
03:15		*	103			*	67				
03:30		*	104			*	67				
03:45		*	161	0	449	*	64	0	265	0	714
04:00		*	115			*	59				
04:15		*	129			*	59				
04:30		*	103			*	63				
04:45		*	146	0	493	*	65	0	246	0	739
05:00		*	90			*	47				
05:15		*	100			*	66				
05:30		*	100			*	60				
05:45		*	82	0	372	*	44	0	217	0	589
06:00		*	54			*	40				
06:15		*	76			*	47				
06:30		*	56			*	33				
06:45		*	65	0	251	*	36	0	156	0	407
07:00		*	64			*	35				
07:15		*	67			*	28				
07:30		*	36			*	31				
07:45		*	44	0	211	*	18	0	112	0	323
08:00		*	37			*	16				
08:15		*	33			*	21				
08:30		*	31			*	16				
08:45		*	39	0	140	*	11	0	64	0	204
09:00		*	34			*	10				
09:15		*	25			*	13				
09:30		*	28			*	13				
09:45		*	23	0	110	*	12	0	48	0	158
10:00		*	10			*	8				
10:15		*	21			*	5				
10:30		*	19			*	6				
10:45		*	19	0	69	*	6	0	25	0	94
11:00		*	7			*	4				
11:15		*	12			*	5				
11:30		*	16			*	3				
11:45		*	4	0	39	*	3	0	15	0	54
Total		0	2134			0	1148			0	3282
Percent		0.0%	100.0%			0.0%	100.0%			0.0%	100.0%

Wilson Okamoto Corporation

1907 S. Beretania St., Suite 400
Honolulu, HI 96826

Wilikina Drive
Site Code:
Station ID:
Between Kamananui Rd. and Kaukonahua Rd.

Latitude: 0' 0.000 Undefined

Start Time	01-Feb-11 Tue	WB		Hour Totals		EB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		10	55			5	51				
12:15		11	56			5	60				
12:30		4	55			1	58				
12:45		11	59	36	225	3	60	14	229	50	454
01:00		5	47			2	50				
01:15		4	59			2	62				
01:30		8	67			0	59				
01:45		0	61	17	234	2	60	6	231	23	465
02:00		3	64			5	48				
02:15		4	41			2	52				
02:30		3	58			5	82				
02:45		0	77	10	240	6	48	18	230	28	470
03:00		1	83			5	59				
03:15		3	100			9	45				
03:30		2	133			6	61				
03:45		0	153	6	469	8	52	28	217	34	686
04:00		1	163			13	63				
04:15		1	134			17	61				
04:30		3	124			32	49				
04:45		3	99	8	520	52	75	114	248	122	768
05:00		6	115			65	66				
05:15		8	109			96	68				
05:30		19	89			96	48				
05:45		31	80	64	393	121	34	378	216	442	609
06:00		12	66			89	49				
06:15		21	73			123	33				
06:30		26	71			83	52				
06:45		28	78	87	288	76	46	371	180	458	468
07:00		30	56			83	34				
07:15		46	64			96	32				
07:30		57	53			81	27				
07:45		51	32	184	205	92	31	352	124	536	329
08:00		33	40			72	16				
08:15		39	33			86	28				
08:30		31	36			105	14				
08:45		24	36	127	145	75	14	338	72	465	217
09:00		45	31			65	12				
09:15		32	35			77	13				
09:30		42	32			83	14				
09:45		34	33	153	131	54	8	279	47	432	178
10:00		42	20			37	4				
10:15		34	32			39	11				
10:30		52	23			50	6				
10:45		44	18	172	93	47	4	173	25	345	118
11:00		37	10			50	10				
11:15		40	18			42	2				
11:30		49	16			51	9				
11:45		56	6	182	50	46	3	189	24	371	74
Total		1046	2993			2260	1843			3306	4836
Percent		25.9%	74.1%			55.1%	44.9%			40.6%	59.4%

Wilson Okamoto Corporation
1907 S. Beretania St., Suite 400
Honolulu, HI 96826

Wilikina Drive
Site Code:
Station ID:
Between Kamananui Rd. and Kaukonahua Rd.

Latitude: 0' 0.000 Undefined

Start	02-Feb-11	WB		Hour Totals		EB		Hour Totals		Combined Totals	
Time	Wed	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		7	*			3	*				
12:15		5	*			3	*				
12:30		6	*			1	*				
12:45		13	*	31	0	3	*	10	0	41	0
01:00		3	*			2	*				
01:15		5	*			2	*				
01:30		10	*			3	*				
01:45		3	*	21	0	1	*	8	0	29	0
02:00		2	*			1	*				
02:15		0	*			4	*				
02:30		5	*			5	*				
02:45		7	*	14	0	4	*	14	0	28	0
03:00		1	*			6	*				
03:15		4	*			10	*				
03:30		5	*			10	*				
03:45		0	*	10	0	7	*	33	0	43	0
04:00		4	*			15	*				
04:15		3	*			15	*				
04:30		1	*			37	*				
04:45		3	*	11	0	52	*	119	0	130	0
05:00		2	*			60	*				
05:15		7	*			92	*				
05:30		8	*			91	*				
05:45		11	*	28	0	113	*	356	0	384	0
06:00		16	*			108	*				
06:15		23	*			95	*				
06:30		32	*			89	*				
06:45		28	*	99	0	77	*	369	0	468	0
07:00		36	*			86	*				
07:15		43	*			116	*				
07:30		57	*			83	*				
07:45		58	*	194	0	94	*	379	0	573	0
08:00		36	*			101	*				
08:15		48	*			70	*				
08:30		44	*			91	*				
08:45		30	*	158	0	61	*	323	0	481	0
09:00		39	*			63	*				
09:15		44	*			55	*				
09:30		16	*			30	*				
09:45		*	*	*	*	*	*	*	*	*	*
10:00		*	*	*	*	*	*	*	*	*	*
10:15		*	*	*	*	*	*	*	*	*	*
10:30		*	*	*	*	*	*	*	*	*	*
10:45		*	*	*	*	*	*	*	*	*	*
11:00		*	*	*	*	*	*	*	*	*	*
11:15		*	*	*	*	*	*	*	*	*	*
11:30		*	*	*	*	*	*	*	*	*	*
11:45		*	*	*	*	*	*	*	*	*	*
Total		665	0			1759	0			2177	0
Percent		100.0%	0.0%			100.0%	0.0%			100.0%	0.0%
Grand Total		1711	5127			4019	2991			5483	8118
Percent		25.0%	75.0%			57.3%	42.7%			40.3%	59.7%

ADT ADT 8,142 AADT 8,142

APPENDIX B

LEVEL OF SERVICE DEFINITIONS

LEVEL OF SERVICE DEFINITIONS

LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

Level of Service (LOS) for signalized intersections is defined in terms of delay, which is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. Specifically, level-of-service (LOS) criteria are stated in terms of the average control delay per vehicle, typically a 15-min analysis period. The criteria are given in the following table.

Table 1: Level-of-Service Criteria for Signalized Intersections

Level of Service	Control Delay per Vehicle (sec/veh)
A	≤10.0
B	>10.0 and ≤20.0
C	>20.0 and ≤35.0
D	>35.0 and ≤55.0
E	>55.0 and ≤80.0
F	>80.0

Delay is a complex measure and depends on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group.

Level of Service A describes operations with low control delay, up to 10 sec per vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.

Level of Service B describes operations with control delay greater than 10 and up to 20 sec per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of delay.

Level of Service C describes operations with control delay greater than 20 and up to 35 sec per vehicle. These higher delays may result from only fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. Cycle failure occurs when a given green phase does not serve queued vehicles and overflows occur. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.

Level of Service D describes operations with control delay greater than 35 and up to 55 sec per vehicle. At level of service D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

"Highway Capacity Manual," Transportation Research Board, 2000.

Level of Service E describes operation with control delay greater than 55 and up to 80 sec per vehicle. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent.

Level of Service F describes operations with control delay in excess of 80 sec per vehicle. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity lane groups. It may also occur at high v/c ratios with many individual cycle failures. Poor progression and long cycle lengths may also contribute significantly to high delay levels.

"Highway Capacity Manual," Transportation Research Board, 2000.

LEVEL OF SERVICE DEFINITIONS

LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

Level of Service (LOS) criteria are given in Table 1. As used here, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue to the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position, including deceleration of vehicles from free-flow speed to the speed of vehicles in the queue.

The average total delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation. If the degree of saturation is greater than about 0.9, average control delay is significantly affected by the length of the analysis period.

Table 1: Level-of-Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay (Sec/Veh)
A	≤10.0
B	>10.0 and ≤15.0
C	>15.0 and ≤25.0
D	>25.0 and ≤35.0
E	>35.0 and ≤50.0
F	>50.0

"Highway Capacity Manual," Transportation Research Board, 2000.

APPENDIX C

CAPACITY ANALYSIS CALCULATIONS
EXISTING PEAK HOUR TRAFFIC ANALYSIS

HCM Signalized Intersection Capacity Analysis
5: Kamananui & Wilikina

2/17/2011

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	276	1	192	0	1	366
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	1863		1770	1863
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	1583	1863		1770	1863
Peak-hour factor, PHF	0.95	0.95	0.79	0.79	0.85	0.85
Adj. Flow (vph)	291	1	243	0	1	431
RTOR Reduction (vph)	0	1	0	0	0	0
Lane Group Flow (vph)	291	0	243	0	1	431
Turn Type		Perm			Prot	
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	12.5	12.5	14.4		0.8	20.2
Effective Green, g (s)	12.5	12.5	14.4		0.8	20.2
Actuated g/C Ratio	0.29	0.29	0.34		0.02	0.47
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	518	463	628		33	881
v/s Ratio Prot	c0.16		0.13		0.00	c0.23
v/s Ratio Perm		0.00				
v/c Ratio	0.56	0.00	0.39		0.03	0.49
Uniform Delay, d1	12.8	10.7	10.8		20.6	7.7
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.4	0.0	0.4		0.4	0.4
Delay (s)	14.2	10.7	11.2		20.9	8.1
Level of Service	B	B	B		C	A
Approach Delay (s)	14.2		11.2			8.2
Approach LOS	B		B			A

Intersection Summary			
HCM Average Control Delay	10.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	42.7	Sum of lost time (s)	10.0
Intersection Capacity Utilization	42.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
5: Kamananui & Wilikina

2/17/2011

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	515	1	539	0	1	251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	1863		1770	1863
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	1583	1863		1770	1863
Peak-hour factor, PHF	0.90	0.90	0.94	0.94	0.84	0.84
Adj. Flow (vph)	572	1	573	0	1	299
RTOR Reduction (vph)	0	1	0	0	0	0
Lane Group Flow (vph)	572	0	573	0	1	299
Turn Type		Perm			Prot	
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	27.0	27.0	26.5		0.6	32.1
Effective Green, g (s)	27.0	27.0	26.5		0.6	32.1
Actuated g/C Ratio	0.39	0.39	0.38		0.01	0.46
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	692	619	714		15	865
v/s Ratio Prot	c0.32		c0.31		0.00	c0.16
v/s Ratio Perm		0.00				
v/c Ratio	0.83	0.00	0.80		0.07	0.35
Uniform Delay, d1	18.9	12.8	19.0		34.0	11.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	8.0	0.0	6.5		1.9	0.2
Delay (s)	26.9	12.8	25.5		35.8	12.0
Level of Service	C	B	C		D	B
Approach Delay (s)	26.9		25.5			12.1
Approach LOS	C		C			B

Intersection Summary			
HCM Average Control Delay	23.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	69.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	2	55	190	3	82	365
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.65	0.65	0.77	0.77	0.87	0.87
Hourly flow rate (vph)	3	85	247	4	94	420
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	857	249			251	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	857	249			251	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	89			93	
cM capacity (veh/h)	304	790			1315	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	3	85	251	94	420
Volume Left	3	0	0	94	0
Volume Right	0	85	4	0	0
cSH	304	790	1700	1315	1700
Volume to Capacity	0.01	0.11	0.15	0.07	0.25
Queue Length 95th (ft)	1	9	0	6	0
Control Delay (s)	16.9	10.1	0.0	7.9	0.0
Lane LOS	C	B		A	
Approach Delay (s)	10.3		0.0	1.5	
Approach LOS	B				

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	29.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	4	82	535	5	66	248
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.83	0.89	0.89	0.90	0.90
Hourly flow rate (vph)	5	99	601	6	73	276
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1026	604			607	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1026	604			607	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	80			92	
cM capacity (veh/h)	240	498			971	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	5	99	607	73	276
Volume Left	5	0	0	73	0
Volume Right	0	99	6	0	0
cSH	240	498	1700	971	1700
Volume to Capacity	0.02	0.20	0.36	0.08	0.16
Queue Length 95th (ft)	2	18	0	6	0
Control Delay (s)	20.3	14.0	0.0	9.0	0.0
Lane LOS	C	B		A	
Approach Delay (s)	14.3		0.0	1.9	
Approach LOS	B				

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	45.5%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX D

TRIP GENERATION

TRIP GENERATION RATE
TRUCK TRAFFIC FOR JUNE 2010
PROVIDED BY HAWAIIAN EARTH RECYCLING LLC

Day	AM Peak			PM Peak		
	In	Out	Total	In	Out	Total
6/1/2010	14	4	18	5	1	6
6/2/2010	11	3	14	6	3	9
6/3/2010	13	2	15	5	1	6
6/4/2010	21	2	23	5	0	5
6/5/2010	9	3	12	1	3	4
6/6/2010	4	0	4	0	0	0
6/7/2010	9	3	12	3	1	4
6/8/2010	12	1	13	5	3	8
6/9/2010	19	1	20	5	1	6
6/10/2010	13	2	15	3	0	3
6/11/2010	18	3	21	3	1	4
6/12/2010	8	8	16	1	3	4
6/13/2010	7	0	7	0	0	0
6/14/2010	16	1	17	6	3	9
6/15/2010	17	0	17	2	4	6
6/16/2010	16	1	17	1	1	2
6/17/2010	26	3	29	10	1	11
6/18/2010	19	2	21	7	1	8
6/19/2010	9	5	14	1	1	2
6/20/2010	1	0	1	0	0	0
6/21/2010	10	1	11	6	0	6
6/22/2010	12	3	15	5	1	6
6/23/2010	19	0	19	7	4	11
6/24/2010	14	2	16	6	3	9
6/25/2010	13	6	19	4	4	8
6/26/2010	10	4	14	1	3	4
6/27/2010	2	0	2	0	0	0
6/28/2010	12	3	15	1	1	2
6/29/2010	15	2	17	1	1	2
6/30/2010	10	0	10	3	0	3
Total	**379**	**65**	**444**	**103**	**45**	**148**
Average	**13**	**2**	**15**	**3**	**2**	**5**
Rate			**0.17**	**0.04**	**0.02**	**0.06**
Directional	**85%**	**15%**		**70%**	**30%**	

Trip Generation for 150,000 TPY:

AM Peak	Rate	Trips
Total	0.17	26
In		22
Out		4
PM Peak	**Rate**	**Trips**
Total	0.06	9
In		6
Out		3

APPENDIX E

CAPACITY ANALYSIS CALCULATIONS
PROJECTED YEAR 2014 PEAK HOUR TRAFFIC
ANALYSIS WITHOUT PROJECT



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	280	1	195	0	1	371
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	1863		1770	1863
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	1583	1863		1770	1863
Peak-hour factor, PHF	0.95	0.95	0.79	0.79	0.85	0.85
Adj. Flow (vph)	295	1	247	0	1	436
RTOR Reduction (vph)	0	1	0	0	0	0
Lane Group Flow (vph)	295	0	247	0	1	436
Turn Type		Perm			Prot	
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	12.6	12.6	14.6		0.8	20.4
Effective Green, g (s)	12.6	12.6	14.6		0.8	20.4
Actuated g/C Ratio	0.29	0.29	0.34		0.02	0.47
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	519	464	633		33	884
v/s Ratio Prot	c0.17		0.13		0.00	c0.23
v/s Ratio Perm		0.00				
v/c Ratio	0.57	0.00	0.39		0.03	0.49
Uniform Delay, d1	12.9	10.7	10.8		20.7	7.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.4	0.0	0.4		0.4	0.4
Delay (s)	14.3	10.7	11.2		21.1	8.2
Level of Service	B	B	B		C	A
Approach Delay (s)	14.3		11.2			8.2
Approach LOS	B		B			A

Intersection Summary			
HCM Average Control Delay	10.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	43.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5: Kamananui & Wilikina

2/17/2011

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	523	1	547	0	1	255
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	1863		1770	1863
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	1583	1863		1770	1863
Peak-hour factor, PHF	0.90	0.90	0.94	0.94	0.84	0.84
Adj. Flow (vph)	581	1	582	0	1	304
RTOR Reduction (vph)	0	1	0	0	0	0
Lane Group Flow (vph)	581	0	582	0	1	304
Turn Type		Perm			Prot	
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	27.7	27.7	27.1		0.6	32.7
Effective Green, g (s)	27.7	27.7	27.1		0.6	32.7
Actuated g/C Ratio	0.39	0.39	0.38		0.01	0.46
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	696	623	717		15	865
v/s Ratio Prot	c0.33		c0.31		0.00	c0.16
v/s Ratio Perm		0.00				
v/c Ratio	0.83	0.00	0.81		0.07	0.35
Uniform Delay, d1	19.3	13.0	19.4		34.6	12.1
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	8.5	0.0	7.0		1.9	0.2
Delay (s)	27.8	13.0	26.3		36.5	12.3
Level of Service	C	B	C		D	B
Approach Delay (s)	27.8		26.3			12.4
Approach LOS	C		C			B

Intersection Summary			
HCM Average Control Delay	24.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	70.4	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
3: Kaukonahua & Wilikina

2/17/2011

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	2	56	193	3	83	370
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.65	0.65	0.77	0.77	0.87	0.87
Hourly flow rate (vph)	3	86	251	4	95	425
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	869	253			255	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	869	253			255	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	89			93	
cM capacity (veh/h)	299	786			1310	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	3	86	255	95	425
Volume Left	3	0	0	95	0
Volume Right	0	86	4	0	0
cSH	299	786	1700	1310	1700
Volume to Capacity	0.01	0.11	0.15	0.07	0.25
Queue Length 95th (ft)	1	9	0	6	0
Control Delay (s)	17.2	10.1	0.0	8.0	0.0
Lane LOS	C	B		A	
Approach Delay (s)	10.4		0.0	1.5	
Approach LOS	B				

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	29.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	4	83	543	5	67	252
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.83	0.89	0.89	0.90	0.90
Hourly flow rate (vph)	5	100	610	6	74	280
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1042	613			616	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1042	613			616	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	80			92	
cM capacity (veh/h)	235	493			964	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	5	100	616	74	280
Volume Left	5	0	0	74	0
Volume Right	0	100	6	0	0
cSH	235	493	1700	964	1700
Volume to Capacity	0.02	0.20	0.36	0.08	0.16
Queue Length 95th (ft)	2	19	0	6	0
Control Delay (s)	20.7	14.2	0.0	9.0	0.0
Lane LOS	C	B		A	
Approach Delay (s)	14.5		0.0	1.9	
Approach LOS	B				

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX F

CAPACITY ANALYSIS CALCULATIONS
PROJECTED YEAR 2014 PEAK HOUR TRAFFIC
ANALYSIS WITH PROJECT

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	280	1	217	0	1	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	1696		1770	1845
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	1583	1696		1770	1845
Peak-hour factor, PHF	0.95	0.95	0.79	0.79	0.85	0.85
Adj. Flow (vph)	295	1	275	0	1	441
RTOR Reduction (vph)	0	1	0	0	0	0
Lane Group Flow (vph)	295	0	275	0	1	441
Heavy Vehicles (%)	2%	2%	12%	2%	2%	3%
Turn Type		Perm			Prot	
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	12.9	12.9	15.3		0.8	21.1
Effective Green, g (s)	12.9	12.9	15.3		0.8	21.1
Actuated g/C Ratio	0.29	0.29	0.35		0.02	0.48
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	519	464	590		32	885
v/s Ratio Prot	c0.17		0.16		0.00	c0.24
v/s Ratio Perm		0.00				
v/c Ratio	0.57	0.00	0.47		0.03	0.50
Uniform Delay, d1	13.2	11.0	11.2		21.2	7.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.4	0.0	0.6		0.4	0.4
Delay (s)	14.6	11.0	11.8		21.6	8.3
Level of Service	B	B	B		C	A
Approach Delay (s)	14.6		11.8			8.3
Approach LOS	B		B			A

Intersection Summary			
HCM Average Control Delay	11.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	44.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	43.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	523	1	553	0	1	258
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	1845		1770	1845
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	1583	1845		1770	1845
Peak-hour factor, PHF	0.90	0.90	0.94	0.94	0.84	0.84
Adj. Flow (vph)	581	1	588	0	1	307
RTOR Reduction (vph)	0	1	0	0	0	0
Lane Group Flow (vph)	581	0	588	0	1	307
Heavy Vehicles (%)	2%	2%	3%	2%	2%	3%
Turn Type		Perm			Prot	
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	27.9	27.9	27.6		0.6	33.2
Effective Green, g (s)	27.9	27.9	27.6		0.6	33.2
Actuated g/C Ratio	0.39	0.39	0.39		0.01	0.47
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	695	621	716		15	862
v/s Ratio Prot	c0.33		c0.32		0.00	c0.17
v/s Ratio Perm		0.00				
v/c Ratio	0.84	0.00	0.82		0.07	0.36
Uniform Delay, d1	19.5	13.1	19.5		35.0	12.1
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	8.6	0.0	7.5		1.9	0.3
Delay (s)	28.1	13.1	27.1		36.8	12.4
Level of Service	C	B	C		D	B
Approach Delay (s)	28.1		27.1			12.4
Approach LOS	C		C			B

Intersection Summary			
HCM Average Control Delay	24.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	71.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
7: Driveway & Wilikina

2/17/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	4	22	196	372	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	4	24	213	404	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	665	404	404			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	665	404	404			
tC, single (s)	6.4	7.2	5.1			
tC, 2 stage (s)						
tF (s)	3.5	4.2	3.1			
p0 queue free %	100	99	97			
cM capacity (veh/h)	412	479	776			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	4	237	404
Volume Left	0	24	0
Volume Right	4	0	0
cSH	479	776	1700
Volume to Capacity	0.01	0.03	0.24
Queue Length 95th (ft)	1	2	0
Control Delay (s)	12.6	1.3	0.0
Lane LOS	B	A	
Approach Delay (s)	12.6	1.3	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
7: Wilikina &

2/17/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	3	6	548	256	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	3	7	596	278	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	887	278	278			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	887	278	278			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	99			
cM capacity (veh/h)	313	761	1284			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	3	602	278
Volume Left	0	7	0
Volume Right	3	0	0
cSH	761	1284	1700
Volume to Capacity	0.00	0.01	0.16
Queue Length 95th (ft)	0	0	0
Control Delay (s)	9.8	0.1	0.0
Lane LOS	A	A	
Approach Delay (s)	9.8	0.1	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	43.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Kaukonahua & Wilikina

2/17/2011

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	2	56	193	3	83	370
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.65	0.65	0.77	0.77	0.87	0.87
Hourly flow rate (vph)	3	86	251	4	95	425
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	869	253			255	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	869	253			255	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	89			93	
cM capacity (veh/h)	299	786			1310	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	3	86	255	95	425
Volume Left	3	0	0	95	0
Volume Right	0	86	4	0	0
cSH	299	786	1700	1310	1700
Volume to Capacity	0.01	0.11	0.15	0.07	0.25
Queue Length 95th (ft)	1	9	0	6	0
Control Delay (s)	17.2	10.1	0.0	8.0	0.0
Lane LOS	C	B		A	
Approach Delay (s)	10.4		0.0	1.5	
Approach LOS	B				

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	29.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Kaukonahua & Wilikina

2/17/2011

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	4	83	543	5	67	252
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.83	0.89	0.89	0.90	0.90
Hourly flow rate (vph)	5	100	610	6	74	280
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1042	613			616	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1042	613			616	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	80			92	
cM capacity (veh/h)	235	493			964	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	5	100	616	74	280
Volume Left	5	0	0	74	0
Volume Right	0	100	6	0	0
cSH	235	493	1700	964	1700
Volume to Capacity	0.02	0.20	0.36	0.08	0.16
Queue Length 95th (ft)	2	19	0	6	0
Control Delay (s)	20.7	14.2	0.0	9.0	0.0
Lane LOS	C	B		A	
Approach Delay (s)	14.5		0.0	1.9	
Approach LOS	B				

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix J

Letter from Department of Planning & Permitting
May 25, 2011

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
TELEPHONE: (808) 768-8000 • FAX: (808) 768-6041
DEPT. WEB SITE: www.honoluludpp.org • CITY WEB SITE: www.honolulu.gov

PETER B. CARLISLE
MAYOR

DAVID K. TANOUE
DIRECTOR

JIRO A. SUMADA
DEPUTY DIRECTOR

2011/ELOG-522(ST)

May 25, 2011

RECEIVED
MAY 26 2011
WILSON OKAMOTO CORPORATION

Mr. Earl Matsukawa
Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Matsukawa:

Subject: In-Vessel Composting Facility
Hawaiian Earth Recycling, LLC
65-1101 Wilikina Drive - Waialua
Tax Map Key 6-5-2: 26

This letter is in response to your letter of March 7, 2011, and confirms the meeting of May 18, 2011, which was attended by Greg Apa, Mark Cummings, Keith Kurahashi, and yourself, and the Director of the Department of Planning and Permitting (DPP) and several members of our staff, regarding the need for a State Special Use Permit (SUP) for the proposed in-vessel composting facility at the above site.

As you are aware, on January 12, 2011 (the pre-assessment consultation for No. 2010/ELOG-2633), the DPP concluded that the processing of municipal sewage residue is not a typical agricultural use, and therefore, the proposed operation that utilizes dewatered sewage sludge requires an SUP or a State Land Use District Boundary Amendment (to a more appropriate district) pursuant to Chapter 205, Hawaii Revised Statutes.

During the May 18 meeting, the Director reconfirmed that an SUP is required, and acknowledged that, although there is no trigger for an Environmental Impact Statement (EIS), the Department of Environmental Services has required that your client prepare an EIS, pursuant to the EIS requirements prescribed by Chapter 343, Hawaii Revised Statutes. Therefore, during the EIS review process, the DPP will provide additional comments regarding the facility. Based on the submitted information, it appears that the area, which will be subject to the SUP (versus other non-sludge utilizing areas) will be less than 15 total acres. Therefore, the SUP will fall under the purview of the Honolulu Planning Commission and not the State Land Use Commission. The DPP will process the SUP and the Conditional Use Permit (Major) for the major composting facility concurrently to the extent possible.

If you have any questions regarding this letter, please call Steve Tagawa of our staff at 768-8024.

Very truly yours,

David K. Tanoue, Director
Department of Planning and Permitting

DKT:cs

cc: Planning Division (Kathy Sokugawa)
DOA (Earl Yamamoto)

Appendix K

Pre-Assessment Consultation Comment Letters

DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND, PACIFIC REGION
HEADQUARTERS, UNITED STATES ARMY GARRISON, HAWAII
851 WRIGHT AVENUE, WHEELER ARMY AIRFIELD
SCHOFIELD BARRACKS, HAWAII 96857-5000

REPLY TO
ATTENTION OF

EM

JAN 1 1 2011

Office of the Garrison Commander

RECEIVED
JAN 14 2011
WILSON OKAMOTO CORPORATION

Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826
Attention: Mr. Earl Matsukawa, Project Manager

Dear Mr. Matsukawa,

Thank you for the opportunity to review the project summary and exhibits sent in the December 03, 2010 solicitation for comments titled "Environmental Assessment (EA) / Environmental Impact Statement Preparation Notice (EISPN), Pre-Assessment Consultation, In-Vessel Composting Facility Project, Tax Map Key: 6-5-002:026, Wailua, Oahu, Hawaii".

In response I request the following items be addressed in preparation of any environmental assessment documentation. Please consider:

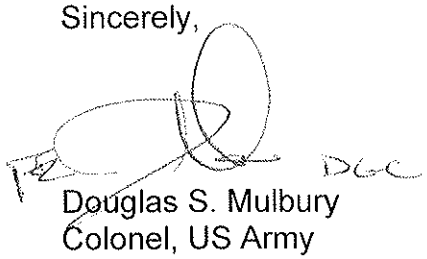
a. Traffic Impacts to Central Oahu and the areas immediate to Schofield Barracks including peak times and months. Note that approximately 5,000 Soldiers (that live both on and off post) from the 2nd Stryker Brigade, as well as 300 Soldiers from the 307th Signal Battalion at Helemano Military Reservation, are are currently deployed. Traffic data, if collected in the immediate future, may be skewed due to this fact. Please consider this point when calculating and determining potential traffic impacts.

b. Air Quality (odor and particulate matter). Schofield Barracks may potentially be impacted due to the close proximity of the proposed project site to Schofield Barracks. Please generate and display radial odor contours and compare to industry standard guidance/values for incorporation into documentation meant for review. Indicate odor values for both Gore™ covered and uncovered compost as well as anticipated length of time material will be uncovered. Additionally, please indicate whether particulate emissions are anticipated and if so what would the region of influence be as well as what impacts are anticipated.

c. Noise from both traffic and facility operations are likely to occur. Please examine the potential impacts to the surrounding areas and display radial noise contours and compare to industry standard guidance/values for incorporation into documentation meant for review.

I request the opportunity and look forward to review any draft environmental documentation prepared concerning this innovative composting facility. If you should have any questions please contact William Rogers at 656-1530.

Sincerely,



Douglas S. Mulbury
Colonel, US Army
Commanding

WILSON OKAMOTO
CORPORATION
ENGINEERS | PLANNERS | CONSULTANTS

1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii, 96826 USA
Phone: 808-946-2277
FAX: 808-946-2253
www.wilsonokamoto.com

8135-01
February 23, 2011

Colonel Douglas S. Mulbury
Department of the Army
US Army Installation Management Command, Pacific Region
Headquarters, United States Army Garrison, Hawaii
851 Wright Avenue, Wheeler Army Airfield
Schofield Barracks, HI 96857

Attention: Mr. William Rogers

Subject: Environmental Assessment (EA)/Environmental Impact Statement Preparation Notice (EISPN) Pre-Assessment Consultation
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Colonel Mulbury:

Thank you for your letter dated January 11, 2011. We offer the following responses in respective order of your comments:

1. A Traffic Impact Assessment will be prepared and findings included in the forthcoming Draft Environmental Impact Statement (EIS). We appreciate the information on the status of troop deployment. The information will be forwarded to the traffic engineers for consideration.

2. The in-vessel composting system is a system that is effective in odor control. The receiving building will be an enclosed/covered facility, where all pre-consumer and post-consumer food wastes, green waste and dewatered sewage sludge are delivered. The receiving facility will have a biofilter system, an odor removing air filter system, as the primary odor control measure.

   Short-term and long-term impacts will be discussed in the forthcoming Draft EIS. Noise and air quality impacts will comply with State Department of Health Administrative Rules.

3. A copy of the forthcoming EISPN and subsequent Draft EIS will be sent to you for your review and comment.

Should you have any questions, please call Tracy Fukuda or myself at 946-2277. Thank you for your participation during the EIS process.

Sincerely,

Earl Matsukawa, AICP
Project Manager

Enclosures

cc: Mr. Greg Apa, Hawaiian Earth Recycling LLC
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

NEIL AMBERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN T. OKAHARA
DEPUTY DIRECTOR

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

(P)1302.0

JAN - 4 2011

RECEIVED
JAN 05 2011
WILSON OKAMOTO CORPORATION

Mr. Earl Matsukawa, Project Manager
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawai'i 96826

Dear Mr. Matsukawa:

Subject: Environmental Assessment/Environmental Impact Statement Preparation Notice Pre-Assessment Consultation
In-Vessel Composting Facility Project
Wailua, Oahu, Hawai'i
TMK: (1) 6-5-002: 026

Thank you for the opportunity to provide comments for the subject project. The proposed project does not impact any of the Department of Accounting and General Services' projects or existing facilities, and we have no comments to offer at this time.

If you have any questions please have your staff call Ms. Gayle Takasaki of the Public Works Division at 586-0584.

Sincerely,

BRUCE A. COPPA
State Comptroller

GT:lnn

WILSON OKAMOTO
CORPORATION
ENGINEERS | PLANNERS | CONSULTANTS

1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii, 96826 USA
Phone: 808-946-2277
FAX: 808-946-2253
www.wilsonokamoto.com

8135-01
February 23, 2010

Mr. Bruce A. Coppa, Comptroller
Department of Accounting & General Services
Kalanimoku Building
P.O. Box 119
Honolulu, HI 96810

Subject: Environmental Assessment (EA)/Environmental Impact Statement Preparation Notice (EISPN) Pre-Assessment Consultation
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Coppa:

Thank you for your letter dated January 4, 2011 (Ref. No. (P)1302.0). We acknowledge that you have no comments to offer at this time and the proposed project does not impact any of the Department's projects or existing facilities.

Should you have any questions, please call Tracy Fukuda or myself at 946-2277. Thank you for your participation during the EIS process.

Sincerely,

Earl Matsukawa, AICP
Project Manager

Enclosures

cc: Mr. Greg Apa, Hawaiian Earth Recycling LLC
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

Neil Abercrombie
GOVERNOR OF HAWAII

Keith R. Ridley
Acting Director of Health

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

In reply, please refer to:
EMD/CWB

12071PDCL.10

December 29, 2010

EM

Mr. Earl Matsukawa, AICP
Project Manager
Wilson Okamoto Corporation
1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii 96826

RECEIVED
JAN 03 2011
WILSON OKAMOTO CORPORATION

Dear Mr. Matsukawa:

SUBJECT: Comments on Environmental Assessment/Environmental Impact Statement Preparation Notice (EA/EISPN) Pre-Assessment Consultation for the In-Vessel Composting Facility Project Wailua, Island of Oahu, Hawaii

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges receipt of your letter, dated December 3, 2010, requesting comments on the subject project. We have reviewed your letter and offer these comments on your project. Please note that our review is based solely on the information provided in your letter and its compliance with Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at http://www.hawaii.gov/health/environmental/env-planning/landuse/CWB-standardcomment.pdf.

1. Any project and its potential impacts to State waters must meet the following criteria:

   a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.

   b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.

   c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).

2. You may be required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for the discharge of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55). For the following types of discharges into Class A or Class 2 State waters, you may apply for NPDES general permit coverage by submitting a Notice of Intent (NOI) form:

a. Storm water associated with construction activities, including clearing, grading, excavation, demolition, stockpiling, and staging 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 start of the construction activities.

b. Storm water associated with industrial activities, as categorized in Title 40 of the Code of Federal Regulations (CFR), Sections 122.26(b)(14)(i) through122.26(b)(14)(ix) and 122.26(b)(14)(xi).

c. Hydrotesting waters.

You must submit a separate NOI form for each type of discharge at least 30 calendar days prior to the start of the discharge activity, except when applying for coverage for discharges of storm water associated with construction activity. For this type of discharge, the NOI must be submitted 30 calendar days before to the start of construction activities. 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.

3. For types of wastewater not listed in Item 2 above or wastewater discharging into Class 1 or Class AA waters, you may need an NPDES individual permit. An application for an NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. The NPDES application forms may be picked up at our office or downloaded from our website at http://www.hawaii.gov/health/environmental/water/cleanwater/forms/indiv-index.html.

4. It is recommended that an assessment be performed on the project's construction and operation related impacts to all State surface waters (including Kaukonahua Stream and any wetlands) in the vicinity of the project site.

5. 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); 40 CFR, Section 122.2; and Hawaii Administrative Rules (HAR), Chapter 11-54.

6. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of $25,000 per day per violation.

If you have any questions, please visit our website at http://www.hawaii.gov/health/environmental/water/cleanwater/index.html, or contact the Engineering Section, CWB, at 586-4309.

Sincerely,

for ALEC WONG, P.E., CHIEF
Clean Water Branch

DCL:ml

c: DOH-EPO # I-3477 [via email only]

WILSON OKAMOTO
CORPORATION
ENGINEERS | PLANNERS | CONSULTANTS

1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii, 96826 USA
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FAX: 808-946-2253
www.wilsonokamoto.com

8135-01
February 23, 2010

Mr. Alec Wong, P.E., Chief
Clean Water Branch
Department of Health
State of Hawaii
P.O. Box 3378
Honolulu, HI 96801

Subject: Environmental Assessment (EA)/Environmental Impact Statement Preparation Notice (EISPN) Pre-Assessment Consultation
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Wong:

Thank you for your letter dated December 29, 2010 (Reference No. EMD/CWB 12071PDCL.10). We offer the following comments in the respective order of your comments:

1. The project will comply with Hawaii Administrative Rules, Chapters 11-54 and 11-55 as applicable to the protection of State waters.

2. The area of disturbance exceeds 1.0 acre and a National Pollutant Discharge Elimination (NPDES) for Stormwater Associated with Construction Activities will be required prior to construction. The forthcoming EISPN will state the natural drainage course for the project site is toward Kaukonahua Stream, which is designated Class 2 Inland.

   Rainfall collected will be directed to retention basins from which water will be drawn to assist the maintenance of proper moisture content of the composting material. The facility will provide separate stormwater and leachate collection and reuse systems. The leachate will be directed to the leachate collection system for re-processing and will not be discharged to the stormwater collection system. Stormwater is handled in a separate collection system and contained in retention basins on the project site. No discharge from basins is anticipated as the water required for operation will exceed the amount stored. Supplemental water from the well will be required to make up the balance. As a result of stormwater remaining on-site, HER will be requesting an exemption from requiring a NPDES for Storm Water Associated with Industrial Activities.

   Hydrotesting and dewatering is not anticipated at this time. Should discharges from dewatering and hydrotesting be required, a NPDES permit will be submitted.

3. The project is not anticipated to increase the discharge of stormwater into State waters. All stormwater generated over proposed impervious surfaced constructed for the composting operation will be kept on site within storm water retention ponds. This water will be used for the composting process.

4. Impacts to surface waters and mitigation measures will be discussed in the forthcoming Draft EIS.

5. The project will not conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into navigable waters. A Section 401 Water Quality Certification is not anticipated.

WILSON OKAMOTO CORPORATION
ENGINEERS | PLANNERS | CONSULTANTS

6. We acknowledge that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 Water Quality Certification are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of $25,000 per day per violation.

Should you have any questions, please call Tracy Fukuda or myself at 946-2277. Thank you for your participation during the EIS process.

Sincerely,

Earl Matsukawa, AICP
Project Manager

Enclosures

cc: Mr. Greg Apa, Hawaiian Earth Recycling LLC
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

NEAL A. PALAFOX, M.D., M.P.H.
INTERIM DIRECTOR OF HEALTH

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

In reply, please refer to:
File:
11-030A CAB

EM

January 24, 2011

Mr. Earl Matsukawa, AICP
Project Manager
Wilson Okamoto Corporation
1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii 96826

RECEIVED
JAN 27 2011
WILSON OKAMOTO CORPORATION

Dear Mr. Matsukawa:

SUBJECT: In-Vessel Composting Facility Project, Waialua, Oahu
Environmental Assessment/Environmental Impact Statement
Pre-Assessment Consultation

The project may require an Air Pollution Control Permit from the Department of Health, Clean Air Branch. The owner or operator must comply with all applicable air permit conditions and requirements. If you need assistance in determining whether a permit is required for this project, please contact the Clean Air Branch at the telephone number provided below.

The project should address the potential dust and odor nuisance concerns. Activities must comply with the provisions of Hawaii Administrative Rules, §11-60.1-33 on Fugitive Dust and §11-59-4 on Ambient Air Quality Standards on Hydrogen Sulfide during construction and daily operations. In addition, for cases involving mixed land use, we strongly recommend that buffer zones be established, wherever possible, in order to alleviate potential dust and odor nuisance problems.

We encourage the contractor to implement a dust control plan, which does not require approval by the Department of Health, to comply with the fugitive dust regulations.

Dust control measures 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 source at the site prior to start-up of construction activities;
c) Landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase;
d) Minimizing 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. Also, controlling dust from daily operations of material being processed, stockpiled, and hauled to and from the facility.

If you have any questions, please contact Mr. Barry Ching of the Clean Air Branch at 586-4200.

Sincerely,

WILFRED K. NAGAMINE
Manager, Clean Air Branch

BC:rg

WILSON OKAMOTO
CORPORATION
ENGINEERS | PLANNERS | CONSULTANTS

1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii, 96826 USA
Phone: 808-946-2277
FAX: 808-946-2253
www.wilsonokamoto.com

8135-01
February 23, 2010

Mr. Wilfred K. Nagamine, Manager
Clean Air Branch
Department of Health
State of Hawaii
P.O. Box 3378
Honolulu, HI 96801-3378

Attention: Mr. Barry Ching

Subject: Environmental Assessment (EA)/Environmental Impact Statement Preparation Notice (EISPN) Pre-Assessment Consultation
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Nagamine:

Thank you for your letter dated January 24, 2011 (Reference No. 11-030A CAB). We acknowledge the project must comply with Department of Health rules during construction and operation of the facility. Air quality impacts will be discussed in the forthcoming EISPN. An air quality study will be conducted and included in the Draft EIS.

The project will comply with fugitive dust rules and mitigation measures will be implemented as appropriate.

Should you have any questions, please call Tracy Fukuda or myself at 946-2277. Thank you for your participation during the EIS process.

Sincerely,

Earl Matsukawa, AICP
Project Manager

Enclosures

cc: Mr. Greg Apa, Hawaiian Earth Recycling LLC
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

EM

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED
DEC 29 2010
WILSON OKAMOTO CORPORATION

December 28, 2010

Wilson Okamoto Corporation
1907 South Beretania Street Suite 400
Honolulu, Hawaii 96826

Attention: Mr. Earl Matsukawa, Project Manager

Ladies and Gentlemen:

Subject: Pre-Assessment Consultation for Environmental Assessment/ Environmental Impact Statement Preparation Notice for Proposed In-Vessel Composting Facility Project

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

Other than the comments from Division of Forestry & Wildlife, Engineering Division, the Department of Land and Natural Resources has no other comments to offer on the subject matter. Should you have any questions, please feel free to call our office at 587-0414. Thank you.

Sincerely,

Russell Y. Tsuji
Administrator

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

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

RECEIVED
LAND DIVISION
2010 DEC 15 P 3:01
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
POST OFFICE BOX 621
HONOLULU, HAWAII 96809
Phone: (808) 587-0433
Fax: (808) 587-0455

December 9, 2010

MEMORANDUM

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

FROM: Charlene Unoki, Assistant Administrator Charlene

SUBJECT: Pre-Assessment Consultation for Environmental Assessment/Environmental Impact Statement Preparation Notice for Proposed In-Vessel Composting Facility Project

LOCATION: Island of Oahu

APPLICANT: Wilson Okamoto Corporation on behalf of the City & County of Honolulu, Department of Environmental Services and Hawaiian Earth Recycling LLC

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by December 23, 2010.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

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

Signed: _____
Date: _____

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/CharleneUnoki
RE:EAPrepNoticeInVesselCompostFacility
Oahu.811

COMMENTS

( ) We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone ___.

(X) **Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone D. The Flood Insurance Program does not have any regulations for developments within Flood Zone D.**

( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ___.

( ) Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

( ) Mr. Robert Sumitomo at (808) 768-8097 or Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting.

( ) Mr. Carter Romero at (808) 961-8943 of the County of Hawaii, Department of Public Works.

( ) Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.

( ) Ms. Wynne Ushigome at (808) 241-4890 of the County of Kauai, Department of Public Works.

( ) The applicant should include water demands and infrastructure required to meet project needs. Please note that projects within State lands requiring water service from the Honolulu Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.

( ) The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.

( ) Additional Comments: _____

( ) Other: _____

Should you have any questions, please call Ms. Suzie S. Agraan of the Planning Branch at 587-0258.

Signed: _____
CARTY S. CHANG, CHIEF ENGINEER

Date: 12/14/10

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809
Phone: (808) 587-0433
Fax: (808) 587-0455

RECEIVED
LAND DIVISION
2010 DEC 15 P 3:05
DEPT OF LAND & NATURAL RESOURCES
STATE OF HAWAII

December 9, 2010

MEMORANDUM

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

FROM: Charlene Unoki, Assistant Administrator Charlene

SUBJECT: Pre-Assessment Consultation for Environmental Assessment/Environmental Impact Statement Preparation Notice for Proposed In-Vessel Composting Facility Project

LOCATION: Island of Oahu

APPLICANT: Wilson Okamoto Corporation on behalf of the City & County of Honolulu, Department of Environmental Services and Hawaiian Earth Recycling LLC

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by December 23, 2010.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

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

Signed: Barry Key
Date: 12-14-10

WILSON OKAMOTO
CORPORATION
ENGINEERS | PLANNERS | CONSULTANTS

1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii, 96826 USA
Phone: 808-946-2277
FAX: 808-946-2253
www.wilsonokamoto.com

8135-01
February 23, 2010

Mr. Russell Y. Tsuji, Administrator
Land Division
Department of Land & Natural Resources
State of Hawaii
P.O. Box 621
Honolulu, HI 96809

Subject: Environmental Assessment (EA)/Environmental Impact Statement Preparation Notice (EISPN) Pre-Assessment Consultation
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Tsuji:

Thank you for your letter dated December 28, 2010. We offer the following comments in the respective order of your comments:

Engineering Division

1. We acknowledge that the project site is located within Flood Zone D which is defined as areas in which flood hazards are undetermined, but possible. This will be stated in the forthcoming EISPN. No impacts related to flooding are anticipated given the project site's elevation ranges from 855 feet to 940 feet mean sea level.

Division of Forestry and Wildlife

1. We acknowledge that you have no comments to offer at this time.

Should you have any questions, please call Tracy Fukuda or myself at 946-2277. Thank you for your participation during the EIS process.

Sincerely,

Earl Matsukawa, AICP
Project Manager

Enclosures

cc: Mr. Greg Apa, Hawaiian Earth Recycling LLC
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

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

GUY KAULUKUKUI
FIRST DEPUTY

WILLIAM M. TAM
ACTING DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

EM

January 27, 2011

RECEIVED
FEB 01 2011
WILSON OKAMOTO CORPORATION

Earl Matsukawa
Project Manager
Wilson Okamoto Corporation
1907 South Beretania St. Suite 400
Honolulu, HI 96826

LOG NO: 2010.3912
DOC NO: 1101MV25
Archaeology

TF

Dear Mr. Matsukawa:

SUBJECT: **HRS 6E-8 Historic Preservation Review –**
Environmental Assessment/Environmental Impact Statement Preparation Notice
Pre-Consultation for the Waialua In-Vessel Composting Facility
Kamananui Ahupua'a, Waialua District, O'ahu Island
TMK Parcel #: (1) 6-5-002:026

Thank you for the opportunity to comment on the aforementioned EISPN that was received by our office on December 8 2010. We apologize for the delayed review. According to your letter, the City and County of Honolulu plans to develop a green waste composting facility on 112 acres of agricultural land .5 miles north of Schofield Barracks. A review of our records indicates that are no known archaeological sites within this subject parcel. However, our records also indicate there has been no previous archaeological investigation on this subject parcel. Aerial photographs of this project indicate that the proposed site has been modified and utilized for intensive agriculture. Therefore it is highly unlikely that any historic properties remain within the project area.

Your letter indicates that you plan to prepare an "archaeological resources study" as part of the pending EA/EIS. Because of the likely absence of historic sites within the project area, we suggest that you focus this study on whether or not this planned action will have any visual or indirect impact on the historic properties in the vicinity. Our records indicate that the Kukaniloko Birthing Stones (National Register Site 80-04-0218) are located approx 1.5 miles to the east of the proposed site. In addition, the Kaukonahua gulch just south of the project area was undisturbed by the intensive agriculture, and may contain archaeological resources. Therefore the archaeological study should address any impact this project may have on Kaukonahua gulch.

Please contact Michael Vitousek at (808) 692-8029 or Michael.Vitousek@hawaii.gov if you have any questions or concerns regarding this letter.

Aloha,

Theresa K. Donham
Acting Archaeology Branch Chief
Deputy State Historic Preservation Officer
Historic Preservation Division

WILSON OKAMOTO
CORPORATION
ENGINEERS | PLANNERS | CONSULTANTS

1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii, 96826 USA
Phone: 808-946-2277
FAX: 808-946-2253
www.wilsonokamoto.com

8135-01
February 23, 2010

Ms. Theresa K. Donham, Acting Archaeology Branch Chief
Historic Preservation Division
Department of Land and Natural Resources
State of Hawaii
P.O. Box 621
Honolulu, HI 96809

Attention: Mr. Michael Vitousek

Subject: Environmental Assessment (EA)/Environmental Impact Statement Preparation Notice (EISPN) Pre-Assessment Consultation
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Ms. Donham:

Thank you for your letter dated January 27, 2011 (LOG NO: 2010.3912/DOC NO: 1101MV25). We acknowledge that your review of records indicates no archaeological resources within the project site and that no previous archaeological work has been conducted for the project site.

Visual impacts and environmental impacts to nearby cultural will be discussed in the Draft EIS. An Archaeological Resources Study and Cultural Impact Assessment are being prepared and the results will be included in the Draft EIS.

Should you have any questions, please call Tracy Fukuda or myself at 946-2277. Thank you for your participation during the EIS process.

Sincerely,

Earl Matsukawa, AICP
Project Manager

Enclosures

cc: Mr. Greg Apa, Hawaiian Earth Recycling LLC
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

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

HRD10/5437

December 23, 2010

RECEIVED
JAN 06 2011
WILSON OKAMOTO CORPORATION

EM

Earl Matsukawa
Wilson Okamoto Corporation
1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawai'i 96826

Re: **Pre-Environmental Assessment/Impact Statement Preparation Notice**
In-Vessel Composting Facility Project
Kamananui, Waialua District, Island of O'ahu

Aloha e Earl Matsukawa,

The Office of Hawaiian Affairs (OHA) is in receipt of your December 3, 2010 notification of your intent to prepare an Environmental Assessment/Impact Statement Preparation Notice (EA/ISPN) for a proposed in-vessel composting facility project on 38 acres of land in Kamananui on the Island of O'ahu.

Hawaiian Earth Products is proposing to construct the facility which will process up to 100,000 tons of material for composting a year. Operations may be expanded in the future through agreements with the Honolulu City and County (C&C). The facility will take material from existing C&C facilities.

OHA has no specific comments at this time. Thank you for initiating consultation at this early stage and we look forward to reviewing the EA/ISPN and providing additional comments at that time. Should you have any questions, please contact Keola Lindsey at 594-0244 or keolal@oha.org.

'O wau iho nō me ka 'oia'i'o,

Clyde W. Nāmu'o
Chief Executive Officer

WILSON OKAMOTO
CORPORATION
ENGINEERS | PLANNERS | CONSULTANTS

1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii, 96826 USA
Phone: 808-946-2277
FAX: 808-946-2253
www.wilsonokamoto.com

8135-01
February 23, 2010

Mr. Clyde Namuo, Chief Executive Officer
Office of Hawaiian Affairs
711 Kapiolani Boulevard, Suite 500
Honolulu, HI 96813

Attention: Mr. Keola Lindsey

Subject: Environmental Assessment (EA)/Environmental Impact Statement Preparation Notice (EISPN) Pre-Assessment Consultation
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Namuo:

Thank you for your letter dated December 23, 2010 (Reference No. HRD10/5437). We acknowledge that you have no comments to offer at this time. An Archaeological Literature Review and Cultural Impact Assessment are being conducted and the results will be included in the Draft EIS. A copy of the forthcoming EISPN will be sent to you for your review and comment.

Should you have any questions, please call Tracy Fukuda or myself at 946-2277. Thank you for your participation during the EIS process.

Sincerely,

Earl Matsukawa, AICP
Project Manager

Enclosures

cc: Mr. Greg Apa, Hawaiian Earth Recycling LLC
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

NEIL ABERCROMBIE
GOVERNOR

GLENN M. OKIMOTO
INTERIM DIRECTOR

Deputy Directors
Ford N. Fuchigami
Jan S. Gouveia
Randy Grune
Jadine Urasaki

IN REPLY REFER TO:
DIR 1528
STP 8.0309

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

January 6, 2011

RECEIVED
JAN 13 2011
WILSON OKAMOTO CORPORATION

Mr. Earl Matsukawa, Project Manager
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Matsukawa:

Subject: In-Vessel Composting Facility Project
Pre-Assessment Consultation for Environmental Assessment (EA)/
Environmental Impact Statement Preparation Notice (EISPN)

Thank you for requesting the State Department of Transportation's (DOT) review of the subject project.

DOT understands that the City and County of Honolulu, Department of Environmental Services (ENV) and Hawaiian Earth Recycling LLC are proposing to construct an in-vessel composting facility in Waialua. The proposed facility will consist of: truck weighing scale, enclosed tipping and preparation building, open processing area, stormwater retention pond, leachate storage tank, and an open product storage area. These facilities will encompass 38 acres of the 112 acres parcel. The remainder is used for the existing open windrow composting operations (green-waste only) and a demonstration area using compost to assist crop production. Access to the project will be from Wilikina Drive.

DOT does not anticipate any significant adverse impacts to the State transportation facilities. However, the applicant should be informed that a permit is required from DOT Highways Division, to transport oversized and overweight equipment/loads within the State highway facilities.

DOT appreciates the opportunity to provide comments. If there are any questions, or a need to meet with DOT staff, please contact Mr. David Shimokawa of the DOT Statewide Transportation Planning Office at telephone number (808) 831-7976.

Very truly yours,

GLENN M. OKIMOTO, Ph.D.
Interim Director of Transportation

WILSON OKAMOTO
CORPORATION
ENGINEERS | PLANNERS | CONSULTANTS

1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii, 96826 USA
Phone: 808-946-2277
FAX: 808-946-2253
www.wilsonokamoto.com

8135-01
February 23, 2010

Mr. Glenn M. Okimoto, Interim Director
Department of Transportation
Aliiaimoku Building
869 Punchbowl Street
Honolulu, HI 96813

Attention: Mr. David Shimokawa

Subject: Environmental Assessment (EA)/Environmental Impact Statement Preparation Notice (EISPN) Pre-Assessment Consultation
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Okimoto:

Thank you for your letter dated January 6, 2011 (Reference No. DIR 1528, STP 8.0309). We acknowledge that the Department does not anticipate any significant impacts to State transportation facilities. If oversized and overweight equipment/loads are transported within the State highway facilities, an application for a permit will be submitted to State DOT Highways Division.

A copy of the forthcoming EISPN will be sent to you for your review and comment.

Should you have any questions, please call Tracy Fukuda or myself at 946-2277. Thank you for your participation during the EIS process.

Sincerely,

Earl Matsukawa, AICP
Project Manager

Enclosures

cc: Mr. Greg Apa, Hawaiian Earth Recycling LLC
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843

PETER B. CARLISLE, MAYOR

RANDALL Y. S. CHUNG, Chairman
ANTHONY R. GUERRERO, JR.
WILLIAM K. MAHOE
THERESIA C. McMURDO
ADAM C. WONG

GEORGE "KEOKI" MIYAMOTO, Ex-Officio
MICHAEL D. FORMBY, Ex-Officio

WAYNE M. HASHIRO, P.E.
Manager and Chief Engineer

DEAN A. NAKANO
Deputy Manager

December 14, 2010

Mr. Earl Matsukawa
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

RECEIVED
DEC 21 2010
WILSON OKAMOTO CORPORATION

Dear Mr. Matsukawa:

Subject: Your Letter Dated December 3, 2010 Requesting Comments on the Environmental Assessment (EA)/ Environmental Impact Statement (EIS) Pre-Assessment for the In-Vessel Composting Facility Project, TMK 6-5-2: 26

Thank you for the opportunity to comment on the proposed project.

The Board of Water Supply does not have water facilities in this area. Water service should be provided by a private water system.

If you have any questions, please contact Robert Chun at 748-5443.

Very truly yours,

PAUL S. KIKUCHI
Chief Financial Officer
Customer Care Division

WILSON OKAMOTO
CORPORATION
ENGINEERS | PLANNERS | CONSULTANTS

1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii, 96826 USA
Phone: 808-946-2277
FAX: 808-946-2253
www.wilsonokamoto.com

8135-01
February 23, 2010

Mr. Paul Kikuchi, Chief Financial Officer
Customer Care Division
Board of Water Supply
630 South Beretania Street
Honolulu, HI 96843

Attention: Mr. Robert Chun

Subject: Environmental Assessment (EA)/Environmental Impact Statement Preparation Notice (EISPN) Pre-Assessment Consultation
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Kikuchi:

Thank you for your letter dated December 14, 2010. We acknowledge that the Board of Water Supply does not have facilities in this area and the project will be serviced by its own private water system.

Should you have any questions, please call Tracy Fukuda or myself at 946-2277. Thank you for your participation during the EIS process.

Sincerely,

Earl Matsukawa, AICP
Project Manager

Enclosures

cc: Mr. Greg Apa, Hawaiian Earth Recycling LLC
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
TELEPHONE: (808) 768-8000 • FAX: (808) 768-6041
DEPT. WEB SITE: www.honoluludpp.org • CITY WEB SITE: www.honolulu.gov

EM

PETER B. CARLISLE
MAYOR

DAVID K. TANOUE
DIRECTOR

ROBERT M. SUMITOMO
DEPUTY DIRECTOR

2010/ELOG-2633 (BLB)

January 12, 2011

RECEIVED
JAN 13 2011
WILSON OKAMOTO CORPORATION

Mr. Earl Matsukawa, AICP
Wilson Okamoto Corporation
1907 Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Matsukawa:

Subject: Pre-assessment Consultation
Environmental Assessment (EA)/Environmental Impact Statement Preparation Notice (EISPN)
Hawaiian Earth Recycling LLC
In-Vessel Composting Facility Project
Wilikina Drive - Waialua
Tax Map Key 6-5-2: 26

This is in response to your request, received December 7, 2010, for pre-assessment consultation comments concerning the EA/EISPN for the subject project. We apologize for the lateness in our response, and have the following comments to offer:

Land Use Permits Division Comments:

We understand that the proposed project includes an in-vessel composting facility that will process up to 100,000 tons per year of green waste, food waste, and sewage sludge. The output will be marketable compost products such as soil amendments and potting soil. Please note that our records indicate that the correct zoning of the site is AG-1 Restricted Agricultural District; not AG-2 General Agricultural District, as described in your letter. For purposes of the Land Use Ordinance (LUO), the proposed use is regulated as "major composting." Pursuant to the AG-1 District standards enumerated in LUO Section 21-3.50-4(a) [Table 21-3], a major composting facility is permitted in the AG-1 District subject to an approved Conditional Use Permit (Major). The project site is not in the Special Management Area.

For questions regarding the Land Use Permits Division comments, please contact Blake La Benz of our staff at 768-8016.

Planning Division Comments:

With regards to the North Shore Sustainable Community Plan, the project is not consistent with the Policies and Guidelines pertaining to Agricultural Lands and Agricultural Support Facilities, since it does not propose to maintain a direct relationship to local agricultural production. Hence there is no relationship between the project and crop production, sales, or research. Our records also indicate that the project site is in the State Land Use Agriculture District. The recycling of off-site green waste, food waste, and the treatment of sewage sludge are not permissible uses within the State Agricultural District, and will require an approved Special Use Permit.

For any questions regarding Planning Division comments, please contact Bonnie Arakawa of our staff at 768-8048.

Thank you for this opportunity to review and comment on the EA/EISPN for the subject project.

Very truly yours,

David K. Tanoue, Director
Department of Planning and Permitting

DKT:cs

WILSON OKAMOTO
CORPORATION
ENGINEERS | PLANNERS | CONSULTANTS

1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii, 96826 USA
Phone: 808-946-2277
FAX: 808-946-2253
www.wilsonokamoto.com

8135-01
February 23, 2010

Mr. David Tanoue, Director
Department of Planning & Permitting
City & County of Honolulu
650 South King Street
Honolulu, HI 96813

Attention: Mr. Blake La Benz and Ms. Bonnie Arakawa

Subject: Environmental Assessment (EA)/Environmental Impact Statement Preparation Notice (EISPN) Pre-Assessment Consultation
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Tanoue:

Thank you for your letter of January 12, 2011 conveying comments of your Land Use Permits Division and Planning Division, respectively. Pursuant to our meeting on February 22, 2011 with you and your staff, we will prepare correspondence discussing the nature of the proposed use relative to the permits and plan cited in your letter. We will also request your determination of the applicable land use regulatory requirements. Your determination will be included in the identification of required permits and approvals in the subsequent Draft EIS.

Should you have any questions, please call Tracy Fukuda or myself at 946-2277. Thank you for your participation during the EIS process.

Sincerely,

Earl Matsukawa, AICP
Project Manager

Enclosures

cc: Mr. Greg Apa, Hawaiian Earth Recycling LLC
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

DEPARTMENT OF TRANSPORTATION SERVICES

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 3RD FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8305 • Fax: (808) 768-4730 • Internet: www.honolulu.gov

PETER B. CARLISLE
MAYOR

WAYNE Y. YOSHIOKA
ACTING DIRECTOR

KAI NANI KRAUT, P.E.
DEPUTY DIRECTOR

KENNETH TORU HAMAYASU, P.E.
DEPUTY DIRECTOR

EM

TP12/10-394791R

January 25, 2011

RECEIVED
JAN 27 2011
WILSON OKAMOTO CORPORATION

Mr. Earl Matsukawa, AICP
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Matsukawa:

Subject: Pre-Consultation for Environmental Assessment (EA)/Environmental Impact Statement (EISPN): In-Vessel Composting Facility, Wailua, Oahu, Hawaii

This responds to your letter requesting consultation in preparing for an EA/EISPN related to the subject project.

The department wishes to reserve comment on the project pending the preparation of a traffic impact assessment study for the EA/EISPN document. Upon completion of the study, we request that a copy of the study be forwarded to our department for review and comment.

Thank you for the opportunity to participate in your consultation process.

Very truly yours,

WAYNE Y. YOSHIOKA
Acting Director

WILSON OKAMOTO
CORPORATION
ENGINEERS | PLANNERS | CONSULTANTS

1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii, 96826 USA
Phone: 808-946-2277
FAX: 808-946-2253
www.wilsonokamoto.com

8135-01
February 23, 2010

Mr. Wayne Yoshioka, Director
Department of Transportation Services
City & County of Honolulu
650 South King Street, 3rd Floor
Honolulu, HI 96813

Subject: Environmental Assessment (EA)/Environmental Impact Statement Preparation Notice (EISPN) Pre-Assessment Consultation
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Yoshioka:

Thank you for your letter dated January 25, 2011 (Reference No. TP12/10-394791R). We acknowledge you wish to reserve comment pending review of the traffic impact assessment report (TIAR) is completed, which will be included in the Draft EIS.

Should you have any questions, please call Tracy Fukuda or myself at 946-2277. Thank you for your participation during the EIS process.

Sincerely,

Earl Matsukawa, AICP
Project Manager

Enclosures

cc: Mr. Greg Apa, Hawaiian Earth Recycling LLC
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

Appendix L

Environmental Impact Statement Preparation Notice Consultation Comment Letters

EM

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN T. OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810-0119

(P)1057.1

MAR 2 1 2011

RECEIVED
MAR 2 2 2011
WILSON OKAMOTO CORPORATION

Mr. Earl Matsukawa, Project Manager
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Matsukawa:

Subject: Environmental Assessment (EA)/Environmental Impact Statement Preparation Notice (EISPN) Pre-Assessment Consultation
In-Vessel Composting Facility Project
Wailua, Oahu, Hawai'i
TMK: (1) 6-5-002: 026

Thank you for the opportunity to provide comments for the subject property. The proposed project does not impact any of the Department of Accounting and General Services' projects or existing facilities, and we have no comments to offer at this time.

If you have any questions, please call me at 586-0400 or have your staff call Ms. Gayle Takasaki of the Public Works Division at 586-0584.

Sincerely,

BRUCE A. COPPA
State Comptroller

c: Mr. Steven Serikaku, C&C DES

WILSON OKAMOTO
CORPORATION
ENGINEERS | PLANNERS | CONSULTANTS

1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii, 96826 USA
Phone: 808-946-2277
FAX: 808-946-2253
www.wilsonokamoto.com

8135-01
June 9, 2011

Mr. Bruce A. Coppa, Comptroller
Department of Accounting & General Services
Kalanimoku Building
P.O. Box 119
Honolulu, HI 96810

Subject: Environmental Impact Statement Preparation Notice (EISPN)
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Coppa:

Thank you for your letter dated March 24, 2011 (Ref. No. (P)1057.1). We acknowledge that the proposed project does not impact any of the Department's projects or existing facilities and that you have no comments to offer at this time.

Should you have any questions, please call Tracy Fukuda or myself at 946-2277. Thank you for your participation during the EIS process.

Sincerely,

for Earl Matsukawa, AICP
Project Manager

cc: Mr. Greg Apa, Hawaiian Earth Recycling LLC
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

NEIL ABERCROMBIE
GOVERNOR
STATE OF HAWAI'I

ALBERT "ALAPAKI" NAHALE-A
CHAIRMAN
HAWAIIAN HOMES COMMISSION

ROBERT J. HALL
DEPUTY TO THE CHAIRMAN

STATE OF HAWAI'I
DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HAWAI'I 96805

EM
TF

March 10, 2011

RECEIVED
MAR 11 2011
WILSON OKAMOTO CORPORATION

Wilson Okamoto Corporation
Attn: Mr. Earl Matsukawa, AICP
Suite 400, Artesian Plaza
1907 South Beretania Street
Honolulu, Hawaii 96826

Subject: Environmental Assessment/Environmental Impact Statement Preparation Notice
In-Vessel Composting Facility Project
Waialua, Island of Oahu, Hawaii
Tax Map Keys: 6-5-002:026

Aloha Mr. Matsukawa:

Mahalo for the opportunity to provide comment regarding the subject proposal.

The Department of Hawaiian Home Lands has no comments to offer.

If you have any questions, please call Darrell Yagodich at 620-9418 or by email at darrell.c.yagodich@hawaii.gov.

Me ke Aloha

Albert "Alapaki" Nahale-a
Chairman, Hawaiian Home Lands

Cc: City and County of Honolulu
Mr. Steven Serikaku

WILSON OKAMOTO
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8135-01
June 9, 2011

Mr. Albert "Alapaki" Nahale-a, Chairman
Departmetn of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96808

Attention: Mr. Darrell Yagodich

Subject: Environmental Impact Statement Preparation Notice (EISPN)
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Nahale-a:

Thank you for your letter dated March 10, 2010. We acknowledge that you have no comments to offer at this time.

Should you have any questions, please call Tracy Fukuda or myself at 946-2277. Thank you for your participation during the EIS process.

Sincerely,

for Earl Matsukawa, AICP
Project Manager

cc: Mr. Greg Apa, Hawaiian Earth Recycling LLC
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

Tracy Fukuda

From: Wilson Okamoto Corporation
Sent: Friday, April 08, 2011 10:01 AM
To: Tracy Fukuda
Subject: FW: Comments on an FEA-EISPN for the In-Vessel Composting Facility at Waialua, Oahu by the City and County of Honolulu
Importance: High
Attachments: oledata.mso; image001.wmz; image003.wmz; image002.gif

From: Segundo, Leslie [mailto:ehs001oeqc@doh.hawaii.gov]
Sent: Thursday, April 07, 2011 6:56 PM
To: Wilson Okamoto Corporation; info@opala.org
Cc: Hooser, Gary L; mayor@honolulu.gov
Subject: Comments on an FEA-EISPN for the In-Vessel Composting Facility at Waialua, Oahu by the City and County of Honolulu
Importance: High

NEIL ABERCROMBIE
GOVERNOR OF HAWAI'I

GARY L. HOOSER
INTERIM DIRECTOR

STATE OF HAWAI'I
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
235 SOUTH BERETANIA STREET
LEIOPAPA A KAMEHAMEHA, SUITE 702
HONOLULU, HAWAI'I 96813
Telephone (808) 586-4185
Facsimile (808) 586-4186
Electronic Mail: OEQC@doh.hawaii.gov

April 7, 2011

Hawaiian Earth Recycling LLC
91-400 Malakole Street
Kapolei, Hawai'i 96707

Mr. Stephen Serikaku
City and County of Honolulu
Department of Environmental Services
1000 'Ulu'ohi'a Street, Suite 308
Kapolei, Hawai'i 96707

Ms. Tracy Fukuda
Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hawai'i 96826

Dear Hawaiian Earth Recycling LLC, Mr. Serikaku, and Ms. Fukuda::

The Office of Environmental Quality Control has reviewed the Final Environmental Assessment (FEA) for the In-Vessel Composting Facility situated at Tax Map Key 6-5-002, in the judicial district of Waialua, on the island of

O'ahu. At the outset, the City and County of Honolulu, Department of Environmental Services determined that the proposed action by the City and County of Honolulu as owner, and Hawaiian Earth Recycling LLC, as operator of the City owned facility, did not trigger the requirements for Chapter 343, HRS; but both the Department of Environmental Services and that both the City and Hawaiian Earth Recycling agreed that contractual requirements mandate that the proposed action undergo the Chapter 343, Hawai'i Revised Statutes process as an Environmental Impact Statement Preparation Notice (pursuant to Section 11-200-15, Hawai'i Administrative Rules) – the use of City lands.

Since the parties (the City and its facility operator) have agreed to undergo the EIS process for the use of City lands, under Section 11-200-4, Hawaii Administrative Rules, the mayor of the City and County of Honolulu would become the accepting authority for the subsequent final Environmental Impact Statement.

The process appears to resemble pyrolysis of matter (in a closed vessel with no air emissions). In the upcoming draft EIS, please the physico-chemical nature of the process to be used at the City's Waialua property. In particular, please provide a physico-chemical profile of the material feedstock and the resultant product, accounting for stoichiometric relationships between the feedstock and the final product. Please discuss whether the products would contain detectable amounts of constituents identified in Appendix VIII of Chapter 11-261, Hawai'i Administrative Rules as well as the end uses of the product.

Thank you for the opportunity to comment. If there are any questions, please call me at (808) 586-4185.

Respectfully,
Leslie Segundo
Environmental Health Specialist
Office of Environmental Quality Control

c: Director of Environmental Quality Control
Timothy Steinberger, P.E., Director of Environmental Services
Accepting Authority - Mayor Peter Carlisle, City and County of Honolulu

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8135-01
June 9, 2011

Mr. Leslie Segundo, Environmental Health Specialist
Office of Environmental Quality Control
Department of Health
235 S. Beretania Street, Suite 702
Leiopapa Building
Honolulu, HI 96813

Subject: Environmental Impact Statement Preparation Notice (EISPN)
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Segundo:

Thank you for your letter dated April 7, 2011. We offer the following responses in respective order of your comments:

1. On July 31, 2009, the Department of Environmental Services, City & County of Honolulu (ENV) issued a Request for Proposals (RFP) for the Financing, Design, Engineering, Construction and Operation of a Green Waste, Food Waste and Sewage Sludge In-Vessel Facility (Project). Hawaiian Earth Recycling LLC (HER) submitted a proposal for an in-vessel composting facility in Waialua in response to the RFP and was subsequently selected. On September 20, 2010, ENV and HER entered into a contract for the Project. HER proposes to construct the in-vessel composting facility on private land, owned by Cedar Grove Hawaii LLC, and not on any property owned by the City and County of Honolulu. Once constructed, the facility will be owned by HER and not by the City and County of Honolulu.

   As a part of the contractual requirements between the ENV and HER, the environmental documentation requirements prescribed under Chapter 343, Environmental Impact Statements, Hawaii Revised Statutes (as amended) and Hawaii Administrative Rules Chapter 200 (Environmental Impact Statement Rules) Title 11, of the State of Hawaii Department of Health as amended (State of Hawaii 1996) will be followed for this Project. It should also be noted that ENV will be the accepting authority for the final EIS.

2. A description of the in-vessel composting process will be provided in the forthcoming Draft EIS.

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The GORE™ Cover System is an aerobic composting process with more than 150 operating facilities world-wide. The incoming materials will be handled as follows: the green waste and food waste will be manually and mechanically sorted in an enclosed building to remove, as much as possible, non-compostable materials. The materials will then be ground into a uniform and homogenized size, then placed in windrows, approximately 10-12 ft. wide by 8-10 ft. in height and 300 ft. in length). It is then covered with the GORE™ Cover, which is weighed down on its perimeter to hold it in place. Air is then introduced though air channels, which will provide collection of any leachate generated, located underneath the full length of the windrow. After 21-28 days, the first phase of composting is completed and the windrows are then consolidated for the succeeding 2nd and 3rd phase. Each phase is covered with the GORE™ Cover. After the completion of the 3rd phase the materials are fully composted and stable.

With the sewage sludge, the material is received in a separate receiving and handling enclosed building. The sewage sludge is mixed with a bulking material, primarily ground wood, within the enclosed building. The mixed material is handled in the same manner as the greenwaste and foodwaste but on a separate GORE™ Cover composting pad.

The ENV will be delivering dewater sewage sludge to the facility for composting. Under current regulations, the ENV tests the sewage sludge for hazardous chemicals on an annual basis. The final composted product, that being both the green waste and food waste combined composted material and the separately composted dewatered sewage sludge composted, will be tested to meet both US Composting Council (USCC) and Process to Further Reduce Pathogens (PFRP) standards, which is conducted by a third-party independent review of its chemical composition.

As you will note from the process description, the GORE™ Cover System is not similar to pyrolysis because the composting is conducted with atmospheric gases and pressures. Please visit the GORE™ Cover System Website for more detailed information http://www.gore.com/en_xx/industries/environment/environment.html

With regards to HRS Chapter 11-261, the facility will not accept any types of hazardous wastes. As indicated above, the ENV tests the sewage sludge for hazardous chemicals on an annual basis. When the materials are fully composted, the material is fully tested to meet USCS and PFRP. Please visit the US Composting Council for more information, http://compostingcouncil.org/.

WILSON OKAMOTO
CORPORATION
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If you have any questions, please call Tracy Fukuda or myself at 946-2277. Thank you for your participation during the EIS process.

Sincerely,

for Earl Matsukawa, AICP
Project Manager

cc: Mr. Greg Apa, Hawaiian Earth Recycling LLC
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

NEIL ABERCROMBIE
GOVERNOR

GLENN M. OKIMOTO
DIRECTOR

Deputy Directors
FORD N. FUCHIGAMI
JAN S. GOUVEIA
RANDY GRUNE
JADINE URASAKI

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

IN REPLY REFER TO:

STP 8.0401

April 8, 2011

RECEIVED
APR 15 2011
WILSON OKAMOTO CORPORATION

Mr. Earl Matsukawa, AICP
Project Manager
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Matsukawa:

Subject: In-Vessel Composting Facility Project
Environmental Impact Statement Preparation Notice (EISPN)

The State Department of Transportation (DOT) previously commented on the Pre-Assessment Consultation for Environmental Assessment/EISPN (EC) for the subject project in its letter STP 8.0309 dated January 6, 2011 (in Appendix A of the EISPN).

DOT does not anticipate any significant adverse impacts to the State transportation facilities. However (as noted in the EISPN), the applicant is required to obtain a permit from DOT Highways Division, to transport oversize and overweight equipment/loads within the State highways facilities. Further, the applicant should also coordinate with DOT Highways Division regarding its plans to keep the State highway facilities clean of products or debris hauled or tracked to and from the subject project site.

DOT requests at least four copies of the Draft Environmental Impact Statement (DEIS) when available. If there are any questions or the need to meet with Highways staff, please contact Mr. David Shimokawa of the DOT Statewide Transportation Planning Office at telephone number (808) 831-7976.

Very truly yours,

GLENN M. OKIMOTO, Ph.D.
Director of Transportation

Attachment: Ltr STP 8.0309 dtd 1/6/11

c: Mr. Steven Serikaku, C&C of Honolulu, Department of Environmental Services

NEIL ABERCROMBIE
GOVERNOR

GLENN M. OKIMOTO
INTERIM DIRECTOR

Deputy Directors
Ford N. Fuchigami
Jan S. Gouveia
Randy Grune
Jadine Urasaki

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

IN REPLY REFER TO:
DIR 1528
STP 8.0309

January 6, 2011

Mr. Earl Matsukawa, Project Manager
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Matsukawa:

Subject: In-Vessel Composting Facility Project
Pre-Assessment Consultation for Environmental Assessment (EA)/
Environmental Impact Statement Preparation Notice (EISPN)

Thank you for requesting the State Department of Transportation's (DOT) review of the subject project.

DOT understands that the City and County of Honolulu, Department of Environmental Services (ENV) and Hawaiian Earth Recycling LLC are proposing to construct an in-vessel composting facility in Waialua. The proposed facility will consist of: truck weighing scale, enclosed tipping and preparation building, open processing area, stormwater retention pond, leachate storage tank, and an open product storage area. These facilities will encompass 38 acres of the 112 acres parcel. The remainder is used for the existing open windrow composting operations (green-waste only) and a demonstration area using compost to assist crop production. Access to the project will be from Wilikina Drive.

DOT does not anticipate any significant adverse impacts to the State transportation facilities. However, the applicant should be informed that a permit is required from DOT Highways Division, to transport oversized and overweight equipment/loads within the State highway facilities.

DOT appreciates the opportunity to provide comments. If there are any questions, or a need to meet with DOT staff, please contact Mr. David Shimokawa of the DOT Statewide Transportation Planning Office at telephone number (808) 831-7976.

Very truly yours,

GLENN M. OKIMOTO, Ph.D.
Interim Director of Transportation

WILSON OKAMOTO
CORPORATION
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Artesian Plaza, Suite 400
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8135-01
June 9, 2011

Mr. Glenn M. Okimoto, Interim Director
Department of Transportation
Aliiaimoku Building
869 Punchbowl Street
Honolulu, HI 96813

Attention: Mr. David Shimokawa

Subject: Environmental Impact Statement Preparation Notice (EISPN)
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Okimoto:

Thank you for your letter dated April 8, 2011 (Reference No. STP 8.0401). We acknowledge that the Department does not anticipate any significant impacts to State transportation facilities.

Since oversized and overweight equipment/loads will be using State highway facilities for the proposed project, an application for a permit will be submitted to State DOT Highways Division. The applicant will implement appropriate mitigation measures on their trucks to prevent products and/or debris being hauled from impacting State highway facilities. Please note, no excavated material will be removed from the site for the construction of the facility.

Copies of the forthcoming Draft EIS will be sent to you for your review and comment.

Should you have any questions, please call Tracy Fukuda or myself at 946-2277. Thank you for your participation during the EIS process.

Sincerely,

for Earl Matsukawa, AICP
Project Manager

cc: Mr. Greg Apa, Hawaiian Earth Recycling LLC
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843

March 7, 2011

PETER B. CARLISLE, MAYOR

RANDALL Y. S. CHUNG, Chairman
DENISE C. DE COSTA
ANTHONY R. GUERRERO, JR.
THERESIA C. McMURDO
ADAM C. WONG

WESTLEY K.C. CHUN, Ex-Officio
GLENN M. OKIMOTO, Ex-Officio

WAYNE M. HASHIRO, P.E.
Manager and Chief Engineer

DEAN A. NAKANO
Deputy Manager

RECEIVED
MAR 09 2011
WILSON OKAMOTO CORPORATION

EM
TF

Mr. Earl Matsukawa, AICP
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Matsukawa:

Subject: Your Letter Dated March 2, 2011 Requesting Comments on the Environmental Assessment/Environmental Impact Statement Preparation Notice for the In-Vessel Composting Facility Project in Waialua, TMK: 6-5-2: 26

Thank you for the opportunity to comment on the proposed composting facility.

The Board of Water Supply does not have water facilities in this area. Water service should be provided by a private water system.

If you have any questions, please contact Robert Chun at 748-5443.

Very truly yours,

PAUL S. KIKUCHI
Chief Financial Officer
Customer Care Division

cc: Mr. Steven Serikaku, Department of Environmental Services

WILSON OKAMOTO
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Honolulu, Hawaii, 96826 USA
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FAX: 808-946-2253
www.wilsonokamoto.com

8135-01
June 9, 2011

Mr. Paul Kikuchi, Chief Financial Officer
Customer Care Division
Board of Water Supply
630 South Beretania Street
Honolulu, HI 96843

Attention: Mr. Robert Chun

Subject: Environmental Impact Statement Preparation Notice (EISPN)
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Kikuchi:

Thank you for your letter dated March 7, 2011. We acknowledge that the Board of Water Supply does not have facilities in this area and the project will be serviced by its own private water system. The facility was issued a Water Use Permit by the DLNR, Commission on Water Resource Management dated March 1, 2010.

Should you have any questions, please call Tracy Fukuda or myself at 946-2277. Thank you for your participation during the EIS process.

Sincerely,

for Earl Matsukawa, AICP
Project Manager

cc: Mr. Greg Apa, Hawaiian Earth Recycling LLC
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

DEPARTMENT OF TRANSPORTATION SERVICES

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 3RD FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8305 • Fax: (808) 768-4730 • Internet: www.honolulu.gov

PETER B. CARLISLE
MAYOR

WAYNE Y. YOSHIOKA
DIRECTOR

KAI NANI KRAUT, P.E.
DEPUTY DIRECTOR

KENNETH TORU HAMAYASU, P.E.
DEPUTY DIRECTOR

EM
TF

TP3/11-406525R

March 31, 2011

RECEIVED
APR 04 2011
WILSON OKAMOTO CORPORATION

Mr. Earl Matsukawa, AICP
Director Planning
Wilson Okamoto Corporation
1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Matsukawa:

Subject: Environmental Assessment/Environmental Impact Statement Preparation Notice (EA/EISPN) In-Vessel Composting Facility Project; Waialua, Oahu, Hawaii; Tax Map Key (TMK): 6-5-002: 026

This responds to your letter of March 2, 2011, requesting our comments concerning this proposed project.

Our Traffic Engineering Division (TED) has the following comments:

- The Traffic Impact Analysis Report (TIAR) should include a sight distance analysis with respect to the proposed on-site driveway and Wilikina Drive.

- The TIAR should include a discussion of the breakdown of vehicle types that will be utilizing the facility and the frequency of those vehicles ingressing/egressing the facility.

- The TIAR should include a description of mitigative measures to the traffic impacts the facility may have on Wilikina Drive.

Our Public Transit Division (PTD) has the following comments:

- The EA/EISPN should include a description of Public Transit that services the area and the impact of your project on our Public Transit system operations during construction and after completion. Basic information is available on our websites: www.thebus.org and www.honolulu.gov/dts. For more details, you may contact our staff at 768-8370.

- Construction notes should include the following note concerning transit:

  "This project will affect bus routes, bus stops, and paratransit operations, therefore, the Contractor shall notify the Department of Transportation Services, Public Transit Division at 768-8396 and Oahu Transit Services, Inc. (bus operations: 848-4578 or 852-6016 and paratransit operations: 454-5041 or 454-5020) of the scope of work, location, proposed closure of any street, traffic lane, sidewalk, or bus stop and duration of project at least two weeks prior to construction."

Thank you for the opportunity to review this matter. Should you have any further questions, please contact Michael Murphy of my staff at 768-8359.

Very truly yours,

WAYNE Y. YOSHIOKA
Director

cc: Mr. Steven Serikaku, DES

WILSON OKAMOTO
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Artesian Plaza, Suite 400
Honolulu, Hawaii, 96826 USA
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FAX: 808-946-2253
www.wilsonokamoto.com

8135-01
June 9, 2011

Mr. Wayne Yoshioka, Director
Department of Transportation Services
City & County of Honolulu
650 South King Street, 3rd Floor
Honolulu, HI 96813

Attention: Mr. Michael Murphy

Subject: Environmental Impact Statement Preparation Notice (EISPN)
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Yoshioka:

Thank you for your letter dated March 31, 2011 (Reference No. TP3/11-406525R). We offer the following responses in respective order of your comments:

1. The Traffic Impact Analysis Report (TIAR) typically, does not include sight distance analyses, however, adequate sight distance will be provided through the civil engineering design for the driveway connection to Wilikina Drive. These design plans will be submitted to DTS for review and approval.

   Traffic operations with the project are expected to remain similar to existing conditions. The installation of a traffic signal along Wilikina Drive at the project access driveway does not appear to be warranted and may instead impact traffic flow along Wilikina Drive. However, the traffic signal operations at the adjacent intersection of Wilikina Drive and Kamananui Road should create gaps in the through traffic stream along Wilikina Drive that would allow ingress and egress maneuvers at the project's access driveway. The TIAR will be summarized and included in the forthcoming Draft EIS.

2. Since almost all of the vehicle trips generated by the proposed facility are expected to be trucks or other heavy vehicles, the TIAR conservatively assumes that 100% of vehicle trips will be large trucks (WB-40).

3. The TIAR will include recommendations of improvements, if appropriate, that would mitigate the traffic impacts resulting from the proposed project.

4. The forthcoming Draft EIS will include a description of public transit services in the area and discuss any impacts to the proposed project or public transit system operations.

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CORPORATION
ENGINEERS | PLANNERS | CONSULTANTS

5. When design plans are prepared, the construction notes shall include the following transit note:

   This project will affect bus routes, bus stops, and paratransit operations, therefore the Contractor shall notify the Department of Transportation Services, Public Transit Division at 768-8396 and Oahu Transit Services, Inc. (bus operations: 848-4578 or 848-6016 and paratransit operations: 454-5041 or 454-5020) of the scope of work, location, proposed closure of any street, traffic lane, sidewalk, or bus stop and duration of project at least two weeks prior to construction."

Should you have any questions, please call Tracy Fukuda or myself at 946-2277. Thank you for your participation during the EIS process.

Sincerely,

for Earl Matsukawa, AICP
Project Manager

cc: Mr. Greg Apa, Hawaiian Earth Recycling LLC
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

HOUSE OF REPRESENTATIVES
STATE OF HAWAII
STATE CAPITOL
HONOLULU, HAWAII 96813

EM

April 6, 2011

Mr. Earl Matsukawa
Wilson Okamoto Corporation
1907 S. Beretania Street, Ste. 400
Honolulu, HI 96826

RECEIVED
APR 08 2011
WILSON OKAMOTO CORPORATION

Dear Mr. Matsukawa:

RE: In-Vessel Composting Facility Environmental Assessment/Environment Impact Statement Preparation Notice, Waialua, Island of Oahu, TMK: 6-5-002:0 26

Thank you for the opportunity to provide the following comments on the preparation notice referenced above:

1. Community impact-mitigation benefits package needs to be approved and funded by the City and County of Honolulu, before approval is granted to the proposed in-vessel composting facility, Waialua, Island of Oahu, TMK: 6-5-002: 026.

2. Sources and quantity of composting material needs to be disclosed and subject to chemical composition analysis and independent review.

3. Cultural Impact Assessment needs to be completed and reviewed prior to approval of the proposed in-vessel composting facility, Waialua, Island of Oahu, TMK: 6-5-002: 026.

Please feel free to call me at 586-6200 if you have any questions.

Sincerely,

Marcus R. Oshiro
State Representative
District 39
(Wahiawa, Whitmore Village, Launani Valley)

cc: Councilmember Ernie Martin
Senator Donovan Dela Cruz
Representative Gil Riviere

WILSON OKAMOTO
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Phone: 808-946-2277
FAX: 808-946-2253
www.wilsonokamoto.com

8135-01
June 9, 2011

Representative Marcus R. Oshiro
House of Representatives
State of Hawaii
State Capitol
Honolulu, HI 96813

Subject: Environmental Impact Statement Preparation Notice (EISPN)
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Representative Oshiro:

Thank you for your letter dated April 6, 2011. We offer the following responses in respective order of your comments:

1. The EIS process is intended to assess potential impacts of the proposed action and determine appropriate mitigation measures.

   Hawaiian Earth Recycling LLC supports the surrounding community now and has been a good neighbor by providing 20 cubic yards of compost for local residents at no charge at the recently concluded Wahiawa Pineapple Festival. HER will be more than willing to schedule a meeting with you to discuss your ideas concerning the Project.

2. The sources and quantities of materials were included in the City and County of Honolulu, Department of Environmental Services (ENV) Request for Proposals (RFP-ENV-53314) for the Financing, Design, Engineering, Construction and Operation of a Green Waste, Food Waste and Sewage Sludge In-Vessel Facility dated July 31, 2009. In addition, the Draft EIS will include the RFP's sources and quantities of material.

   The ENV will be delivering dewatered sewage sludge to the facility for composting. Under current regulations, the ENV tests the sewage sludge for hazardous chemicals on an annual basis. In addition, the final composted product, that being both the green waste and food waste combined composted material and the separately composted dewatered sewage sludge composted, will be tested to meet both US Composting Council (USCC) and Process to Further Reduce Pathogens (PFRP) standards, which is conducted by a third-party independent review of its chemical composition.

WILSON OKAMOTO
CORPORATION
ENGINEERS | PLANNERS | CONSULTANTS

3. Cultural impact assessment is being prepared and will be included in the forthcoming Draft EIS.

Should you have any questions, please call Tracy Fukuda or myself at 946-2277. Thank you for your participation during the EIS process.

Sincerely,

for Earl Matsukawa, AICP
Project Manager

cc: Mr. Greg Apa, Hawaiian Earth Recycling LLC
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

DEPARTMENT OF FACILITY MAINTENANCE

CITY AND COUNTY OF HONOLULU

1000 Uluohia Street, Suite 215, Kapolei, Hawaii 96707
Phone: (808) 768-3343 • Fax: (808) 768-3381
Website: www.honolulu.gov

PETER B. CARLISLE
MAYOR

WESTLEY K.C. CHUN, Ph.D., P.E., BCEE
ACTING DIRECTOR & CHIEF ENGINEER

GEORGE "KEOKI" MIYAMOTO
DEPUTY DIRECTOR

IN REPLY REFER TO:
DRM 11-218

April 6, 2011

RECEIVED
APR 07 2011
WILSON OKAMOTO CORPORATION

Mr. Earl Matsukawa, AICP
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Matsukawa:

Subject: Environmental Assessment/ Environmental Impact Statement Preparation Notice (EA/EISPN)
In-Vessel Composting Facility Project
Waialua, Island of Oahu, Hawaii
Tax Map Key: 6-5-002: 026

Thank you for the opportunity to review and comment on the EA/EISPN dated February 2011 for the proposed subject green waste, food waste and dewatered sewage sludge composting facility project.

We have no comments to offer as the proposed facility will be within privately-owned lands and will have negligible impact on our maintenance operations.

Should you have any questions, please call Charles Pignataro of the Division of Road Maintenance, at 768-3697.

Sincerely,

Westley K.C. Chun, Ph.D., P.E., BCEE
Acting Director & Chief Engineer

c: Department of Environmental Services - Attn.: Steven Serikaku

WILSON OKAMOTO
CORPORATION
ENGINEERS | PLANNERS | CONSULTANTS

1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii, 96826 USA
Phone: 808-946-2277
FAX: 808-946-2253
www.wilsonokamoto.com

8135-01
June 9, 2011

Mr. Westley K.C. Chun, Ph.D, P.E., BCEE, Acting Director
Department of Facility Maintenance
City & County of Honolulu
1000 Uluohia Street, Suite 215
Kapolei, HI 96707

Attention: Mr. Charles Pignataro

Subject: Environmental Impact Statement Preparation Notice (EISPN)
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Chun:

Thank you for your letter dated April 6, 2011 (Reference No. DRM 11-218). We acknowledge that the proposed project would have negligible impact any on your Department's maintenance operations and that you have no comments to offer at this time.

Should you have any questions, please call Tracy Fukuda or myself at 946-2277. Thank you for your participation during the EIS process.

Sincerely,

for Earl Matsukawa, AICP
Project Manager

cc: Mr. Greg Apa, Hawaiian Earth Recycling LLC
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

DEPARTMENT OF PARKS & RECREATION

CITY AND COUNTY OF HONOLULU

1000 Uluohia Street, Suite 309, Kapolei, Hawaii 96707
Phone: (808) 768-3003 • Fax: (808) 768-3053
Website: www.honolulu.gov

RECEIVED
APR 06 2011
WILSON OKAMOTO CORPORATION

PETER B. CARLISLE
MAYOR

GARY B. CABATO
DIRECTOR

ALBERT TUFONO
DEPUTY DIRECTOR

April 1, 2011

Mr. Earl Matsukawa, AICP
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Matsukawa:

Subject: Environmental Assessment/EIS Preparation Notice
In-Vessel Composting Facility Project
Waialua, Island of Oahu, Hawaii
Tax Map Key: 6-5-002:026

Thank you for the opportunity to review and comment on the Environmental Assessment Preparation Notice for the In-Vessel Composting Facility Project.

The Department of Parks and Recreation has no comment, as the proposed project will not impact any program or facility of the department. You may remove us as a consulted party to the balance of the EIS process.

Should you have any questions, please contact Mr. John Reid, Planner, at 768-3017.

Sincerely,

GARY B. CABATO
Director

GBC:jr
(406446)

cc: Mr. Steven Serikaku, Department of Environmental Services

WILSON OKAMOTO
CORPORATION
ENGINEERS | PLANNERS | CONSULTANTS

1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii, 96826 USA
Phone: 808-946-2277
FAX: 808-946-2253
www.wilsonokamoto.com

8135-01
June 9, 2011

Mr. Gary B. Cabato, Director
Department of Parks and Recreation
City & County of Honolulu
1000 Uluohia Street, Suite 309
Kapolei, HI 96707

Attention: Mr. John Reid

Subject: Environmental Impact Statement Preparation Notice (EISPN)
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Cabato:

Thank you for your letter dated April 1, 2011. We acknowledge that the proposed project would not impact any of the Department's programs or facilities and that you have no comments to offer. Your department will be removed as a consulted party for the forthcoming Draft EIS, as requested.

Should you have any questions, please call Tracy Fukuda or myself at 946-2277. Thank you for your participation during the EIS process.

Sincerely,

for Earl Matsukawa, AICP
Project Manager

cc: Mr. Greg Apa, Hawaiian Earth Recycling LLC
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

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

RECEIVED
APR 06 2011
WILSON OKAMOTO CORPORATION

HRD11/5437B

March 31, 2011

Earl Matsukawa
Wilson Okamoto Corporation
1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawai'i 96826

Re: **Environmental Assessment/Impact Statement Preparation Notice**
In-Vessel Composting Facility Project
Kamananui, Waialua District, Island of O'ahu

Aloha e Earl Matsukawa,

The Office of Hawaiian Affairs (OHA) is in receipt of your March 2, 2011 Environmental Assessment/Environmental Impact Statement Preparation Notice (EA/EISPN) for a proposed in-vessel composting facility in (project) Kamananui on the Island of O'ahu. The statement that this project is not subject to the requirements of Chapter 343, Hawaii Revised Statutes is expressed repeatedly throughout the ES/EISPN and it is our understanding environmental documentation is being prepared because of contractual requirements between Hawaiian Earth Recycling, LLC (HER) and the City and County of Honolulu-Environmental Services Department (ESD). OHA would like to see additional information on this statement in the draft EA/EIS.

HER proposes construction of the project with composting facilities, open windrow composting operations for green waste and product demonstrations on a 112 acre parcel owned by Cedar Grove Hawaii LLC. At full capacity, project facilities will process up to 150,000 tons of green waste, consumer food waste and dewatered sewage sludge (sludge) per year. Marketable products such as compost, soil amendments, potting mixes and erosion control materials will be produced.

OHA appreciates that this project is a component to the City and County of Honolulu's overall Solid waste Management Program and has the potential to take a significant amount of recyclable material which had previously been sent to the only landfill on the Island of O'ahu, and turn it into a marketable product. Hawaiian Earth Products (a HER affiliated company) currently operates two composting facilities at Campbell Industrial Park and Kapa'a Quarry which process approximately 85,000 tons of consumer food and green waste per year.

It is our understanding that sludge is not currently processed at these existing facilities. The EA/EISPN details that 15 to 20 percent of the total material processed at the new facility in Kamananui will be sludge from the Honouliuli and Kailua Wastewater Treatment Facilities and there is a potential additional sludge will be processed in the future (EA/EISPN, Chapter 2.3). OHA requests that the draft EA/EIS provide additional information on the proven technologies which this project will employ (such as the GORE Cover System described in the EA/EISPN) in order to address issues related to transporting and processing sludge to ensure the health of the environment and community. We also request that the forthcoming draft EA/EIS also specifically describe the screening and testing process which will be conducted on the processed product to ensure compliance with U.S. Environmental Protection Agency standards (EA/EISPN, Chapter 2.3).

A well will be drilled and a pump installed to support the project (EA/EISPN, Chapter 3.3.1). Information on the Well Construction Permit which has been issued by the Commission on Water Resource Management and the status of a Pump Installation Application/Permit should be included in the draft EA/EIS. The existing facilities operated by Hawaiian Earth Products require State of Hawai'i-Department of Health (DOH) permits for open windrow composting operations and we seek clarification whether the project will also require a DOH permit for open windrow composting.

The project area has been subject to intensive agricultural cultivation (EA/EISPN, Chapter 3.8) with fields fallowed since 2004. An archaeological assessment and cultural impact assessment (CIA) are forthcoming. By letter dated December 23, 2010 OHA provided comments to the CIA preparer, Cultural Surveys Hawai'i, Inc. and recommended consultation occur with Mr. Thomas Shirai, Ms. Leimaile Quitevis, the North Shore Neighborhood Board and those with connections to Kukaniloko (Friends of Kukaniloko and Wahiawā Hawaiian Civic Club. These groups and individuals should also be sent a copy of the draft EA/EIS and afforded the opportunity to comment.

Thank you for the opportunity to provide comments. We look forward to reviewing the draft EA/EIS. Should you have any questions, please contact Keola Lindsey at 594-0244 or keolal@oha.org.

'O wau iho nō me ka 'oia'i'o,

Clyde W. Nāmu'o
Chief Executive Officer

C: Steven Serikaku, City and County of Honolulu-Environmental Services Department

WILSON OKAMOTO
CORPORATION
ENGINEERS | PLANNERS | CONSULTANTS

1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii, 96826 USA
Phone: 808-946-2277
FAX: 808-946-2253
www.wilsonokamoto.com

8135-01
June 9, 2011

Mr. Clyde Namuo, Director
Office of Hawaiian Affairs
State of Hawaii
711 Kapiolani Boulevard, Suite 500
Honolulu, HI 96813

Attention: Mr. Keola Lindsey

Subject: Environmental Impact Statement Preparation Notice (EISPN)
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Namuo:

Thank you for your letter dated March 31, 2011 (Reference No. HRD11/5437B). We offer the following responses in respective order of your comments:

1. The forthcoming Draft EIS clarifies that as part of the contractual requirements between the City & County of Honolulu Department of Environmental Services (ENV) and Hawaiian Earth Recycling LLC (HER), the environmental documentation requirements prescribed under Chapter 343, Environmental Impact Statements, Hawaii Revised Statutes (as amended) and Hawaii Administrative Rules Chapter 200 (Environmental Impact Statement Rules) Title 11, of the State of Hawaii Department of Health, as amended (State of Hawaii 1996) will be followed for this project.. If you desire additional information on this matter, please contact Mr. Steven Serikaku of the City and County of Honolulu, Environmental Services.

2. The forthcoming Draft EIS will describe the GORE™ Cover System. Please visit the GORE™ Cover System Website for more detailed information http://www.gore.com/en_xx/industries/environment/environment.html

   The ENV will be delivering dewatered sewage sludge to the facility for composting. Under current regulations, the ENV tests the sewage sludge for hazardous chemicals on an annual basis. In addition, the final composted product, that being both the green waste and food waste combined composted material and the separately composted dewatered sewage sludge composted, will be tested to meet both US Composting Council USCC and Process to Further Reduce Pathogens (PFRP) standards, which is conducted by a third-party independent review of its chemical composition.

WILSON OKAMOTO CORPORATION
ENGINEERS | PLANNERS | CONSULTANTS

3. Hawaiian Earth Products (HEP) currently operates open windrow composting operations at the Waialua site with a Department Permit (DOH Permit No. CO-0091-08). The project proposes to continue the open windrow composting operations under the current DOH permit. With the inclusion of the dewatered sewage sludge, the separate facility will require revision of its existing DOH permit to include any and all issues related to the composting of the dewatered sewage sludge.

   HER received a Well Construction Permit from DLNR, Commission on Water Resource Management (CWRM). The status of the permit will be included in the forthcoming Draft EIS.

4. Cultural Surveys Hawaii (CSH) contacted these parties for the forthcoming Draft EIS.

Should you have any questions, please call Tracy Fukuda or myself at 946-2277. Thank you for your participation during the EIS process.

Sincerely,

for Earl Matsukawa, AICP
Project Manager

cc: Mr. Greg Apa, Hawaiian Earth Recycling LLC
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

EM

April 6, 2011

Wilson Okamoto Corporation
1907 South Beretania Street Suite 400
Honolulu, Hawaii 96826

RECEIVED
APR 08 2011
WILSON OKAMOTO CORPORATION

Attention: Mr. Earl Matsukawa, AICP

Ladies and Gentlemen:

Subject: Environmental Assessment/Environmental Impact Statement Preparation Notice In-Vessel Composting Facility Project

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

Other than the comments from Division of Forestry & Wildlife, Engineering Division, the Department of Land and Natural Resources has no other comments to offer on the subject matter. Should you have any questions, please feel free to call our office at 587-0414. Thank you.

Sincerely,

Russell Y. Tsuji
Administrator

Cc: Dept of Environmental Services

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

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

GUY H. KAULUKUKUI
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

March 14, 2011

Earl Matsukawa
Project Manager
Wilson Okamoto Corporation
1907 South Beretania St. Suite 400
Honolulu, HI 96826

Dear Mr. Matsukawa:

We received the Environmental Assessment EISPN for the in-vessel composting facility in Waialua on the island of Oahu dated February 2011, and thank you for the opportunity to provide input.

Although we feel that the composting of green waste is likely to be a low risk for introducing or spreading invasive species, we feel that it should be addressed in the EIS. Green waste can easily be contaminated by reproductive parts of invasive plants, as well as by insects pests and other animals. That the compost product will be free of contamination through sterilization or by the composting techniques used should be clearly stated and supported with scientific data. It is also important to limit green waste accepted at this facility to only that which is generated on island, rather than accepting material from neighbor island which could include species not present on Oahu. These hitchhiking pests could escape during transportation or during processing at the project site.

While we predict any risk here could be mitigated, we recommend that this important issue be considered in your environmental review process.

RECEIVED
LAND DIVISION
2011 MAR 11 A 11: 29
DEPT OF LAND & NATURAL RESOURCES
STATE OF HAWAII

Sincerely,

Randy Kennedy

Paul J. Conry, Administrator
Division of Forestry and Wildlife

c: Mr. William J. Aila, Jr. – Chairperson DLNR
DOFAW – Oahu Branch

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED
LAND DIVISION
2011 APR -5 P 2:15

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

March 9, 2011

'11 MAR 09 PM03:56 ENGINEERING

MEMORANDUM

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

FROM: Charlene Unoki, Assistant Administrator
SUBJECT: Environmental Assessment/Environmental Impact Statement Preparation Notice for In-Vessel Composting Facility Project
LOCATION: Island of Oahu
APPLICANT: Wilson Okamoto Corporation on behalf of City & County of Honolulu Department of Environmental Services

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by April 4, 2011.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

reviewed the Pre-Consultation for the EA/EIS PN and have no additional

( ) We have no objections.
(✓) We have ~~no~~ comments.
( ) Comments are attached.

Signed:
Date: 4/4/11

WILSON OKAMOTO
CORPORATION
ENGINEERS | PLANNERS | CONSULTANTS

1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii, 96826 USA
Phone: 808-946-2277
FAX: 808-946-2253
www.wilsonokamoto.com

8135-01
June 9, 2011

Mr. Russel Y. Tsuji, Administrator
Land Division
Department of Land and Natural Resources
State of Hawaii
P.O. Box 621
Honolulu, HI 96809

Subject: Environmental Impact Statement Preparation Notice (EISPN)
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Tsuji:

Thank you for your letter dated April 6, 2011. We offer the following responses in respective order of your comments:

Division of Forestry and Wildlife

The forthcoming Draft EIS will clarify that only green waste, food waste, and dewatered sewage sludge from Oahu will be processed at the proposed composting facility.

The City & County of Honolulu Department of Environmental Services (ENV) will be delivering dewatered sewage sludge to the facility for composting. Under current regulations, the ENV tests the sewage sludge for hazardous chemicals on an annual basis. In addition, the final composted product, that being both the green waste and food waste combined composted material and the separately composted dewatered sewage sludge composted, will be tested to meet both US Composting Council (USCC) and Process to Further Reduce Pathogens (PFRP) standards, which is conducted by a third-party independent review of its chemical composition.

Engineering Division

We acknowledge you have no additional comments to offer at this time.

Should you have any questions, please call Tracy Fukuda or myself at 946-2277. Thank you for your participation during the EIS process.

Sincerely,

for Earl Matsukawa, AICP
Project Manager

cc: Mr. Greg Apa, Hawaiian Earth Recycling LLC
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

LORETTA J. FUDDY, A.C.S.W., M.P.H.
DIRECTOR OF HEALTH

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

In reply, please refer to:
File:

April 20, 2011 S04258SL

EM

Mr. Earl Matsukawa, Project Manager
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

RECEIVED
APR 27 2011
WILSON OKAMOTO CORPORATION

Dear Mr. Matsukawa:

SUBJECT: Environmental Assessment/Environmental Impact Statement Preparation Notice
In-Vessel Composting Facility Project
Waialua, Oahu, Hawaii
Tax Map Key: 6-5-002:026

The Department of Health (DOH), Solid Waste Section (SWS) received a copy of the subject Environmental Assessment/Environmental Impact Statement Preparation Notice (EA/EISPN) from the Office of Planning, State Department of Business Economic Development and Tourism on April 4, 2011. This letter provides our comments with respect to the project at the subject proposed facility. We understand that our comments will be received after your deadline; however, we hope that you consider them in your development of your Environmental Assessment and/or Environmental Impact Statement (EA/EIS).

Our primary concerns with biosolids and food waste composting facilities are their potential for odor, dust, and fire problems, that may be generated from the operations and impact the surrounding areas. We have the following recommendations for your inclusion into the EA/EIS:

1. Air Quality Study. The proposed study should address odor and dust that may be generated from all steps/stages of the operation from waste acceptance and preparation, to active composting and curing, to compost screening and finished product storage. The EA/EISPN stated that odor and dust will be controlled because the receiving building would be a fully enclosed facility with a biofilter system, and that the composting operation will use the Gore Cover System, which is an in-vessel composting system. However, there was no discussion on how the waste will be taken from the enclosed building to the outdoor Gore

Cover System. This point of the operation may be a potential source of odor. Similarly, a potential dust problem may be generated from the moving/transporting of material and the screening of finished compost, which will occur outdoors. The study should also discuss the potential odor and dust impacts in relation to local climate and wind patterns.

2. Biosolids Compost Marketability Study. We recommend that the marketability of this compost be conducted. The long-term storage of finished biosolids compost at two (2) locations on Oahu suggests that either the marketing of such material has not been conducted, or that such market could not be easily developed on-island. The DOH-SWS' concern over the marketability of this compost is the continued and increasing storage of finished compost, which may increase fire conditions at the site, and may impact the space available to conduct active and curing composting activities.

If you have any questions regarding our comments, please contact Ms. Sue Liu of our Solid Waste Section at (808) 586-4226.

Sincerely,

STEVEN Y.K. CHANG, P.E., CHIEF
Solid and Hazardous Waste Branch

8135-01
June 9, 2011

WILSON OKAMOTO CORPORATION
ENGINEERS | PLANNERS | CONSULTANTS

1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii, 96826 USA
Phone: 808-946-2277
FAX: 808-946-2253
www.wilsonokamoto.com

Mr. Steven Y.K. Chang, P.E., Chief
Solid and Hazardous Waste Branch
Department of Health
State of Hawaii
P.O. Box 3378
Honolulu, HI 96801-3378

Attention: Ms. Sue Liu

Subject: Environmental Impact Statement Preparation Notice (EISPN)
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Chang:

Thank you for your letter dated April 20, 2011 (Ref. No. S04258SL). We offer the following responses in respective order of your comments:

1. The forthcoming Draft EIS will assess odor and dust generated from all stages of the composting process, including initial stages of moving the composting material from the enclosed building to the GORE™ Cover Composting System Pad. An odor study is being conducted and the study will be included in the Draft EIS. In addition, dust will be controlled at this Project, as it is, at the current composting operation by the used of water trucks and/or sprinkler systems to water the roads and completed compost storage stockpiles.

2. It is noted that your letter is recommending a Biosolids Market Study. It is not proposed that the finished biosolids composted to be stored at either the Kailua or Campbell transfer stations. And has with its existing operations at the Hawaiian Earth Products' Campbell facility, Hawaiian Earth Recycling LLC has proven in the past to be capable and equipped to handle any issues that may be related to potential fire issues with the storage of any finished product. Currently, fire and dust control is effectively accomplished by daily watering at the existing facilities operations. The same fire control procedures will be implemented at the Waialua site. This will be addressed in Draft EIS.

Should you have any questions, please call Tracy Fukuda or myself at 946-2277. Thank you for your participation during the EIS process.

Sincerely,

Earl Matsukawa, AICP
Project Manager

cc: Mr. Greg Apa, Hawaiian Earth Recycling LLC
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

Appendix M

Draft Environmental Impact Statement Consultation Comment Letters

NEAL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810-0119

(P)1131.1

EM

JUN 29 2011

Mr. Earl Matsukawa, Project Manager
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawai'i 96826

RECEIVED
JUN 30 2011
WILSON OKAMOTO CORPORATION

Dear Mr. Matsukawa:

Subject: Draft Environmental Impact Statement
In-Vessel Composting Facility Project
Wailua, Oahu, Hawaii
TMK: (1) 6-5-002: 026

Thank you for the opportunity to provide comments for the subject property. The proposed project does not impact any of the Department of Accounting and General Services' projects or existing facilities, and we have no comments to offer at this time.

If you have any questions, please call me at 586-0400 or have your staff call Ms. Gayle Takasaki of the Public Works Division at 586-0500.

Sincerely,

BRUCE A. COPPA
State Comptroller

c: Mr. Steven Serikaku, C&C Department of Environmental Services

Hawaiian Earth Recycling LLC

Project Office: 1169 Mikole Street, Honolulu, Hawaii 96825

Operating Location: 91-400 Malakole Street, Kapolei Hawaii 96707

September 12, 2011

Mr. Bruce A. Coppa, Comptroller
Department of Accounting & General Services
Kalanimoku Building
P.O. Box 119
Honolulu, HI 96810

Subject: Draft Environmental Impact Statement (DEIS)
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Coppa:

Thank you for your letter dated June 29, 2011 (Ref. No. (P)1131.1). We acknowledge that the proposed project does not impact any of the Department's projects or existing facilities and that you have no comments to offer at this time.

Should you have any questions, please call me at 792-0126. Thank you for your participation during the EIS process.

Sincerely,

F. Gregory Apa
Project Manager

cc: Mr. Earl Matsukawa, Wilson Okamoto Corporation
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

EM

NEIL ABERCROMBIE
GOVERNOR

KATHRYN S. MATAYOSHI
SUPERINTENDENT

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

OFFICE OF THE SUPERINTENDENT

RECEIVED
JUL 07 2011
WILSON OKAMOTO CORPORATION

July 6, 2011

Mr. Earl Matsukawa, Project Manager
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawai`i 96826

Dear Mr. Matsukawa:

SUBJECT: Draft Environmental Impact Statement for an In-Vessel Composting Facility
Waialua, Oahu, TMK: 6-5-002:026

The Department of Education has no comment or concern with the establishment of a composting facility on Wilikina Drive in Waialua.

If you have any questions, please call Heidi Meeker of the Facilities Development Branch at 377-8301.

Very truly yours,

Kathryn S. Matayoshi
Superintendent

KSM:jmb

c: Randolph Moore, Assistant Superintendent, OSFSS

Hawaiian Earth Recycling LLC

Project Office: 1169 Mikole Street, Honolulu, Hawaii 96825

Operating Location: 91-400 Malakole Street, Kapolei Hawaii 96707

September 12, 2011

Ms. Kathryn S. Matayoshi, Superintendent
Department of Education
P.O. Box 2360
Honolulu, HI 96804

Subject: Draft Environmental Impact Statement (DEIS)
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Ms. Matayoshi:

Thank you for your letter dated July 6, 2011. We acknowledge that you have no comments or concerns with the proposed project.

Should you have any questions, please call me at 792-0126. Thank you for your participation during the EIS process.

Sincerely,

F. Gregory Apa
Project Manager

cc: Mr. Earl Matsukawa, Wilson Okamoto Corporation
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

NEIL ABERCROMBIE
GOVERNOR

MAJOR GENERAL DARRYLL D. M. WONG
DIRECTOR OF CIVIL DEFENSE

EDWARD T. TEIXEIRA
VICE DIRECTOR OF CIVIL DEFENSE

PHONE (808) 733-4300
FAX (808) 733-4287

STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE DIRECTOR OF CIVIL DEFENSE
3949 DIAMOND HEAD ROAD
HONOLULU, HAWAII 96816-4495

EM

August 3, 2011

RECEIVED
AUG 04 2011
WILSON OKAMOTO CORPORATION

Mr. Earl Matsukawa, AICP
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Matsukawa:

Draft Environmental Impact Statement (DEIS)
In-Vessel Composting Facility Project; TMK: (1) 6-5-002:026

Thank you for the opportunity to comment on this proposed project. According to the DEIS provided and based on the Flood Rate Insurance Map, the subject property lies in an area designated Flood Hazard Zone D which is used for unstudied areas where flood hazards are undetected but flooding is possible.

The historically agricultural district of Waialua is located in the largest drainage area on Oahu. We strongly recommend that mitigation measures be considered in the planning and design phase of any new construction; as mitigation prevents loss of life, minimizes loss of property, and provides for continuity of essential services. Generally, the cost of integrating mitigation measures during construction is approximately one-third the cost of post-construction retrofits.

If you have any questions, please call Havinne Okamura, State Civil Defense Hazard Mitigation Planner, at 733-4300, ext. 556.

Sincerely,

EDWARD T. TEIXEIRA
Vice Director of Civil Defense

c: Steven Serikaku, City and County of Honolulu Department of Environmental Services

Hawaiian Earth Recycling LLC

Project Office: 1169 Mikole Street, Honolulu, Hawaii 96825

Operating Location: 91-400 Malakole Street, Kapolei Hawaii 96707

September 12, 2011

Mr. Edward T. Teixeria, Vice Director
Department of Defense
3949 Diamond Head Road
Honolulu, HI 96816-4495

Attention: Havinne Okamura

Subject: Draft Environmental Impact Statement (DEIS)
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Teixeria:

Thank you for your letter dated August 3, 2011. Best management practices will be implemented during construction and operation of the proposed project to address any potential drainage and/or flooding issues.

Should you have any questions, please call me at 792-0126. Thank you for your participation during the EIS process.

Sincerely,

F. Gregory Apa
Project Manager

cc: Mr. Earl Matsukawa, Wilson Okamoto Corporation
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

NEIL ABERCROMBIE
GOVERNOR
STATE OF HAWAI'I

ALBERT "ALAPAKI" NAHALE-A
CHAIRMAN
HAWAIIAN HOMES COMMISSION

MICHELLE K. KAUHANE
DEPUTY TO THE CHAIRMAN

M. WAIALEALE SARSONA
EXECUTIVE ASSISTANT

STATE OF HAWAI'I
DEPARTMENT OF HAWAIIAN HOME LANDS

P. O. BOX 1879
HONOLULU, HAWAI'I 96805

EM

July 14, 2011

RECEIVED
AUG 03 2011
WILSON OKAMOTO CORPORATION

Mr. Earl Matsukawa, AICP
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

Aloha Mr. Matsukawa:

Subject: DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
IN-VESSEL COMPOSTING FACILITY PROJECT
WAIALUA, ISLAND OF OAHU, HAWAII
TAX MAP KEY: 6-5-002:026

Mahalo for the opportunity to review and provide comments on this subject matter. The Department of Hawaiian Home Lands has no comment to offer.

If you have any questions, please call our Planning Office at (808) 620-9519.

Me Ke aloha,

for Albert "Alapaki" Nahale-a
Chairman
Department of Hawaiian Home Lands

Hawaiian Earth Recycling LLC

Project Office: 1169 Mikole Street, Honolulu, Hawaii 96825

Operating Location: 91-400 Malakole Street, Kapolei Hawaii 96707

September 12, 2011

Mr. Albert "Alapaki" Nahale-a, Chairman
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96808

Subject: Draft Environmental Impact Statement (DEIS)
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Nahale-a:

Thank you for your letter dated July 14, 2011. We acknowledge that you have no comments to offer at this time.

Should you have any questions, please call me at 792-0126. Thank you for your participation during the EIS process.

Sincerely,

F. Gregory Apa
Project Manager

cc: Mr. Earl Matsukawa, Wilson Okamoto Corporation
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

Neil Abercrombie
GOVERNOR OF HAWAII

Keith R. Ridley
Acting Director of Health

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

In reply, please refer to:
EMD/CWB

12071PDCL.10

December 29, 2010

Mr. Earl Matsukawa, AICP
Project Manager
Wilson Okamoto Corporation
1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Matsukawa:

SUBJECT: Comments on Environmental Assessment/Environmental Impact Statement Preparation Notice (EA/EISPN) Pre-Assessment Consultation for the In-Vessel Composting Facility Project Wailua, Island of Oahu, Hawaii

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges receipt of your letter, dated December 3, 2010, requesting comments on the subject project. We have reviewed your letter and offer these comments on your project. Please note that our review is based solely on the information provided in your letter and its compliance with Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at http://www.hawaii.gov/health/environmental/env-planning/landuse/CWB-standardcomment.pdf.

1. Any project and its potential impacts to State waters must meet the following criteria:

   a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.

   b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.

   c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).

2. You may be required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for the discharge of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55). For the following types of discharges into Class A or Class 2 State waters, you may apply for NPDES general permit coverage by submitting a Notice of Intent (NOI) form:

a. Storm water associated with construction activities, including clearing, grading, excavation, demolition, stockpiling, and staging 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 start of the construction activities.

b. Storm water associated with industrial activities, as categorized in Title 40 of the Code of Federal Regulations (CFR), Sections 122.26(b)(14)(i) through122.26(b)(14)(ix) and 122.26(b)(14)(xi).

c. Hydrotesting waters.

You must submit a separate NOI form for each type of discharge at least 30 calendar days prior to the start of the discharge activity, except when applying for coverage for discharges of storm water associated with construction activity. For this type of discharge, the NOI must be submitted 30 calendar days before to the start of construction activities. 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.

3. For types of wastewater not listed in Item 2 above or wastewater discharging into Class 1 or Class AA waters, you may need an NPDES individual permit. An application for an NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. The NPDES application forms may be picked up at our office or downloaded from our website at http://www.hawaii.gov/health/environmental/water/cleanwater/forms/indiv-index.html.

4. It is recommended that an assessment be performed on the project's construction and operation related impacts to all State surface waters (including Kaukonahua Stream and any wetlands) in the vicinity of the project site.

5. 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); 40 CFR, Section 122.2; and Hawaii Administrative Rules (HAR), Chapter 11-54.

6. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of $25,000 per day per violation.

If you have any questions, please visit our website at http://www.hawaii.gov/health/environmental/water/cleanwater/index.html, or contact the Engineering Section, CWB, at 586-4309.

Sincerely,

Joanna Kato

for ALEC WONG, P.E., CHIEF
Clean Water Branch

DCL:ml

c: DOH-EPO # I-3477 [via email only]

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

LORETTA J. FUDDY, A.C.S.W., M.P.H.
DIRECTOR OF HEALTH

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

In reply, please refer to:
EMD/CWB

06049PDCL.11

June 30, 2011

Mr. Earl Matsukawa, AICP
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

RECEIVED
JUL 01 2011
WILSON OKAMOTO CORPORATION

EM
TF

Dear Mr. Matsukawa:

Subject: Comments on Draft Environmental Impact Statement (DEIS) for the In-Vessel Composting Facility Project Waialua, Island of Oahu, Hawaii

The Department of Health (DOH), Clean Water Branch (CWB), has reviewed the subject document and has no comments at this time. The DOH-CWB previously provided pre-assessment consultation comments (DOH-CWB Letter No. 12071PDCL.10, dated De cember 29, 2010).

Please note that our review is based solely on the information provided in the subject document and its compliance with the Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at: http://www.hawaii.gov/health/environmental/env-planning/landuse/CWB-standardcomment.pdf.

If you have any questions, please visit our website at: http://www.hawaii.gov/health/environmental/water/cleanwater/index.html, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,

Alec Wong

ALEC WONG, P.E., CHIEF
Clean Water Branch

DCL:ml

c: DOH-EPO # 11-119
Mr. Steven Serikaku, CCH-DES

Neil Abercrombie
GOVERNOR OF HAWAII

LORETTA J. FUDDY, A.C.S.W., M.P.H.
DIRECTOR OF HEALTH

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

In reply, please refer to:
EMD/CWB

07013PJF.11

EM

July 13, 2011

RECEIVED
JUL 15 2011
WILSON OKAMOTO CORPORATION

Mr. Earl Matsukawa
Project Manager
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Matsukawa:

SUBJECT: Environmental Assessment/Environmental Impact Statement Preparation Notice for In-Vessel Composting Facility Project
Waialua, Island of Oahu, Hawaii
TMK: (1) 6-5-002:026

The Department of Health, Clean Water Branch (CWB), has reviewed the subject document and offers these comments on your project. Please note that our review is based solely on the information provided in the subject document and its compliance with the Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at:
http://www.hawaii.gov/health/environmental/env-planning/landuse/CWB-standardcomment.pdf.

1. Any project and its potential impacts to State waters must meet the following criteria:

   a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.

   b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.

   c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).

2. You may be required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55). For the following types of discharges into Class A or Class 2 State waters, you may apply for an NPDES general permit coverage by submitting a Notice of Intent (NOI) form:

a. Storm water associated with 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. This includes areas used for a construction base yard and the storage of any construction related equipment, material, and waste products. An NPDES permit is required before the start of the construction activities.

a. Hydrotesting water.

b. Construction dewatering effluent.

You must submit a separate NOI form for each type of discharge at least 30 calendar days prior to the start of the discharge activity, except when applying for coverage for discharges of storm water associated with construction activity. For this type of discharge, the NOI must be submitted 30 calendar days before to the start of construction activities. 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.

3. For other types of wastewater not listed in Item No. 2 above or wastewater discharging into Class 1 or Class AA waters, an NPDES individual permit will need to be obtained. An application for an NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. The NPDES application forms may be picked up at our office or downloaded from our website at http://hawaii.gov/health/environmental/water/cleanwater/forms/environmental/water/cleanwater/forms/indiv-index.html.

4. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage is required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of $25,000 per day per violation.

If you have any questions, please visit our website at: http://www.hawaii.gov/health/environmental/water/cleanwater/index.html, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,

ALEC WONG, P.E., CHIEF
Clean Water Branch

JF:ml

c: Mr. Steven Serikaku, City and County of Honolulu, Department of Environmental Services
DOH-EPO #11-034 [via email only]

Hawaiian Earth Recycling LLC

Project Office: 1169 Mikole Street, Honolulu, Hawaii 96825

Operating Location: 91-400 Malakole Street, Kapolei Hawaii 96707

September 12, 2011

Mr. Alec Wong, P.E., Chief
Clean Water Branch
Department of Health
State of Hawaii
P.O. Box 3378
Honolulu, HI 96801-3378

Subject: Draft Environmental Impact Statement (DEIS)
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Wong:

Thank you for your letters dated June 30, 2011 (Ref. No. 06049PDCL.11) and July 13, 2011 (Ref. No. 07013PJF.11). We offer the following responses in respective order of your comments:

1. The proposed project will comply with Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55, as applicable.

2. The proposed project will require an NPDES permit for Storm Water Associated with Construction Activities. Dewatering and hydrotesting is anticipated at this time. If dewatering and/or hydrotesting are needed, separate Notice of Intent (NOI) forms for each type of discharge will be submitted at least 30 calendar days prior to the start of discharge activity.

3. Because the Project will have no off-site discharge of any type, an Individual NPDES Permit is not anticipated.

4. We acknowledged that discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 Water Quality Certification are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of $25,000 per day per violation.

We apologize that your comment letter on the Environmental Impact Statement Preparation Notice was not included in the Draft EIS. It will be included in the forthcoming Final EIS.

Should you have any questions, please call me at 792-0126. Thank you for your participation during the EIS process.

Sincerely,

F. Gregory Apa
Project Manager

cc: Mr. Earl Matsukawa, Wilson Okamoto Corporation
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

NEIL ABERCROMBIE
GOVERNOR

PATRICIA McMANAMAN
DIRECTOR

PANKAJ BHANOT
DEPUTY DIRECTOR

RECEIVED
JUL 25 2011
WILSON OKAMOTO CORPORATION

STATE OF HAWAII
DEPARTMENT OF HUMAN SERVICES
Benefit, Employment and Support Services Division
820 Mililani Street, Suite 606
Honolulu, Hawaii 96813

July 21, 2011

Refer to 11:0413

Mr. Earl Matsukawa, AICP
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Matsukawa:

Thank you for your letter dated July 12, 2011, requesting a review and comment on the Draft Environmental Impact Statement (EIS) for the In-Vessel Composting Facility project. The Director of the Department of Human Services (DHS) has referred your letter to me for a response.

We have reviewed the EIS and have no comment, as the proposed project will not impact programs or services that DHS provides in the community. Please remove us as a consulted party for the balance of the EIS process.

A copy of this letter is being forwarded to at the City and County of Honolulu, Department of Environmental Services, as you requested.

Should you have any questions, please contact Ms. Marja Leivo, Child Care Program Specialist, at 586-7112.

Sincerely,

Scott Nakasone
Acting Division Administrator

c: Patricia McManaman, Director
Steven Serikaku, City & County of Honolulu Environmental Services

Hawaiian Earth Recycling LLC

Project Office: 1169 Mikole Street, Honolulu, Hawaii 96825

Operating Location: 91-400 Malakole Street, Kapolei Hawaii 96707

September 12, 2011

Mr. Scott Nakasone, Acting Division Administrator
Department of Human Services
State of Hawaii
820 Mililani Street, Suite 606
Honolulu, HI 96813

Subject: Draft Environmental Impact Statement (DEIS)
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Nakasone:

Thank you for your letter dated July 21, 2011 (Ref. No. 11:0413). We acknowledge that the proposed project will not impact programs or services that DHS provides in the community. We will remove you from the consultation list for the remainder of the EIS process, as requested.

Should you have any questions, please call me at 792-0126. Thank you for your participation during the EIS process.

Sincerely,

F. Gregory Apa
Project Manager

cc: Mr. Earl Matsukawa, Wilson Okamoto Corporation
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

EM

NEIL ABERCROMBIE
GOVERNOR

DWIGHT TAKAMINE
DIRECTOR

AUDREY HIDANO
DEPUTY DIRECTOR

STATE OF HAWAII
DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS
830 PUNCHBOWL STREET, ROOM 321
HONOLULU, HAWAII 96813
www.hawaii.gov/labor
Phone: (808) 586-8844/Fax: (808) 586-9099

RECEIVED
JUL 07 2011
WILSON OKAMOTO CORPORATION

July 5, 2011

Mr. Earl Matsukawa, AICP
Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Dear Mr. Matsukawa:

This is in response to your request for comments dated June 17, 2011 on the Draft Environmental Impact Statement for the In-Vessel Composting Facility Project located in Waialua, Oahu. The Department of Labor and Industrial Relations has no comments, and we foresee no impact on our existing or proposed programs.

Should you have any questions, please call me at 586-8844.

Sincerely,

DWIGHT TAKAMINE
Director

C: Steven Serikaku, Dept. of Environmental Services

Hawaiian Earth Recycling LLC

Project Office: 1169 Mikole Street, Honolulu, Hawaii 96825

Operating Location: 91-400 Malakole Street, Kapolei Hawaii 96707

September 12, 2011

Mr. Dwight Takamine, Director
Department of Labor and Industrial Relations
State of Hawaii
830 Punchbowl Street, Room 321
Honolulu, HI 96813

Subject: Draft Environmental Impact Statement (DEIS)
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Takamine:

Thank you for your letter dated July 5, 2011. We acknowledge that the proposed project will not impact existing programs and that you have no comments to offer at this time.

Should you have any questions, please call me at 792-0126. Thank you for your participation during the EIS process.

Sincerely,

F. Gregory Apa
Project Manager

cc: Mr. Earl Matsukawa, Wilson Okamoto Corporation
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

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

EM

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

August 12, 2011

RECEIVED
AUG 16 2011
WILSON OKAMOTO CORPORATION

Wilson Okamoto Corporation
Attention: Mr. Earl Matsukawa, AICP
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Dear Mr. Matsukawa

SUBJECT: Draft Environmental Impact Statement for In-Vessel Composting Facility Project, Waialua, Island of Oahu; TMK: (1) 6-5-002:026; Applicant is Hawaiian Earth Recycling LLC

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

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

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosures
cc: City and County of Honolulu
Department of Environmental Services
Attention: Mr. Steven Serikaku (w/copies)

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED
LAND DIVISION
2011 JUN 28 A 9:47
DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII

'11 JUN 21 AM 11:23 ENGINEERING

June 20, 2011

MEMORANDUM

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
x Engineering Division
x Div. of Forestry & Wildlife
x Div. of State Parks
x Commission on Water Resource Management
__Office of Conservation & Coastal Lands
__Land Division –

FROM: Charlene Unoki, Assistant Administrator
SUBJECT: Draft Environmental Impact Statement for In-Vessel Composting Facility Project
LOCATION: Island of Oahu
APPLICANT: Wilson Okamoto Corporation on behalf of Hawaiian Earth Recycling LLC

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by August 4, 2011.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

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

Signed: _____
Date: 6/29/11

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/CharleneUnoki
Ref.: DEISInVesselCompostingFacility
Oahu.841

( ) We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone ___.

( ) Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone ___.

( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ___.

( ) Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

( ) Mr. Robert Sumitomo (808) 768-8097 or Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting.

( ) Mr. Carter Romero at (808) 961-8943 of the County of Hawaii, Department of Public Works.

( ) Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.

( ) Ms. Wynne Ushigome at (808) 241-4890 of the County of Kauai, Department of Public Works.

( ) The applicant should include water demands and infrastructure required to meet project needs. Please note that projects within State lands requiring water service from the Honolulu Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.

( ) The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.

( ) Additional Comments: _____

_____

(X) Other: Our previous comments dated December 14, 2010 and April 4, 2011, which were attached in the Draft Environmental Impact Statement, still apply.

Should you have any questions, please call Ms. Suzie S. Agraan of the Planning Branch at 587-0258.

Signed: _____
CARTY S. CHANG, CHIEF ENGINEER

Date: 6/21/11

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

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

RECEIVED
LAND DIVISION
2011 JUN 29 P 2:58

RECEIVED
STATE PARKS DIV
'11 JUN 21 A10 :20

DEPT OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

DEPT OF LAND &
NATURAL RESOUR

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

June 20, 2011

MEMORANDUM

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
x Engineering Division
x Div. of Forestry & Wildlife
x Div. of State Parks
x Commission on Water Resource Management
__Office of Conservation & Coastal Lands
__Land Division –

FROM: Charlene Unoki, Assistant Administrator
SUBJECT: Draft Environmental Impact Statement for In-Vessel Composting Facility Project
LOCATION: Island of Oahu
APPLICANT: Wilson Okamoto Corporation on behalf of Hawaiian Earth Recycling LLC

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by August 4, 2011.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

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

Signed: _____
Date: 6/27/11

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

June 20, 2011

MEMORANDUM

2011 JUN 21 PM 12:46

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
x Engineering Division
x Div. of Forestry & Wildlife
x Div. of State Parks
x Commission on Water Resource Management
__Office of Conservation & Coastal Lands
__Land Division –

FROM: Charlene Unoki, Assistant Administrator
SUBJECT: Draft Environmental Impact Statement for In-Vessel Composting Facility Project
LOCATION: Island of Oahu
APPLICANT: Wilson Okamoto Corporation on behalf of Hawaiian Earth Recycling LLC

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by August 4, 2011.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

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

Signed: _____
Date: _____

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON

WILLIAM D. BALFOUR, JR.
SUMNER ERDMAN
LORETTA J. FUDDY, A.C.S.W., M.P.H.
NEAL S. FUJIWARA
DONNA FAY K. KIYOSAKI, P.E.
LAWRENCE H. MIIKE, M.D., J.D.

WILLIAM M. TAM
DEPUTY DIRECTOR

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

July 13, 2011

REF: WUP 876 Draft EA comments.doc

RECEIVED
LAND DIVISION
2011 JUL 15 A 9:34
DEPT OF LAND & NATURAL RESOURCES
STATE OF HAWAII

TO: Russell Tsuji, Administrator
Land Division

FROM: William M. Tam, Deputy Director
Commission on Water Resource Management

SUBJECT: Draft EA of In-Vessel Composting Facility Project (Hawaiian Earth Products)

FILE NO.: WUP 876, Well No. 3104-02
TMK NO.: 6-5-002:026

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

Our comments related to water resources are checked off below.

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

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

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

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

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

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

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

Permits required by CWRM:
Additional information and forms are available at http://hawaii.gov/dlnr/cwrm/resources_permits.htm.

☐ 8. The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit is required prior to use of water.

☐ 9. A Well Construction Permit(s) is (are) required any well construction work begins.

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

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

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

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

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

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

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

☒ OTHER:

Pg 3-38 states that there is a ground water use permit for 0.359 million gallons per day of ground water from well no. 3104-02. Ground Water Use Permit no. 879 approved on 2/17/10 is actually for 0.355 mgd, which is less than the originally requested 0.359 mgd.

If there are any questions, please contact Roy Hardy at 587-0274.

Hawaiian Earth Recycling LLC

Project Office: 1169 Mikole Street, Honolulu, Hawaii 96825

Operating Location: 91-400 Malakole Street, Kapolei Hawaii 96707

September 12, 2011

Mr. Russel Y. Tsuji, Administrator
Land Division
Department of Land and Natural Resources
State of Hawaii
P.O. Box 621
Honolulu, HI 96809

Subject: Draft Environmental Impact Statement (DEIS)
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Tsuji:

Thank you for your letter dated August 12, 2011. We offer the following responses in respective order of your comments:

Engineering Division

We acknowledge your previous comments dated December 14, 2010 and April 4, 2011 still apply.

Division of State Parks

We acknowledge you have no comments to offer at this time.

Commission on Water Resource Management

We acknowledge the correction for Ground Water Use Permit No. 879 for 0.355 million gallons per day. The forthcoming Final EIS will be revised.

Should you have any questions, please call me at 792-0126. Thank you for your participation during the EIS process.

Sincerely,

F. Gregory Apa
Project Manager

cc: Mr. Earl Matsukawa, Wilson Okamoto Corporation
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

NEIL ABERCROMBIE
GOVERNOR

GLENN M. OKIMOTO
DIRECTOR

Deputy Directors
FORD N. FUCHIGAMI
JAN S. GOUVEIA
RANDY GRUNE
JADINE URASAKI

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

IN REPLY REFER TO:
STP 8.0474

July 7, 2011

EM

Mr. Earl Matsukawa, AICP
Project Manager
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

RECEIVED
JUL 13 2011
WILSON OKAMOTO CORPORATION

Dear Mr. Matsukawa:

Subject: In-Vessel Composting Facility
Draft Environmental Impact Statement (DEIS)

The State Department of Transportation (DOT) previously commented on the Environmental Impact Statement Preparation Notice (EISPN) for the subject project in its letter STP 8.0401 dated April 8, 2011 (in Appendix L of the EISPN).

Given that the portion of Wilikina Drive fronting the project is under County jurisdiction, DOT does not anticipate any significant adverse impacts to the State transportation facilities. However, as noted in the EISPN, the applicant is required to obtain a permit from DOT Highways Division, to transport oversize and overweight equipment/loads within the State highways facilities. Further, the applicant should also coordinate with DOT Highways Division regarding its plans to keep the State highway facilities clean of products or debris hauled or tracked to and from the subject project site.

If there are any questions or the need to meet with DOT Highways staff, please contact Mr. David Shimokawa of the DOT Statewide Transportation Planning Office at telephone number (808) 831-7976.

Very truly yours,

GLENN M. OKIMOTO, Ph.D.
Director of Transportation

c: Steven Serikaku, City and County of Honolulu, Department of Environmental Services

Hawaiian Earth Recycling LLC

Project Office: 1169 Mikole Street, Honolulu, Hawaii 96825

Operating Location: 91-400 Malakole Street, Kapolei Hawaii 96707

September 12, 2011

Mr. Glenn M. Okimoto, Interim Director
Department of Transportation
Aliiaimoku Building
869 Punchbowl Street
Honolulu, HI 96813

Attention: Mr. David Shimokawa

Subject: Draft Environmental Impact Statement (DEIS)
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Okimoto:

Thank you for your letter dated July 7, 2011 (Reference No. STP 8.0474). We acknowledge that the Department does not anticipate any significant impacts to State transportation facilities.

Since oversized and overweight equipment/loads will be using State highway facilities for the proposed project, an application for a permit will be submitted to State DOT Highways Division. The applicant will implement appropriate mitigation measures on their trucks to prevent products and/or debris being hauled from impacting State highway facilities.

Should you have any questions, please call me at 792-0126. Thank you for your participation during the EIS process.

Sincerely,

F. Gregory Apa
Project Manager

cc: Mr. Earl Matsukawa, Wilson Okamoto Corporation
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 11TH FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8480 • Fax: (808) 768-4567
Web site: www.honolulu.gov

PETER B. CARLISLE
MAYOR

COLLINS D. LAM, P.E.
DIRECTOR

LORI M. K. KAHIKINA, P.E.
DEPUTY DIRECTOR

EM
TF

July 21, 2011

Mr. Earl Matsukawa, AICP
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

RECEIVED
JUL 25 2011
WILSON OKAMOTO CORPORATION

Dear Mr. Matsukawa:

Draft Environmental Impact Statement (DEIS)
In-Vessel Composting Facility Project
Waialua, Island of Oahu, Hawaii
Tax Map Key: 6-5-002:026

Thank you for the opportunity to review the Draft Environmental Impact Statement (DEIS).

The Department of Design and Construction has no comments to offer.

Should there be any questions, please contact me at 768-8480.

Sincerely,

for Collins D. Lam, P.E.
Director

CDL:pg(421399)

Cc:

City & County of Honolulu
Depart of Environmental Services
1000 Uluohia Street, Suite 201
Kapolei, Hawaii 96707
Attention: Mr. Steven Serikaku

Hawaiian Earth Recycling LLC

Project Office: 1169 Mikole Street, Honolulu, Hawaii 96825

Operating Location: 91-400 Malakole Street, Kapolei Hawaii 96707

September 12, 2011

Mr. Collins D. Lam, P.E., Director
Department of Design & Construction
City & County of Honolulu
650 S. King Sreet, 11th Floor
Honolulu, HI 96813

Subject: Draft Environmental Impact Statement (DEIS)
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Lam:

Thank you for your letter dated July 21, 2011. We acknowledge that you have no comments to offer at this time.

Should you have any questions, please call me at 792-0126. Thank you for your participation during the EIS process.

Sincerely,

F. Gregory Apa
Project Manager

cc: Mr. Earl Matsukawa, Wilson Okamoto Corporation
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

DEPARTMENT OF FACILITY MAINTENANCE

CITY AND COUNTY OF HONOLULU

1000 Uluohia Street, Suite 215, Kapolei, Hawaii 96707
Phone: (808) 768-3343 • Fax: (808) 768-3381
Website: www.honolulu.gov

PETER B. CARLISLE
MAYOR

WESTLEY K.C. CHUN, Ph.D., P.E., BCEE
DIRECTOR & CHIEF ENGINEER

GEORGE "KEOKI" MIYAMOTO
DEPUTY DIRECTOR

IN REPLY REFER TO:
DRM 11-517

July 1, 2011

RECEIVED
JUL 08 2011
WILSON OKAMOTO CORPORATION

Mr. Earl Matsukawa, AICP
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Matsukawa:

Subject: Draft Environmental Impact Statement (DEIS)
In-Vessel Composting Facility Project
Waialua, Island of Oahu, Hawaii
Tax Map Key: 6-5-002:026

Thank you for the opportunity to review and comment on the DEIS dated June 2011 for the proposed subject green waste, food waste and dewatered sewage sludge composting facility project.

We have no comments to offer as the proposed facility will be within privately-owned lands and will have negligible impact on our maintenance operations.

Should you have any questions, please call Charles Pignataro of the Division of Road Maintenance, at 768-3697.

Sincerely,

for Westley K.C. Chun, Ph.D., P.E., BCEE
Director & Chief Engineer

c: Department of Environmental Services – (Attn: Steven Serikaku)

Hawaiian Earth Recycling LLC

Project Office: 1169 Mikole Street, Honolulu, Hawaii 96825

Operating Location: 91-400 Malakole Street, Kapolei Hawaii 96707

September 12, 2011

Mr. Westley K.C. Chun, Ph.D., P.E., BCEE, Director & Chief Engineer
Department of Facility Maintenance
City & County of Honolulu
1000 Uluohia Street, Suite 215
Kapolei, HI 96707

Subject: Draft Environmental Impact Statement (DEIS)
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Chun:

Thank you for your letter dated July 1, 2011 (Ref. No. DRM 11-517). We acknowledge that you have no comments to offer as the proposed facility will be within privately-owned lands and will have negligible impacts on your maintenance programs.

Should you have any questions, please call me at 792-0126. Thank you for your participation during the EIS process.

Sincerely,

F. Gregory Apa
Project Manager

cc: Mr. Earl Matsukawa, Wilson Okamoto Corporation
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

DEPARTMENT OF TRANSPORTATION SERVICES

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 3RD FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8305 • Fax: (808) 768-4730 • Internet: www.honolulu.gov

PETER B. CARLISLE
MAYOR

WAYNE Y. YOSHIOKA
DIRECTOR

KAI NANI KRAUT, P.E.
DEPUTY DIRECTOR

TP6/11-406525R

July 18, 2011

EM
TF

Mr. Earl Matsukawa, AICP
Project Manager
Wilson Okamoto Corporation
1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii 96826

RECEIVED
JUL 20 2011
WILSON OKAMOTO CORPORATION

Dear Mr. Matsukawa:

Subject: Draft Environmental Impact Statement (DEIS) In-Vessel Composting Facility Project; Waialua, Oahu, Hawaii
Tax Map Key (TMK): 6-5-002: 026

This responds to your letter of June 9, 2011, which responded to our previous pre-consultation comments, and your letter of June 17, 2011, requesting our comments concerning the DEIS.

We have no additional comments to offer at this time.

Thank you for the opportunity to review this matter. Should you have any further questions, please contact Michael Murphy of my staff at 768-8359.

Very truly yours,

WAYNE Y. YOSHIOKA
Director

cc: Mr. Steven Serikaku, DES

DEPARTMENT OF TRANSPORTATION SERVICES

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 3RD FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8305 • Fax: (808) 768-4730 • Internet: www.honolulu.gov

PETER B. CARLISLE
MAYOR

WAYNE Y. YOSHIOKA
DIRECTOR

KAI NANI KRAUT, P.E.
DEPUTY DIRECTOR

EM

TP6/11-406525R

July 27, 2011

RECEIVED
JUL 28 2011
WILSON OKAMOTO CORPORATION

Mr. Earl Matsukawa, AICP
Project Manager
Wilson Okamoto Corporation
1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Matsukawa:

Subject: Draft Environmental Impact Statement (DEIS) In-Vessel Composting Facility Project; Waialua, Oahu, Hawaii
Tax Map Key (TMK): 6-5-002: 026

We are providing additional comments from our Traffic Engineering Division (TED).

- Regarding Section 3.10, page 3-32 – The report states that the traffic signals at the intersection of Kamananui Road and Wilikina Drive will provide sufficient gaps in traffic flow to allow ingress and egress into the project. However, the report states that most of the trips entering the facility are expected to be traveling north-bound on Wilikina Drive and turning left into the project. As a result, the traffic signal at Kamananui Road, which is south of the project, will not be able to create the gaps in traffic as stated in the report.

- A gate or chain for the facility, if used, shall be set in far enough into the project's driveway to allow a vehicle to pull totally off of the roadway when opening/closing the facility gate.

- Sight distance for the ingress and egress of the driveway should be based on operating speeds along Wilikina Drive.

Thank you for the opportunity to review this matter. Should you have any further questions, please contact Michael Murphy of my staff at 768-8359.

Very truly yours,

WAYNE Y. YOSHIOKA
Director

cc: Mr. Steven Serikaku, DES
DTS/Traffic Engineering Division

Hawaiian Earth Recycling LLC

Project Office: 1169 Mikole Street, Honolulu, Hawaii 96825

Operating Location: 91-400 Malakole Street, Kapolei Hawaii 96707

September 12, 2011

Mr. Wayne Yoshioka, Director
Department of Transportation Services
City & County of Honolulu
650 South King Street, 3rd Floor
Honolulu, HI 96813

Attention: Mr. Michael Murphy

Subject: Draft Environmental Impact Statement (DEIS)
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Yoshioka:

Thank you for your letters dated July 18 and 27, 2011 (Reference No. TP6/11-406525R). We offer the following responses in respective order of your comments:

1. We concur that the majority of vehicles entering the proposed facility are expected to be traveling northbound on Wilikina Drive and turning left into the project site. Upon exiting the facility, most will travel southbound. These movements can be accomplished with minimal conflicts.

   Traffic exiting the facility heading northbound, however, would have to negotiate traffic headed in both directions along Wilikina Drive. For the left-turn movements, the traffic signal operations at the intersection of Wilikina Drive and Kamananui Road should create gaps to facilitate this maneuver.

   Hawaiian Earth Products (HEP), Hawaiian Earth Recycling's (HER) affiliated operating company, has been delivering thirty (30) ton trailer loads, in fifty-three (53) foot trailer and tractor units, of mulched or composted materials to the project site. Since April 2010, HER has been delivering this material from its Campbell Industrial Park Composting Facility or more than 110,000 tons of material. This material is transported by eighteen (18) trailer/tractor truck trips each operating day and the trucks enter the property via a left hand turn from Wilikina Drive and exit the property via a right hand turn onto Wilikina Drive. Since April 2010, HEP or HER has not received any complaints about this additional trailer/tractor traffic.

2. A gate/chain at the entrance to the facility will be set far enough away from the driveway entrance to allow a vehicle to stay completely out of the roadway when opening/closing the facility gate/chain.

3. Sight distances for safe ingress and egress from the driveway were determined based on posted speed limits. As a result, the location of the driveway has been adjusted in the site plan along Wilikina Drive.

Should you have any questions, please call me at 792-0126. Thank you for your participation during the EIS process.

Sincerely,

F. Gregory Apa
Project Manager

cc: Mr. Earl Matsukawa, Wilson Okamoto Corporation
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843

PETER B. CARLISLE, MAYOR

RANDALL Y. S. CHUNG, Chairman
DENISE M. C. DE COSTA
ANTHONY R. GUERRERO, JR.
THERESIA C. McMURDO
ADAM C. WONG

WESTLEY K.C. CHUN, Ex-Officio
GLENN M. OKIMOTO, Ex-Officio

WAYNE M. HASHIRO, P.E.
Manager and Chief Engineer

DEAN A. NAKANO
Deputy Manager

June 24, 2011

RECEIVED
JUN 28 2011
WILSON OKAMOTO CORPORATION

EM
TF

Mr. Earl Matsukawa, AICP
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Matsukawa :

Subject: Your Letter Dated June 17, 2011 Requesting Comments on the Draft Environmental Impact Statement for the In-Vessel Composting Facility Project in Waialua, TMK: 6-5-2: 26

Thank you for the opportunity to comment on the proposed composting facility.

The comment in our letter dated March 7, 2011, which is included in the document, is still applicable.

If you have any questions, please contact Robert Chun at 748-5443.

Very truly yours,

PAUL S. KIKUCHI
Chief Financial Officer
Customer Care Division

cc: Mr. Steven Serikaku, Department of Environmental Services

Hawaiian Earth Recycling LLC

Project Office: 1169 Mikole Street, Honolulu, Hawaii 96825

Operating Location: 91-400 Malakole Street, Kapolei Hawaii 96707

September 12, 2011

Mr. Paul Kikuchi, Chief Financial Officer
Customer Care Division
Board of Water Supply
630 South Beretania Street
Honolulu, HI 96843

Attention: Mr. Robert Chun

Subject: Draft Environmental Impact Statement (DEIS)
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Mr. Kikuchi:

Thank you for your letter dated June 24, 2011. We acknowledge that your previous comment letter dated March 7, 2011 is still applicable.

Should you have any questions, please call me at 792-0126. Thank you for your participation during the EIS process.

Sincerely,

F. Gregory Apa
Project Manager

cc: Mr. Earl Matsukawa, Wilson Okamoto Corporation
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

HOUSE OF REPRESENTATIVES

STATE OF HAWAII
STATE CAPITOL
HONOLULU, HAWAII 96813

August 6, 2011

Mr. Gregory Apa
Hawaiian Earth Recycling, LLC
91-400 Malakole Street
Kapolei, Hawaii 96707

Mr. Steven Serikaku
Department of Environmental Services
1000 Uluohia Street, Suite 212
Kapolei, Hawaii 96707

Mr. Earl Matsukawa
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96813

RE: COMMENTS ON IN-VESSEL COMPOSTING FACILITY DRAFT EIS

Dear Sirs:

Pursuant to the semi-monthly periodic bulletin issued by the Office of Environmental Quality Control dated June 23, 2011, I offer the following comments on the draft environmental impact statement (Draft EIS) prepared for the proposed construction of an in-vessel compositing facility in Waialua on the Island of Oahu, TMK: 6-5-002:026:

I. INADEQUATE REVIEW OF LAWS AND POLICIES THAT MAY BE TRIGGERED BY IN-VESSEL COMPOSTING PROJECT

Section 4.0 of the Draft EIS provides a review of the State and county plans and policies related to the proposed project with focus on land use and planning laws. However, there are other laws and policies that may undoubtedly be triggered should the in-vessel composting project commence.

Of particular note is Title 19, Hawaii Revised Statutes, entitled "Health". Among the many laws that might be triggered include but are not limited to:

- Chapter 339, HRS (Litter Control);
- Chapter 340A, HRS (Solid Waste);
- Chapter 340B, HRS (Wastewater Treatment Personnel);
- Chapter 340E, HRS (Safe Drinking Water);
- Chapter 341, HRS (Environmental Quality Control);
- Chapter 342B, HRS (Air Pollution Control);
- Chapter 342D, HRS (Water Pollution);
- Chapter 342G, HRS (Integrated Solid Waste Management);
- Chapter 342H, HRS (Solid Waste Pollution);
- Chapter 342J, HRS (Hazardous Waste); and
- Chapter 343, HRS (Environmental Impact Statements).

Although Section 7.0 of the Draft EIS provides a list of permits, approvals and reviews which **may** be required, the Draft EIS does not provide a comprehensive discussion of all federal and state laws and county ordinances applicable for operations to commence. Accordingly, it may seem problematic to fully ascertain the environmental impacts of the proposed in-vessel facility, let alone reach the finding that there would be minimal impacts, if the standards that must be met are not agreed to and stated for the record at the outset.

In fact, from the perspectives of the City and County of Honolulu's Department of Environmental Services (ENV) and Hawaiian Earth Recycling (HER), it is unclear whether an EIS is required under law. The preface to the Draft EIS states:

> *"As part of the **contractual requirements** between ENV and HER, the environmental documentation requirements prescribed under Chapter 343, Environmental Impact Statements, Hawaii Revised Statutes (as amended) and Hawaii Administrative Rules Chapter 200 (Environmental Impact Statement Rules) Title 11, of the State of Hawaii Department of Health, as amended (State of Hawaii 1996) will be followed for this project."* [Emphasis added.]

As such, since there doesn't appear to be a statutory basis for this EIS report, it is unclear how any opinions, errors, or omissions, however described, that may be in this EIS report will impact the progress of this project. Additionally, because the scope of this report does not appear to coincide with any specific statutory requirement, it is unclear whether this report might be interpreted that the in-vessel composting facility will have "no anticipated significant impact" if indeed the scope of the assessment is too narrow.

Furthermore, the lack of a discussion on the various permits needed for the project raises questions on whether the public's health, welfare and safety will be impacted by this project. For example, the Hawaii State Legislature enacted stringent requirements on the processing and disposal of solid waste, as found in Chapters 342G (Integrated Solid Waste Management), and 342H (Solid Waste Pollution), HRS.

Specifically, Section 342G, HRS, states:

> *". . . The **Department of Health** shall evaluate the public health consequences of using compost for specific applications and bioconversion for the processing of municipal solid waste. . ."* [Emphasis added.]

Although the Draft EIS has indicated that the Department of Health was provided the opportunity to comment on both the Draft EIS and the Draft EA, it is unclear from either document whether before commencing with this project, the Department of Health would need to approve this particular initiative.

It is also unclear from the text of the Draft EIS whether the applicant is currently in the process of obtaining a new permit from the Department of Health to conduct composting operations at the Waialua site, or plans to utilize its existing permit authorized for the facility at Campbell Industrial Park. However, because current operations at the Campbell site process green waste only and not food waste and sewage sludge (see, Draft EIS at 1-1), it would seem that the proposed activities would constitute a new use for which the operator should appropriately need to apply for and obtain a new solid waste permit pursuant to Chapter 342H, HRS, prior to operation.

II. TRANSPORTATION OF DEWATERED SEWAGE SLUDGE TO IN-VESSEL COMPOSTING FACILITY NOT DISCUSSED

Section 2-1 of the Draft EIS states:

> *"Dewatered sewage sludge will come from the CCH's Honouliuli and Kailua Regional Wastewater Treatment Facilities. In the future,*

> *dewatered sewage sludge may come from other wastewater treatment facilities. Per ENV's National Pollutant Discharge Elimination System (NPDES) Permit, the ENV tests the sewage sludge for hazardous chemicals on an annual basis."*

Despite this, with the exception of a general discussion on the traffic impacts the proposed project will have to the community, the Draft EIS does not appear to address the possible environmental impacts the transportation of food waste and dewatered sewage sludge may have on the immediate area as well as all on the communities situated along the routes these materials will be transported. As such, it is unclear from the Draft EIS whether the transportation of these materials would be hazardous to the public.

The Draft EIS further states in Section 2-1:

> *"Per ENV's National Pollutant Discharge Elimination System (NPDES) Permit, the ENV tests the sewage sludge for hazardous chemicals on an **annual basis**. The final composted product, that being both the green waste and food waste combined composted material and the separately composted dewatered sewage sludge and green waste combined composted material, will be tested to meet both US Composting Council (USCC) and Process to Further Reduce Pathogens (PFRP) standards, which is conducted by a third-party independent review of its chemical composition."* [Emphasis added.]

Arguably, since the sewage sludge is tested only on an annual basis for hazardous chemicals, any potential inclusion of hazardous chemicals in the sewage sludge might be transported to the proposed in-vessel facility during the periods between annual testing. Should any of the sludge spill during transportation, whether inadvertently or because of vehicular accident, potentially hazardous substances could conceivably contaminate the environment.

It should also be noted that transportation of sewage sludge from the Honouliuli Regional Wastewater Treatment Facility to the proposed in-vessel facility will undoubtedly require the material to be transported across the Pearl Harbor aquifer, the largest freshwater aquifer on Oahu. Material transported from the Kailua Regional Wastewater Treatment Facility would require the material to be transported across the Windward and North Groundwater sectors, depending on the routes taken. Further, the proposed in-vessel composting facility would be situated over the Central Groundwater sector. (**See**, Section 3.3.1 of the Draft EIS.)

Should sewage sludge contaminate any of these aquifers (through leaching of spilled materials), the quality of water meant for human consumption from any of three of the five groundwater sectors on Oahu could be compromised.

The hauling of sewage sludge is controversial, as evidenced by news articles in recent weeks, attached.

III. SOURCE AND TYPE OF FOOD WASTE COMPONENT INCOMPLETE; IMPACTS ON PERCENTAGE OF SEWAGE SLUDGE COMPONENT

Section 2.3 of the Draft EIS states:

> *"The proposed in-vessel composting facility will be able to process up to 150,000 tons per year (TPY) of green waste, food waste, and dewatered sewage sludge and produce marketable products such as compost, soil amendments, potting mixes, and erosion control materials. By weight, this total amount is estimated to consist of approximately 70 to 80 percent green waste, 5 to 10 percent food waste and 15 to 20 percent dewatered sewage sludge."* [Emphasis added.]
>
> ***"Food waste will be delivered from a soon to be developed CCH food waste collection program and by private haulers and businesses."*** [Emphasis added.]

Because the food waste to be transported has yet to be determined, it is unclear whether the transportation of these materials might also pose hazards (or nuisances) to the public.

Furthermore, because no information is provided in the Draft EIS concerning whether there will be an adequate stream of food waste to process 7,500 to 15,000 tons (5 to 10 percent of 150,000 tons) each year, especially in the early years of operation, it would seem that there may be pressure by the City and County of Honolulu to process more than the anticipated 22,500 to 30,000 tons (15 to 20 percent of 150,000 tons) of sewage sludge each year cited in the Draft EIS. Considering that the Sand Island and Honouliuli treatment facilities may have already reached their operational capacities and are currently under consideration of transporting sewage to the Kailua Treatment Facility, this scenario may not be farfetched.

If the City and County of Honolulu intends to diversify refuse collection to include food waste, such a system may likely require public education, the distribution of separate collection containers to residents, and the development of alternative pick-up schedules, which would may require the appropriation of funds, the adoption of administrative rules, and possibly even contract amendments with public sector workers. Given the current fiscal challenges and revenue forecasts, it would be useful to learn whether adequate funds are budgeted for these purposes.

Likewise, regarding commercial food waste, there may need to be incentives for businesses to dispose of food waste in a manner other than what is currently being done. Whether the City and County of Honolulu intends to establish these incentives through legislation or other means remains to be seen.

As mentioned earlier, the transporting of sewage sludge has become controversial and raises issues of fundamental fairness to the communities impacted. In many ways, the proposed in-vessel composting facility will become a new sewage treatment facility located in Central Oahu, with Wahiawa being the end of the line for the sewage from Windward Oahu and the Honolulu Urban Core.

IV. POSSIBLE NEGATIVE IMPACTS ON VIEW PLANES AT KUKANILOKO BIRTHING STONES

In her comments on the Draft EIS, Theresa Donham, Acting Archaeology Branch Chief of the Historic Preservation Division, Department of Land and Natural Resources, wrote:

> *". . . Your letter indicates that you plan to prepare an 'archeological resources study' as part of the pending EA/EIS. Because of the likely absence of historic sites within the project area, **we suggest that you focus this study on whether or not this planned action will have any visual or indirect impact on historic properties in the vicinity.** Our records indicate that the Kukaniloko Birthing Stones (National Register Site 80-04-0218) are located approx 1.5 miles to the east of the proposed site. In addition, the Kaukonahua gulch just south of the project area was undisturbed by the intensive agriculture, and may contain archaeological resources. Therefore the archaeological study should address any impact this project may have on Kaukonahua gulch."* [Emphasis added.]

In response, Earl Matsukawa, AICP, Project Manager of Wilson Okamoto Corporation wrote:

> *". . . **Visual impacts** . . . to nearby cultural [sites] **will be discussed in the Draft EIS**. . ."* [Emphasis added.]

Despite assurances that the Draft EIS would assess the visual impacts of the proposed in-vessel composting facility to these historic sites, there is no discussion in the text of the Draft EIS on the visual impacts of the proposed facility to the Kukaniloko Birthing Stones, situated just 1.5 miles away.

Considering the relatively flat area on which the proposed facility will be situated, the 38-foot high processing facility will be seen from great distances. As such, the proposed in-vessel composting facility might negatively impact the visual planes surrounding the Kukaniloko Birthing Stones.

According to the Department of Land and Natural Resources website, the Kukaniloko Birthing Stones is one of the most significant cultural sites on Oahu. (See, http://www.hawaiistateparks.org/parks/oahu/kukaniloko.cfm) The significance was recognized in the listing of the site on the National and Hawaii Registers of Historic Places. A 5-acre parcel encompassing the site was acquired by the State of Hawaii in 1992 and placed under the jurisdiction of State Parks to preserve and interpret this historic site.

The site is managed and maintained through a partnership between State Parks, the Hawaiian Civic Club of Wahiawa, and the Friends of Kukaniloko.

It should be noted that Appendix H of the Draft EIS entitled, "Cultural Impact Assessment for Proposed In-Vessel Composting Facility, Cultural Surveys Hawaii, Inc. March 2011", states:

> *". . . HER should brief and consult with community members and organizations as the Project design progresses, especially Tom Lenchanko and the Hawaiian Civic Club of Wahiawa, the kahu (guardian) and curator of Kukaniloko Birthstones State Monument, respectively. **This on-going consultation should keep the community informed of any changes that could result in unanticipated adverse cultural impacts**."* [Emphasis added.]

It is unclear whether Mr. Lenchanko or the Friends of Kukaniloko were consulted during the preparation of this Draft EIS.

IV. PUBLIC PERCEPTION AND COMMUNITY IMPACT MITIGATION

Despite the conclusions offered by the Draft EIS, the proposed in-vessel composting facility will undoubtedly impact the State. These impacts most definitely will affect daily life and relationships around Central and North Shore Oahu.

In my view, because of the serious questions raised concerning:

- The statutory basis for this report;
- The unclear status of Department of Health permits;
- The lack of review on the transportation of sewage sludge;
- The still-pending development of a consistent food waste stream; and
- The possible negative impacts this project might have on one of the most important cultural sites on Oahu,

more must be done to ensure the protection of the general public and the fostering of goodwill between the City and County of Honolulu, the operators of the proposed facility, and the communities of Wahiawa, Waialua, and all other communities that might be impacted by this project.

Therefore, I strongly urge the parties to continue discussions with community leaders to develop a package of impact mitigation measures for the benefit of the communities of Wahiawa and Waialua. This could conceivably include road improvements along the travel routes, infrastructure improvements to Wahiawa General Hospital (the primary health care facility for Central and North Shore Oahu), and other community service programs.

Please be advised that I will continue to monitor the progress of this project and act accordingly in my capacity as the State Representative of the 39th House District to do what is in the best interests of my constituents.

Thank you for the opportunity to comment on the Draft EIS. Should you have any questions, please do not hesitate to contact me at 586-6200.

Very Truly Yours,



REPRESENTATIVE MARCUS R. OSHIRO
39th House District
(Wahiawa, Whitmore Village, Launani Valley)

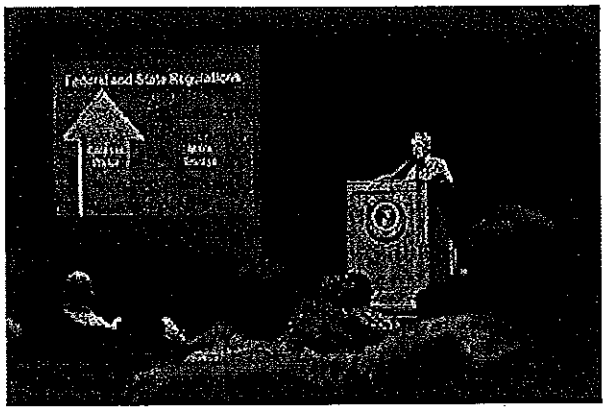
Attachments
C: Representative Gil Riviere
Representative Cynthia Thielen
Senator Donovan Dela Cruz
Wahiawa Neighborhood Board
North Shore Neighborhood Board
Wahiawa Community and Business Association
Wahiawa General Hospital
State of Hawaii Department of Health
State of Hawaii Department of Land and Natural Resources
State of Hawaii Department of Transportation
Office of Hawaiian Affairs
U.S. Army Installation Management Command, Pacific Region

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Public briefed on sludge hauling

"We do not want to wait for failure," the city says in support of its plan

By B.J. Reyes
POSTED: 01:30 a.m. HST, Aug 02, 2011



BRUCE ASATO / BASATO@STARADVERTISER.COM
City Environmental Services Director Tim Steinberger addressed a gathering on Honolulu's waste-water treatment facilities in a public informational meeting Monday night at the Mission Memorial auditorium.

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City officials sought to ease community members' concerns over plans to truck raw sewage sludge from urban Honolulu to outlying communities.

The public meeting was held Monday night by the city as it continues planning for test runs later this month of trucking raw sewage sludge from Sand Island to Honouliuli Wastewater Treatment Plant to ease congestion on the Honolulu facility.

The city ultimately plans to haul the sludge to plants in Kailua and Waianae — in addition to Honouliuli — as it deals with delays in the expansion of facilities at Sand Island.

Hauling sludge to the other plants is seen as a temporary means of relieving the over-capacity "digester" at Sand Island while the administration and City Council work out plans for the safest, most cost-effective way to expand the facility.

"We do not want to wait for failure," said Tim Steinberger, director of the city Department of Environmental Services. "That is simply not an option."

The public meeting at the city's Mission Memorial Auditorium attracted about 50 people, mostly city workers and staff members for various elected officials and government agencies. Monday's meeting came as the City Council prepared for its own informational briefing on the matter Wednesday before the Public Works and Sustainability Committee.

While there was no formal question-and-answer session, officials stuck around after the hourlong series of presentations to speak informally with those in attendance.

"I commend the administration for putting this meeting together," said Councilman Ikaika Anderson, who was among a handful of lawmakers in attendance. "However, I do look forward to an actual discussion between the administration and City Council on Wednesday.

"What the people of Honolulu want to hear about is what the contingency plans are to deal with the excess sewage. ... What they want is for the Council and the administration to come together and solve the problem."

MAYOR Peter Carlisle announced plans last month for the test runs to Honouliuli while the city concurrently conducts an environmental assessment of the entire project to haul sludge to additional plants in Kailua

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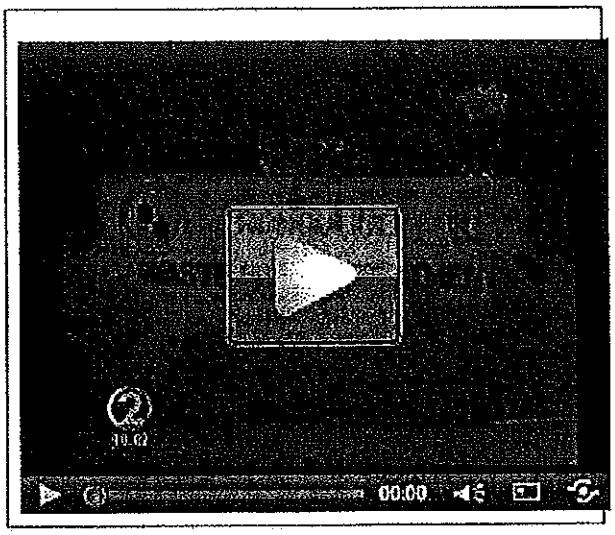
City details what it hopes to learn from trucking sludge

Reported by: Marisa Yamane

Email: myamane@khon2.com

Published: 8/01 9:50 pm

Updated: 8/01 10:32 pm



This month, the City will begin testing a plan of hauling raw sewage sludge from Sand Island to Ewa.

The City Department of Environmental Services held a meeting tonight to brief the public on why it needs to do this test and what it hopes to learn.

There's been some opposition to this especially from lawmakers who say they don't want sludge trucked through their neighborhoods.

But the City says it has no other option right now.

The City's largest wastewater treatment plant, on Sand Island, is in need of help.

"Although we are not experiencing failure at this time at Sand Island, we do know we are experiencing flows that are greater than the capacity of the existing facility," said Tim Steinberger, City Department of Environmental Services Director.

Steinberger used this analogy to explain why the City needs to haul some of the sludge away: "Say if your bathtub begins to overflow, and you find out your drain cock that you have is broken and you can't get the drain out so it starts overflowing. The first thing you're going to do is try to get rid of the water right? So you may say get the bucket out and start bailing it out and put it down the bathroom sink while I shut the water off, and that's basically what we're looking at."

There are only three plants with facilities to handle the job -- in Waianae, Kailua, and Honouliuli in Ewa.

But the first two can't be used right now because of various reasons.

That leaves Honouliuli as the only option.

"Well we don't know how much can be transported to the other treatment plant before it increases our risk at the other facility. And also we don't know if we can accomplish this task with the equipment we have on hand. And we don't know if there's going to be odor problems associated with this," said Steinberger.

And those are the questions they hope to answer by doing the test runs to Honouliuli starting this month.

The plan calls for one truck load a day for up to 30 days.

One tanker carries up to 5,000 gallons.

This is a temporary solution as the Council works with City officials on a long-term solution for the Sand Island plant.

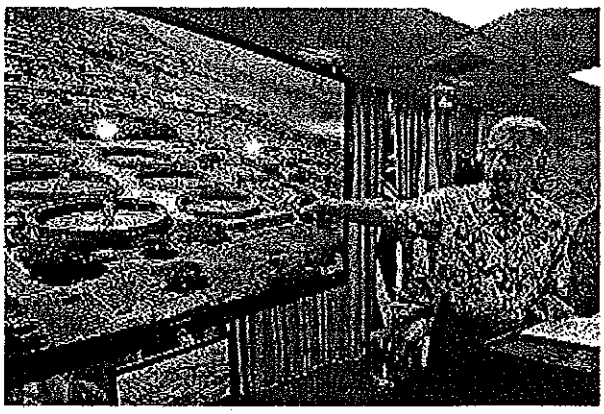
The mayor has ordered an environmental assessment to be done for not only Honouliuli, but also Kailua and Waianae.

"And that will be ongoing for the next 6-8 months. We are currently in the process of identifying our consultant," said Steinberger.

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City to test hauling of sewage to Ewa plant

By B.J. Reyes
POSTED: 01:30 a.m. HST, Jul 21, 2011



Dennis oda / doda@staradvertiser.com
Mayor Peter Carlisle pointed to a photograph of the Sand Island Wastewater Treatment Plant after his announcement Wednesday that test runs of sewage sludge hauls from Sand Island to the Honouliuli treatment plant are scheduled to begin in August.

Beginning next month, the Honouliuli Wastewater Treatment Plant in Ewa will receive additional truckloads of raw sewage sludge from Sand Island as the city begins testing for a long-term plan of hauling waste to reduce intake at the over-capacity Honolulu site.

WASTEWATER TALK

>> **What:** The city will hold a public meeting at which administrators and engineers will be on hand to discuss plans to haul raw sewage sludge from Sand Island to wastewater treatment plants in Honouliuli, Kailua and Waianae.
>> **When:** 7 p.m., Aug. 1
>> **Where:** Mission Memorial Auditorium (Civic Center grounds, next to Honolulu Hale)

The city ultimately plans to haul the sludge to plants in Kailua and Waianae — in addition to Honouliuli — as it deals with delays in the expansion of facilities at Sand Island, which takes in sewage within the urban core from Aina Haina to Halawa. Test runs are not being made to Kailua and Waianae at this time because of mechanical issues at those plants, officials said.

Mayor Peter Carlisle has ordered a formal environmental assessment be conducted on the plan to haul sewage to all three waste-water treatment plants.

"Since it may be inevitable, it would be a waste of time to wait until we are ordered to do it," Carlisle said in announcing the hauling plans at a news conference Wednesday. "Therefore, we will do it now."

Hauling sewage sludge to the other plants is seen as a temporary means of relieving the over-capacity "digester" at Sand Island while the administration and City Council work out plans for the safest, most cost-effective way to expand the facility.

"I do look forward to working with the administration to finding a long-term solution and I think the Council is committed to that end," said City Councilman Ikaika Anderson.

Anderson, whose district includes Kailua, said he is pleased with the decision to conduct an environmental assessment. Reaction from lawmakers in affected communities was mixed, as some appreciated the environmental study but remained wary of sludge being trucked through residential areas.

"The fact that they're doing an environmental assessment, at the very least, is commendable and certainly should be done," said state Sen. Will Espero, whose district includes the Honouliuli plant

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HAWAII NEWS NOW

Test runs to truck raw sewage start in August

Posted: Jul 20, 2011 9:19 AM
Updated: Jul 21, 2011 11:04 AM

By Tim Sakahara - bio | email

HONOLULU (HawaiiNewsNow) - Heading toward a sewage crisis Honolulu Mayor Peter Carlisle implements a plan to start trucking raw sewage sludge but there are also steps to protect the environment.


Honolulu Mayor Peter Carlisle

Mayor Carlisle used the example from earlier this year when the Waimanalo Gulch landfill failed and trash, medical waste and needles wound up on the beaches. It wasn't pretty, but he says it will be even worse if the Sand Island sewage digester fails.



"We have a problem. We need another egg," announced Mayor Carlisle.

He's not referring to breakfast, but an egg as in a digester which breaks down sewage sludge and can turn it into fertilizer. The egg at Sand Island is beyond full. The city needs to flush out the excess so it will start by trucking at most one 5,000 gallon truck load a day for 30 days to the Honouliuli Wastewater Treatment Plant in Ewa Beach.


Cynthia Thielen

For now they will not go to Waianae because its digester is full of silt from recent storms. And they'll skip Kailua because that facility is fixing its digester and building an odor control system. That leaves Honouliuli which has plenty of space for sludge.


Ikaika Anderson

"I am painfully, completely and utterly aware that nobody wants this in their community but you have to realize we have to play with the cards we are dealt," said Mayor Carlisle. "Not in my backyard has no place with this since we are all responsible for creating the waste that is going to all of our treatment plants."



The city says it's been trucking raw sewage for decades to the landfill and other sewage plants. City administrators say there has been a single spill or accident from city drivers.

Still the mayor also says he will do an environmental assessment to study the impact of trucking more sludge something the mayor credited Kailua lawmaker Cynthia Thielen for helping push through.

"I think that's responsible leadership. Now I will challenge the council go back and do it the way it should have been done put the money in the upcoming budget and build that second digester at sand island," said Rep. Thielen, (R) Kailua.

Star Advertiser

City waits to increase sludge runs

The proposed trips from Sand Island face community opposition, though officials say similar cross-island hauls already take place

By B.J. Reyes
POSTED: 01:30 a.m. HST, Jul 17, 2011

Amid legal questions and with a public informational briefing set for next month, the city is moving ahead with planning for the temporary trucking of raw sewage sludge from its Sand Island Wastewater Treatment facility to treatment plants in Honouliuli, Kailua and Waianae.

Hauling would involve three 5,000-gallon trucks making two daily runs — up to 210,000 gallons per week — from Sand Island, which is over capacity, to each of the three outlying plants. It was expected to begin by the end of the month, but officials say details still are being finalized, including test runs of one delivery per day to determine the impact of the sludge transportation.

At least one state lawmaker says a formal environmental assessment is needed before the hauling can begin. City officials, noting that the Department of Environmental Services already hauls more than 200,000 gallons of sludge per week to the plants in Kailua and Honouliuli, said the city corporation counsel is studying the request.

"If the EA is required, we're not going to violate the law," said Tim Steinberger, city environmental services director.

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raised in a study about fertilizer pellets the company is producing. Council members then passed unanimously a resolution requiring the city to examine alternative technologies for treating sewage sludge and report back to the Council within 90 days.

"The main goal is to implement a new technology that will be less costly, more efficient and not compromise public health and safety," Cachola and Council Chairman Ernie Martin said in a joint statement. Both noted that even had the funds been appropriated, it would have taken at least two years for the digester to come online and that hauling of sludge would still have to occur.

Martin has said the Council will reconsider the funding next year, but he and Cachola noted that they already had approached the administration and proposed a pilot program to allow private companies to test thir technologies at no cost to the city.

"The excess sludge at Sand Island would be used to test their technologies and possibly eliminate the need to truck it elsewhere," the councilmen said, adding that the proposal was agreed to by the administration.

The resolution could still slow the expansion at Sand Island.

"If the City Council puts a condition that we must use one of those (alternative) technologies ... then that could slow everything down for some time because then you kind of have to start from square one," Steinberger said, adding that new projects typically take as long as six years to complete.

The interim short-term solution appears to be hauling, but it likely will not begin without a fight.

The City Council has scheduled an informational briefing on the plan for Aug. 3, while community groups on Windward Oahu also are organizing forums to discuss solutions and make presentations on alternative technologies.

Steinberger has said feasibility test runs would be the first step, to determine both the impact on the affected communities and whether the diversion of sludge is effective at managing the over-capacity at Sand Island.

"If we increase the risk at the other facility, then that's something that we wouldn't pursue," he said.

The city has experience hauling sludge. Because there are no digesters at treatment plants in Kahuku, Waimanalo, Wahiawa and Paalaa Kai, a total of roughly 216,600 gallons per week is hauled from those facilities to Kailua and Honouliuli. However, only the Wahiawa plant trucks sludge on a daily basis, the others haul on a semi-weekly schedule.

But test runs for the additional hauling from Sand Island are not good enough for some, including state lawmakers from the affected districts who say public hearings and even a formal environmental assessment should take place before the hauling even starts.

State Rep. Cynthia Thielen, a retired environmental attorney who fought the construction of the H-3 freeway, informed the city in a letter that an environmental assessment is needed, based on the 2009 Superferry decision by the state Supreme Court that said such a study is required when there may be secondary impacts on a community.

"I believe that I'm on strong grounds that they need to do an environmental assessment and we're working on putting together that position paper for the (Aug. 3) meeting," said Thielen (R, Kailua-Kaneohe).
She said she had retained the services of a pro bono attorney to help research and craft the position paper, but stopped short of saying she would go to court to force an assessment.

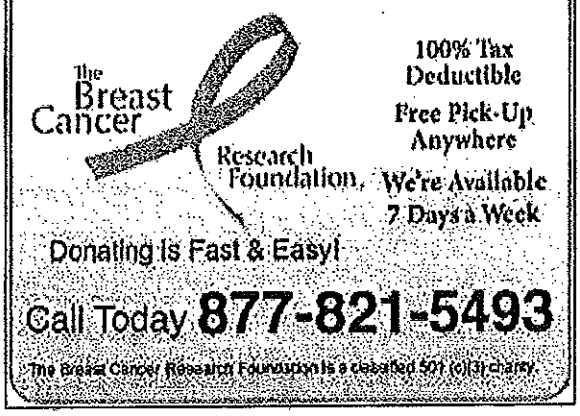
"The difficulty with going to court is it's a very expensive process," she said. "And obviously, I don't think that's the best way to deal with it or the practical way to deal with it.

"I think what has to happen is public outcry to say that this decision is just wrong."

Democratic state Sen. Will Espero, whose district

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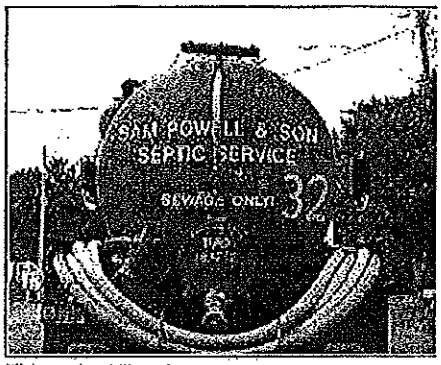
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Budget Battle Left Few Sewage Sludge Options

By Michael Levine | 07/15/2011



Flickr: smittenkitteneric

A plan to truck sewage sludge from Sand Island to Windward or Leeward Oahu has taken jabs from city and state politicians. But the city says its options are limited by budget cuts and environmental laws.

If trucking the waste to Kailua, Honouliuli or Waianae for processing is found to be either unfeasible or illegal, the list of choices gets shorter still.

Continuing to run the Sand Island digester at a higher rate than its designed capacity would amount to tempting the sludge gods. It could lead to environmental issues and potential fines and would leave the city ill-prepared in the case of an emergency, according to Department of Environmental Services Director Tim Steinberger.

Steinberger is also reluctant to bust out his nuclear option — an effective moratorium on all major development projects from Niu Valley to Halawa that he calls "a last resort." But that possibility remains on the table, if only as illustration of how dire the situation has become and how complacency isn't acceptable.

"We have to figure out something to do if we're not going to have that interim (solution) in place for another year and a half or two years, and we can't just sit there and do nothing," Steinberger said Wednesday.

The pressure, building for years, came to a head at last week's meeting of the Honolulu City Council. The council unanimously passed a resolution instructing Steinberger's department to investigate new technologies for processing wastewater and report back within 90 days.

This particular course of actions was set in motion in May and June, when the council removed a single wastewa project from Mayor Peter Carlisle's proposed capital budget. That $26 million item would have allowed the city to move forward with its plans to construct a second in-vessel bioconversion facility, known colloquially as an "egg." The money would have also allowed the city to build an interim fix to lessen the load on the first digester for the t years it takes to construct the second egg.

State Rep. Cynthia Thielen wrote letters to both the administration and the council criticizing the move and calling for an environmental assessment to review the impacts of trucking the sludge around the island. Steinberger said that because the practice will be temporary, it's not subject to an environmental review.

While the city weighs Cachola's political analysis, considers Thielen's legal analysis and explores its short-term options, it's also investigating more alternatives.

The council's resolution calls for an exploration of more technologies. But it's silent on whether those should be short- or long-term solutions; on whether they should supplant or supplement the Synagro system; and whether the council is willing to spend extra money to implement the technologies.

Steinberger said his team is at work to get answer to the council in the 90-day window laid out in the resolution. The conversation will continue soon, as Martin said he intends to hold an informational briefing as part of the Public Works Committee's August meeting.

DISCUSSION: *Should the city truck sewage sludge from Sand Island to Honouliuli or Kailua? Join the conversation.*

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Have feedback? Suggestions? Email Us!

Hawaiian Earth Recycling LLC

Project Office: 1169 Mikole Street, Honolulu, Hawaii 96825

Operating Location: 91-400 Malakole Street, Kapolei Hawaii 96707

September 12, 2011

Representative Marcus R. Oshiro
House of Representatives
State of Hawaii
State Capitol
Honolulu, HI 96813

Subject: Draft Environmental Impact Statement (DEIS)
In-Vessel Composting Facility Project
Tax Map Key: 6-5-002: 026
Waialua, Oahu, Hawaii

Dear Representative Oshiro:

Thank you for meeting with us on September 2, 2011 to discuss your August 6, 2011 comment letter on the Draft Environmental Impact Statement (DEIS) In-Vessel Composting Facility Project. The following responses are offered in respective order of your comments:

I. Inadequate review of laws and policies

The Environmental Impact Statement guidelines and rules for the State of Hawaii are specifically detailed in Chapter 200, Hawaii Administrative Rules (HAR), Environmental Impact Statement Rules, under Section 11-200-17 Content Requirements; Draft Environmental Impact lists:

> *B.6. Compatibility with land use plans and policies, and listing of permits or approvals.* (emphasis added).

The subject DEIS complied with and includes this information required by Section 11-200-17, Content Requirements. The Content Requirements do not require a listing of all applicable laws because all Federal and Hawaii State laws and all City and County of Honolulu Ordinances should be applicable to any undertaking on Oahu that may be evaluated through an EIS pursuant to Chapter 343, Hawaii Revised Statutes (HRS). Please make special note that this proposed project would not be exempt from any law or ordinance. The rules require a listing of permits but not an analysis of the project's compliance with permit standards.

The DEIS cites applicable laws and ordinance as they apply to likely environmental impacts of the proposed project. The list of Regulations noted in your letter are included

in the DOH operating permits for the project, that Hawaiian Earth Recycling will comply with in order to receive the operating permit. The DEIS also details what permits and approvals that may be required by State agencies, that are delegated to comply with Federal statutes, and City & County of Honolulu (C&CH) to permit, construct and operate, which are not required to be discussed in a DEIS:

- *Chapter 339, HRS (Litter Control)*

  The proposed project would be subject to laws prohibiting littering and be a DOH permit condition. The City & County of Honolulu (C&CH) materials will be off-loaded inside an enclosed air-controlled receiving building and then composted under the GORE™ Cover System. Therefore, the project would not involve activities suggesting that littering would be a significant concern.

- *Chapter 340A, HRS, Solid Waste*

  Chapter 7 of the Draft EIS lists the Solid Waste Management Permit (SWMP). The site currently has a State of Hawaii Department of Health (DOH) approved composting permit, which is noted in the DEIS. With the inclusion of dewatered sewage sludge (biosolids), the DOH Solid Waste Management Permit will be modified to incorporate all DOH requirements for the composting of biosolids as clearly specified in Hawaii Administrative Rules (HAR) Title 11 DOH Chapter 58.1-41.

- *Chapter 340B, HRS, Wastewater Treatment Personnel*

  Section 3.14 of the DEIS states that a septic system will be installed to accommodate wastewater generated on-site (see Section 3.14 in Draft EIS). The septic system will accommodate the number of on-site personnel and will be subject to approval by DOH - Wastewater Branch permitting requirements.

  The proposed project is not a wastewater treatment facility.

- *Chapter 340E, HRS, Safe Drinking Water*

  The proposed project would not involve activities suggesting that there will be significant impacts on safe drinking water. Please note, that there are no Board of Water Supply's (BOWS) wells, reservoirs or water supply lines on or near then proposed project site. Hence the reason, HER submitted and received approval for a water well permit by BOWS. Section 3.3.1 of the DEIS discusses impacts on groundwater.

- *Chapter 341, HRS, Environmental Quality Control*

  This statute created the Environmental Center, Environmental Council, and the Office of Environmental Quality Control (OEQC), within the structure of the state

government to stimulate, expand and coordinate efforts to maintain the quality of Hawaii's environment. The EIS is being prepared as a requirement of the City contract and the EIS is following the requirements of Chapter 343, HRS. The Council oversees the Chapter 343, HRS process.

The Environmental Impact Statement Preparation Notice (EISPN) and DEIS was published in OEQC's The Environmental Notice on March 8, 2011 and June 23, 2011. Copies of the EISPN and DEIS were distributed to University of Hawaii, Environmental Center (UH) and OEQC.

OEQC's comments on the EISPN and our response is included in Appendix L in the DEIS. UH did not submit comments.

- *Chapter 342B, HRS, Air Pollution Control*

  Section 3.6 of the DEIS discusses air quality impacts and identifies dust control measures that will be employed, as appropriate, during construction to comply with HAR, Title 11, Chapter 60 "Air Pollution Control." That section also discusses measures to mitigate dust generation within the project site once the facility becomes operational.

  As mentioned in Chapter 7 List of Permits and Approvals, a Temporary Non-Covered Source Permit for outdoor diesel powered equipment, such as, grinders and a Solid Waste Management Permit may be required.

- *Chapter 342D, HRS, Water Pollution*

  The proposed project would not involve activities suggesting that there will be significant impacts on water quality. Section 3.3.2 of the DEIS discusses impacts on surface waters and, including the need to comply with HAR Chapters 11-54 and 11-55, as applicable to all State waters and the need to obtain a National Pollutant Discharge Elimination System (NPDES) Notice of Intent (NOI) for Storm Water Associated with Construction Activities from the DOH.

  The proposed site layout has been designed to retain on stormwater on-site for re-use. In addition, the separate leachate collection systems for the green and food waste compost system and the dewatered biosolids compost system are close loop for reuse associated with the composting of those feed stocks only.

- *Chapter 342G, HRS, Integrated Solid Waste Management*

  The C&CH revised its Integrated Solid Waste Management Plan (ISWMP) in 2008. Section 5.6 Sewage Sludge of the ISWMP states:

  "Industry research suggests that the greatest opportunity for increased diversion from Hawaii's waste stream is through the recovery of organic materials. It can reduce

landfill reliance, while promoting growth opportunities for local businesses and products of value to Hawaii's tourism, agricultural, and landscape businesses."

The ISWMP goes on to state further:

"A number of alternatives to disposal have been implemented in Hawaii and throughout different parts of the country. The most prominent of these techniques involve centralized composting:

- *Commercial co-composting (biosolids or food waste, open or in-vessel systems)."*

As of this date, the C&CH has a long term contract with Synagro to process sewage sludge from the Sand Island WWTP into a pelletized compost product. The proposed project will process the sewage sludge primarily from the City's Honouliuli and Kailua wastewater treatment facilities.

The proposed project will help to meet the goals of the ISWMP and can be an important component of the C&CH's Solid Waste Management System while *"....promoting growth opportunities for local businesses and products of value..."*

This project will not only promote the reuse of composted green waste, food waste and dewatered sewage sludge for the beneficial use in the Island's agricultural and landscape industries, but reduce the reliance on the Island's only municipal solid waste landfill for the burial of these recyclable materials. HER trusts that the Representative would strongly support such a project that would promote such beneficial reuse of these materials.

- *Chapter 342H, HRS, Solid Waste Pollution*

The proposed project would be subject to all applicable DOH rules on solid waste disposal pursuant to Chapter 342H, HRS. The solid wastes that would be generated by the project's operation would be those materials removed from the greenwaste and food wastes that are not compostable. These materials, such as plastic bags, would be removed by sorting the incoming materials and/or screening of the finished composted products and then appropriately disposed at primarily the C&CH H-Power facility to generate electricity. It is estimated that this would represented less than a 1/10 of 1% of incoming materials by volume. Therefore, the proposed project would not involve activities indicating that solid waste pollution would be particular concern.

- *Chapter 342J, HRS, Hazardous Waste*

The proposed project would be subject to all applicable federal and state laws and rules pertaining to hazardous waste. All DOH operating permits would preclude the acceptance of any hazardous materials at the proposed facility. The proposed project would not involve activities indicating that hazardous wastes would be a particular concern.

- *Chapter 343, HRS, Environmental Impact Statements*

  As discussed, the proposed project is not subject to Chapter 343, HRS because it is not located in any of the geographic "triggers", would not involve any of activity "triggers" nor does the project involve the use of state or county lands or funds. This EIS is being prepared because the contract awarded to Hawaiian Earth Recycling LLC (HER) by the C&CH, Department of Environmental Services (ENV) states that an EIS is required. Since the contract does not specify the content or procedure for the EIS, HER committed to ENV that it would prepare and process the EIS following the content and procedural requirements under Chapter 343, HRS. This is concisely stated in the Preface of the DEIS and the EIS is being undertaken to meet the requirements of the City Contract.

  It should be clarified that the requirement that a proposed action have "no anticipated significant impact" is only applicable to a Final Environmental Assessment and Finding of No Significant Impact. It is not required of the EIS, which are required to disclose significant impacts. Once disclosed, the EIS can be found to be acceptable. For the proposed project, the EIS did not find any significant impacts, so could likely have been processed as an environmental assessment if it were subject to Chapter 343, HRS. It was processed as an EIS per the contract awarded to HER.

  One of the purposes of EA and EIS is to provide various agencies such as the DOH an opportunity to review the project and offer comments, such as the need for permits or approvals. For this project, HER also consulted with DOH - Hazardous & Solid Waste and Wastewater Branch independently and has been in communication to address any concerns expressed.

  The food waste to be composted by the proposed project will be pre- and post consumer food waste, which include fruits and vegetables that are unfit to sell or serve, and fruit and vegetable trimmings. It is not foreseen that meat products will be included at this time.

  The site of proposed project does have an existing DOH SWMP for composting, including the GORE™ Cover System. HER will submit to DOH a new or modified permit for its proposed project to include the composting of the food waste per § 11-58.1-41. The EPA has cited that the GORE ™ Cover System meets the requirements as an in-vessel composting system and meets all temperature requirements to meet the EPA's Process to Further Reduce pathogens, including biosolids. The Draft EIS does not indicate that any permit would be transferred from the Campbell Industrial Park facility.

II. <u>Transportation of dewatered sewage sludge</u>

  The dewatered sludge to be composted by the proposed project is an end product of the wastewater treatment process and is currently taken for disposal to

Waimanalo Gulch Landfill. It has been processed through a sludge digester and dewatered by centrifuges. The C&CH has been transporting dewatered sewage sludge (biosolids) from Kailua Regional Wastewater Treatment Plant and Honouliuli Wastewater Treatment Plant to Waimanalo Gulch Landfill, since 1985. It should be noted that the biosolids to be processed by the project are not the same as the untreated sewage sludge mentioned in the articles you provided.

Currently, the C&CH transports approximately six to seven 20 cubic yards truck loads of biosolids per day to the Waimanalo Gulch landfill from the Honouliuli and Kailua wastewater treatment plants. Existing City personnel were queried and since 1985, only three traffic accidents could be recalled. In the event of an accident the biosolids, which have the consistency of moist dirt, would be thoroughly cleaned by City crews. Hence, it would be highly unlikely to adversely affect a groundwater resource through leaching because the biosolids will have been cleaned up and removed.

It should be noted that the C&CH and many private hauling companies currently collect over 1.3 million tons of refuse annually from residential homes, condominiums, and businesses and then deliver these wastes to either Waimanalo Gulch Landfill, PVT Landfill (construction and demolition waste), H-Power, recycling or composting facilities using City and State owned roadways. There is no provision in Chapter 343, HRS that any new or change in routes used for transporting biosolids, refuse, greenwaste or food waste on State and City roadways is a "trigger" for the preparation of an EA or EIS.

The proposed in-vessel composting facility is not a wastewater treatment plant. No free liquids wastes, such as raw wastewater, will be delivered or conveyed to the compost facility. The facility is engineered and designed by WL GORE™ composting engineering group to handle green waste, food waste and dewatered sewage sludge (biosolids). The facility will be turning recyclable materials (green waste, food waste and biosolids) into fully stabilized compost products (i.e. will not revert to dewatered sewage sludge, green waste or food waste) that can be used in the agricultural industry, commercial industry and home owners. Under the Contract with the City up to 150,000 tons of recyclable waste could be composted instead of going to Oahu's landfills.

III. Source and type of food waste component

Food waste will be delivered from a soon to be developed City and County of Honolulu food waste collection program. By far, the greatest volume of material to be composted at the proposed project will be green waste, 70% to 80%. Food waste will be a relatively minor addition at only 5% to 10% of the total stream. As discussed previously, no meat products are envisioned to be composted at this time. This food waste collection would include fruit or vegetable trimmings that residents may place into their greenwaste collection containers.

IV. Possible negative impacts on view planes at Kukaniloko Birthing Stones

The Kukaniloko Birthing Stones are located approximately 1.5 miles southwest of the project site. As of today, the existing composting facility is not visible from birthing stones. It is unlikely that the proposed facility's receiving building would be visible because of the intervening distance and undulating topography. With the maturation of the facility's landscaping, it would be provide more visual screens.

Cultural Surveys Hawaii conducted an archaeological assessment and a cultural impact assessment and the reports are included in its entirety in the Draft EIS. Mr. Tom Lechanko and Ms. Velma Kekipi were interviewed, which was recommended in your letter. Please refer to DEIS, Appendix H.

V. Public perception and community impact mitigation

HER and its affiliated Hawaiian Earth Products (HEP) has been in the composting business in Hawaii since 1993. Currently, HER's composting operations divert approximately 85,000 tons of waste from the C&CH's H-Power and landfill facilities. Since 1993, HEP has composted more than 800,000 tons of green waste and more than 90% of the composted finished products have been utilized by Oahu's agricultural community.

Many commercial, agricultural and residential customers are familiar, use and trust HEP's "Menehune Magic" brands of compost products and soil blends. HEP is the only composting operation that can compost, deliver and apply these composted finished products to the agricultural industry, i.e. farms, as a soil amendment.

The selection of the proposed location for the facility was based on the project's ability to serve the abundance of nearby agricultural lands with a need of large quantities of composted materials in a short hauling distance. One costly hindrance by the agricultural industry's ability to increase its use of compost has been the distance to haul the compost. The Waialua location serves to reduce this barrier significantly.

More than a dozen agricultural industry companies located in the Kunia/Wahiawa/ Waialua/North Shore use HEP products to improve crop production. In addition, the USDA has awarded $300,000.00 grant to HEP to assist farmers in using compost in remediating former pineapple fields which will return these fields to sustainable agricultural production. Compost has proven to effectively increase the pH levels of these former pineapple fields which will allow the diversification of the area's agriculture.

The project will be an important and integral component of Oahu's overall solid waste management system, as private companies, such as HER, assist the C&CH's

efforts to direct materials for reuse. Without the proposed facility up to 150,000 tons per year of green waste, food waste and dewatered sewage sludge could be buried in Oahu's only landfill.

HER supports the surrounding community now and has been a good neighbor by providing 20 cubic yards of compost for local residents at no charge at the recently concluded Wahiawa Pineapple Festival.

The proposed project was presented to the Wahiawa-Whitmore Village and North Shore Neighborhood Boards in March 2011 and on June 20 and June 28, 2011. The Wahiawa-Whitmore Village Neighborhood Board supported HER's CUP-Major and SUP applications by a vote of 5-0 on June 20, 2011. The North Shore Neighborhood Board supported the same verdict by a vote of 12-1 on June 28, 2011.

Several members of both Boards supported the project because the facility will provide jobs in the community. But more importantly, serve as a tangible signal to all that would drive Wilikina Drive that the agricultural industry is regaining a foothold in these former sugarcane and pineapple fields through companies such as HER that will build and sustain ag-based projects and just allow the field to be filled with homes.

The proposal for impact migration benefits package would normally be associated with publicly financed infrastructure projects, such as, a wastewater treatment plant or landfill. These types of "public nuisance" facilities are seen as project s that the surrounding residents would not normally welcome with open arms. Therefore, an impact migration benefits package is provide to those residents that a hosting facilities that are necessary to sever the good of the greater resident population. This project does not meet any of these types of impacts.

The project is 100% privately financed, will produce reusable products and has been welcome by the community. HER has made three separate presentations to both noted Neighborhood Boards and by the resulting votes has been welcome by the area's residents.

HER has also presented to the Wahiawa Rainbow Seniors and Wahiawa Community & Business Association, Inc. HER will continue to provide updates to the community.

We hope that this response clarifies the proposed project and the manner in which it was evaluated by the EIS process. HER would be more than willing to host a tour of both our existing facilities and the proposed site to expand on the information contained in this letter.

Should you have any questions, please call me at 792-0126. Thank you for your participation during the EIS process.

Sincerely,

F. Gregory Apa
Project Manager

cc: Mr. Earl Matsukawa, Wilson Okamoto Corporation
Mr. Steve Serikaku, City & County of Honolulu Environmental Services

Appendix N

Letter from
Wahiawa Community & Business Association
May 20, 2011

May 20, 2011

Mr. Greg Apa
Hawaiian Earth Recycling
1169 Mikole Street
Honolulu, Hawaii 96819

Dear Mr. Apa:

On May 9, 2011 the Wahiawa Community and Business Association (WCBA) board of directors heard a presentation on the proposed In-Vessel Composting Facility to be developed outside of Wahiawa on former Galbraith Trust lands.

Representatives from the project applicant, Hawaii Earth Recycling, LLC, fielded questions from board members and the board voted unanimously to support this project.

Recycling organic matter such as green waste, food waste and sewage sludge and turning it into beneficial agricultural products is a necessity in today's world. The rising cost of agricultural inputs such as fertilizers hurts the farmers' bottom line and it's difficult to pass on that cost because of the soft economy.

Having alternatives to imported oil-based fertilizers such as locally produced organic compost will allow our agricultural industry to be more resilient in these uncertain economic times.

Sustainability and food self-sufficiency is very top of mind for Hawaii's residents being that we are the most isolated land mass and heavily dependent on imports. Turning waste into organic matter to regenerate our farmlands on a larger scale is a step in the right direction.

Respectfully,

William R. Putre
President

Daniel S. Nakasone
Economic Development Committee Chair

Wahiawa Community & Business Association, Inc.
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